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THE ILLUSTRATED
Journal of Agriculture

Montreal, January 1, 1896.

Table of Contents

NOTES BY THE WAY:

Linseed-cake.....	279
Mangels.....	279
Mushrooms.....	279
Farm-pupils in England.....	279
Manurial value of foods.....	279
Sheep-scab.....	279
Points that tell against a horse.....	279
Ag. statistics.....	279
Calves scouring.....	279
Ropy milk.....	279
Liquid manure.....	279
Dressed rams.....	279
Food and milk.....	280
Arson.....	280
England's wheat crop '95.....	280
Frosty bits.....	280
Why Canadian farmers prosper.....	280
Carbohydrates.....	280
Comparison of foods.....	280
Hellers cow, calves.....	280
Clover sickness.....	280
Preserving a good road.....	280
Potatoes as cattle-food.....	280
Vetches or tare.....	281
Tile-drain-outlets.....	281
Nitrogen.....	281
Colostrum or bet-tyn.....	282
Calves-foot.....	282
Nitrogenous horse-food.....	282
Horse-beans.....	282
Comp. of Ag. Manur.....	282
Report of the Judges.....	282
Argent oil farms.....	282
Farmer's Clubs, of Rouville.....	282
Fruit.....	283
Honey.....	283
Insect-destroyers.....	283
Potatoes, &c.....	283
Report of M.M. Oigault and Leclair.....	283
Conclusion.....	283

THE DAIRY:

Artificial colouring.....	285
Ventilation for cowhouses.....	286
Turnips and butter flavour.....	286
Fat in milk.....	286
Stable management of cows.....	286
M. Bouthillier on crops and scalding.....	286
Losses in creaming.....	287
Ontario Dairyman.....	287
Some points in butter-making.....	288
Eastern Ontario Dairyman.....	288

SWINE:

Duroc-Jerseys.....	288
The best breed of pigs.....	288
Scotch farmers in England.....	289
Turnip-taste.....	289
Farmer's Syndicate of P. Q.....	289
"GIVE US OF YOUR KNOWLEDGE".....	289

HOUSEHOLD MATTERS:

Comforts in a farm kitchen.....	289
A new cooking utensil.....	290
Cracks in the floor.....	290
"Virgins" improved upon.....	290
Deep and insomnia.....	290
Window gardening.....	290
Hints.....	290
Optical delusions.....	290
Taffy.....	290
Bottle-bells.....	291

THE HIVE:

Winter care of bees.....	291
Why farming does not pay.....	291
"A farmer's song," by Geo. Moore.....	291
Ginseng culture.....	291
Hors, by the Editor.....	291
Mark-Lane prices.....	293
ROTHAMSTED EXPERIMENTS.....	293

Notes by the Way.

Linseed-cake.—A propos of a paragraph on "linseed cake" in our last number, we have received a letter from one of the largest dealers in seed, grain, &c., showing that we were utterly in error as to the present price of cake. We stated that, "if it could be had cheaper," than the old price, i. e., \$34.00, "we should be glad to

know of it." Our correspondent quotes prices as follows: "Pure ground linseed-meal, made in Winnipeg, out of the best and cleanest seed, and by the old machinery in use in Montreal 30 years ago, and therefore with a little more oil (fat) in it than cake made by more modern machinery: Retail price \$22.00 a ton; large lots for less, if a car-load is taken \$20.00 a ton, or even less." These prices are low enough in all conscience, and should induce a large consumption of the article in question.

Mangels.—It is really a wonderful thing, if one comes to think of it, that our neighbours in the states will not grow mangels. According to the *Country Gentleman*, they are selling in New Jersey for from \$14 to \$16 a ton! Now, a very moderate crop of mangels may be set at 20 tons an acre, which at the above prices, would be worth, or rather would sell for, from \$280 to \$300! Some seasons, the paper continues, they can be bought for \$10 a ton, but even at that price an acre's yield would fetch \$200: what other farm product would be as profitable?

Mushrooms.—A few years ago, the village of Lachine was full of excellent mushrooms, gathered in the pastures just below the fine maple-groves of the Boyer and Dawes properties. Why not try to grow them in other pastures, where the land is too full of stones to be comfortably ploughed? There are thousands of acres that would grow mushrooms admirably, and would prove a source of profit to the owner without injury to the pasture. The first thing is to get good spawn that will run freely when properly placed in a fitting medium, as thus: break the spawn into pieces about the size of a hen's egg; then, raise the turf, with a spade, and bury a piece of the spawn about 4 inches deep. The turf must be made thoroughly firm again, by treading and beating it down with the back of the spade, otherwise, the spawn will not run freely into the surrounding soil but will probably fail entirely. The proper distance between the inserted lumps of spawn is from 4 to 6 yards each way. The inoculation should be done in the spring, and a dressing of salt will do the crop no harm. Why do mushrooms almost invariably do better in a horse-pasture than where cows or sheep graze?

Farm-pupils in England.—A pleasant life is that of a farm-pupil in the midland counties of England, as the following advertisement in the *Agricultural Gazette* will show:

A LINCOLNSHIRE FARMER, who holds a certificate of the Royal Agricultural Society for farming, has VACANCIES for TWO PUPILS; resides within easy distance of the Belvoir and the Cottles more Hounds.—Address, W. E. WADSLBY, White House, Dunsby, Bourne, Lincs.

Two packs of foxhounds within easy reach! How many hunters is the pupil expected to keep. If he only hunts three days a week, he will require at least 2 hunters and a hack. Probably, the advertiser is at this present moment clamoring for a duty on foreign grain, &c., to enable him and his pupils to keep up such a style of living.

Manurial value of foods.—A vast difference exists in England between the theoretical and the practical values of foods given to stock as regards

the manurial properties left on the land. Theoretically, cotton-seed cake is held to leave behind $\frac{1}{2}$ of its cost, but, practically, no land-agent would, or valuing an outgoing tenant's inventory allow more than $\frac{1}{4}$, and many a good judge considers $\frac{1}{4}$ as quite sufficient when the cake, &c., are consumed on pastures.

Sheep-scab.—This disease; which has caused a good deal of excitement lately on account of the order for the slaughter of all United-States' and Canadian sheep at the port of entry in England; this disease is always serious and sometimes fatal. It is caused by a tiny but awfully prolific beast called an *acarus*. So prolific is it that a pair of acari may have produced at the end of a fortnight a family of 15, and at the end of three months their progeny will number a million and a half. Worth while guarding against it is it not? To this end all rubbing places, such as gate-posts, trees, broken fences, &c., should be thoroughly disinfected, and all locks of wool found where diseased sheep have been should be collected and burnt. When dipping is resorted to, great care should be taken that the liquid reaches all the scabby parts, saturating them thoroughly. After dipping, all the diseased sheep should be kept by themselves, carefully examine, and doubtful cases dressed with mercurial ointment.

Points that tell against a horse.—The following is from the advice given to those to whom the selection of horses for the British cavalry is entrusted:

Reject a horse whose forelegs are not straight; it will not stand wear. Stand behind the horse as it walks away from you, and you will be able to notice there defects if they exist. Reject a horse that is light below the knee, especially if immediately below the knee; the conformation is essentially weak; or a horse with long or short or upright pasterns—long pasterns are subject to sprains; short or upright pasterns make a horse unpleasant to ride, and, on account of extra concussions, are apt to cause ossific deposits; or a horse with toes turned in (1) or out. The twist generally occurs at the fetlock. Toes turned out are more objectionable than toes turned in. When toes turn out the fetlocks are generally turned in, and animals so formed are apt to cut or brush. Both, however, are very weak formations.

Reject a horse whose hind legs are too far behind; good propelling power will be wanting, and disease as a result may be expected in the hocks. And a horse which goes either very wide or very close behind, and one with very straight or very bent hocks; the former cause undue concussion; the latter are apt to give way.

Reject a horse that is "split up"—that is, shows much daylight from between the thighs; propelling power comes from behind, and must be deficient in horses without due muscular development between the thighs.

Reject a horse with flat or overly large feet, or with very small feet; medium sized are best; also a horse with one foot smaller than the other.

The preliminary Agricultural Produce Statistics issued by the Board of Agriculture, giving the estimated pro-

(1) The most perfect hunter we ever had turned his toes in. Along the road he was constantly stumbling, but in the field he never made a mistake.—Ed.

duce of wheat, barley, and oats in Great Britain for 1895, have been published. The averages for the whole of Great Britain are 26 23 bushels of wheat, as compared with 30.69 for last year, and 29.32 as the ten years' average; 31.69 bushels of barley, against 34.50 and 33.02; and 37.06 bushels of oats, against 4.64 and 38.21. The yield of wheat is not quite so low as it was estimated during harvest; but only once before during the preceding ten years—namely, in the first of the two recent years of drought, 1893—has it been so low as it is put for the present year.

CALVES SCOURING.—I have a few young calves in the scour, if you could let me know what would be a good cure, through the *Agricultural Gazette*, I should be very much obliged.—J. B. W. (When a number of calves commence scouring the first step towards checking it should be an endeavour to find the cause of the mischief, and in about nine cases out of ten the evil may be discovered either in the food they are having or the manner in which it is supplied. J. B. W. does not say how his calves are being fed, but if he will forward particulars in this respect I may offer him useful advice. If the calves are being hand fed with milk, it will be well to give them each a dose of linseed oil, and add lime water each time to their milk. Should the diarrhoea continue after this, give them a few doses of the following:—Prepared chalk 8 oz., catechu (powdered) 1 oz., powdered opium 2 drachms, powdered ginger 4 drachms, powdered aniseed 2 oz.; mix thoroughly, and give each calf that requires it one or two tablespoonful (according to age) in a little cold flour gruel two or three times each day as long as necessary, discontinuing the medicine immediately the scouring ceases. A dessertspoonful of brandy may with advantage be given with the above medicine if the patients are chilly or weak.—A.) (1)

COWS GIVING ROPY MILK.—This condition of the milk is caused by slight systemic derangement, the liver generally being the organ chiefly affected, but often in only such a comparatively mild degree that the animals give no visible signs of ill-health. Give a fair dose of Epsom salts ($\frac{3}{4}$ lb.) to each cow, and follow this with a dose each alternate day of the following: Bicarbonate of soda 1 ounce, extract of taraxacum 4 drachms, extract of gentian 4 drachms, water 3 quart. Dissolve the taraxacum and the gentian with $\frac{1}{2}$ pint of the water (hot), and the bicarbonate of soda in the remaining $\frac{3}{4}$ pint, mix the whole, and give when sufficiently cool. There is usually some general cause such as the existence in the food or water of some deleterious material, which is the primary cause of this trouble. Allow your cows always to have access to lumps of rock salt.—A.

LIQUID MANURE.—On a dairy farm the liquid manure of a some twenty cows and runnags from yards are collected in a tank fitted with a chain pump. I shall be obliged if you will say what you consider to be the best method of utilising the same, the quantity to apply, and the best time of application. The land is light, gravelly loam, and the farm is half arable and half temporary pasture.

(1) We have often heard, in England, that vetches given to cows will cause ropiness in milk.—Ed.

Apply the liquid manure from a water barrel or cart provided with a distributor, such as you see used in watering the streets. The precise quantity per acre is not material, as at ordinary pace you will apply a quantity which you will repeat over the same area of grassland to suit your own convenience. You must, however, apply the liquid during wet weather, as otherwise even a little would burn up your grass.)

Dressed Lambs are not wanted in hot weather and sell poorly at \$1.75 a 2.25 each, in leading wholesale markets.

Food and milk.—Says the "Dairy-Records" of the Michigan Experiment Station: "The effect of any change of food is exhibited most often in the amount of the milk yield, rather than in its quality." Very likely; but that is an avowal that it is not unusual for a change of food to exhibit its effect in the quality of the milk.

Argon.—Professor Ramsay, University College, London, Eng., quite recently discovered a new element in atmosphere. What Argon is, more than a third constituent of the atmosphere; what are its uses, virtues, propensities; what part it performs in the economy of nature, nobody yet knows. All that is yet known of it is that there is such an element in the atmosphere; that it is not a vague fraction of the bulk of the whole, but is as one in one hundred and twenty-five of the bulk of the air; that in every room there are pounds of it, gallons of it. Argon is now being sent to chemists all over the world by parcels-post. Until this discovery, air was represented by the symbol $N_2 O_2$; but now, it has been found necessary to add A, to the symbol, which now reads $N_2 O_2 A_1$. Well might Socrates say that he had learned enough to know that he knew nothing! How we envy those who are just born into this marvellous world; for the next century will see very wonderful things.

England's wheat-crop of 1895 seems to have been very fine in quality, though the yield was nearly 3 bushels below the average of 29.90 bushels to the imperial acre. Millers there say that the samples hitherto delivered are the best since 1887, and even as good as those of that marvellous wheat year, 1868. There is still a great deal, comparatively speaking, of the 1894 crop left, and as that has been standing in the stack for some 16 months, its quality is so much improved that it goes into market on equal terms with the crop of '95. But how can times be so bad for the English farmers if "a considerable reserve" of wheat has been kept back for more than a twelve-months?

Horses' mouths are not frost-proof. Chopping off their tails and shaving the hair off the stumps is bad enough, but how much suffering is carelessly inflicted on the poor brutes by putting cold bits into their mouths. Just let any one try the effect of putting his tongue to a piece of iron in a frosty morning, and see how he likes the sensation! Not much trouble, one would think, to put the bit in one's pocket for a few minutes.

Why Canadian farmers prosper.—According to Prof. Saunders the Canadian crops are very much superior in yield to the crops of the United States:

The average wheat crop of the U. S. yields 12.3 bu. p. a.; Canada 14.6 Barley, U. S., 21.4; Canada 24.7 Oats, U. S. 25.1; Canada 28.7. Value of cattle exports in 1875, \$1,000,000, 1892, 7,500,000. Cheese exports in 1894, \$4,000,000; 1894, \$12,000,000 Canada now supplies 46 per cent of all the cheese used in Great Britain, and exports more of this commodity than the entire United States.

Carbohydrates.—Says the U. S. "Handbook of the Expt. Stations," a propos of carbohydrates: "They are not permanently stored up as such in the animal body, but are either stored up as fat, or burned in the system to produce heat and energy." Just so but it has taken the Expt. Stations a long time to find out what Lawes found out 50 years ago.

Comparison of different foods.—The following, from the *Country Gentleman* is a fair estimate of the different values of vegetables as animal food. Still, the price of bran seems to us to be put too high. We do not believe in it as a food when it costs more than at most \$14 a ton. And the writer of the answer seems to forget that the potatoes need cooking, to burst the starch-cells, whereas swedes (*rutabagas*), and cabbages, are quite as profitable uncooked as cooked. Any how, the weight that can be raised on an acre of land is a large factor in the value of any crop, and we hold that it is as easy to grow 30 tons of cabbages on an acre as it is to grow 20 tons of swedes on the same superficies.

Comparing Different Foods.—I lease give relative feeding value for milch cows, of cabbage, potatoes and swedes, compared with wheat bran at \$18 a ton.—G. P. S., *Marathon, N. Y.* [The only method of estimating the relative nutritive value of cattle foods that is to any degree exact, is on the basis of the digestible material which they contain. In comparing foods of the same class, this method must be fairly accurate, and in any case, no better way seems to be available. Applying this method to the foods about which inquiry is made, we get the following results: A ton of bran contains on the average 1200 lbs. of digestible material. With the bran at \$18 per ton, the digestible material costs 15 cents per lb. Potatoes contain on the average 352 lbs. of digestible material in one ton, and rutabagas 164 lbs. At 15 cents per lb. for digestible substance a ton of potatoes would be worth \$5 28, or 16c. per bu., and rutabagas \$2.46 per ton, or 7½c. bu. Calculated on the same basis, the cabbages would be worth about \$2 25 per ton. The prices seem small, but are doubtless fairly correct. Two and two make four in animal nutrition as in every other relation. It should be remembered, however, that a small proportion of roots added to a dry ration may yield a return all out of proportion to these prices, not because of the actual potential energy contained in them, but because of their general beneficial effect on the health and appetite of the animal.]

In England, as a general rule, no ordinary farmer ever thinks of rearing a heifer's first calf. Of course, this does not refer to a farmer who keeps thoroughbreds. We used to allow the first calf to suck the dam; thinking, and probably with reason, that it improved the udder and teats, and packed the young one off to

market as soon as it was fit to kill. But, Mr. Marvii James, as the following will show, holds that there are good practical reasons for this proceeding, and evidently speaks from experience.

"Marvin L. James of Shubert, Neb., writes the 'Practical Farmer' that it is his experience that the first calf of a heifer does not as a rule make as good a cow or show after breeding power as highly as the calves which are born at a mature period. He says a cow may improve each year for several years after her first calf is born, and each heifer calf being as good as herself, at the time of birth will consequently be an improvement over the one preceding it. On the other hand, take the heifer calf from a two-year-old heifer, then the heifer calf of heifer No. 2, and so on, and there will be no improvement whatever, or in other words, there would never have been any dairy cattle under those circumstances." Any man who has looked carefully into this would rather pay twice for the calf of a fully developed dairy cow, say seven years old, than have the other sort as a gift.

Clover-sickness.—Our old friend, Mr. William Hale, of Sherbrooke, used to be a profound sceptic as to the existence of what is generally called "clover sickness"; in other words, he did not believe that the too frequent sowings of the red-clover had the effect of making the land refuse to grow the plant at all. Does he still disbelieve in the disease? If so, perhaps the following extract from the *Country Gentleman* may convince him that there are many farmers, in many States of the Union, that agree with the editor of this periodical:

"C. O. F.," writing from the Rhode Island Experiment Station, mentions the fact (p. 643) that in New-England, "clover seeding often fails to catch and produce a good crop. Failure is so often the rule that farmers have gotten out of the way of sowing any clover at all." "I. P. R.," writing from the New-York station in regard to "clover running out," says (p. 611) that "not only in Maryland, but in New-York as well, much clover seed has failed during the present season and clover is becoming more and more precarious as a hay crop." He adds: "One is led to suspect, from the many letters that reach us on his subject, that possibly the land is becoming what is called 'clover-sick' although so far as we know nothing of that character has ever been noticed in the United States, although it is quite common in England."

"It was through experience with land that had grown repeated crops of clover and potatoes in close rotation for many years, that I was led to try rye in connection with a leguminous crop other than clover—the latter having become so uncertain that no rotation could be maintained."

Preserving a Good Road.—The London (Eng.) Road Improvement Association has issued the following rules for keeping Macadam and Telford pavements in repair:

1. Never allow a hollow, a rut, or a puddle to remain on a road, but fill it up at once with chips from the stone heap.

2. Always use chips for patching and for all repairs during the summer season.

3. Never put fresh stones on the road, if by cross-picking and a thorough use of the rake, the surface can

be made smooth and kept at the proper strength and section.

4. Remember that the rake is the most useful tool in your collection, and it should be kept close at hand the whole year round.

5. Do not spread large patches of stone over the whole width of the road, but coat the middle or horse track first, and when this has worn in, coat each of the sides in turn.

6. In moderately dry weather and on hard roads always pick up the old surface into ridges six inches apart, and remove all large and projecting stones before applying a new coating.

7. Never spread stones more than one stone deep, but add a second layer when the first has worn in, if one coat be not enough.

8. Never shoot stones on the road and crack them where they lie, or a smooth surface will be out of the question (1)

9. Never put a stone upon the road for repairing purpose that will not freely pass in every direction through a two inch ring, and remember that smaller stones should be used for patching and for all slight repairs.

10. Recollect that hard stones should be broken in finer gauge than soft, but that the two-inch gauge is the largest that should be used under any circumstances where no steam roller is employed.

