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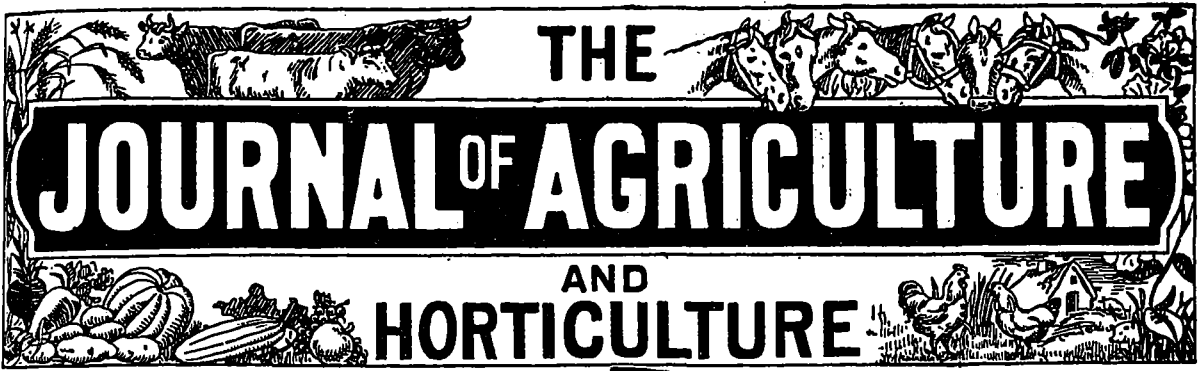
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THE JOURNAL OF AGRICULTURE AND HORTICULTURE

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.. THE ..

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Notes by the Way.

Horse-hoe.—A very fair specimen of a horse-hoe we saw at work the other day, on a farm at Ste. Anne de Bellevue; it had one or two imperfection that could easily be remedied; these were, in the first place: too many hoes; secondly, improper angle of the two hinder side-hoes; thirdly, too short stilts.

1. There is no need for more than three hoes on any horse-hoe, if the three are properly placed. The front hoe should be of a fair breadth, and have a slight "pitch" or incline, downwards; this will keep it in the ground and tend to steady the working of the implement. The two middle hoes only serve to gather rubbish, and should be abolished: a horse-hoe and a *drill-grubber* are two different implements.

2. The two hinder side-hoes are very properly curved so as to cut the sides of the drills, leaving but a couple of inches for the hand-hoe to attend to; but they are placed in an improper position, the points or ends being opposite the one to the other, instead of which, a twist being given to the stem of each, one hoe should overlap the work of the other, and, the proper inclination or angle being given, the weeds and the rubbish would glide down the blades and no longer hinder the work of the hoe. An engraving of a rough implement we had made, 14 years ago, at Sorel, will give a good idea of what we mean, as to the position of the three hoes, only, it must be observed, the maker, in his first coup d'essai omitted to give the proper curve to the two side-hoes; this was afterwards remedied. See Journal for 1889.

3. The stilts of the implement are too short, and therefore the whole affair is unsteady in its work unless the hoes are let deeply into the

ground, which is not always convenient; for instance, in hoeing corn after it is up a foot or so in height the work should be shallow, as, although mangels, swedes, etc., do not suffer by having their rootlets cut off, for each rootlet cut off, nature will provide two or more, corn, which is wanted to ripen its seed, should be allowed to retain them untouched.

We hope Mr. Vilas, of East-Farnham, will not of this very well constructed little implement.

Science and fiction.—Mr. Alfred R. Russell, the celebrated man of science, like the equally celebrated Watts, the inventor of the steam-engine, is by no means a contemner of fiction. He takes plenty of recreation, is a great grower of orchids, plays at chess, and thoroughly appreciates the higher style of music, very unlike his famous friend Darwin who was a continuous worker at his one great subject, which Mr. Wallace is not; for, as he remarked to an "interviewer" lately: I should not be happy without some work, but I vary it with gardening, walking, or novel-reading. Even when in the midst of writing a book, I never cease to read light literature." What Watts and Wallace did not despise, no man need be ashamed of cherishing with a warm affection.