11. Never be without your ring gauge; remember Macadam's advice, that any stone you cannot easily put into your mouth should be broken smaller.

12. Use chips, if possible, for binding newly-laid stones together, and remember that road sweepings, horse droppings, sods or grass and other rubbish, when used for this purpose, will ruin the best road ever constructed.

13. Remember that water-worn or rounded stones should never be used upon steep gradients, or they will fall to bind together.

14. Never allow dust or mud to lie on the surface of the roads, for either of these will double the cost of maintenance.

15. Recollect that dust becomes mud at the first shower, and that mud forms a wet blanket which will keep a road in a filthy condition for weeks at a time, instead of allowing it to dry in a few hours.

16. Remember that the middle of the road should always be a little higher than the sides, so that the rain may run into the side gutters at once.

17. Never allow the water tables, gutters, and ditches to clog, but keep them clear the whole year through.

Potatoes as cattle-food.—As potatoes are very cheap, owing to the abundant crop all over the world this year, the experiments of M. Aimé Girard, a well known chemist in France, have, no doubt, excited a great deal of interest in this country and the States, as well as in Europe. The following is from the pen of Mr. T. Bowick, a frequent correspondent of the *Country Gentleman*. We call attention to the last three lines of the letter, which we have underlined:

Last winter was the second season of M. Aimé Girard's systematic trials, and the results fully confirm those of the first season. To begin with, the question whether raw or cooked potatoes are preferable may be at once dismissed with the statement that in the earlier season the latter proved greatly superior for both cattle and sheep. Last season M. Girard selected nine

(1) This, we regret to say, is the almost invariable practice in Montreal.—Ed.

beasts of three breeds for fattening mainly on steamed potatoes. He used no cake or corn, and yet he finished the bullocks off for the butchers so that they were in exceptionally prime condition, producing meat of the very best quality. The ration per bullock throughout the whole of the trial consisted of 55 pounds of steamed potatoes, 6½ pounds of chaffed hay, about 13 pounds of loose hay, and 1 ounce of salt. The potatoes, after being thoroughly cooked, so that they fell to pieces on being taken out of the steamer, were placed in alternate layers with hay chaff in a tub, the mixture being well stirred, and then left for 24 hours. It was given to the beasts in three meals per day, while the loose hay was supplied to them in the intervals—most of it after the last meal of the mixture. The finishing of these beasts, which were nearly fat to begin with, occupied from 63 to 71 days in all but one case, in which 85 days were allowed, because the animal did not start well on his diet. The average gain in live weight was over 3 lbs. per day, nearly 3.1 lb. This is a very remarkable result, especially for the finishing stage of fattening. Very satisfactory, too, was the average percentage of carcass to live weight, which proved to be 60½. As to the quality of the meat, M. Girard gives the testimony of several high authorities to the effect that it was excellent, and that there was no excess of fat. The meat was sold at a price higher than that of the average first-class meat of the day. But the reader will ask, does it pay? Or rather, what price does the farmer get for his potatoes (so used) and for his hay? *I am sorry that the reply is wholly unsatisfactory—the potatoes and the hay making a very insignificant return when made into meat in this fashion.*

VETCHES.

EDS. COUNTRY GENTLEMAN—I am satisfied that some one who has knowledge of the English plant "vetches" and is familiar with its cultivation and the methods of feeding it, can give your readers valuable information by writing an article on that subject for your paper. My attention has been called to what is said of it by the Canadian farmers. But my information about the plant is very meagre. How is it grown? When should the seed be sown? How much to the acre? When should it be cut? How is it fed green as a soiling food? Is it or can it be made into hay or cut into the silo? Is the plant adapted to the climate and soil of western New York? Is it a profitable crop grown to be fed to milch cows? When fed, should it be fed separately or in connection with other foods? I suppose the plant is an annual. I am informed the Canadians feed it to work horses. How does it compare as a milk producing food with peas and oats?

I cut into the silo this year 70 ton loads of peas and oats from 12 acres besides soiling my herd from the field. That crop is all that saved me during the drought, and from the destruction made by grasshoppers.

A. H.

Jamestown, N. Y.

The culture of vetches has been tried many times in America, and as a rule, has been abandoned because the yield was not so satisfactory as clover or corn, and they are inclined to lodge like peas, and are therefore difficult to harvest. They are nitrogen-

gatherers, and all animals are fond of them, either cured or green.

There are several varieties, both European and American. One in common cultivation in Italy, where this plant is quite largely raised, is *Vicia sativa*. They grow best in a rather moist, warm climate on calcareous soil.

The objection to the American farmer would be the difficulty of harvesting it. The seed should be sown in the spring. (*as early as possible*.—Ed.) a little before the time for planting corn, either in drills as wheat is sown, or by broadcasting. From three pecks to a bushel of seed per acre will be required. Cutting may be done when the seeds are nearly mature, but it would be best to feed the material green, as soiling food. It could be put in the silo out or uncut, but would be difficult to keep on account of the large percentage of nitrogen which it contains.

The plant, without doubt, would grow well on any of the good soils of western New York, provided the land is not composed largely of clay. (*It does well on clays*.—Ed.) It is probable that it is not as profitable a crop to grow for milch cows as alfalfa, which would be far more likely to give satisfactory results. Most certainly it should be fed with other foods which contain a large per cent. of carbohydrates.

The plant is an annual. There is no reason why it could not be fed to horses doing light work satisfactorily if put to hard use, the ration should be balanced up with foods which contain more heat and energy producers.

It is equal in quality when green to peas and oats, and probably superior to either when made into hay. It is also probable that the yield as compared with peas and oats would be less.

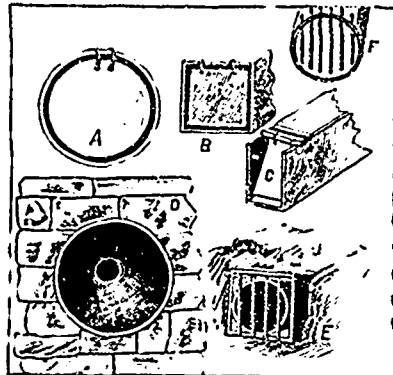
Vetches.—"Tares or vetches," says the above "are not much grown in this country;" and it then proceeds to give instruction as to the cultivation of the plant, starting by recommending 3 pecks to one bushel an acre as the proper quantity to sow. If the readers of the paper in question try to grow vetches with such a quantity of seed, they will not be likely to continue cultivating the crop; the proper quantity of the large vetch, the only sort fit for spring sowing, is 2½ bushels an acre with a bushel of oats to support the tares. The land should be fall-ploughed, and the mixed seed put in, with the drill if there is one handy, or with the grubber. In each case, the land should be well harrowed both before and after sowing, and when the crop is well up—say, 3 inches high—a roller passed over it will make the surface smooth for the scythe. Every reasonably strong loamy farm should have at least 4 acres of tares; sown early at twice, with a fortnight's interval between the sowings. They are good for all sorts of stock. As fast as they are consumed, the land should be ploughed, made fine, and sown with turnips up to the 20th July, and, after that date, with rape.

If vetches are wanted for hay, they should be cut when in full bloom; it allowed to nearly mature their seed they would be almost uneatable by any stock. Green vetches, before blooming, are mighty apt to cause scour. In the silo, they would keep as well as red-clover. The great trouble with making vetch-hay is that when nearly ready to carry, if a shower fall upon them the hay is absolutely spoiled. Vetches, pease, rape, and oats sown together make splendid food for milch-cows. In England, we have grown

hundreds of acres of winter-tares; the seed is smaller than the seed of the spring-vetch, and the crop heartier. Where large flocks are kept and folded on winter-tares, the sheep with a little grain or cake, do well: a little rape is generally sown with the tares when intended for this purpose.

PROTECTING TILE OUTLETS.

Unless special care is taken to protect the outlet of a tile drain, there is danger of its being more or less injured. If it is in the pasture, stock tramping about it are liable to crowd the tiles out of place or break them. Where land washes very easily, heavy rains will frequently displace them.



VARIOUS STYLES OF DRAIN OUTLETS.

It is also sometimes desirable to close the opening in the drain that muskrats, rabbits and other vermin cannot enter it during a dry time and build an obstruction. Several such devices are illustrated in the cut.

Outlet D is particularly suited to a tile which has its opening in the bank of a creek or ditch some distance from the bottom. It is merely a wall of stone or brick laid in cement. This protection prevents the washing away of earth from about the outlet or a displacement of tile or earth by freezing. Where stone is abundant, this style of an outlet is as practical as any and more substantial than many others. Outlet C consists of a wooden box made of 2-in. hard wood open at one end, which is slipped over the end of the drain. At the outer end a door, hinged at the top, is so arranged that the water can readily flow out, but nothing can go up the tile. A similar box outlet, E, is square at the outer end, over which iron rods are secured or a piece of strong wire netting is fastened. Outlet F is simply a tile with holes, in the top and bottom through which iron rods are passed. Trapdoor outlet A is a tile to the opening of which a circular piece of galvanized sheet iron is so attached that the water can pass out, but the entrance of any foreign matter is prevented. Outlet B is similar with a square tile for the end. These last are seldom made in the west, but are more generally in use in the east. When obtainable, they are more easily fitted with a piece of sheet iron. Often a small sewer tile is used to finish the lower end of a drain. The object in all these cases is to prevent an obstruction to the flow of water and to protect the drain.

Farm and Home.

NITROGEN.

(Continued.)

If there is one point more than another in which the nitrogenous matters in food distinguish themselves, it is in the nutrition of young animals. During the first few days after parturition, the milk is heavily charged with albuminoids, and those who, after the fashion of their ancestors, throw it away, are guilty of depriving the young animal of what is intended by nature as a means of ridding it of the indurated feces that have accumulated in its intestines.

In the cow, the *colostrum*, or *beistyn*, as the Scotch call it, contains about 20.7% of albuminoids, a proportion that gradually diminishes, until, about the fifth or sixth day, the milk becomes of a normal composition, containing only 3.7%.

Hence, when making up a ration for young calves during a deficiency of their natural food—milk—we have so often recommended our readers never to omit linseed—flaxseed—not only because, when mixed with skim-milk, the crushed linseed, by its oil, replaces the fat that the skimmer has deprived it of, but also, because the richness of the seed in albuminoids favours the rapid formation of nitrogenous tissue or lean meat. And what is true of the calf is also true of the foal, the lamb, and the pig: all young animals should have food rich in albuminoids, and, of course, in fat too: maize, Indian-corn, is by no means suitable food for young animals.

Horses, to do good work without suffering much loss of flesh, require plenty of nitrogenous food. Hence, the great stress all English stud-grooms lay upon plenty of *old beans* being at hand for their charges. This is an invariable rule in all hunting stables. For a hunter leaves the stable at, say, 9 o'clock A. M., has, very likely, from ten to fifteen miles to go to cover, and, even supposing a fox is found by eleven o'clock, is killed at noon, and the rider does not stay to find another fox, the horse will not reach the stable till perhaps 3 or 4 P. M., and unless his general food contains plenty of "stand by," he will be pretty faint before he gets home. Beans contain 4.08% of nitrogen, oats contain 2.06—just one-half as much; but the stablemen found out the use of beans, for horses in hard work, without ever having heard of such a word as nitrogen.

We saw that in cow's milk the albuminoid ratio was 1:3.6, so it is clear that a cow giving a full yield of milk must require a diet strong in nitrogen. As long as she is at pasture in good grass, with plenty of the different clovers in it, she can get along pretty well, but in a worn-out timothy meadow two or three pounds of linseed-cake, or an equivalent of pease-meal, will help her wonderfully. (1) If a cow gives 210 lbs. of milk a week, the nitrogen therein contained will be about equal to that contained in 100 lbs. of increased weight in a fattening bullock. All the great milk-farmers in England and Scotland give their cows plenty of nitrogenous food either in the form of bean-meal, pease-meal, or in cake. Vetches—tares—pease, and oats, sown together, are about the best green-fodder for milch cows: mown when the pulse is in bloom, there is no fear

(1) Cottonseed meal, being more astringent than linseed-cake, will do well for cows when, in a wet season, they are scouring.

of scour. The pigs will be glad of the remains; it is worth noticing how these crafty animals, when the vetches are a little old and tough, chew them and reject the fibre that nature teaches them is indigestible.

Nitrogen in manure—The proportion of nitrogen in the food that will reappear in the solid excrement depends upon what scientists call "the digestion coefficient" of the nitrogenous constituents, that is, the proportion of each constituent digested for 100 supplied in the food. For instance: while wheat straw is digestible to the extent of only 1% of the quantity of nitrogenous matter contained in the food, bean straw contains 10%—almost half—of the digestible nitrogenous are administered. It is a pity we do not grow more horse beans on our heavy land. Some of the lower "terraces" at Compton would turn out great crops of them and the dairy-farmers would soon see the beneficial effects they would have on their cows. The straw looks queer, but, if cut a little before the pods turn black, and given plenty of field-room, the cows will grind them up without waste: this by the way.

Now, we find that, by Wolff's tables, the digestion coefficient of nitrogenous matter in barley-meal given to a hog was 78; so, out of a 100 lbs. of nitrogen consumed 22 will be voided in solid excrement, and 78 will pass into the blood; and as 500 lbs. of barley-meal contains about 53 lbs of nitrogenous matter, which is probably able to produce 100 lbs. of pig-meat, containing 7.8 lbs. of albuminoids, it follows from these data that for 100 lbs. of nitrogen consumed, 14.7 are stored up as carcass, 22 reappear in the solid excrement, and 63.3 pass off as urea, &c., in the urine: but the annexed table will show you this much more clearly than our clumsy phraseology can.

NITROGEN IN ANIMAL PRODUCE, AND VOIDED, FOR 100 CONSUMED AS FOOD.

	Stored up as increase of milk	Voided as solid excrement	Voided as liquid excrement	Total excrement
Oxen, fattening.....	3.9	22.6	73.5	96.1
Sheep.....	4.0	16.0	80.0	100.0
Pigs.....	11.7	21.0	67.3	100.0
Milking cow.....	24.5	18.1	57.4	75.5

The relation of food to manure in the case of milking cows is taken from the Rothamsted experiments, in which the cows were liberally but not extravagantly fed, and gave about 27 lbs. of milk a day a piece.

Observe how important a part of the food finds its way into the manure! Of food administered to the fattening ox, only 3.9 lbs. of the nitrogen is recovered in the animal's body while 96.1 lbs. is ejected in the liquid and solid excrements. And, yet, people will not take care of the liquid when they have got it. Why? Because they cannot see its value. Farmers take pretty good care of the solids, but there is not much sense in allowing the liquid to be washed out of the dung-heap under the unspotted eaves of the stable, though the nitrogen—the most costly of all manurial constituents to buy—contained in it is generally three or four times as much as is contained in the solids.

Value of nitrogenous constituents of food in manure.—The average amount of nitrogen in some of our usual cattle-foods is as follows:

NITROGEN IN 100 PARTS;

Cotton cake decorticated.....	7.04
Flax seed.....	3.28
Horse beans.....	4.08
Bean.....	2.32
Oats.....	2.06
Wheat.....	1.87
Barley.....	1.70
Indian-corn.....	1.66
Brewers' grains.....	.78
Potatoes.....	.31
Swedes.....	.22
Carrots.....	.21
Mangels.....	.18
White turnips.....	.16
Bean straw.....	1.30
Oat.....	.64
Barley.....	.56
Wheat.....	.48

Thus, one ton of decorticated cotton seed-cake or meal contains about four times as much nitrogen as a ton of wheat, barley, or corn, and thirty-nine times as much as a ton of mangel; and, as we said before, bean and pease-straw are much more valuable than the straw of the cereals.

Pease-straw is generally so badly harvested in this country, by being allowed to stand too long before cutting, and then having to endure the rains of September, that it loses a good deal of its value. But, after all, one need only see the avidity with which a ewe pitches into it, in winter, to see how suited to the palate of the sheep this "haulm" is.

Now, the nitrogen of the solid excrements is not in a shape suitable for plant food—it has to be nitrified in the soil first. Hence, we see how very erroneous the usual calculation of pseudo-scientists is, when they value farmyard dung by the number of pounds of manurial constituents contained in it multiplied by the market-price of those constituents in nitrate of soda, sulphate of ammonia, phosphates, kainit, &c. Taking into consideration the losses during preparation, cartage, turning, &c., and the slowness of action of dung, Lawes and Gilbert estimate that the manure actually obtained from food has not more than half the value of the manurial constituents voided by the animal, if these are reckoned at the prices given for nitrogen, &c., in the usual artificial manures. The following extract, from the Eng. Ag. Gazette, will give some idea of the opinion of English valuers as to the lasting properties of the manure of milch-cows:

Allowance for bean meal.—What proportion is allowed at valuation for bean meal (purchased) consumed by dairy cows, according to the Agricultural Holdings Act, 1883?—H. [The usual allowance under the Agricultural Holdings Act, 1883, for purchased corn or meal used on the farm is one-eighth of the amount, as shown by certified vouchers, consumed on the farm during the last two years of the tenancy.—(Concluded.)

COMPETITION OF AGRICULTURAL MERIT 1895.

REPORT OF THE JUDGES.

(Continued.)

SYSTEM OF CROPPING OF MR. NICHOLS, STAYNEVILLE, ARGENTUIL.

Heavy land, farmed with a view to breeding and dairying: 2 good siloes.
1st year.—After pasture, maize, oats and pease, manured.
2nd year.—Oats after the maize, with 10 lbs. of clover and 2 gals. of timothy to the arpent.

After the oats and pease, cold, green fodder, carrots, horse-beans, turnips, sunflowers, manured.

The land is then mown two or three years and fed two years.

Mr Nichols spares no pains in working his land, which is very heavy, and to pulverise it properly he makes great use of the disk harrow, an implement whose value is not sufficiently appreciated.

There are 177 arpents of this farm, 30 of which are in permanent pasture.

Stock.—70 head of cattle, 4 horses, 80 fine registered Shropshires, 30 Berkshire pigs, 6 of which are boars—registered: 1 head of cattle to 2½ arpents of land.

Crops.—10 arpents of silo maize; 4 arpents of green fodder; 1 arpent silo-horse-beans; 1 arpent silo-sunflowers; 1 arpent carrots; 1 arpent swedes.

Like the good farmer he is, Mr. Nichols treats his land well by growing lots of root-crops and clover, although the soil is heavy. The maize-rows are 3 feet apart, and the crop is the finest we saw in the five counties we visited. Only enough potatoes are grown for the family.

Poor when he started, with no other support but his pluck, Mr. Nichols is now out of debt, and is probably the best model we can offer to the imitation of our young men.

ANOTHER STYLE OF FARMING ON VERY LIGHT SANDY LAND.

On our road to New Glasgow, we stopped at Mr. Lloyd's, St-Lin. Although Mr. Lloyd is not farming in the district we are visiting, he is near it enough to excuse our describing to the public the admirable system of cultivation pursued by him on an ungrateful soil, i. e., a very sandy one; a system that renders him an example to be followed by all the farmers of the district.

1st year.—After pasture, hoed crops: first of all, in the fall, he ploughs in a coat of rotted dung, with a shallow furrow. In spring, he grubs twice, along and across, and uses the spring-tooth harrow; then, the seed of the root-crop is sown and properly cultivated.

2nd year.—Oats, barley, or buckwheat, with 8 lbs. of mixed clovers, and 1 gallon of timothy to the arpent. 3rd and 4th year.—Meadow.

On this soil he pastures 5 years.
Stock.—30 head of cattle, very fine; 22 Chester-whites, Berkshires, and Yorkshires, almost all registered; 200 head of poultry and lots of chickens; all this on 120 arpents (101 acres) of very light land. Useless to say that all the manure is preserved most carefully.

M. MAXIMIN MERCIER'S SYSTEM, ST-MARTIN

1st year.—After 3 to 5 years' pasture, oats, gaborago, and maize, without dung.

2nd year.—Buckwheat, ploughed in at the end of June, and resown for seed.

3rd year.—Oats, or maslin, with 8 lbs. of clover and 1½ gallon of timothy to the arpent.

Meadows 2 or 3 years, and pastures 3 to 5 years.

M. Mercier dungs the meadows when the plant is not good, ploughing it down in the fall, with a deep furrow, and sows hoed-crops; next year grain with grass-seeds.

A good plan. (1)

(1) We cannot approve of hoed crops after grass. Oats after grass, hoed crops to follow oats.—Ed.

MR. ARCHIBALD OSWALD'S FARMING, ST-AUGUSTIN.

Pretty much the style that suits the generality of farmers in this province.

1st year.—After pasture, oats or maslin.

2nd year.—Hoed-crops with manure.

3rd year.—Barley or other grain, with 8 to 10 pounds of clover and 2 gallons of timothy to the arpent.

Two to three years in meadow and 2 years fed off (1)

(From the French).

(To be continued.)

THE FARMER'S CLUBS OF ROUVILLE COUNTY.

DR. W. GRIGNON'S REPORT.

Successful campaign.—Apples and the Bouillie-Bordelaise.—Orchards.—Honey.—Pease.—Potatoes and the Bouillie-Bordelaise.—Lucerne.—Ashes as manure.—The pupils at Oka.—Hoed-crops.—Clover-seed exported to England.—Liquid-manure-tanks.—Orchards on heavy land.—Women attending the lectures.—Growing maize.—Fattening hogs for bacon.—Winter creamery, autumn calving of cows.—Summary.

ST-HILAIRE FARMERS' CLUB.

In this parish there is a large production of honey, and of maple-sugar and syrup. There are two well supplied cheeseries, and 100 families of farmers, of whom 50 are members of the Club.

Thanks to the *Journal d'Agriculture* and the Club, according to M. Authier, the Notary, a great improvement is visible in the condition of the farming community.

The reading of the *Journal* and the discussions in the Club have convinced the farmers that great advantages are to be derived from spraying fruit-trees with Bouillie-Bordelaise.

The following have thoroughly succeeded in this mode of dressing the trees:

MM. Herm. Leduc, Galipeau, Dery, Marsan, Brouillot, Noisoux, Gayot, Denis, les Sœurs de la Miséricorde, Provost, Larivée, Veuve Brodeur, O. Leduc, Côté, fils, Ludger Côté, Alida Noisoux.

M. Olivier l'Oseille was the first man in St-Hilaire to spray fruit-trees; M. Jo. Hanault cures *mildew* in his vines by that process.

M. Misael Larivée sprayed one row of trees twice, and found a good deal of benefit by it, both as to the leaves and fruit, over the other rows.

M. Pierre Denis found his sprayed trees much better than the unsprayed trees of his neighbour, the leaves of which were squinny and the fruit spotted.

So much are the farmers now convinced of the advantages of spraying, that next year there will not be a single unsprayed orchard in the parish. It is found to be as indispensable as Paris-greening for potatoes.

A sprayer has been imported from France, as a model, by M. Chanteloup, of Montreal, who sells like pumps for \$10.00. I saw, at M. J. Blanchard's, a Lewis sprayer, which only costs \$6.00: its work is perfectly satisfactory.

At the end of my report will be found the way to spray trees and how to make the Bouillie. This is the plan

(1) What we should call a perfect rotation.—Ed.

followed by M. Blanchard, Abbotsford, and answers well, being very easily done and most effective.

The gnawing-worm, is the terror of the orchardist. At all my lectures, I am asked to give instructions for their extermination. Generally, a fine iron-wire is introduced into the hole the beast makes in the tree, and it is killed. Sometimes the hole is not straight, and the worm is got at with difficulty. Perhaps, forcing a strong solution of Paris-green into the hole, with a syringe, would answer well. The worm is the worst foe the orchardist has to contend with, especially in dry, elevated situations. Any one who knows how to destroy it infallibly would greatly serve farmers by publishing his method in the *Journal d'Agriculture*.

M. Ls. L'Espérance has some superb crab-apples, which keep well up to May and June. He has just sold two barrels for \$11.00. The Sœurs de la Miséricorde, too, have some fine fruit of this kind.

Prizes for crabs :

Next January (1896), at Iberville, a competition will be held to encourage the growing of the best sorts of crabs in the province.

Four prizes will be offered ; \$3, \$2, and \$1 ; and a provincial prize of \$10.

A gold medal will be awarded to the hort obtaining the greatest success during 5 years of competition. These apples must possess, both as to the fruit and the tree, the qualities requisite to constitute a good, salable, winter-apple. M. Danlop, Outremont, P. Q., will give any farther details required. This gentleman, to whom I sent two crab-trees, from M. P. Denis' orchard, speaks very favourably of the them.

The cultivation of orchards.—M. Denis has 2,000 apple-trees. Until lately, they appeared to be sickly, worn-out. The leaves were yellow, squinny and rough. Last year, he sowed the whole orchard with buck wheat, and this year with oats and clover. He states that it has completely changed the look of the orchard ; the leaves are larger and of a fine deep green in colour. The trees seem to have started into a new life. The land of an orchard should be ploughed and sown with buckwheat (1) at least every fourth year.

The largest branches should never be cut off. The Sœurs de la Miséricorde still regret having done so : at least, so says their farmer. According to MM. Denis and Blanchard, "there should never be less than 40 feet between apple-trees.

M. Hamel prefers orchards facing the north : the roots of the trees should be more attended to than the heads.

Honey.—M. Louis Hamel has 66 hives. He thoroughly understands the business. Four hives gave him, last year, 30 gallons of honey, which he sold for \$35.00 !

"I always put two swarms into one hive, and sometimes three." One swarm often will not make more than 20 lbs. of honey ; while two together will make 60 lbs, and three 200 lbs.

This year's honey-yield is not so great as last year's was, because of the cold nights and the paucity of honey in the clover-blossoms. There was only a fortnight's real honey-gather-

(1) We should prefer alternating buckwheat with clover.—Ed.

ing instead of 6 weeks. The season of the lime blossom was the most-productive. (1)

THE ST-JEAN-BTE., ROUVILLE, FARMER'S CLUB.

There are 280 families in this parish, and 5 well supplied cheeseries, 3 of which belong to cooperative associations. The shareholders are satisfied with this system.

M. Ludger Guertin gathered six barrels of apples from a 10 year-old tree (the Elzéar.)

M. C. Gaboury, who sprayed his trees this year with B. B., says that his worst fruit is finer than the best of last year.

How to use coal-ashes :

M. le curé Véronneau mulched his currants with 3 inches of coal ashes. The effect was marvellous (2) ; the fruit was better in flavour, the bushes more healthy, and the insects vanished.

Pear-trees.—M. Véronneau imported from France 5 sorts of pear-trees, which turned out well ; Belle d'Anjou and Jules Chrétien, (3) among others ; they yielded very fine pears, bigger than one's fist, ripened perfectly. The trees cost 45 cents a piece.

M. St. Boucher, St. Hilaire, gathered from one tree 3 bushels of perfectly ripe pears.

Potatoes.—M. Wilfrid Touchette has tried 8 sorts of potatoes ; they were all sprayed with B. B. ; names :

- Lee's Favourite ;
- Beauty of Hebron ;
- Dakota red ;
- Thornburn ;
- Snowball ;
- Maggie Murphy ;
- Rose of Ireland ; (4)
- Early Puritan.

The Snowball is very early ; the Rose of Ireland is proof against the potato beetle, and yielded 17½ bushels from a planting of half a bushel. Still, he prefers the Dakota red to all the others.

Maize.—M. W. Touchette is highly pleased with the "Pear's Prolific," which is very good for ensilage, and ripens within 8 or 10 days of the Canada corn. The seed is very large.

Mangels for hogs.—M. L. Guertin fed 22 hogs with the produce of ½ arpent of mangels. He lays great stress on the piggery being warm.

ST-MATTHIAS' FARMER'S CLUB.

This parish contains 100 farmers' families ; there are 35 members of the club, and 3 cheeseries, two of which are doomed to annihilation, to the benefit of every one.

Very few fruit trees grown here.

M. Nadeau, the curé, has grown the "Early Yellow Flint" maize very successfully. The ears are long and well grained. M. le vicomte de Bouthillier, too, has a very fine field of maize, the finest I have seen in the country.

Lucerne.—Mr. Cheese has out his lucerne 3 times and is delighted with it.

(1) *Tilleul* is the lime in England, the linden in the U. S., and the bass-wood of Canada. There is a white lime—*tilia-alba*—in the little garden between Dorchester and St-Catherine Streets, Montreal (near the Western Hospital) that is worth inspection. The foliage is superb.—Ed.

(2) Mr. Martin, nurseryman at Côte St-Paul, told us, some 12 years ago, that the English gooseberry, mulched with coal-ashes, never mildewed.—Ed.

(3) Is this the old "Bonne Chrétienne," so well known in England ? Is not the "Belle d'Anjou," the "Beurré d'Anjou" which we grew fifty years ago?—Ed.

(4) Perhaps, the "Rosa d'Erina," which is the same thing.—Ed.

M. Amable Ostigny has some very fine crabs, and M. Alfred Morin gave me "Elzéar" apples of good quality, very like *Famousses*.

Sale of clover and timothy.—M. Amédée Nadeau deals in hay, clover, and timothy. The former fetches \$8.00 a ton for export to England ; the latter and cow hay (*le petit foin à vache*) are sent to the States. Clover at \$8.00 a ton pays better than timothy at \$10.00, while the yield of clover is at least a ton an arpent more than that of timothy, without reckoning that the clover exhausts the land less than timothy. Doubtless, the English take the trouble to chaff the clover and improve it by a slight fermentation. (1)

What shall we do with our clover, our inferior hay and our straw ?

Consume them on the farm ; but before feeding them to stock, they should be improved by chaffing them, at the rate of one of hay to two of straw, and making them undergo a slight fermentation. That is what I do with mine and the results are highly satisfactory.

RICHÉLIEU FARMER'S CLUB.

There are 4 cheeseries to be met with on 4 miles of road ! Three too many. Why then patronise them ?

The Station Master told me that hay and clover are in great request ; 500 cars are required for these products to-day.

Two crops in one.—M. Henri Robert sowed 5 lbs. of turnip-seed with his oats. When the oats were cut, some of the leaves of the turnips were cut too (probably), but recovered, and he has enough turnips now to keep his 10 cows during the whole of the winter of 1896. (2)

We must change our seed-grain and sow plenty of clover.—The Club has bought 300 bushels of fine oats, and maize, and 5,700 lbs. of grass-seed.

ST-MARIE DE MONNOIR CLUB.

In this fine parish there are about 250 families, and a club that is able to reckon a large number of members, who have greatly contributed to the advancement of agriculture. There are, though, 5 cheeseries, two large and three small ones : Oh ! if the two large ones would only ruin the small ones ! as a farmer remarked to me *en passant*.

Progress accomplished.—The herds are very much improved, many more acres are sown to roots, to clover for seed, and especially to maize : 5 or 6 arpents on each farm. The Club bought \$1,100 worth of clover-seed, timothy and maize, in which latter crop a great many pumpkins are grown. Farmers, here, are anxious to be informed as to the nutritive value of the pumpkin, and how to use it. (3) Farmers, here, want

(1) Precisely what they do not do. Horses eat at least ⅓ of all the clover grown in England—sheep have some—cows never see it. The clover is chaffed, mixed with the oats, and given dry.—Ed.

(2) About as bad use of the land as may be. Ten cows would require 30 tons of turnips at least for the 200 days of winter. How they must have grown after harvest !—Ed.

(3) According to Stewart, pumpkins are, as one would judge by inspection, of very little value. Besides, growing two crops at the same time is an awful crime in agriculture, except, of course, in the case of grass-seed. The following is the valuation of the pumpkin (by Wolf or Stewart) :

DIGESTIBLE NUTRIENTS			
Albuminoids.	Carbohydrates.	Fat.	Value of 100 lbs.
0.4	7.1	0.1	0.08

Value per ton \$1.60 ; value of swedes per ton \$3.00 ; of carrots \$3.60 ; according to Stewart : v. "Feeding animals," pp. 156, 157. To use pumpkins : chop them up roughly, and give them raw, any cooking would be waste of time.—Ed.

to know how to cure *foot-disease* in hogs.

ST-ANGÈLE FARMER'S CLUB.

Of families there are in this parish 145 ; the club counts 115 members, and there is only one cheesery, which is well patronised.

I was mightily struck with the earnestness with which people, here, flocked to my lectures, and with the attention with which they listened to my words. The hall was filled. Though people everywhere seemed desirous of gaining information, the seeking after it was more evident here than elsewhere.

The people speak with pride of their two pupils at the Oka School of Agriculture ; MM. Augusto and Joseph Fournier ; they are besieged with questions when they are spending their holidays at home. Their studies will be finished in the course of a year, and a great deal is expected from them : these two young men will have to put in practice the valuable information they have gained at Oka.

Steps in advance : Mutual instruction through discussions at the Club ; purchase of fine Ayrshire bulls and of well bred boars ; 200 bushels of maize for seed ; four times as many acres of roots grown. M. Jo. Nadeau has 4½ arpents in vegetables, and has tried the effects of wide or narrow distances between the rows of mangels. He has a liquid manure-tank and waters his dung with the contents. The cost of the tank has been repaid ten-fold the first winter, thanks to the increased value of the dung.

A Canadian Cow.—M. C. Paradis, the village school-master, has a 12-yr-old Canadian cow, with badly shaped horns, rather lean than fat, and yet she gives six pots of milk a day. (A pot is an indefinite measure, generally equal to about 2 quarts wine-measure.—Ed.) She evidently turns her food into milk and not into meat.

M. Paradis has half an arpent of mangels near the school. He shows the pupils how to sow them ; explains why he stirs the ground deeply ; and why he makes the rows so far apart. When used, he will tell the lads how much weight there was, and how many days they lasted his cow. This is, indeed, practical instruction, which will greatly benefit the pupils. The cow gives milk from one calving to the next without intermission. (Rather hard upon the calf "*en ventre de sa mère*."—Ed.)

(From the French.)

(To be continued)

REPORT OF MM. G. A GIGAUT AND J. D. LECLAIR.

August 28th. 1894.

VISIT TO M. AUGUSTE GRANDJEAN FARMER, AT MALLEVILLE, PLOERMEL, BRITTANY.

This farm is about 116 arpents (98 acres) in extent, of which 15 are permanent meadows. There are 40 milch-cows, 30 heifers and bulis, 6 brood-mares, 3 two-year-old fillies, 3 yearlings and 5 foals. M. Grandjean ploughs with the "Double Brabant" plough ; he makes a deep furrow when clover is to be sown ; part of the land is drained. There are 4½ acres in swedes and 2½ in cattle-cabbage—*thousand heads* and the *cavalier* cabbage. He prefers the *cavalier* to the *moellier*, because in heavily-manured land the stalk of the *moellier* is liable to rot.

Periodical liming is the rule on this farm. Clover is generally cut twice a

year. Oats yield about 55 bushels to the arpent (8 quarters 1 bushel to the imperial acre).

The dung is not under shelter; there is a urine tank built in ashlar-work; the liquid manure is spread on the meadows. After haying, the meadows are grazed. Composts are made of rubbish and rich mould, for spreading on the meadows when they are frozen, so as not out them up.

Every year one half of the meadow land is manured with dung or compost. The cows are Bretons. The grubber is used for clearing the stubbles. The land is sandy, with a schistose subsoil. The cows graze but seldom; they are almost always kept in.

In his orchard, M Grandjean, last winter, sprinkled his apple trees with a solution of sulphate of copper before the leaves burst. The result was good. The horses at 4 year's old generally sell for 300 to 600 frs. (\$60.00 to \$120.00). When sold for cavalry remounts, they fetch as much as 900 to 1000 frs. (\$180.00 to \$200.00).

VISIT TO THE AGRICULTURAL SCHOOL OF "THE THREE CROSES," NEAR RENNES, FRANCE.

MONSIEUR E. HÉRISANT, Director. —

There are 24 pupils. The dung is not under cover, but in the middle of the yard, which is paved with stone. The tank is brick set in cement; it is so arranged that no rain water can get in.

There are 40 milch cows, many of which are Cotentins; in winter their food consists of hay, mangels, straw and cake. Mr. Hérissant highly approves of the Cotentins, as their milk yield is both copious and rich.

Liquid manure and composts sustain the fertility of the permanent meadows. The composts are spread in June and July. Lime, in some form, is added to the composts. Milk, dish-washings, potatoes, cabbage-leaves, Jerusalem artichokes are given to the swine. Prickly-comfrey is not approved of, though in some parts of Lower Brittany it is used for pig-food. The red clover has been attacked by a disease; when sown too often in the same place, bacteria are developed which destroy the plant. In the garden, there are strawberries called "four-seasons," which yield fruit in spring, summer, and autumn; (1) when common strawberries are bearing fruit, the others should have their flowers pinched off, so as to get them to yield more abundant crops when their turn comes. On the 28th August, we ate strawberries. M. Hérissant had just gathered.

AUGUST 29th 1894

VISIT TO THE DAIRY-SCHOOL AT COUTLOGON.

This school is only for girls. Besides butter, "Port du Salut" and soft cheeses are made here. The former sells for 1 fr., 89 centimes the kilo, wholesale; Camembert for 5 francs a dozen, weighing 220 to 300 grammes each (100 grammes—3 oz. 8 drachms). The butter sells for 3 frs. the 2.20 lbs., wholesale Cream is churned at 55° F. The managers intend to pasteurise the milk for butter-making, or at least to try the plan. Churning stops when the butter is in tiny grains.

The butter is sometimes worked dry, under the kneader, but sometimes in the churn with a little water. After the first working, it is left two or three hours in a trough with ice; it is then worked over again, and made into pats for market.

(1) Same in England, but the fruit after August is not worth eating.—E.

Some of the butter is salted, and the rest, intended for the Paris market, receives no salt, and keeps just as well. The salt given is 2 per cent.

Camembert cheese is made of milk from which $\frac{1}{4}$ of the cream has been skimmed; it takes three weeks to ripen, and is worth 35 centimes a cheese. It is sent to America in soldered tins, like those used for butter sent to hot countries. When intended for the European market, it is wrapped in straw.

Next year, this school will occupy a house—stone and brick—which the government is now building at a cost of \$12,000; it is nearly finished. The creamery and cheesery are separated to prevent, says Madame Bodin, the bacteria of the one from invading the other. The skimming will be done here in future in different ways, by separators and in vats; in order that all may receive the teaching appropriate to their various needs and installations.

Many utensils have already arrived for the new buildings: a pasteuriser, a steriliser, and an aerator. Several Americans have attended this school; the girls feed and milk the cows. Nothing can surpass the fitting up of the cheese-ripening room. At a moment's notice, instantaneously, so to speak, warm air can be introduced when the temperature is falling (or the reverse), or when it is desired to expel damp.

The ripening of the cheese is a very delicate operation, adds Madame Bodin, and everything is so arranged as never to hinder its progress, which does not go on satisfactorily unless under the circumstances peculiarly required by each kind of cheese.

August 31st, 1894.

VISIT TO THE AGRICULTURAL SCHOOL AT GRIGNON.

This school is under the control of the government. M. Lezé, one of the professors, showed us over the magnificent class rooms, the laboratory, the collection (*musée*) and all parts of this vast establishment. The farm buildings, and the farm itself, were visited in company with the practical instructor, who was good enough to explain to us the system of farming pursued, and to tell us all about the farm management.