We were led to the above remarks by a passage in a letter from one of the English correspondents of the New-York papers, stating that: "All London is talking of Thackeray, as it is the fiftieth anniversary of the publication of "Vanity Fair." Our readers may or may not be admirers of the great novelist, but in our opinion, *valeat quantum*, "Esmond," a tale of Queen's Anne's time, is the greatest romance ever written, not excepting Fielding's "Tom Jones," "Waverley," or "The Antiquary," and any one who will imbue his mind with the moral teachings of the amiable author, will never repent taking our advice not only to read, but to study and weigh every word he ever wrote.

Rearing calves.—Below will be found an article from "Hoard" on the waste of skim-milk. Many years ago, in or about 1850, we tried the effect of unlimited skim-milk on a half-bred shorthorn steer. He took, on an average 16 quarts imperial a day, and at 20 months old we sent him to Smithfield (London) market.

Such a lot of bone we never saw in a skin of the same size, and we were not surprised when our salesman's note came, to find that he had gone to the "Sausage-makers."

We always used crushed flaxseed for our calves, small hand-mills being easily had in England for just cracking the grain. We mentioned this in the first volume of the Journal, 1879, and are happy to hear that these mills are still in vogue. Here, of course, the seed has to be mixed with other grain, if it is sent to the mill, lest the oil should clog the stones.—Ed.

HOW SKIM-MILK IS WASTED

A very thoughtful article on this question appeared in the *Creamery Gazette* recently, written by the editor, Henry Wallace. He enumerates several of the ways in which skim milk is lessened in value and sometimes rendered practically worthless. It is too bad that many farmers, who keep cows and who greatly need all the profit the business can bring them, should have some ideas as they do about the value of skim milk, and the proper way to handle it.

Mr. Wallace rightly says that sweet skim milk, as a food to the farmer, with corn in the crib to balance it, is worth more, pound for pound, than the cream which has been taken out of it. To support this statement, he says:

We say "is worth more," for the cream is largely a carbohydrate, and he has an abundance of that on the farm in the shape of corn, timothy hay, and straw. He is short of albuminoids, unless he is rich in clover hay and clover pasture. Hence, the skim milk is actually worth more to him for growing stock than the cream itself, provided, of course, he knows how to use it.

He enumerates the leading causes for the waste of skim milk as follows, all of which have been repeatedly commented upon before in the *Dairyman*:

1. By getting it back from the creamery sour.
2. Improper methods of feeding on the farm. It is folly to feed it to the calf alone, on the theory that the poorer the feed you give a calf the more you must give of it. The milk of a good cow should furnish enough skim milk for two calves.
3. Feeding it without balancing. Do not try to balance up skim milk with oil meal. It can not be done, for oil meal itself has about the same nutritive ratio as skim milk, and it will not balance it. Flax seed meal will, but oil meal will not. The cheapest and best thing with which to balance skim milk is corn meal, until the calf is a

month or six weeks old, and after that shelled corn.

On this point, speaking from our own experience in raising calves of distinctive dairy breeds, we have always found ground flax-seed meal much the best of all other feeds to balance skim milk with.—*Hoard.*

The Orchard and Garden.

(CONDUCTED BY MR GEO. MOORE.)

SYSTEM

The successful man in any calling, is the systematic man. He who lets his work drive him is always in a hurry and yet does not accomplish so much as he who has established for himself a systematic method of doing things at the right time and in the right way.

Perhaps, this proportion applies with even greater force to the farmer and gardener than to the mechanic—for the following reason. The progression of the seasons goes on with unvarying certainty and if work on the land is neglected to be done at the proper time, failure will be the consequence.