In summer, each cow gets all the green maize she will eat, 500 grammes (about $1\frac{1}{4}$ lb.) of cake and the same of bran, and of rye flour, a day; the flour, bran and cake are mixed and given to the cows before they are watered. In winter, mangels with straw-chaff, 35 to 45 kilos a cow; the best milkers getting even 50 kilos a day, 5 kilos of hay, and the same ration of flour, bran and cake as in summer. Sometimes they have from 12 to 15 kilos of boiled potatoes, in which case, the ration of mangels is diminished.

Raw potatoes should never be given. There is no fixed rule for the quantity of food each cow receives, but the more of it she can easily transmute into milk, the more food she is allowed. The mangels are cut by the machine. The cows calve at various seasons, and for a short time after calving, they are milked thrice a day.

THE FRESHING OF SWINE.

Two kilos of barley-meal, 5 kilos of boiled potatoes, 10 kilos of wash a day each; to this is sometimes added nubbins of maize, roots, etc.

The sheep get carrots with chaffed straw, allowed to ferment for 24 hours.

The horses are fed on hay, oats and carrots, of which last they get 5 kilos a day. The dung is not under cover, but in the middle of the stable-yard, far away from the eaves drip.

In the middle of the mizon is the tank, which receives the running from the mizon and the urine from the stables, etc., through tronches.

The liquid manure serves to moisten the dung whenever it requires it to keep it moist. The remainder is used on the meadows and the compost. Its use has a marked effect on the yield of the meadows, as the foreman showed us. He took us to a meadow, part of which had been treated with the liquid, where, although it had been cut once already, the grass of the liquid manure part was very luxuriant, 12 to 15 inches high, and a great contrast to the part that had received no liquid. Every year, many compost heaps are made from the waste matter of the farm, the scrapings of ditches, mud from the brook, etc. These composts are not spread till two years after they are made; the first year they are drenched with liquid manure, and the second they are turned over twice and then spread on the meadows. If the meadows require lime it is mixed with the compost. As soon as the compost or the liquid manure is spread, the foreman said, the white clover springs up abundantly, red clover is cut twice a year; lucerne is also grown and cut as often as thrice a year; but this plant demands a previous subsoil. The wood on the farm is kept in good order and pruned every sixth year. (1) The common plough is used when the land is to be laid into ridges (*planches*) with open furrows, and the "double Brabant" for other ploughings. This plough is, so to speak, automatic, so that, when well set as to depth and breadth of the furrow, it keeps to its work almost without the interference of the ploughman. It is carried on a carriage frame and cannot get out of gear.

27th and 28th August, 1894.

VISIT TO THE REV. BROTHER ABEL, OF THE FRATERNITY OF CHRISTIAN DOCTRINE, FLOERMEL, BRITANNY.

This fraternity has published a short treatise on agriculture that is now studied by its farm pupils, 2,000 in number.

Such teaching causes the children to become fonder of agriculture and prepares them for the more advanced studies in the art of farming. Every fortnight they visit the farm of one of the *habitans* of the neighborhood, and even, do the work there. The farmers almost always consent to try experiments, and to grow special crops for the instruction of these pupils, and willingly explain to them their methods of cultivation. These farmers are selected from the most skilful of the district, and act, to a certain extent, as teachers of farming to the lads. Brother Abel prefers this system to having experiment fields annexed to schools, since it often happens that the schoolmaster wants both practice and experience and does not understand farming. Thus, he loses all his reputation, and his failures injure him in the opinion of the public. Brother Abel is convinced that a vast number of the experiment fields organized by the French Government are far from being of any use to the farmers of France.

(1) Does this mean that one-sixth is cut down every sixth year—made a cove of—in England?—A. R. J. F.

Asked his opinion of rural banks, Brother Abel informed us that none had been as yet founded in Brittany, and that the chief of agronomes of that country had not yet decided whether or not to favor their establishment till their usefulness had been elsewhere proved by a longer experience.

31st August, 1894.

VISIT TO M. JOHANNET, SECRETARY OF THE SOCIETY OF THE FARMERS OF FRANCE.

Mr. Johannet holds that the syndicates organized are rendering service to the agricultural class. The annual subscriptions of the members of these associations vary from two to six francs. They retain a commission on the amount of the sales effected through their means, and this, Mr. Johannet believes, is 1 per cent; that is, at least, the sum exacted by the central syndicate of Paris. The rural syndicates are only organized in a few places; the idea is still in embryo. The central syndicate now includes nearly 7,000 members and several rural syndicates are affiliated to it. The law does not allow an agricultural *comitium* to affiliate itself directly to a syndicate. The central syndicate was founded in 1884; it publishes one a fortnight a journal that is distributed among its members.

September 1st, 1894.

VISIT TO A MANUFACTORY OF RENNET, COLOURING MATTERS, AND LACTIC FERMENTS AT AUDERVILLIERS, NEAR PARIS, FRANCE.

Two chemists are attached to this establishment and are entrusted with the duty of preparing the above products.

Every time a lot of rennet is prepared, a chemist takes a sample of it, mixes it with milk, and by this means ascertains if it has the necessary force to cause a proper coagulation in determined time. M. Beaury, one of the chemists, told us that liquid lactic ferments can hardly be kept for more than a month.

He has not so much confidence in the dry as in the liquid ferment, because the dry must be in contact with the air, and necessarily absorbs those bacteria that are inimical to the good effects it is intended to produce.

VISIT TO THE BUTTER FACTORY OF MR. A. BAQUET, VESLY, BURE, FRANCE.

This establishment contains an installation furnished by the firm of Th. Pilter, Paris; there is a Laval-Alpha separator on a new model, a rotary butter maker and a churn on the Baquet system, made by the Pilters. This churn is an inclined barrel churn, driven by an under-gear, this rotation in a sloping position allows the agglomeration of the grains of butter to be seen and the churn to be stopped at the proper moment.

It is not the custom in this factory to warm the milk when it is above 65° F. When it has to be warmed it is done by means of a coil; when the milk rises beyond a certain heat a ball closes the distributing pipe more or less. The cream is ripened in a vat with a double envelope and a confined aperture (*ouverture reserrée*), and by means of this double envelope the cream is warmed as much as is wanted. If too warm in the morning it is passed over a Lawrence refrigerator before churning.

The expulsion of the butter-milk is done in the Laval *délaiteuse*, which is highly thought of. The *kneader* is only used to gather the butter and mix in the salt.

There is also in this factory an acetometer, thought to be very useful in determining the proper acidity to be given to the cream. This instrument in the hands of an intelligent operator may be of great value in making butter.

The cream is always ripened naturally, and this answers very well. The butter not sold at home is sent to the Paris market, and fetches almost as high a price as Isigny butter.

The cream is driven (*forcée*) in the churn by compressed air.

The mechanical *délaiteuse* can work about 320 lbs. of butter in 2½ hours.

The average of milk delivered at the factory per cow is ten litres in winter and 15 litres in summer; general average may be 13 (11.44 quarts).

Mr. Baquet himself was not at home, to our loss, for he would have given us very valuable information on the crop grown in this country for the promotion of dairying.

MAMIROLLE SCHOOL.

At the special invitation of Mr. Tisserand, Director of Agriculture, we visited the National Dairy School at Mamirolle. Mr. Martin, author of an essay on making Gruyère cheese, is the director of this school, where butter and a variety of cheese are made. The school is spacious; it contains several offices for the foreman, the accountant, and the director, a large laboratory, and several apartments. There are two rooms for each kind of cheese, such as each needs, and their ripening is not left to chance, but is scientifically carried on by the maintaining of a suitable state of moisture and temperature. By attention to these points the cheese is fit for sale in less time than formerly, and the "culls" have been fewer by 25 per cent.

France does not produce enough Gruyère for its own consumption, but has to import some from Switzerland. It was for a long time believed that this manufacture was only suited to mountainous districts, but M. Dornic, the chemist at this school, told us of several places, quite different in climate and grasses, where the making of Gruyère was carried on successfully. We think it right to mention that one of the obstacles was surmounted by giving the cows food well supplied with the various salts of lime. The director told us that cows fed on roots gave a milk more difficult to work up (*coagulate*?), and the cheese made from it was not so good in flavour.

The liquid rennet of the shops is not used alone for the Emmenthal or Gruyère cheese; it has been found to make cheese inferior in flavour and difficult to work. The rennet "Aisy" is of the greatest value, but requires some experience in the cheese-maker in its use.

The acetometer is used to test each lot of milk delivered; as it makes known the condition of the milk, it is a very useful guide to the methods to be applied. It lessens the earlier difficulties of the manufacture, especially for a maker whose unfortunately dull sense of taste may prevent him from finding out the faults of the milk.

At this school there is a staff of permanent servants, whose usefulness is greatly appreciated at the begin-

ning of the course. Pupils are admitted to this school after an entrance examination, in which it is ascertained if the lad has intelligence enough to understand the course. Every year nine scholarship holders (*boursiers*) attend the school; diplomas are granted, after twelve months' attendance, to those who obtain a certain number of marks on each subject; and we may add that application and industry are reckoned to the pupil's good.

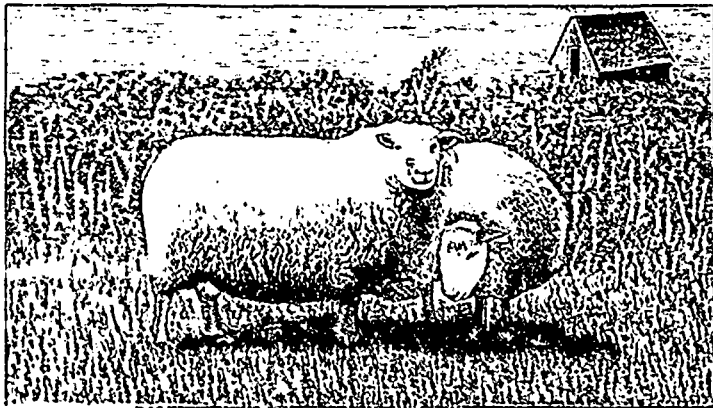
Farmers within a certain distance benefit by this school, where their soils are analyzed to find out what fertilizers are needed to produce the crops desired.

The director holds that the degree of moisture in butter has no other cause than the imperfect expulsion of the buttermilk, whether the butter be worked dry or with water. They do not use the *délaiteuse* here; it is not found to do away with the *kneader*.

A good many voluntary pupils are admitted to follow the practical and theoretical course.

The only waters that are considered injurious to butter are those impregnated with sulphur or iron, and water that contains organic matter in excess.

The working of butter with the naked hand is not encouraged neither do they think here that butter can be improved by being subjected for a length of time to exposure to cold.



TWO ROMNEY MARSH, KENT, RAMS

We visited the establishments of Messrs. Th. Pilter and F. Fouché, in Paris. Besides the apparatus for creameries and cheeseries to be found in all establishments of this kind, we particularly remarked, at M. Fouché's, a multitubular apparatus for the sterilization and cooling of milk without exposure to the contact of air. The implements generally used for the latter object by no means prevent the re-seeding (*with bacteria? Trans.*) by contact with often contaminated air, as we have found in our own experience.

The sterilization of milk for town use is becoming general; indeed, in all firms of the kind we saw *autoclaves* (1) made expressly for this purpose. Among other agricultural implements at M. Pilter's, we saw a liquid manure-cart, fitted with a pump and a tap of peculiar construction, which spreads the liquid equally over a space as wide as the width of the cart. It is doubtless possible to make something less costly to do this, but it shows that in France, as well as all over the continent, at least in the north, particular care is devoted to the preservation of the urine.

The thermometers used by these firms are all tested, so as to prevent any grave errors occurring owing to the use of inexact instruments.

(1) From its look, I should judge the word to mean "self-lockers"; but it is not in my dictionary.—A. R. J. F.

On September 1st we accepted the hearty invitation of M. Edmond Groult, the founder of the "Maison Cantonnaux," and travelled to Lixieux, in Calvados. Following the route laid down for us, we visited an establishment for the classification and preparation of export butter. Every Saturday the butter of the week brought to market is bought by the firm, and sorted according to its flavor. Each assorted lot is worked over separately, and packed in boxes of different sizes, according to its destination; an argument in favour of uniformity in taste, color and packing. The butter is lightly salted, and is sold in competition with Danish butter.

CAMEMBERT CHEESE

At M. Rendu's Château de Roques we saw a dairy in which Camembert cheese is made. The milk is received thrice a day, and the evening's milk is kept in a cool place till morning. This is skimmed first, then warmed and poured into buckets, in which it is mixed before adding the rennet. This cream is ripened and churned in a separate room, into which no smell from the cheesery can enter.

On the day we arrived, they were just opening the factory, so we could only see a part of the operation. We were struck with the size of the factory and with the scrupulous arrangement of the interior adjustment for conducting the ripening of the cheese;

through the reservoir in which are the cans. Towards the end of the churning a quantity of cold water is added to dilute the buttermilk; it is allowed to run off, and four or five times as much pure, cold water is introduced; this, again, is run off, and the worker expels the water from the butter and mixes in the salt. No mangels are given to the cows, as they give a bad taste to the butter. Twenty three litres of milk produce, on the average, one kilo of butter.

Here, also, is a splendid orchard, especially rich in cider apples. With information as to the soils of the Province of Quebec, M. Décour thinks he could furnish the most suitable varieties of fruit for cider-making. Generally speaking, calcareous sandy soils are the best for apple-growing.

M. Maurice's farm, which we visited next, is all in grass; it is never ploughed. The dairy is arranged for butter-making, for Camembert cheese, and Livarot cheese with the skim-milk. The butter is made as just described; Camembert is made invariably with full milk, and the more fat it contains the more it sells for. On this farm there are 50 Norman cows, which are milked three times a day, and give about 12 litres (10½ quarts) each a day for 8 months, but steps are being taken to have an equal quantity of milk daily throughout the year. The cows are large, and are sold off to the butcher at from 70 to 75 centimes a pound, live weight. Liquid manure, dung, composts of earth, all unite in maintaining the fertility of these pastures.

M. Maurice has an orchard of 12 hectares (about 26 acres), the yield of which is some 2,000 *razières*, say, 2,750 bushels, worth about 25 cents, delivered at the station. Almost every farmer has a cider-press, and makes good cider. A *razière* (1½ bush.) makes 40 litres of cider, worth 12 francs the hectolitre. It is fit for sale two or three months after being made.

(Concluded.)

The Dairy.

ARTIFICIAL COLOURING OF DAIRY PRODUCTS.

In the answer given to a correspondent at p. 435 of the *Gazette* the colouring of milk is said to be "regularly done," and it is also stated that there is no law against colouring milk. Now, it seems to me that the addition of any foreign substance milk, or the subtraction from milk of any of its own constituents, is an offence against the law. Milk coloured by annatto or by carrots is not pure milk, and, if it is sold as pure, then the purchaser does not get what he is entitled to get. Your correspondent may rest satisfied that if he uses decorticated cotton cake, and mangels also, the colour of his milk will be very white. Mangels given in full quantity will, in combination even with rich foods, produce a milk not only deficient in colour, but deficient in cream. (1) Of course, we all know that decorticated cotton cake will give us a milk rich in cream. As a large user of such cake, I have to confess that the colour of the milk requires some other food with the cake to correct the deficiency in colour.

moisture, temperature and light were furnished at will, and at the proper degree. The method of making the cheese is described at length by many writers, but the secret of success lies in certain small details, among which we are fortunate enough to be able to point out the following: The salt must be perfectly dry. To dry it, M. Rendu passes the piece of his furnace through a drying room of several stages; thus, heat, that would otherwise be lost, is used for this purpose, and amply suffices for the task.

Milk costs here 2 sous a litre (.88 of a quart) in summer and 5 sous in winter. A good herd is expected to yield 10 litres of milk a day per cow during the summer months. The cows kept here are Norman.

M. Décour is the proprietor of the farm "La Chimère," which contains 200 hectares, 50 of which are in wood (150 hectares = about 330 acres or 390 arpents). It is divided into small farms, with a steward (*farm-bailiff*) (1) over each, but the whole is under M. Décour's own management. A separator-dairy, worked by a petroleum engine, has been started at the central farm, and there the milk from the small farms is skimmed. The cream is kept in a cold chamber, where it ripens naturally at all seasons; a current of cold water circulates at will

(1) Does any one know from what language the word *grive*, used in Scotland to denote a farm-bailiff, is taken? Danish?

(1) Food, then, does change the quality of milk!—Ed.

Let your correspondent use maize-meal in conjunction with his cake, and then probably he will find that his milk will not be very white. Or, what is better still, let him use cut clover instead of cut hay, and then he will find that he may use decocted cake in moderate quantity without the objectionable consequence of finding his milk very white.

(Eng. Ag. Gazette)

J. S. Woodward in speaking of the way we abuse "Our Foster Mother, the Cow," gave an example of one barn 26 ft. wide, 45 ft. long, 6½ ft. high, having 26 cows in it, or cubic space equal to what a 150 pound man would have if nailed up in a box 34 x 35 inches and 6 ft. long. After you had kept him thus for 20 hours, the body would be there, but the man would be gone. The illustration is as striking as mixed. The next barn described would give one square inch hole in the "coffin" for ventilation. But this was nothing to the awful horrors of torture ascribed to the rigid stanchion. Besides the stiff necks and sleepless nights, we were told of ill shaped bunches on her knees and distorted shoulders. The cow is fed oat straw, and corn meal, an unbalanced ration, which makes no provision for milk or bone or muscle, and many a cow will give her hide for her keep by spring. Out of our 1,600,000 cows, 1,000,000 of them drink from the ice-bound brook. Must have water to make milk. Should have plenty of it and whenever they want it. Germs will not breed fast in sunlight. Give comfortable stables. Educate to eat hearty. Over eating is a vice in a man, but a virtue in a cow. Give no extra exercise. Let the bull do that. The vital energy used up by the cow is equal to a 40 mile drive for a horse; don't need more. — *Ex.*

TURNIPS AND BUTTER FLAVOR.

Several correspondents desire to know what will correct the turnip flavor in butter, and one expresses the opinion that turnips should never be fed to milk cows, as they are apt to taint both the milk and butter. Carrots and mangolds are no doubt preferable to turnips as food for cows giving milk, but the best authorities assert that if fed at or near one milking all the unpleasant effects will pass away before the next. It is undoubtedly the case that a great deal of milk and butter is spoiled for customers by the acrid flavor imparted by feeding turnips. The question was recently put to three expert butter-makers how to counteract the turnip flavor so often complained of. The replies given were as follows, according to the 'Nor-West Farmer':—

No. 1 replied:— 'We have always fed turnips in the autumn and winter when making butter, and have sent our butter to the best markets and have always obtained the best prices for it, with the statement, "butter first-class." I have had the opinion of an expert on our butter, and he says if I want a certificate he will give me one stating that he could detect no turnip taint, that it was very fine in make and of first-class quality. The manner of making is this:— We are very careful to have the milking attended to so that the milk shall be clean, and free from anything that could in any way taint the milk, as this would be retained in the cream. As soon as possible after milking, we

pour boiling hot water into the can until it attains about 125 deg. Fahr., then we set in the common creamers or pans. The creamers we run off every 36 hours, and the pans every 48 hours, and as soon as the cream is ripe or turned a little sour we temper it to 60 deg., and about ten minutes before churning we dissolve a teaspoonful of prepared saltpetre in warm water and stir into the cream, and then churn. When the butter is in granules, we let it stand a few minutes, and then run off the buttermilk and wash the butter in the churn, until the water is clear, and then salt with fine salt, one ounce to the pound of butter.'

No. 2 wrote:— 'As you request me to furnish your readers information as to the quantity of turnips fed, I would say that I give each cow about half a bushel twice a day, fed after milking. I have an underground stone milkhouse with stone floor. The milk keeps sweet for three days in the hottest time in summer. We use mostly shallow pans, skim every twenty-four hours, pans kept well scalded and clean, churn in the autumn from 60 deg to 64 deg. If I were giving each cow two bushels a day I would dissolve some saltpetre and put some in the cream.'

No. 3 said:— Beautiful butter can be made if the cows are given only a small allowance of turnips after they are milked, at first, gradually increasing the quantity. The milk was set in pans, and two or three quarts of ice cold pure water put in the pan and the milk strained into it. The butter was beautiful; not the least unpleasant smell or taste of turnips was noticeable.'

N. W. Farmer.

FAT IN MILK.

EDS. COUNTRY GENTLEMAN—It is by no means a new thing that men of science and those of practice should differ in opinion about things. It has been the case ever since there was any science. It seems to be the right domain of science to give to the practical men the true reasons for things, and to discover the exact principle that underlies common practice. This pertains distinctly to the feeding of cows. It is worthy of regard that practical dairymen have a most confirmed belief that the way to get richer milk is to feed fatty food, and that if foods that are deficient in fats are used, the milk is proportionately, to a large extent, also deficient in fat.

Now we cannot well "Go back on" the results of twenty or thirty years experience in feeding cows and abandon what one has learned by months of steady feeding for rich milk for profit and not for experiment only, and accept the results of such tests as three days feeding or even a month of it, on different foods. There is, as asserted, an individuality in cows; there is in everything. But this individuality may be said to be the natural amount of resistance to changes on account of permanence of disposition. Some animals are slow to change this disposition, others are quick to respond to variations in feeding or other environments. And thus it is that it may take months to produce any change in this special character which some have called individuality. I should miss my point greatly if I omitted to mention the experience of Prof. Robertson who stands at the head of his profession as

a practical farmer and scientific investigator—in feeding cows grain on pasture for a whole summer, and with the result that the influence of this feeding went over to the next summer, and the benefit was conspicuous after the intermission of half a year. This is the kind of test we dairymen want our scientific teachers to undertake before they insist that our years of feeding for practical purposes and on business methods, and all their lessons should be abandoned for the results of one month or even a few days of feeding on varieties of foods.

This is one of the most important matters to feeders of cows. If we are throwing away money in buying foods rich in fats for the impossible end of making more butter of the milk, it is well to know it; and if we are right, it is well to know that too, that those who are always halting between two opinions may decide without delay and abandon profitless feeding for a better method.

It is a remarkable incongruity that we should be taught that our crops are to be fed on the principle that one element cannot replace another, and that nature always works in the easiest way to reach her ends, and at the same time that in feeding animals the fats in the food should not go to make the fats in the animal, but the protein should do this. Thus nature goes to the very great trouble to break up organized matter to effect some end when there is the precise matter all ready for use and merely to be distributed by the circulation wherever it is needed in the body of an animal. I admit this is only a rational argument and not a fact, but it has its force, and as much of it as the contrary argument has that the protein is broken up in the digestive organs and the hydro carbons of it changed into fat by a very indirect way.

The Royal Society of England settled this matter years ago, when I was a student of medicine, and the profession then wholly changed their beliefs, upon which the present remaining old idea is based, and accepted the new and well determined one that the fats of food or medicine were not changed in the system, but were passed still undigested into the circulation and deposited in the tissues where they were needed. The chemists seem to have not accepted this fact, proved by very numerous experiments, and still deny it, holding to the other view which they urge practical men to adopt against the almost, if not universal, belief to the contrary.

I might mention one fact in addition, which is that Dr. Taylor the Microscopist of the Agricultural Department at Washington, in tests of butter, found that that made from feeding cotton seed meal had precisely the same reactions as the oleomargarine made from cotton oil had, and asserted that if he were to analyze butter made from cows fed on this meal he could not distinguish it from the bogus article.

H. STEWART.

Macon County, N. C.

STABLE MANAGEMENT OF COWS IN WINTER.

[C. L. Hill, Rosendale, at Wisconsin Dairymen's Convention, 1895.]

I would divide this subject into three heads: First, the stable; second, the care of the stable; and third, the care of the cattle. The stable should be so arranged as to be convenient for

the every day work, and all plans should centre around this idea, as the amount of labour required to do the necessary chores will largely depend on the arranging of the stables. If any are going to build new barns, I would advise visiting several good dairy barns and carefully noting the good points and defects also. I would profit by others' experience.

You will find that a stable made of two thicknesses of boards with paper between will be dryer and warmer than a stone basement. The model arrangement for a rectangular barn is two long rows of cattle facing each other, with a chance to drive on the feeding floor, and also behind each row of cattle so as to easily remove the manure. Make the barn larger than you now think you will need, or else plan it so you can build on to the end as it is needed.

By all means have a silo so situated as to be convenient for feeding. Have plenty of windows; in fact, have the south side largely glass. In our barn I have often noticed this winter if the sun shines at all it will shine on all but one or two at a time for the entire day. Have the stable so arranged that in case of weather 30° below zero it can still be shut up so it will freeze very little if at all. If an old stable, line it with paper and another thickness of boards. Don't go to the other extreme and shut it up so it will fairly steam when you open it. Some box ventilators running from near the floor up out of the ceiling will be an excellent way to keep the air pure. The ventilators can be made by boarding up between two of the silo studs down to within a foot or two of the floor. Let each one decide for themselves what kind of a fastener they will use, but let it be something that will keep the cattle reasonably clean.

The much condemned rigid stanchion is generally used and will answer in most cases. (1) If you use this make the floor the cattle stand on vary in length from four to five feet as there will be that much difference between the smallest heifer and the largest cow. Have the gutter sixteen inches wide, at least, and six inches deep. If possible have the walk behind the gutter wide enough to drive a wagon or sleigh through and draw the manure direct to the field. (2)

The manger should be about 24 inches wide and the feeding floor 6 inches above it, and the ceiling 6½ on 7 feet above the feeding floor. There are a few essential things in the care of a stable, and a couple of heavy brooms are almost as necessary as a fork.

Our feeding floor is swept every morning after milking and it adds a good deal to the looks. Then, if the cattle leave anything at all, the mangers are all swept out while the cattle are out to drink. After the stables are cleaned and bedded the walk is swept into the gutter. Another use for the broom is to occasionally sweep the ceiling and sides of the stable thoroughly so as to remove all loose dust and cobwebs, thereby removing, according to Prof. Russell, one of the chief causes of bacteria. Use plenty of good clean straw for bedding. It will pay, in the end, I believe, to cut all the bedding if conveniences are at hand for so doing. It will then make a better absorbent and make the manure finer, which is quite an object if it is to be used on corn land. Be sure your gutter is water tight and use road dust, sifted coal ashes, chaff or sawdust, to absorb what liquid the

(1) A neck-chain, slipping up and down a pole, is the simplest and best tie. — *Es.*
(2) That depends. — *Es.*

straw doesn't take up. I would also use land plaster by sprinkling a few pounds over the bedding just before each milking. If you have never used plaster in this way you will be surprised to see how much better the stable will smell.

These precautions to save the liquids will greatly enhance the value of the manure as the fertilizing elements are worth four times as much in the liquid as in the solid excrement—that is, from a given weight of each.

The chief virtues in the care of cattle are kindness and regularity.

Have regular hours for milking, feeding and watering. Don't milk this morning at 5 o'clock because you are in a hurry to get to work, and tomorrow at 7 o'clock because it is Sunday, or there isn't much work to do.

I don't like to see every animal jump up every time the owner goes into the stable as if they expected to be fed. If you feed them regularly you won't disturb them if you go in the stable between times. Plan your work so there will be a time both morning and afternoon when you can leave the cows to their dreams.

Be kind to the cattle, both young and old, at all times. A piece of rail or milking stool will make a very poor curry-comb.

You had better have to push a cow out of the way once in a while than have to chase them all over the farm when you want to catch one. Anything that tends to disturb them will disturb your profits.

We have had a couple of chances to prove this winter. Mr. John Decker was at the farm testing a cow and one day he wanted to take a picture of her. She became excited and showed it that night, especially in the milk.

Week before last there was a Farmer's Institute at Rosendale and at noon several strangers went to the barn to look at the cattle. Some of the men wore fur coats and the cows were all more or less excited and some positively frantic. Three of them were scouring in less than half an hour and it took most of them a couple of days to get over it.

If the time can be spared it will pay to card and brush the cattle, and at least it will make them like to have you around them. Salt them each day, or better yet have salt where they can have constant access to it. Our cattle are not out of doors long enough to get what salt they want from a box at this season of the year so I salt them each morning in the barn.

Our cattle go out about 10:30 o'clock each morning to drink and give us a chance to clean up the stable. Some prefer to water in the barn, but in all I know about it yet we shall not adopt this method.

They go sixty rods to a spring to drink each day and I yet see no ill effects. We have a tank and a good heater but haven't used them for seven

years. We would do so though rather than have them drink ice water. Ours is a breeding herd as well as a dairy herd and we think the pure air they get in this way does them more good than the cold does harm. However, they are not allowed to stand out of doors and make camels of themselves when they get back from the spring. They have seldom been out over thirty or forty minutes on stormy days, and often less.

We must avoid tuberculosis by seeing that the cows breathe good air only at all times.

Yearlings and dry cows are out longer and exercise is good for them. It will take a little more feed to keep them in good shape, but we are sure their constitution is stronger when they have to bear the closer confinement due to maternity and supplying milk these cold days.

The bulls must also be exercised in

with some satisfaction, after had some pleasure out of them hunting.

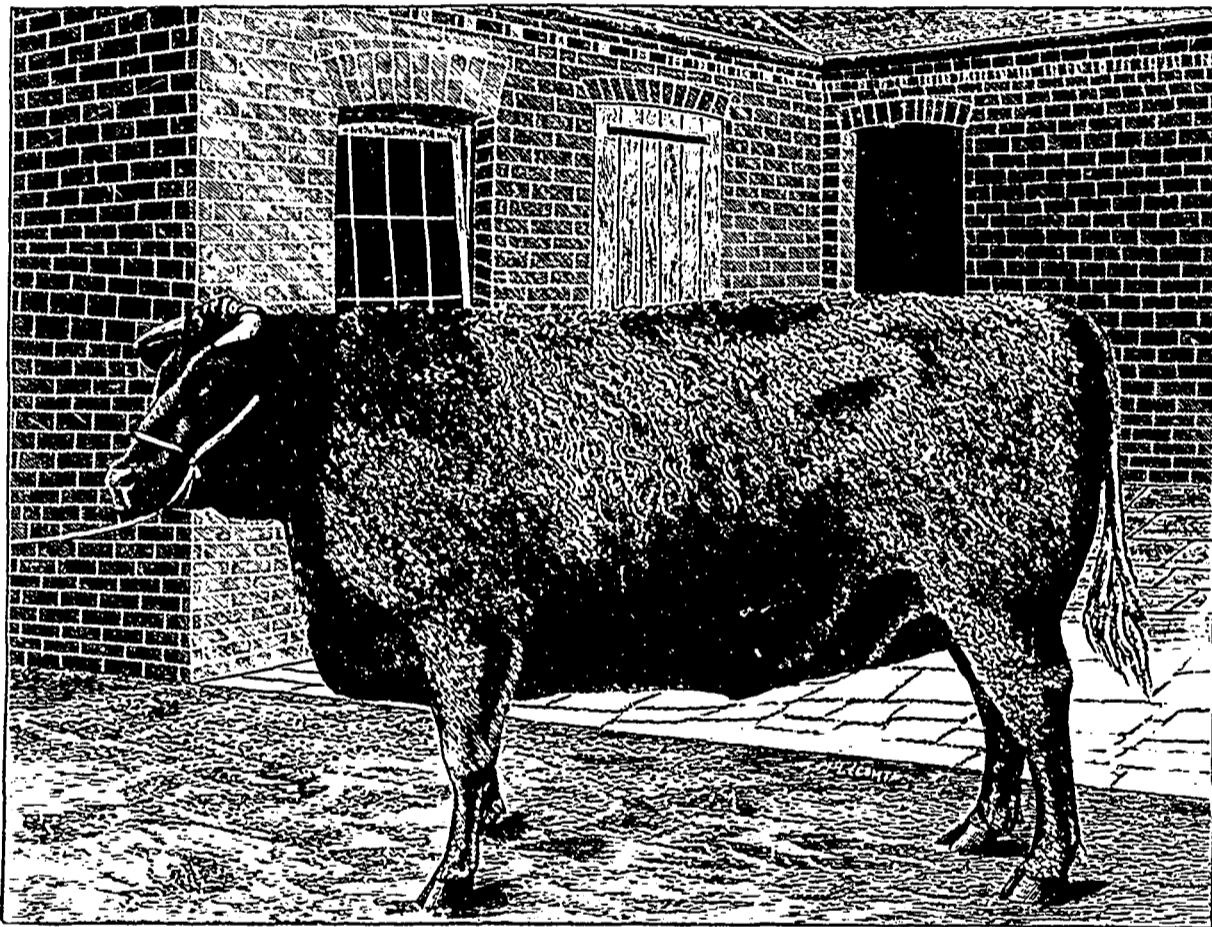
My experiments with sacaline have been so particularly disheartening that, I have been ashamed to say anything about it. I got some plants from "Baltet frères", through the Farmers' Syllicate. They charged me for 200 plants, but I was not able to discover more than 187, when I opened the packages, and although I planted them according to directions, not one ever showed above ground!

Mr. Ausias-Turanno, of the Syndicate, was good enough to enquire about the results of my experiment and refunded me the cost of the plants, as they say they make a point of obliging the people who sell through them to be responsible for the germination of their seeds.

I am afraid that we shall not have a very abundant harvest of anything next year. The ground is frozen deep,

it did to eight tenths of one per cent, or about one-sixth of the whole amount of butter in the milk. This loss is not surprising to one who has opportunity to make such tests, and it is going on every day on hundreds and hundreds of farms in this country. In this case, it amounted to two pounds of butter per day which brought 25 cents a pound to a private trade. Fifteen per cent of the entire production or over \$175 a year; who says that the loss does not amount to much?

More than half this loss can be saved by setting the milk in deep cans and putting them in cold water, and nearly all of it by the use of a hand separator. Where one has the facilities a creamery is very good, but ice or running water below 45 degrees must be at hand and this is not convenient on many farms. But a creamery costs less and is less work to wash and care for than a separator, although, as a rule, it does not raise quite as much of the cream.



SHORTHORN HEIFER FREDERICA.

BRED BY AND THE PROPERTY OF H. M. THE QUEEN, THE PRINCE CONSORT'S SHAW FARM, WINDSOR.
CHAMPION OF THE SMITHFIELD AND BIRRINGHAM SHOWS.

some way and I much prefer working them in a tread power than leading them around. One of our 6 year-old bulls has run the separator for two years and is in the pink of condition all the time. He is kinder and more vigorous and sure than before we worked him. The other bull has so far defied all efforts to make him work, and he is out of doors for a while nearly every day. If you don't work them, turn them loose occasionally.

Have a love for your business. Study the wants of every animal and try to supply them.

You must be enthusiastic if you wish to be successful; in fact, don't be afraid to be called a "cow crank."

Hoard.

"Bleury", Ste-Thérèse,
Jan., 19th., '96.

DEAR JENNER FUST.

I am alas here, not in Europe or rather in that part of it, in which I should like most to find myself, just about 3 miles out from Melton, where I could dispose of my young hunters

after having thawed again after the first frosts this must have played havoc with the roots of grass.

Sincerely yours,

C. F. BOUTHILLIER.

We hear but bad accounts, of the much puffed *Sacaline* on all sides.—Ed.

LOSSES IN CREAMING.

Not long ago, says the *Practical Dairyman*, we made a little investigation into just what the loss was through setting the milk in open pans. A herd of fourteen cows was in milk and giving about 250 pounds of milk a day. The pans were set in a cool room and allowed to stand from 36 to 48 hours or until the milk began to thicken. The skim milk was tested with the Babcock test, and it showed that nearly all the cream rose in the first twelve hours, no difference being shown between that set twelve hours and that set thirty six hours. But the amount of butter fat which was lost was somewhat appalling, amounting as

report and commented upon the fine results from the Babcock tester and in forcible terms urged the more general adoption of this tester. The discussion which followed showed a great interest in this line. He was followed by Mr. William Eager, who advocated the payment of milk according to the amount of butter fat contained in the milk. Prof. Fletcher then gave a practical address upon the hour. He recommended as a remedy kerosene emulsion, a pound of soap, one pint of coal oil and a gallon of water, which if necessary could be diluted.

At the afternoon session about four hundred were present. Mr. John Gould, of Ohio, was the first speaker. He was in favor of selecting good milkers, and claimed the animals should be chosen with a view to the special work required of her, whether for butter or cheese. He advocated silo corn and meal as the best food for milkers. He was followed by the Hon. John Dryden, who spoke highly of the aid the government was now giving to agriculturists and asked for help from the farmers who could be of great

ONTARIO DAIRYMEN.

INTERESTING SESSIONS
AT CAMPBELLTOWN
AND WOODSTOCK
YESTERDAY.

Campbellford, Ont., Jan 9. — Before the morning session of the Eastern Dairymen's Association the members were shown through the Trent Valley woolen mills by the manager, Mr. S. L. Owen, and expressed themselves as highly pleased with the visit.

The morning session opened with an address from Mr. Bensley, one of the inspectors for this district, and after giving his report he dealt with the cleanliness of vessels used and also the surroundings, and urged this strongly upon makers and patrons. Mr. W. W. Grant, another inspector followed with his

service if they united for their general good. Prof. Robertson followed and made his subject 'The hog'. He recommended finishing spring pigs in August when pork was scarce and a good price.

At the evening session the house was packed. Mr. S. L. Owen presided. Mr. Gould was the first speaker and spoke at length on corn, which he said should be planted on sod and cut when glazing and cultivation should be shallow. He was followed by Prof. Robertson, and the Hon. John Dryden, Messrs. Owen and Smith, and the orators were thanked for their efforts to make this meeting a success. After this all repaired to a grand banquet given in honor of the members of the association.

WOODSTOCK CONVENTION OVER.

Woodstock, Ont., Jan. 9—The concluding day's session of the Dairy men's convention was as largely attended as the previous day. The proceedings have been of a very high order, and the delegates have manifested the same interest as before. At the morning session Prof. A. T. Bell presided and a paper was read by Inspector Millar, on, "Mistakes in cheese-making and how to avoid them." A very lively discussion followed, in which a number of prominent dairy men took part. Prof. Dean of the Ontario Agricultural College gave a very able and exhaustive address on 'Is fat of milk a correct measure of its value for cheese making purposes?' The Hon. Theo. Louis then gave a further continuance of his address on 'The hog.' In the afternoon the different standing committees on resolutions and nominations were presented. The following officers were elected for the ensuing year: Hon. president, the Hon. T. Ballantyne, Stratford; president, Mr. A. F. MacLaren, Stratford; first vice president, Mr. J. S. Pearce, London; second vice president, Mr. Harold Eagle, Attercliffe; directors, Messrs. J. Prain, Harriston; J. N. Paget, Camboro; A. Patullo, Woodstock; Thos. Gibson, Forthwich; R. M. Ballantyne, Stratford; J. W. Symington, Camlachie; H. White, Hawkesville.

The newly elected president presided at the remaining session. Addresses were delivered by the Hon. T. Ballantyne, Mr. J. A. Raddick Kingston; President Mills, Guelph; Prof. Dean and the Hon. Theo. Louis. The delegates are being entertained at a banquet by the Woodstock Board of Trade, at which among other visitors are the Hon. Sir Oliver Mowat.

SOME POINTS IN BUTTER MAKING.