It is mysterious to some people how others get on so well. Jones will say "I don't see how neighbour Brown does it; I work as hard as he does but he is always ahead." Now, if Jones would count up the hours which he thoughtlessly wastes, he would find that it is not the question of working hard by *sprints*, but by being continually on the alert to see that nothing is neglected to be done when it should be done. Jones takes advantage of a wet day to take a lounge in the village store, post-office, or smithy; so when he wants a tool or implement, it is not sharp, or it is out of repair. Brown's wet days are spent in keeping everything in order to use immediately when they are required. Jones neglects to make any plan as to what he is going to do with such and such a field, or what seed he proposes to sow. Brown spends bad days also, in studying the plan of campaign for the coming spring; looks out for the best market at which to secure the seed grain he will require; buys it before the seedman's rush comes in; gets better attended to, and has the seed ready instead of having to go to the town for it, losing time when it is most valuable. By watchfulness, diligence, and punctuality Brown succeeds; for the want of these Jones fails; and,

yet poor Jones suffers more from worry of mind and often from more fatigue of muscle than Brown.

Part of a farmer's and gardener's outfit should consist of some tools necessary to repair his implements, so that when any of them get slightly out of order he should sufficiently study their mechanism as to be able to mend them with as little loss of time as may be. System, too, is necessary in out-door work as regards the hours of labor. During the summer season, most of the work can be done by daylight, and if the early morning is devoted to feeding, cleaning and milking, the herdsman, in busy seasons, will have time during the day to assist in the field, and he can go back to his cattle and have all the necessary work done for them before daylight closes, and the hands can then have some time for needed recreation before bed-time.

Early to bed and early to rise, makes a man healthy, wealthy, and wise is an old and true maxim, and one, if copied in practice, the world would be the better for. If we adopt a system of regularity in beginning the labors of the day in reasonably early season, we shall find how much less our work will drag throughout it and how much more satisfactorily we shall have to perform our daily task. And what is true of one day will apply to the whole season's work.

"Order is Heavens first law" systematic application to duty leads to success, and the want of it to anxiety of mind, vexation, loss and often complete failure.

SWEET CIDER

As I see the reverend Trappist Fathers have given, in their clever pamphlet, on fruit, a recipe for making cider I thought perhaps our readers might like a few hints as to how a delicious beverage free from alcohol can be made from the apple. Sweet cider is often made of inferior quality because it is thought that apples that are not fit for market will make good cider. To make the very finest, all worm eaten or partially decayed fruit should be rejected and only sound fruit be used, which, if not quite ripe when gathered, the ripening process can be completed by placing the apples in piles in the orchard, before putting them through the cider mill. The best cider is filtered through properly prepared muslin and charcoal filters. It can be kept sweet for some-

time. Oil of winter green is used as a preservative but by far the best means of preserving the cider is to subject it for a short time to a heat of say 175°, then place it in bottles while hot and cork it air tight. If the air is entirely excluded after the *bacilli* which cause fermentation have been destroyed by heat, and no more are admitted, the cider will remain sweet for an indefinite time and will be found to be a delicious and harmless beverage.

Vinegar is made by placing the apple juice in barrels; not quite filling them, taking out the bung and thus admitting the air to the liquor.

Excellent vinegar is obtained. By these means ill-shaped and partly developed fruit which would not be marketable, provided the wormy or decayed specimens are excluded, can be thus profitably utilised.

FACTS AND FANCIES

It is interesting to remark the curious fancies with regard to vegetation indulged in by our ancestors. The poet Gray, thus alludes to an old custom as to the pea :

As peascods once I plucked, I chanced to see
 One that was closely filled with three times three;
 Which when I cropped, I safely home conveyed,
 And o'er the door the spell in secret laid,
 The latch moved up, when, who should first come in
 But in his proper person Subberkin ?

of which this is the explanation. If the sheller of pease found a pod containing nine, she laid it over the door, and the young man who entered without causing it to roll off would be her future husband. Another custom, in the North of England was, that a disappointed lover by way of consolation was rubbed with pea-straw ; the boys by the girls and *vice versa*. Browne, author of *Britannia's Pastorals* says :

The peascod greene, oft with no little toyle,
 He'd seek for in the fattest, fertil'st soyle,
 And rend it from the stalk to bring it to her,
 And in her bosom for acceptance woove her.