Prof. Robertson, in an address on the subject of butter making, made the following remarks:

"A common complaint that comes to us by mail, is that 'the butter won't come.' Well, the butter will come, if the cream be churned at a proper temperature. I have put the limit of time for churning at thirty-five to forty minutes. I heat the cream just high enough to make the butter come after about thirty-five minutes of agitation. I find some people complain that there are specks in the butter. If you allow the vessel containing the cream to be exposed to the action of the atmosphere, a part of its moisture will evaporate, and a scum or skim will be formed on the top of the cream. That will be broken up by

the churning, and you will have merely small portions of thickened, dried cream in your butter. Prevention is better than an attempt to cure. Let the cream vessel be covered, or by frequent stirring prevent the formation of the skin of dried cream. The straining of the cream into the churn is also a good measure for keeping specks of thickened cream or curd from finding their way into the butter.

"Occasionally butter makers find the butter full of streaks. That condition may come from the retention of proportions of the butter milk in the mass of the butter. The addition of a quart of the water for every two gallons of cream, after the granules of butter begin to appear and before the churning is completed, will help to bring about a speedy and full separation of the buttermilk. When the buttermilk has been removed, the granular butter should be washed with cold water. In summer the temperature of the water should be about fifty-five degrees, and in winter about sixty degrees. For the washing, the churn should be revolved a half faster than for churning. Care should be taken to prevent the granular butter from settling on any sediment of curdy substance which may be left on the sides or bottom of the churn after the butter washing water has been withdrawn.

A streaky condition of the butter sometimes results from an imperfect mixture of the salt with the butter. Re-working, after the salt is dissolved, will correct that. Fine grained salt only should be used. The presence of salt should be perceptible to the taste, but not to the sense of touch.

EASTERN ONTARIO DAIRYMEN.

CLOSE OF THE CONVENTION AT CAMPBELLFORD—SOME INTERESTING PAPERS READ—THE NEW OFFICERS.

Campbellford, Ont., Jan. 11—The first business yesterday at the Eastern Ontario Dairymen's Convention was the election of officers, which resulted as follows:—President, Mr. H. Y. Wade Toronto; first vice president, Mr. F. J. Madden, Newburgh; second vice president, Mr. John McTavish, VanCamp; directors, Messrs. W. Eger, Morrisburg; E. King, North Gower; J. R. Dargavot, Elgin; James Whitten, Wolfman's Corners; T. B. Carlaw, Warworth; auditors, Messrs. Morden Bird, Stirling; R. A. Craig, North Gower. Then followed Mr. Pablow with his report; Prof. Fletcher on insects and how to overcome them, and Prof. Dean on temperature in dairying and the use of rennet and salt.

Mr. J. A. Raddick, of the Kingston Dairy School, gave an outline of the year's work in that institution. The morning session closed with an address from the Hon. J. Gould, of Ohio, on the cow and her care in winter, in which the speaker advocated a flooring of sods inverted.

The afternoon session opened with a heated discussion upon the importance of caseine and butter fat in milk for cheese-making, which was enjoyed by all. Checked cheese was next dealt with by Mr. Pablow, which, he said, was caused either by the curd being too geasy or cooking too much. Prof. Dean next rose to answer some questions but so many were being put that it was necessary to ask the parties to send them direct to the department.

Prof. Robertson gave good advice as to perishable goods and explained the cold storage. He was in favor of branding cheese. Mr. James Whitten dealt with the matter of turnip milk and said the only safe way was not to feed turnips to milk cows. Prof. Dean gave an interesting account of his visit to Holland and Denmark last summer. A resolution of condolence was passed to the relatives of the late Mr. J. B. Harris.

The members passed a hearty vote of thanks to the citizens of Campbellford for their cordiality and this closed the proceedings. Altogether this has been the most successful meeting ever held in this district.

Swine.

A MODEL DUROJ-JERSEY PIG.

This engraving, reproduced directly from a photograph taken for the Country Gentleman at the Madison Square garden Show, does the subject scant justice, quite failing to give a correct idea of the exceptional straightness of her back, which you might use as a ruler—to say nothing of its being of almost perfectly even width from shoulder to ham, and pretty nearly as smooth as a billiard table. The animal appeared to be of gentle and tractable disposition, so far as driving and handling her was concerned, but remarkably lively, and quite averse to standing still before the camera. Her idea was to trot around the ring investigating matters; and the picture had to be taken as best it might, the first time she came to a momentary stop, though the pose was far from being what we wanted.

The sow's name is Dimple 2d, 8664, and she distinguished herself at Madison Square by winning the silver cup as best female of any other breed than Berkshire or Small Yorkshire. She also won sweepstakes award over all sows from five States at the Iowa State fair of 1894, and was a member of the hundred-dollar sweepstake herd, all breeds competing, at the Iowa Inter-State fair of the same year, and Iowa is a State where they know what swine should be. She is of excellent shape all over, with particularly good hams, shoulders and head, and fine color, a bright cherry red. She was farrowed in April 1893; is by Motor 2865 out of Dimple; and is the property of Mr. E. L. Clarkson of Tivoli, N. Y.—one of the most successful breeders of the country and well known to readers of this paper.

THE BEST BREED OF PIGS.

This oft-discussed question has again been revived by a discussion in the Farmer's Sun. A farmer reviewing the Toronto exhibition had stated that the Essex and Suffolk breeds were inferior for every day use, and only kept for the sake of picking up prizes. Of course one of the Essex breeders resented this attack and contended that his breed was noted for its evenness and firmness of flesh, its fat not frying away as some kinds of pork do. The carers were appealed to and joined in condemnation of short thick pig with a tendency to lay on fat. One of them, Mr. F. W. Fearman, goes more into detail and describes the kind of pig he wants in preference to all others and will pay a better price for. The kind of hog that is wanted is one that

weighs between 150 and 200 lbs. when marketed. That is, long, deep in the sides, ham in proportion, small shoulder, small, narrow or thin head. When you look lengthwise of the hog, down over the back, the width is the same from the front of the shoulder down to the tail, not wider in the shoulder, as in the Berkshire or hollowing at the flanks, just in front of the hams, as in poorly or in half fed hogs. These hogs want to grade as "choice lean" not fat, nor yet thin and poor. The English market to which the surplus bacon of this country goes, is very particular as to the size of bacon and its leanness in conjunction with the evidence that it has been well fed. The fat along the back of the full length of the side, including the shoulder and ham, must be about 1½ inches thick, and of an even thickness along the whole side. The trade of this country is getting more particular every year. We can show our run of orders received daily, in which the words "must be lean or don't send it" are almost universally used. There is seldom a day goes by in which we are not in receipt of meats (nicely trimmed well cured, etc. being returned to us, with the complaint, "too fat," "not what we ordered," "unsuitable for our trade." Consequently we are much keener after the hog that will make these meats, the choice long lean hog, weighing 150 to 200 lbs., while the heavy fat hogs are comparatively neglected. The kind of hogs that have so far met these requirements are the improved Yorkshires and the Tamworths, or crosses between these and Chester Whites. We have had some very fine lots of straight Chester Whites. From a farmer's standpoint the question of profitable freeding comes in. He must not overlook that.

This last sentence of Mr. Fearman's contains about the marrow of the whole controversy. A thick "porky" build of pig is not wanted any more, and it should be the aim of the feeder to produce the style now called for. Berkshires, Poland Chinas, Chester Whites, are all kindly feeders and lay on pork easily. Select from these or their grades sows of the right pattern and mate with Tamworth or Yorkshire, if you have found these turn out a cross profitable for feeding. The general consent of a community soon decides such questions. If Shorthorn or Clyde or Shrop grades are more numerous than any others, it is because more people have reason for preferring them. When only one man in a country where all breeds have had ample time for trial, is getting all the prizes offered, it may be inferred that other people don't see enough in that breed to induce them to handle it. Have a little talk with the men who are feeding to good purpose and have been long enough at it to make their experience worth quoting. Do as they do and in nine cases out of a dozen you will be on the right track.

Scotch farmers.—Of course, as an Englishman of the deepest dye, we are not going to allow that the Scotch are better farmers than the English; but we must confess that in the economical management of labour and in the close attention they pay to the work of the farm the Scotchmen beat us hollow. Some ten years ago the County of Essex was invaded by Ayrshire men, who bred farms, and started supplying milk to the London dealers: they are doing well. Now, encouraged by this successful immigration, another band have descended on the county of Kent, and are hard at work on some of the finest farms in

Britain; on the "Green sandstone," near Canterbury, where the best Golding hops are grown. We can fancy how the sight of these hard working fellows must annoy our good old friends the "Men of Kent;" for the next thing will be that, when the Scots are seen to be doing well, and the Landlords find the rents are regularly paid by them, the question will be asked why cannot you; born on the land and better acquainted with its peculiarities and with the demands of the local markets than any stranger can be; why cannot you make as much out of your land as a man who, until two or three years ago, was never within 400 miles of the county? We clip the following bitter, but deserved sarcasm from the leading paper of the dear old county:

Scene.—A farm within the county hunted by the Ashford Valley Harriers. Scotchmen at plough. A Kent Farmer (who is following the pack):—"Are you the Scotchman who hire this farm?"—"I may be." Kent Farmer:—"Then you are two clever people who have come to show us how to make farming pay. Scot:—"I mean to try and make it pay. Kent Farmer:—"Perhaps you will give me a tip or two. Scot:—"Yes, the tip I wad gie ye is to come off that nag, gang home tae yer farm, and look after yer men and tak' a turn at the plow as I doo."—Exit Kent farmer. (*Kentish Observer.*) Observe the canny indirect replies of the North-man to the first two questions.

Turnip taste.—My dairymaid is very dubious about my giving the cows swedes or cabbage, as it may affect the taste of the butter. If it is the correct thing to give it, should it be before or after milking, and would it be best to cut the swedes with a Gardner's turnip-cutter?—SUBSCRIBE TEN YEARS. [There is not likely to be much trouble with these foods if given in moderate quantity, and after the milking; by moderate quantity we mean not more than 30 lbs. daily. When given immediately after milking, the bad flavour becomes dissipated before the next milking. The slicing will not influence the taste much, but make the eating pleasanter to the animals. (*Eng. Ag. Gazette.*)

FARMERS' SYNDICATE
OF THE
PROVINCE OF QUEBEC,
Office: 23 St. Louis Street,
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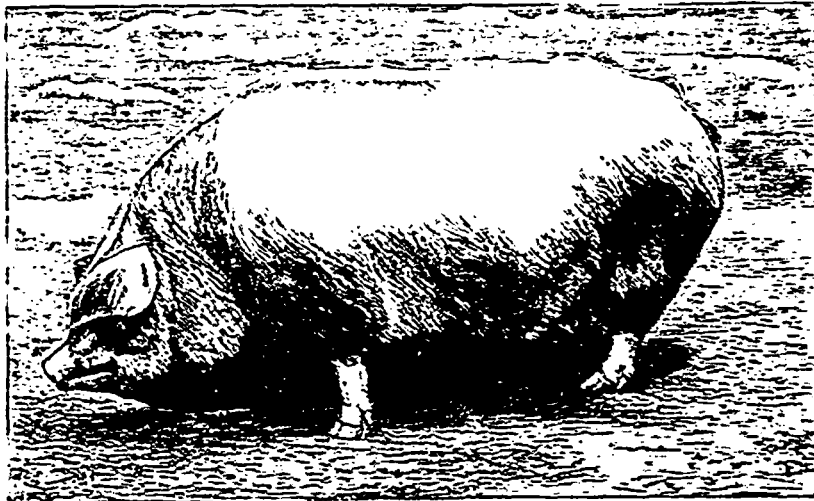
Editor *Journal of Agriculture.*

Sir.—I have often wondered at the dearth of original contributions to your *Journal*. I am quite certain that there are many good farmers in the Province who could in this way give valuable aid to those who have not an extended experience. Some who perhaps have been placed in circumstances which have prevented them from becoming well qualified. Some who, by mismanagement, illness, the wants of a large family, or the pressing weight of a mortgage on the farm, find farming an up hill pull.

I am aware of the different objections, one of which is, the fear of deprecatory criticism. And truly it is a fact, that at farmers clubs, &c., if one of the members attempts to go farther than a few common place remarks; unless he is callous as an alligator, or is animated by a desire to learn to express himself in public, or to benefit his fellows to the best of his ability without fear or favor; he may be privileged to hear remarks that will prevent him from again making an effort to tell what he thinks, or to excite a discussion to draw from others their views and experiences.

and attends to it as diligently, is sure of success? While of those in other vocations, though well equipped with knowledge but through circumstances over which they have no control, the majority fail in providing a comfortable home, and provision for old age. It is true that farming does not give the opportunity of piling up hundreds of thousands of money, but the intelligent farmer of a very few thousand dollars' worth, is sure of providing for all his wants, can enjoy life, his business, and his home, better than the city man worth ten times the capital of the farmer.

There are those who are never willing to admit that they don't know everything necessary to success, but somehow "bad luck" often overtakes them, and when the manna falls, their plate is often bottom side up. When produce is dear they are buyers, and when it is cheap they have it to sell. Information never interests such men. At the same time there are those who are desirous of obtaining information, who read good standard books with that object in view, but it is doubtful if many would admit that there is as much to learn as a young man I knew of whom it was said, that sometimes in haying and harrowing he went two or three times a day to the top of a hill overlooking a valley farmed by several



A MODEL DUROC-JERSEY PIG.

Why is it, that farmer's associations in a short time are wanting in vigor and cohesiveness? Why is it necessary for the Legislature to subsidize them, and that in a short time every object for which they were instituted is gone except the hope of gain? Why is it that farmer organisations of all kinds go to pieces like a rope of sand, unless held together by expectation of profit, or connected with, and controlled by some other class in the community? Is it not a fact that in organisations composed of all classes, and although the farmers may outnumber the others ten to one, that they lose control of the business and responsibility, nay, even push it on the shoulders of the other classes? Why is it so? Why is it that there are only a few Farmers in the Legislature, while there are so many Lawyers? Is it because there are none sufficiently educated to qualify them for the duties? Or because they are not sufficiently alive to the duty of taking their proper place in the work of the country? Or is it on account of the tender regard they have for the interests of other classes?

Is it true that there is no room for promotion in Agriculture? Is there no emulation among farmers? Is that the reason our sons say they won't be farmers; that to be a farmer is to be a nobody? And at the same time is it not true that the intelligent farmer who understands his business as thoroughly as is necessary in other lines,

successful old farmers, and who, when asked why he went, answered, "to look at the weather;" the fact being that he was not oversure of his own judgement, was anxious for information as to the probabilities of the weather, and was guided by the more mature judgement and experience of his neighbours of which he judged by the management of their work. That man made a competency and retired years ago. And I can well remember, in the forties, an old settler who was a very encyclopaedia of information on agriculture, or indeed any other matter. And how the settlers of the then new country, who were everything but farmers, flocked to the little red store to obtain information on various subjects. I remember, in after years, riding five miles to ask him as to my harrowing up a large field of new land corn (it had been a very wet cold spring). I told him that all my neighbours had done so, and sowed barley in place. He said, "they have made a mistake; I know your corn field, don't destroy a hill of it," I took his advice, and the result was, I never harvested a better crop of corn. I sold it for \$7 to \$9 per bushel, and that was my first success, in the first year of my farming. There were no railways in those days.

The one who is so wise that he has nothing to learn, has no claim to a long stay in this world, and the one who hoards his knowledge, while his

neighbour hungers for a suggestion, will never wish to be in the one he has a claim to.

With your leave Mr. Editor I purpose once in a while occupying a place in your columns, endeavoring to fulfil a duty to the *Journal of Agriculture*. During forty years in the past, I have endeavored to the best of my ability, in other periodicals on various subjects, to better my fellow man and to elevate the farmer. I have no pretensions as a writer, but if I can make a remark, or ask a question, which will cause others to think out the subject for themselves. If I can induce, or provoke others, better or worse qualified than myself to give us of their knowledge, I shall have done a good work. We have enough of theorists, plenty of scientists, a sufficiency of opinionists. What would benefit the Province is the practical experience of our own farmers, who have made a success of their business.

The principles of agriculture are as old as Adam. I have not the least doubt that the Egyptians understood raising corn, and the Israelites the breeding of cattle, as well as we of the present day, and that in those days, as at present, there were some more successful than others, by reason of their superior methods of applying the principles, and in aiding nature to provide for the wants of mankind.

JAMES DICKSON.

Trenholmlville, January 1896.

We shall always be glad to hear from Farmer, as Mr. Dickson usually signs his letters.—Ed.

Household-Matters.

Comforts in a farm kitchen.—If the working farmer's wife of Canada could be transported into a New Hampshire farm kitchen for a day or two, I think she would realise what a comfort it is to have so many, and such various contrivances for the help and comfort of the worker. It often falls to the lot of a very fragile woman to have to do a large amount of work, which she could not do without every contrivance to assist her in doing it.

If there is a daughter, she is either at school or teaching others, they do not appear to take kindly to farm work, any better than our Canadian girls do; and as domestic help is more expensive and difficult to get than with us, I fear the every day work without all the little contrivances for doing it, would often be too much for her.

The men are very handy and thoughtful in giving help wherever they can, such as providing everything under shelter to spare the wife the trouble and discomfort of hunting round, or, what is so very dangerous for some women, having to go from a warm kitchen out into the bitter cold of winter.

The men the milking, and churn the butter if any is made.

In the winter they paint, stain, that or varnish any part of the house wants freshening up, so there only remains the small trouble of dusting with a damp cloth or wiping over with water, soap is not used as it spoils the varnish, and will take the paint off the floor very quickly.

Now this sounds very nice, but one thing was very apparent, and often painfully so; that is, the great want of a few trees or a little flower garden to relieve the very stiff whiteness of the buildings.

There is not much work to do on a Canadian farm in the winter, and it is

a small matter for a thoughtful man to see before leaving the house that everything, such as wood, water, and many other little helps are provided before doing so.

I am quite sure many men do this, but I have the authority of the daughters, who say some do not, and so they prefer domestic service in town with its good pay rather than working hard and often in discomfort for nothing. They never realize a certain duty they owe their parents. A pleasant room, with every available help given, is the right of and should be demanded by every woman who has to do her own work.

Our housekeepers must have relief but that relief can only come when we adjust ourselves and our style of living to far simpler methods than those which now pervade in our homes. It is high time that some of us should stop progressing, since progress is not good for all. Domestic expenses are tricky things—they increase almost imperceptibly. But therein lies their greatest danger. Addition is easier than subtraction. A luxury soon become a necessity. Too many of us know where to begin; too few of us where to stop. But all this time our women are wearing themselves out by the frightful wear and tear of housekeeping on a scale which compels all too many to live in false positions. No matter how much a man desire everything comfortable in a home, he values the health and happiness of his wife above all things. If he doesn't, he isn't a man. I concede that men are, in a measure, to blame for this excessive house-keeping. Many a man, well intentioned, brings burdens upon his wife because he doesn't understand what he is doing. But our women are at fault here as well. A wife should not silently assume burdens which in her heart she feels incapable of carrying out. No matter how much she may love her husband, that affection is ill-directed that allows a woman to carry her beyond her physical resources, even in the noblest resolve or for the highest motive. What we do for those we love should be measured by our capacities, not by our desire to do.

A New Kitchen Utensil.—A recent cooking-class lecturer described a kitchen utensil which she had invented herself, and a trial of it proves that it more than bears out the claims that she made for it. It is useful a dozen times a day, makes a double boiler unnecessary, is no trouble to clean, and utilizes the valuable principle of slow cooking. When I add that any one can make it, and that it costs nothing, I need say no more in regard to its merits, as every housewife will be ready to try one for herself.