The pea-pod containing ripe pease had to be snatched off the stem quickly, and if the pease were not shaken out, it was considered a good omen. Shakespeare alludes to the same fancy in "As you like it," act 2, scene 4. In olden times to dream of pease was lucky, and the water in which pease were boiled was considered good to remove warts. No doubt the antiquity of the pea and its popularity as an article of diet, have led

to these fanciful ideas as regards their qualities which have a certain charm to the imaginative mind ; but in these utilitarian days they are lost sight of in the service they render as food for man and animals. The origin of most plants can be generally pretty accurately traced, but that of the pea is of such ancient date as to be lost sight of. The improvements effected in the pea by hybridization, selection, and cultivation have kept pace with those of other vegetables, and have placed them in the foremost rank of culinary delicacies of the garden when eaten green, and we all know the use the dried peas are to our Canadian friends who could not exist long without their *soupe aux pois*. Not only are the edible kinds so useful but the flowers of the sweet-pea are very attractive on account of their beauty and fragrance. The sweet-pea has for centuries been a favorite in the flower garden, but it is only of late years that it has received the special care and attention of the florist; and to show how this has been rewarded, at the July exhibition of the Massachusetts Horticultural Society one collection was shown containing 90 distinct named varieties, comprising colors varying from pure white to primrose, salmon, rose, crimson, purple, lilac, maroon to nearly black, etc.

A small but brilliant novelty

A most useful and beautiful acquisition to our list of bedding plants is the new dwarf "*Tropolum Vesuvium*" well named from its brilliancy and intensity of orange scarlet color and which was awarded a first-class certificate by the Massachusetts Horticultural Society, July 23rd. It is a miniature form of *Tropolum* with dense masses of small flowers and dark green foliage : it's growth is very compact and the pans of specimens in which they were exhibited contained plants not more than four inches high. For dwarf masses of brilliant scarlet, it cannot be surpassed and ribbons planted with this in contrast with the blue lobelia and dwarf allyssum would be very effective.

THE GYPSEY MOTH.

ACNERIA DISPAR.

More than 300 men are now employed in the State of Massachusetts in searching for and destroying the Gypsy Moth, and a few particulars

with regard to it may be useful should the insects afflict us with a visit.

Were it not that the utmost care and perseverance have been practised to suppress them, the insects would have devastated the country. Each female moth lays an average of 600 eggs.

Fortunately she is so weighted with them that she cannot fly and therefore does not spread the plague as much as she might. She dies as soon as the last egg is laid but cases have been found of one female giving out as many as 1500 eggs.

Expert hunters can distinguish the male from the female moths when quite young.

The males can fly easily and for quite a distance. This has been proved by experiment. Thus the females have been taken to a place fully half a mile away from where moths have been found, and have soon been joined by males which have been caught and prevented from escaping.

This (July) is the time of year when they are eating the leaves off the trees; this is only while the creatures are in the caterpillar state, but about the first of August they will change into the pupa state and then, of course, they will cease their depredations. It has been found that they feed at night, and so numerous do they become in a short time that in one night they will destroy a greater part of a trees' foliage. And now for the means by which they are destroyed which, now their habits have been discovered, is much easier than at first.