It consists simply of two lard-pail covers (or other tin covers), fitted together in such a way as to leave an air-space between—that is, with the insides facing each other. A short slit is cut in one side—a can-opener or an old knife will do it—into which the stove lifter can be thrust to serve as a handle, and the "guard," as I call it, is complete. You slip it under the saucepan of oatmeal for breakfast, and there will be no burning—unless indeed, you want it to put under the coffee-pot, which is fatally prone to boil on cold mornings. A witty Frenchman declares that "the soup-pot should barely smile," (1) and the

(1) It should never even "simmer"—200° F is quite hot enough with time.—Ed.

guard will help to bring about this desirable state of things. Meat, too, how apt it is to gallop when it ought barely to simmer! And in the oven your new utensil will be equally valuable—under the pudding or custard, which otherwise might boil up and curdle from the bottom, and under the fruit cake or any other slow-baking loaf, which too often shows a scorched under-crust. In a word, it might be in every kitchen, and the wonder is that none of us thought of it before!

Donée.

Cracks in the Floor.—If the boards of a bare floor do not fit perfectly, say a writer in the Christian Union, have the spaces filled with putty or with a mixture which has been often recommended of late, made of old newspapers soaked in a paste made of flour and water. The proportions of this are one pound of flour, three quarts of water, and one table-spoonful of powdered alum. The newspapers should be torn into bits, and the whole thoroughly boiled and mixed until of the consistency of putty. It may be colored with a little of the staining mixture, and should be forced into the cracks with a knife, when it will soon become hard and dry like *papier maché*.—(Cul. and C. Gentleman.)

The Virgins Improved Upon.—Eds. COUNTRY GENTLEMAN—While reading your valuable journal, which has become a most welcome visitor to my household, I was much interested in the article on "Virgins and Lamps," which I found on page 57. Yet I feel as if the method given, while no doubt a most excellent one, required considerable time, and that is an important factor to the busy women of to-day. Let me tell of a method we have followed for many years, and which has always proved satisfactory, not to me alone but to many friends who have tried my plan.

In the first place, it is well to buy your wicks by the dozen. Soak them in vinegar until thoroughly saturated, then hang them in your kitchen to dry—not too near the stove, as the more slowly they are dried the better the result. Put them carefully away, and you have them ready whenever needed.

I boil my burners once a year, and as to changing wicks why, I never do until too short to use. Once a week trim with scissors all wicks in the duplex burners, but daily rub off their burnt edges. You will find that a Rochester burner must never be trimmed with scissors—it will cause the "snapping" of the flame—but each day wipe away all burnt edges with a flannel cloth.

Fill the lamps every day, and please do this in the morning; do not wait until darkness deepens and lights are called for, or you may be careless and some accident result.

Just a word as to the chimneys. I wash them three times a week in plenty of soap-suds and hot water, rinse, then polish with a linnen cloth. You see my way is based upon economy of time and purse, yet secures me a brilliant light without odor or smoke. A. K. P. Reading, Pa.

Sleep and insomnia.—No Mention of *Insomnia in the Older Medical Text-books.*—Sleep is a greater mystery than insomnia. We hear much of the latter state in these days. But it is more wonderful that we sleep so well than that we are occasionally wakeful. We hear more of sleeplessness than our forefathers did. It is a re-

markable fact that in scarcely any of the older recognized text-books of practice of physic is there any formal notice of insomnia *per se*. In later work, and especially in those devoted to treatment, the subject of insomnia does receive considerable attention. And every now and again the sleeplessness of a great man in the world of science or in that of politics reminds us that eminence has its troubles and of a sort which seldom affect the poor man. It is probable that this evil of wakefulness is more common than it used to be. The excitements and especially the worries of life multiply. Many of the arrangements of society are of a nature to drive away sleep. Even the very pleasures of life are so taken by many as to rob them of one of the greatest pleasures of all—an eight hours' sound sleep, for we maintain that this is what everybody should aim at. It may seem a long time to spend a third of one's life in sleep. But if the other two thirds are used well there is little cause for blame. No rule can be laid down, but it would be well for most people in the intensive days in which we live to devote eight hours to the cultivation of the mood and act of sleep and to resist the domination of all habits and fashions that are inconsistent with this purpose.

For Window Gardeners.—Attend carefully to the watering of all kinds of plants grown indoors.

Ferns only require a moderate amount of water, say about once a week.

Cactuses and succulent-leaved plants may safely have water withheld from them until the end of January.

Bring bulbs starting into growth in a light position near the glass.

Do not water too freely at first.

If a few flowering plants are required to make the window gay for the new year, procure any of the following.—Chinese primulas, cyclamen Roman hyacinths, Erica gracilis, E. hyemalis, and azaleas.

DON'T FOR THE WINDOW GARDEN.—Don't forget that plants will require plenty of fresh air on sunny days.

Don't leave the door or window open too long, unless the weather is very mild, or the plants will become chilled.

Don't allow a direct draught on the plants, especially if the air is cold. Admit it through a door or window at some distance from the plant shelves.

Don't give too much water or try to force the plants. Give them time to become accustomed to their winter quarters.

Don't forget to search for the cracks that will let in the keen air. Stuff them with folded newspapers.

Don't be sorry to give your only rose or geranium blossom to your sick neighbour. It may do her more good than the medicine.

Don't be discouraged if you can't make the plants bloom while the days are short and there is little sun. You will notice a great change in a few weeks.

Household Hints.—Frequent turning is the secret of successful broiling.

Always use a wooden spoon for mixing cake, as an iron one discolors the butter.

A dash of cinnamon in a cup of chocolate after it is poured is said to add a piquant flavor.

Wear well-fitting shoes about your housework. They are less fatiguing than loose, untidy slippers.

If the children have no appetite in the morning, don't allow them to start for school without first drinking a glass of hot milk.

Onions, potatoes and cabbages for soup should always be scalded before being used, to draw out indigestible qualities.

In baking bread or rolls put a sauce-pan of boiling water into the oven. The steam will keep the crust smooth and tender.

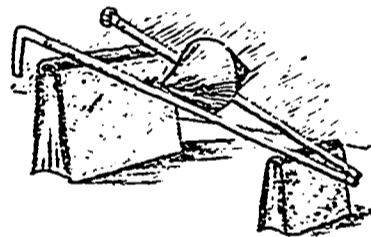
Much of the heavy cake and bread is the result of the oven door being slammed when closed. Shut the door as gently as possible.

It should be universally known that sand or flour scattered over burning oil will extinguish it. Every household in which lamps are used should have a box filled with sand in a convenient place, ready for all emergencies.

A new dainty for afternoon tea, which can be cordially recommended, is a macaroon sandwich. It is made with two macaroons between which is placed a very thin slice of esgo cheese.—Comfort.

A Curious Optical Delusion.—If we place a ball, a cylinder, or any other rolling body on an inclined plane, we all know what will happen—it will roll down hill, obedient to the force of gravity. The following experiment appears to contradict the principle of the inclined plane; but, on the contrary, we shall see that it confirms the customary law of nature:

Glue a couple of small lamp shades securely together by their bases, or they may be two cones of cardboard. Now with two smooth walking sticks construct an inclined plane by placing them on volumes of unequal height,



A ROLLING BODY GOES UP HILL.

as in the drawing, observing, however, that they form an acute angle with each other, whose apex falls beyond the smaller block.

Place this double cone near the lower angle, close to the bottom of the inclined plane, and, to your astonishment, instead of seeing it roll down the remainder of the distance, it will appear to mount the reverse way and steadily revolve up hill.

But you will quickly arrive at the philosophy of the thing when you appreciate the fact that the cone itself is really going down the hill, for as the angle between the walking sticks widens it allows the center of gravity of the cone to descend lower and lower. It is but a curious optical illusion, not a contradiction of the laws of gravity.

Three Kinds of Taffy.—To make coconut taffy, take two pounds of sugar, one third teaspoonful cream of tartar, two thirds cupful of water; cook to the hard crack; add one fresh grated coconut; stir until the batch reaches the soft crack, pour out into a greased pan, and when nearly cold pull white on hook, writes Nellie Willey in an article on "Making Candy at Home" in the December *Ladies' Home Journal*.

Molasses taffy may be made by boiling one pound of sugar, one pound of glucose, one third quart New Orleans molasses; stir all the time and cook to soft crack; set off the fire and stir in one third teaspoonful saleratus; pour into a buttered pan, and when nearly cold pull on the hook and flavor with peppermint.

Another good recipe for molasses taffy is the following:

One quart of New Orleans molasses, one and one fourth pounds of sugar; set on fire and stir and cook until, when dropped in water, it will form rather a hard ball if gathered up between the fingers; this is called hard ball; then add one-quarter pound of butter and cook to soft crack, pour into a greased pan, let it remain until nearly cold, and then pull on hook. — *Vermont F. Advocate.*

Bottle Bells.—Take two chairs, two sticks and 18 wine bottles. Rest the first stick on the tops of the chairs and second stick across the ends of the two seats, the chairs being turned back to back. Now hang the empty bottles to the sticks with strong string each string having a double loop. If the bottles are all of the same size and shape, they can be tuned by pouring water into them—the more the water the lower the note. Strange to say, every empty bottle when struck gives out an entirely different note. Besides wine bottles ordinary medicine bottles may be used. With a musical ear it is not at all difficult to arrange the bottles and fill them with water to just the right height to produce the different notes. Now take a light stick with a "spring" in it, and strike a tune on the bottles. (1)

The Hive.

THE WINTER CARE OF BEES.

It is quite important that bees be well wintered if they are to come out in good shape in the spring, and be in the best condition for active work. Everyone wintering their bees in hives not protected by chaff or sawdust packing, should have them safely housed in some suitable outside repository built purposely for them, or in the cellar. As special repositories are not in general use, I will confine my remarks to cellar wintering, which, all things considered, is by far the best for the average beekeeper. Almost any cellar beneath rooms in which fire is constantly kept, will answer nicely, if everything is properly attended to.

The best time to put them in is about the 20th of November, just before winters sets in and after the last chance of a flight. If the improved modern hives are used, the bottom boards may have been carried in with them or not, as most convenient. The hives should be placed on a platform solidly supported, two (2) feet or so from the cellar bottom. If a large number of hives are to be put in, it is best to leave the bottom boards off and carefully tier up the hives one above the other, with inch strips between, which greatly economizes space. The part of the cellar the bees occupy, should be darkened so that the light does not strike them strongly, or they will fly out more or less during the winter. The light also disturbs them and makes them uneasy.

(1) The hollow iron tube in the Montreal streets appear to us to be all tuned to *b flat*. Ed.

Never put bees on a shelf suspended from the flooring above, as the constant jarring to which they will be subjected is very bad, too. They should not be disturbed during the winter any more than is necessary for an occasional examination to see that everything is all right.

As to the temperature 45 degrees is nearest right, generally speaking, but if other things are as they should be, the variation of a few degrees in temperature either way, is not important. Usually a damp cellar should be kept a little warmer than a dry one. If the bottom boards have been left under the hives, care should be used to see that the entrance does not become clogged with dead bees. They should have a free and unobstructed entrance at all times, or they are likely to get uneasy; ventilation is also hindered when the entrance is closed.

A cellar should be reasonably free from dampness to insure the best results, but if the bees are in good condition when put in, with plenty of well ripened stores, and strong in numbers, little fear need be felt on that score. In a very damp cellar it is advisable to not set the hives too close to the outside walls. If the combs do mould a little, the bees will clean them up all right in the spring. Should there be any mice in the cellar, they should be trapped, as they are a great nuisance, disturbing the bees, and gnawing the combs.

Never place bees in an attic, or bed-room, or an outbuilding, as the constant changes of temperature, the light, and more or less jar to which they are subjected, is pretty sure to result in their death before spring. Bees should be left in their winter quarters until settled warm weather in the spring, which in this climate, comes about the 20th or 25th of April, unless they should become very uneasy and restless, in which case they may be advantageously set out a little earlier.

F. W. JONES.

Bedford, Que.

WHY FARMING DOES NOT PAY.

In the present depression of prices, it is quite a common complaint that farming does not pay, and there is no question but that this is true to a certain extent; but there is yet a more potent reason in too many cases why farming does not pay; namely, the want of system, and neglect to economize in every particular so as to produce the marketable commodities at the least possible cost, and of the very best quality. It is strange how difficult it is to induce some farmers to go out of the old beaten track trodden by their forefathers and they are unwilling to adopt any new methods until the necessity for doing so is actually forced upon them by low prices.

In times of depression, quality is most important, because, if it is hard to dispose of a good article it is next to impossible to sell a poor one, and yet the poor will have some influence in keeping down the price of the superior.

One of the great advantages of the cooperative creamery is that it tends to drive the poor butter makers out of the market. Home made butter, made as some ladies can and do make it, cannot be equalled by any creamery made, but there are other careless ones who manufacture an article too rank to use for anything but greasing cart-wheels but who are prejudiced in favour of their own. These people bring discredit upon all home made butter, and

the sooner they are driven out of the market, the easier it will be to maintain a fair price and the confidence of the public. We also hear of ruinously low prices for meat, no doubt with good cause, but for this we have to thank in some measure the feeders, who do not do justice to the animals by proper management and send their meat on to the market in such a condition that it is scarcely fit for human diet, and then complain of the price! The successful farmer will be the one whose aim is always to produce the best quality of whatsoever he puts his hand to and this by the most economical methods. The first step in economy is to maintain the fertility of the land by liberal manuring thorough and clean cultivation, and constant attention to every detail. Then, to be particular as to the choice of stock, selecting animals of such a breed as will best answer the purpose for which they are intended and not be content with any that are promiscuously bred or of inferior quality, making it a point to improve them as fast as opportunity offers, and this because it has been abundantly exemplified that only thoroughbred animals or at least high grade ones can be made to respond profitably to good feeding. (1) Comfortable, well lighted, well ventilated and perfectly clean stables are a principle factor in true economy. Also, extreme punctuality as to time for feeding, watering, and milking, matters alas too frequently overlooked or neglected by those who complain the most that farming does not pay.

As to forage rations, economy is sadly lacking, in many instances careless and indifferent people do not make the best use of their opportunities to grow all they can wherewith to feed their cattle and other stock and thus secure it at the lowest cost, but have to put out cash for the purpose of purchasing different feeds at a loss to themselves of the profit they have to pay the dealers in these feeds.

It is only lately that many farmers have thought of growing any crops to supplement their pastures, and yet such crops can be grown, especially Indian corn fodder, on a small space of land with comparatively little labour and expense, and the cattle kept in good condition until they go into winter quarters.

It is interesting to notice the remarks of those who have adopted the plan of planting these supplemental crops, as they say they cannot think how they did without them in past times.

That providential invention the silo, makes a grand means of economy in the preserving of winter forage and should be more popular than it is. There is a prejudice in the minds of some who have not been particular enough in the building of the silo or the storing of the silage, but I have yet to meet with the man who has attended faithfully and intelligently to every detail in these respects who does not say he would not be without his silo on any consideration.

Judicious employment of capital is true economy, and capital consists, not in dollars and cents only, but in certain qualities of the man himself, which he should learn to cultivate and make use of, such as pluck, courage, energy, determination, persistent effort to overcome all difficulties. Keeping strict account of income and expenditure leads to economy: one who does this will not be so likely to squander his means. A record of all operations and transactions will en-

(1) Mr. James Drummond, the great Ayrshire breeder, feeds his cattle five times a day, Mr. Moore!—Ed.

gender economy, and save us from a repetition of failures while encouraging us to further successful efforts.

We live in a day of keen competition, in everything else beside farming, and he who prosecutes his business industriously, faithfully, intelligently and economically is the only one who can make it pay.

Let us then not be discouraged by a season of low prices, but make up our minds that there is all the more necessity to adopt the best methods. I have merely glanced at this subject, which each one can elaborate for himself by studying the numerous theories presented by those who have investigated the questions at issue from a scientific stand point, not ignoring them as new fangled notions and unattainable, but putting any of them into practice as far as his means will allow.

Thus he will keep up with the times, and if his lot be not so lucrative as that of some, he will still have the means wherewith to live, and having food and raiment, therewith to be content.

GEO. MOORE.

A FARMER'S SONG.

In nature's great plan
To the very first man,
The earth and its fulness was given
And God taught him now
By the sweat of his brow,
To secure the rich boonties of Heaven.
Now in every place
Where grim want shows her face
By labour he learns to disarm her;
For the fruits of the soil
Shall reward well the toil
Of the faithful, industrious farmer.
Then hurrah for the land and the cattle
Hurrah for the joys of the farm
If the farmer stands close to his duty
Kind Providence shields him from harm.

In every age
On history's page
The farmer's glad lot is commended,
And no man than he
More happy can be
Until his long life shall be ended.
The sailor may boast,
And the warrior host,
When each one returns to his charmer,
But I would not exchange,
Throughout the whole range
Of professions, my own as a farmer.
Chorus—Then hurrah, &c.

Let the wealthy and great
Roll in splen'our and state
I envy him not I declare it,
I eat my own lamb,
My own chicken and ham,
I shear my own fleece and I wear it.
I have flocks and I've flowers,
I've lawns and I've bowers,
The lark is my morn'g alarmer;
So, jolly boys, now
W-h'ring "Good speed the plough."
Long life an' success to the farmer.
Then hurrah for the land and the cattle
Hurrah for the joys of the farm
May the farmer stand staunch by his duty,
And Providence shield him from harm.

G. MOORE.

GINSENG CULTURE.

I have had considerable correspondence from parties in Canada in regard to ginseng culture, and have tried to impress upon all parties the importance of developing this industry, while the wild roots can be found to start with. Canada has long been noted as producing the best quality of ginseng found in America. The export of ginseng from Canada commenced in 1718, and since then, large quantities of the roots have been sent to China, yielding a considerable income. It is found in paying quantities in various parts of the Province and commands the highest market price. The price in New-York for the past

few years has ranged from \$3.00 to \$4.00 a pound for first class wild root.

The impression has obtained in this country that ginseng could not be cultivated. The writer has clearly demonstrated that it can be successfully cultivated, and can be made very profitable. A few figures will show what I am doing in ginseng culture, and give some idea as to its possibilities. I commenced in a small way in the autumn of 1886, the first two years did not amount to anything more than gaining a little experience. But since 1888, I have been developing the business as fast as the nature of the plant would allow. I have at this time, January 1896, in garden 67 beds stocked with roots 30 of them 3 x 16 feet each and 37, 3½ x 16 feet each and about 15,000 trailing roots in forest nursery with about 10,000 seeds sown in forest nursery from which plants are expected next spring. Also last season crops of about 200,000 on hand ready to be sown next fall, to produce plants in the spring of 1897. I have also furnished the public during the past five years with about 80,000 seeds and about 4,300 roots for cultivation.

My grounds have produced 84½ pounds of dry marketable root which sold for \$104.88. From 7½ beds, 3 x 16 feet each, have been taken the past season 2,545 roots weight 145 ½ pounds, from these were taken out for replanting 2,312 roots weight 59 ½ pounds leaving 88 ¾ pounds to be dried for market making 30½ pounds dry which sold for \$161.00. It will be observed that the stock was decreased by only 233 roots. 2,408 seedling roots of one to four years growth, weight 19 lbs. were also taken from 6 of the beds and not included in the above figures.

Four of the beds had been in cultivation five years, the others four years, the plants had produced during the time at least 40,000 seeds value \$30.00. The total value of roots and seeds from the 7½ beds was more than \$300.00 from less than two square rods of ground, in less than five years. The first cost of stocking the beds with small wild roots was less than \$25.00.

No one need think he can rush into ginseng culture by the acres and reap a fortune from it in a few years. It must be worked up from small beginnings and it will take time to place it on a paying basis. But I can see no reason why others may not do as well as I have done. Ginseng can be cultivated in garden, orchard or forest, any light rich soil such as will produce good garden vegetables will grow ginseng; a sandy loam or rich alluvial soil will give good results. It must have shade, either natural or artificial, and should be protected to some extent from hot dry winds, mulching and moisture are essential condition, but the plant will stand drought as well as ordinary crops. The best way to develop this industry is to transplant the wild roots, in this way one soon gets to producing seed in quantity. The seed is the main dependence in ginseng culture, as it does not spread from the root. A few thousand roots put in each year for a few years would place the business on a paying basis. There is no danger of over production of first class root. Ginseng has been cultivated in Korea for hundred of years, and the market has not been over stocked.

Summit Station.

GEO. STANTON.

Onondaga Co. N.-Y., U. S. A.

HOPS.

The Hop, *Humulus Lupulus*, is in the class and order *Diacia Pentandria* of Linnæus, some plants having male and some female flowers. The year of its introduction into England is doubtful; an old lease in Kent, date, 1463, has the following covenant: "Every year during the term, an acre of wode competent and of the best fewell, exceptes Hope tymbere;" so we may suppose hops to have been well known about the beginning of the 15th century.

It is curious to see how the idea of being involved in certain names of plants, and even of living creatures—*lupus* a wolf, hence the pike was called the *water wolf*; and the hop-plant, a little wolf, *lupulus*, bitter i. e., *biter*; confer morsel from *mordeo* to bite, through the French *marceau*; the bit of the bridle, &c., &c.

"Hops," says an old writer, "are hot, and in the third degree inciting appetitive, abstersive, subastrigent, digestive, discutive, diuretic, stomachic, and sudorific: indeed, the spirit of the hop is truly cordial." Very good, we hope its qualities are sufficiently numerous to please all parties.

Hops may be grown to perfection on various soils, but deep, rich, dry soils with porous subsoils are the best for this as for all crops. All heavy lands should be drained 4 feet deep, and at distances from 28 to 40 feet apart, according to the porosity of the subsoil. The roots run down, sometimes, 15 feet into the ground, and no amount of open furrow surface work will save them from rotting in a wet season. For *draining*, v. *Journal of Ag*, p. 99, vol. 2.

It is worth while taking pains about this crop. We know of land that has stood in plant for more than 120 years—it belonged to Mr. Ellis, of Barming, near Maidstone, Kent, Eng., and is, even now, noted for growing large crops of the best quality. The subsoil of this old plantation is the shattery *Kentish Rag*, geologically, the *Green sand*. Poor Mr. Ellis, after hop-growing for forty years, died insolvent about fifty years ago. He was the original of the husband of *David Copperfield's* first love, the "Eidest Miss Larkins." The really superior qualities of hop-soils, like the above named, grow a great weight of the finest sorts, *Goldings* and the *Canterbury*. We do not know of any land in this province fit for their cultivation, unless it be half-way down the slope of the hills near Compton, and other equally favoured districts in the Eastern Townships. The heavy soils of the "French Country" must be satisfied with the coarser varieties: *Jones*, *Grapo*, and *Colegate*; and even these will not last long in plant where the drainage is neglected, as it almost invariably is. Large crops may, undoubtedly, be grown on these heavy alluvial soils: We have known as much as 1480 pounds to the acre on some of the Wealden clays in the border between Kent and Sussex. Blight, however, on these low grounds is very destructive. Here, a piece of old grass deeply, very deeply, ploughed would be the most desirable hop-yard, as the buried turf would help to feed the plant for some time; but we are anticipating.

Situation of Hop-yard.—The site is a very important matter, as shelter from the prevailing winds of the district is a vital point. In Kent, we used to prefer a field sloping to the north, and the idea was, that that aspect has more hours sunshine than a southern exposure. A halt of wood

should be left as a protection, but the yard should not be surrounded by wood on any account, as that would hinder the free circulation of air, and tend to encourage mould.

Preparation of the land for planting.—It is no use talking of trenching the land two feet deep, here, as we do in Kent and Surrey: we must, perforce, be satisfied with ploughing. Two ploughs, following one another in the same furrow, ought to get a depth of 14 inches in ordinary land. The second plough should be a *subsoiler*, where one is to be had. Our great Kentish "Turn-wrest" plough, with 6 horses, we have seen turn up a furrow of 14 inches in depth. It had two wheels, a gallows, and a steel pointed wooden share, and left an amazing amount of crumb (1) In our heavy soils on the chalk hills, any other plough would be broken to pieces in ten minutes work. Trenching used to cost about \$35 an acre; here, as men are not used to the job, double the money would not pay for it. If deep work is necessary in the moderate climate of England, how much more so must it be in our hot summers.

The hills should be arranged in the *Quincunx* form, as in that way there will be more paths for the horse-hoe than where the lines run up and down the field, merely. Besides, there will be more hills on an acre in the *Quincunx* system: i. e., at 6½ feet apart, the usual distance, there will be 1194 hills in the one case, and only 1031 in the other. Pins are stuck in the sites of the future plants, to guide the planters.

Young plants are produced in two ways: by cuttings from the prunings of the bines of the former year's growth, after gathering the crop; in which case, 5 should be set in each hill, in case of accidents; or by *bedded sets*, in which case, 3 are sufficient, as above planted in a nursery-ground a year before they are put out in their future home.

The sorts of Hops generally grown.—These are numerous enough, but five of them are sufficient for our purpose:

Golding's; the finest, richest, and most valuable of all, varying in quality according to the soil in which they are grown. Poles for this sort should be from 16 to 18 feet in length.

Canterburys, these are pretty much the same as the *Golding*, but run more to bine, and the poles may be 2 feet longer.

Grapes; are more suited to our climate and soil than the above. They grow in clusters, hence the name; not so given to bine, but more productive of hops than the finer kinds; take poles from 12 to 14 feet.

Jones; their chief virtue is that they require shorter poles than any other sorts; any broken poles, 10 or 11 feet long, will do for them, as they are inclined to extend their heads and lateral branches from pole to pole; they are less productive but of better quality than the *grape*.

Colegate's sprang from a wild variety found at Chevening in Kent (such a lovely spot). They are hardy but late; run much to bine, and take 18 feet poles. It is as well to have some of these, as they can be picked after the main crop is done, a useful quality where labour is scarce. They are very hard climbers, and require to be tied continually until the bine reaches the top of the pole.

Flemish; a large, coarse kind, only fit for bad porter. We have seen the cones nearly six inches in the greater circumference.

(1) Same plough is used in Normandy, &c. Ed.

Seeds will not produce hops of like character to the parent; so it is useless to attempt sowing. Be satisfied with getting good cuttings from a well managed plantation, and leave seed and bedded sets alone.

As we have seen, hops are *dioecious*, bear *male* and *female* flowers on different plants. Where no males are set out the cones are generally loose and light—the *lupuline*, or yellow resinous powder in which lies the condition as brewers call it, is present in very small quantity. One male hill should be allotted to every 144 female hills, i. e. about 8 or 10 per acre. The extra weight of the cones will pay for the trouble. The males should be planted on the windward side, to allow the farina to be distributed more equally.

Where the land is heavy, we can advise with confidence the application of lime. A great expense, no doubt, in this country, where it costs four times as much as it does at home. But, you must remember, the yard is to stand for years, and will not require a second dressing. Our (family's) Kentish tenants, at least 25 of whom were hop-growers, used to put about 200 bushels per acre on the stronger soils.

Next; the whole field should be manured, and less than one hundred single-horse cart loads per acre will not do much. Where the land is heavy, we approve of digging out a hole, a yard, or so, square, where the hill is to be and filling it with a compost of rich earth, blood, bones, and other handy materials. See that the hills are made as fine as a garden before planting.

The first year, as no crop can be expected, the middle of the alleys may be sown with turnips, mangels, or other roots; always remembering that the horse-hoe must be kept going all the summer, and the hills, &c., kept perfectly clean, and in good tilth. As the bine begins to run from each set, it should be tied up in a bunch, or to a short stake, to prevent the horse-hoe from injuring it. The implement for working in the alleys, though we call it a horse-hoe, is rather a grabber, much heavier and stronger than the usual one for potatoes, &c.

In the autumn of the first year, when the sap is down, and the young bine is brown, it should be cut down, and a little earth thrown on the crown of the hill will preserve the plant from the frost, and shed off any rain that may fall. Level this mound before spring-growth begins; pole early and work all round with a digging fork at once; the poles need not exceed 7 or 8 feet in length. We say, pole early and then dig, for digging before poling very often, in the hands of careless people, destroys more than one hill.

In England we dig the whole of the yard every year. The men are so handy, that an acre a week is the average stint, costing from 16s to 20s an acre. The *hop-spud*, a 3 tined fork, does wonderful work in these skilful hands. The cast-steel forks, sold here as *dang-forks*, will do one-third more work than a spade, and do it 3 inches deeper, too: no stones of any size, of course. But here, we cannot dig—we must plough; the horses should be yoked a *trip*, tandem fashion, and the furrow should be, at least, 10 inches deep. The greatest care should be taken not to bruise the plants in turning at the headlands, and the hills should be well worked by manual labour. By the bye, we regret to say that too many growers in the Eastern Townships leave wide headlands unplanted. Land is plentiful, I

know, but one would think that the headlands would grow roots, if not hops.

Dressing. — I despair of conveying a clear idea of this important operation to my readers. It is done in early spring, by a woman, generally, and a careful woman, too, if such a one can be found. The hill is to be opened with a small hoe (2½ inches, a little below the crown, and the earth cleared away between the sets, which will be found swollen out to four times their original size. These should be cut off between the crown of the hill and the first joint, for it is round the set close to the crown whence the best and most fruitful bine starts. The earth is then drawn back again, and a mark made to show where the hill is.

(To be continued.)

We have received the Memoranda of the Rothamsted Experiments for 1893 and 1894, no results for 1893 having been issued last year. We notice that the rainfall at Rothamsted, as measured in the large gauge of one-thousandth part of an acre, was 24.08 in. in the harvest year 1892-3, and 29.55 in. in 1893-4. In the field which had grown barley forty-three years in succession up to last year the greatest yield was 46½ bushels on the plot dressed annually during the greater part of the time with 275 lbs. of nitrate of soda, 400 lbs. of silicate of soda, 200 lbs. of sulphate of potash, and 100 lbs. each of sulphates of soda and magnesia. During the first six years of the experiment 400 lbs of salts of ammonia were used, and during the next ten years 200 lbs. instead of the nitrate of soda. In 1893 on this plot the yield was only 33½ bushels, but in that season the greatest yield, 43½ bushels an acre, was given by the plot dressed annually with 14 tons of farmyard manure. These are both very costly dressings, and a much more economical result was 41 bushels an acre obtained last year of the plot which received 275 lbs. of nitrate of soda and 3½ cwt. of superphosphate, as compared with 31½ bushels in 1893. Where the nitrate only was used the yields fell to 14½ bushels for 1894 and 14½ for 1893, showing the value of superphosphate for the barley crop. Where the application of 200 lbs. of ammonia salts took the place of the nitrate of soda, 3½ cwt. of superphosphate being also applied, the yield was 34½ bushels in 1894 and 18½ in 1893, showing the inferiority of the salts of ammonia to nitrate of soda in both a wet and a dry season. In the field which had grown wheat continuously for fifty-one years up to last year the greatest yield was 49 bushels an acre, obtained on a plot dressed annually with the quite unremunerative mixture of 600 lbs. of ammonia salts, 3½ cwt. of superphosphate, 200 lbs. of sulphate of potash, and 100 lbs. each of sulphate of soda and magnesia. In 1893 on the same plot the yield was only 21½ bushels, or less than one-half of the yield in 1894. But the heaviest crop of wheat in the dry year 1893, 34½ bushels an acre, was gained on a plot dressed annually with 14 tons of farmyard manure. The wheat experiments are so complicated, and some of the mixtures have been altered so often, that it is difficult to ascertain which has been the most economical dressing. Almost the only clear case of a comparatively moderate dressing applied on a plot which has been cropped regularly (some parts of the field having been treated specially in recent years to kill weeds) and dressed the

same since 1884 is one which has received 275 lbs. of nitrate of soda 3½ cwt. of superphosphate, 200 lbs. of sulphate of potash, and 100 lbs. each of sulphates of soda and magnesia, which yielded 43½ bushels per acre last year, and only 17½ in 1893. A curious result was shown last year in the trial of wheat grown after wheat since 1850 against wheat grown after fallow, in both cases without manure. The wheat after wheat gave 18 bushels, against 15½ after fallow. In the preceding year the former gave only 9½ bushels and the latter 13½. In all but nine out of forty four years the fallow wheat gave the greater yield, but the difference was not nearly sufficient to make good the loss of half the land. That is to say, an acre growing wheat continuously has yielded a great deal more in a course of years than an acre half cropped and half fallowed.

MARK LANE: Prices current; Jan. 13th

WHEAT, per 504 lbs.; British s. s.	
White.....	26 30
Red.....	25 29
London flour per 280 lbs.....	25 —
Barley, foreign.....	15 44
Malting English.....	30 38
Grinding.....	16 21
Oats, English per 8 bushels... 15 27	
White peas.....	32 36

FOREIGN.

Wheat - Manitoba.....	27 29
Canadian white peas.....	27 28
London Cattle market, Oct. 14th:	
Milch cows, per head..	£15 to £23

BEASTS.

Scotch.....	s. d.
Hercfords per stone of 8 lbs..	4 4
Welsh (rants) " "	4 2
Shorthorns " "	4 2
Fat cows " "	3 6

SHEEP.

Small Downs " "	5 8
Half breeds " "	5 6
Calves " "	5 4
Pigs " "	3 6

BUTTER.

Fresh, (Finest factory) per doz. lbs.....	14 15
English Dairy-butter, fresh... 10 13	
Irish (creamery).....	11 6
Danish	11 6

CHEESE.

Cheshire per 112 lbs.....	74 80
Cheddar, finest	56 66

BACON.

Irish.....	47
Canadian	38
Hams, Danish.....	54
American.....	54
Irish, small.....	100
HAY, per load of 2016 lbs.....	
Prime meadow.....	90
" clover.....	92
STRAW, per load 1296 lbs.....	
Best	42
Hops from 40s. to 105s. per 112 lbs.....	40 110

Prices of Pigs at Calne.

Present prices for prime pigs, in lots of not less than 10, on rail within 100 miles of Calne:—

Prime Stores.	Thickness of fat in any part of the back.	Price per cwt.
6 to 10 lbs to 9 to 10 lbs.	1½ inches and under	7s 0d
Under 10 to 10 lbs.	Not exceeding 2½ in.	6s 6d
Under 10 to 10 lbs.	Not exceeding 2½ in.	6s 0d
Under 12 to	Not exceeding 3 in.	6s 0d

Any pigs outside these limits of their value.
Half-truck—12 pigs. Whole truck—24 pigs.
CHAS. & THOS. HARRIS, & Co., Limited, Calne, Wilts, Eng.

THE ROTHAMSTED FEEDING EXPERIMENTS.

THE EXPERIMENT WITH PIGS.

Let us next see whether experiments with pigs lead to similar conclusions. The pig requires much less bulk in his food than the ruminant. His food, and especially his fattening food, consists, weight for weight, of a much larger proportion of digestible or convertible constituents, and contains very little of woody fibre. Thus, while the food of oxen and sheep is composed principally of grass, hay, straw and roots, with a comparatively small proportion of grain, leguminous seeds, or other concentrated foods, that of the pig consists largely of grain or other seeds, which contain a comparatively small amount of indigestible woody fibre and a large proportion of starch or other digestible carbohydrate and nitrogenous matters which are almost entirely in the condition of albuminoids. It is true that the pig consumes also more or less of starchy tubers or saccharine roots, which contain a considerable proportion of their nitrogen in other forms than albuminoids. But the more rapidly he is fattened the larger is the proportion in his food of starchy grains or other ripened seeds.

Notwithstanding the much more concentrated and digestible character of the food of the fattening pig, he consumes a much larger quantity of dry substance in proportion to his weight than either the ox or the sheep. Under these circumstances he yields much more increase, both in proportion to a given live weight within a given time, and to a given amount of dry substance of food consumed. This is clearly illustrated in Table 69 (p. 258), which shows as an approximate average that per 100 pounds live weight per week the fattening ox will consume about 125 pounds of dry substance of food and yield 1.13 pounds of increase; the sheep will consume about 16 pounds of dry substance of food and yield 1.76 pounds of increase; while the pig, on the other hand, will consume about 27 pounds of dry substance of his more concentrated food and yield about 6.43 pounds of increase. Indeed, compared with oxen or sheep, the liberally fed fattening pig will consume much more food in excess of that required for the respiratory function and for mere maintenance, so that the amounts of nonnitrogenous matters consumed for a given live weight within a given time represent in less proportion the respiratory requirements, and in a greater proportion those for increase.

Numerous feeding experiments have been made at Rothamsted with pigs. In 1850, series 1, with 12 pens; series 2, also comprising 12 pens, and series 3, with 5 pens, and subsequently a fourth series of 4 pens was made. The general plan was to give, in one or more pens, food of high or of low percentage of nitrogen, as the case might be, ad libitum; then in others to give a fixed and limited amount of food of low percentage of nitrogen, and ad libitum, a food of high percentage; or a fixed and limited amount of food of high percentage of nitrogen, and ad libitum, a food of low percentage, and so on; and as the ad libitum food always supplied much the larger proportion of the total ration, the animals fixed their own consumption, according to the composition of the foods and to their own requirements, including those both for respiration and maintenance, and for increase.

The foods of high percentage of nitrogen consisted in most cases of an equal mixture of bean and lentil meal, that is, of highly nitrogenous leguminous seeds; and those of low percentage were, in most cases, either maize meal or barley meal. In some, however, either pure starch or pure sugar was given. The details of the foods, the weights, and increase of the animals, and of the amounts of the various foods and of their nitrogenous and nonnitrogenous constituents consumed per 100 pounds live weight per week, and to produce 100 pounds of increase in live weight, have been given and fully discussed in various papers. (1)

The conclusion drawn from the results of the various experiments with pigs was that, in their case, as in that with sheep, it was the supplies in the food of the available nonnitrogenous, or total organic, constituents, rather than those of the available nitrogenous substance, that regulated the amount consumed, both by a given live weight within a given time, and to produce a given amount of increase. The point is, however even more clearly brought to view by the graphic representation of the results given in the colored diagrams facing page 316.

In explanation of them it may be stated that nitrogenous substance is represented by black, nonnitrogenous by yellow, and total organic substance by red. The upper diagram (1) illustrates the relative amounts of the respective constituents consumed per 100 pounds live weight per week, and the lower one (II) the amounts consumed to produce 100 pounds increase in live weight. Each of the thirty columns represents the results of a separate experiment or pen.

The first nine columns show the results of experiments 1 to 8 and 12, of series 1; the next twelve those of the twelve experiments of series 2; the next five those of the five experiments of series 3; and the last four those of the four experiments of series 4. It may be added that there were three pigs in each pen of series 1, 2, and 4, and four in each pen of series 3.

The plan of the diagrams in other respects will be best understood by giving an example. Take, for instance, the amounts of nitrogenous substance consumed per 100 pounds live weight per week, as represented in black in the left hand division of Diagram I. The lowest amount so consumed throughout the thirty experiments was in pen 5, and that amount is taken as 100, and as the standard by which to compare the amounts consumed in the other pens, and it will be seen that in the case of this pen 5 the coloring does not extend above the base line, which is numbered 100 in the column of figures given at each side of the diagram.

(To be continued.)

(1) On the Composition of Foods in Relation to Respiration and the Feeding of Animals (Rept. Brit. Assoc. for 1852), Pig Feeding (Journ. Roy. Agr. Soc. Eng., 14 (1853), p. 459).

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