By an ingenious plan—namely by catching some of the caterpillars, colouring them with a touch of red and then letting them go, the hunters can tell if the same insect returns to his hiding place after his night's revels in the tree. Such being found to be the case, pieces of burlap (coarse sacking) are tied loosely around the trunks of the trees; under this the insects, instead of descending to the ground and hiding under some stone or piece of wood, secrete themselves for the day. The hunter goes early in the morning as soon as the creatures have come down and kills them either with a strong leather mitten which he wears for the purpose or a sharp knife. The caterpillars sometimes measure 2 to 2½ inches in length. It is only by constant watchfulness and hard work that the pest is kept within bounds. There are other somewhat similar insects called the Brown-tail moths, but not so destructive because they are not so long in the caterpillar state their period of eating is shorter, they feed during

the day, which the gypsey moths never do, therefore are much easier detected and destroyed. In the winter their cocoons may be found on the branches of trees and can then be easily killed. The full grown caterpillars are about one inch and a half in length, a small number will soon strip a tree of its foliage. They are less to be feared than the gypsey moths.

THE PLANTING OF FRUIT TREES AND BUSHES

BY THE REV. FATHER-TRAPPISTS.

(From the French)

II.

Selection and preparation of the soil.—Fruit-trees may be cultivated on all kinds of land. Not that they are all equally suitable in a natural state; but they may be made suitable by the industry and intelligence of man.

Clays, with the addition of materials calculated to render them more friable, such as sand, ashes, etc., are especially fit for orcharding. Trenching, followed by a ploughing, before planting, and thorough drainage, are indispensable requisites in the improvement of such soils. One great advantage of clay soils is that they are not easily exhausted. Apples and plums grown on them are of better flavour than those fruits grown on other soils.

Siliceous soils, those in which sand is the chief feature, are inferior; though when the subsoil is clay, they may be improved by (if possible) ploughing up some of it; thus creating a new soil, so to speak, of the very best quality. In the absence of such a subsoil, the cleaning-out of ditches, heavy dressings of dung, the ploughing-in of green-crops, in fact, any kind of unctuous materials capable of increasing the consistency of the soil, should be applied.

Calcareous soils are those in which lime predominates; they are of a whitish hue, harden quickly and crack under the influence of the sun. (1) The addition to such land of humus and nitrogenous matters, turf and all dark coloured stuff, might benefit such land. It is the favourite home of the cherry. (2)

(1) Not the chalk-soil of the English Downs.—Ed.

(2) See the great cherry-orchards of the lovely district of Canterbury, in Kent.—Ed.

Further on, we will point out, in a few lines devoted to each description of fruit, the soils that are peculiarly favourable to their growth.

The thing of all others that fruit trees dread is excess of moisture. In cold damp soils, the roots rot away. Some sort of drainage in such land is indispensable. In low lands, the easiest mode of draining is, generally, the digging of pretty deep ditches around the plantation. (1) In soils of this sort, fruit may be grown successfully if the trees are set out on raised mounds.

We do not advise planting in a low-lying valley subject to much humidity; for fogs and late frosts would hinder the fecundation of the flowers.

Exposure.—An exposure to the South can, as a rule, be only recommended for the vine; because, in spring, the sun would be too powerful in its effects on the orchard, since severe frosts, sometimes occurring at that season, might, when the sap is in circulation, damage the roots and ends of the stems (*picds des tiges*).

Select such an exposure as is indicated by the direction of the dominant winds and the lie of the land. No need of enlarging on the damage done to an orchard “when the stormy winds do blow,” to excuse impressing on the planter’s mind the need of choosing a site protected from the prevailing winds of the locality, or, at the very least, of setting out one or two rows of trees as a wind-break.

Manures.—If trees are to be vigorous, to yield largely, and to be long-lived, they must be well fed. As long as they are young, the dressings, that are necessarily given in preparing the land for their reception, may be sufficient to keep them in good condition; but, when they are beginning to bear, and no other crop can be grown on the intervening spaces, a fresh supply of manure must be afforded. No imperfectly rotted horse or cow dung must be allowed to enter the orchard; for, the decomposition of such dung, taking place in the soil, will cause root-rot. Even thoroughly rotted dung has still one defect: its action is not lasting enough. The best of all is liquid manure, on account of its facility of application. Urine, or the leakage of dung-heaps, diluted with four times its bulk of water, with a pound of sulphate of iron to the 25 gallons, to disinfect it, is a useful application.

(1) Drain-pipes would be choked by the roots in a very short time.—*Ed.*

Action of the air.—The air should be allowed to circulate freely through every part of an orchard, and the soil should be kept constantly pulverised, to allow the air to penetrate as deep as the roots and thereby to strengthen them. The horse-or hand-hoe, kept frequently at work, will secure this. It must be remembered that absence of air in the soil is another cause of root-rot.

Action of light.—Light promotes vegetation and invigorates the tissues. When a tree is too much in the shade, the only branches it puts forth are long and slender, and never bear fruit. It is light alone that imparts to the fruit flavour and colour; so, it is clear, that the spot chosen for an orchard or fruit-garden should never be affected by too much shade.

Household Matters.

(CONDUCTED BY MRS. JENNER FUST).

Looking back for the last fifty years, one is filled with wonder at the vast advances made in everything.

In no community has this vast stride taken a firmer hold than in the farming population.

A man who owns a farm, near a town where he can sell the produce of it need never fear a rainy day

Education will teach him when he has made a mistake how to rectify and profit by the same, also when he takes his produce to market, he must not expect to keep all the returns for himself, but must be content to share with the land a part, in fact never to return empty handed to the land that has yielded him so much.

His must be the head to guide the uneducated minds with a firm hand, to teach and show them how best to make use of the wonderful instruments they have to handle in cultivating the land.

In no place will prosperity be shewn on a farm of this sort better than in the house.

In it will be seen all the little helps so necessary to the comfort of the workers

Where the milk is sold, or sent to the factory for cheese or butter, a great work is taken off the hands of the mistress of the house, thus giving her time to look about, and she will also have more time to look after and guide those who help in the work of the house.

Let no person think for a moment that the

looking after a house, and keeping the expenses within bounds mean play, if so, let them take up the task for a few days, and they will soon find out what it is to provide for and look after a family, where good food must be served at a given time to the workers so that everything shall work evenly.

It is quite certain that the kitchen ought to be one of the brightest rooms in the house, with no stint of the many appliances for the work done there.

The heavy pots and pans of the past have disappeared, and in their stead we have the lightest and most useful vessels of the day.

The paper washtub and pail have greatly simplified and taken away the terrors of washing day.

And where the mistress is blessed with good health she need no longer look forward to the new day with dread, but after starting everything in good working order she will find time for a little well earned recreation.

VEALETTES.

This dish should prove an agreeable surprise to any one willing to try it. I can speak from experience, and say that it is a most delicious way of cooking veal, and not at all a difficult dish to prepare. Cut from the leg of veal three or four large slices about half an inch thick. Trim these neatly, and on each lay a large tablespoonful of dressing made from a cup of bread crumbs, half a teaspoonful of salt, a good dash of pepper, a tablespoonful of powdered sage and lemon thyme mixed, a tablespoonful of butter, and a well-beaten egg. Roll up the slices, secure with tiny wooden skewers, and put them in a baking tin with a little water and butter. Place in a hot oven, and bake for about three-quarters of an hour, basting frequently. When done, take up on a very hot dish, thicken the gravy, pour it over the veal, and serve with slices of lemon.

POACHED EGGS WITH TOMATO SAUCE.

Where eggs must be served in place of meat for a meal like dinner it is well to use an acid vegetable of some kind as a sauce. Put half a can of strained tomatoes in a saucepan; add a slice of onion, a bay leaf, and a sprig of celery. Cover, simmer gently for five minutes, strain again; add two tablespoonfuls of butter and two tablespoonfuls of flour that you have rubbed to a smooth paste. Stir constantly until boiling; add a teaspoonful of

salt, a quarter of a teaspoonful of pepper, and stand aside until wanted. Cover a dish with squares of bread nicely toasted. Then poach the eggs, slip them on top of the toast, pour around them the tomato sauce, and sprinkle with finely-chopped parsley.

A delicious baked custard is made in this way. Put one quart of milk on the stove to scald; beat six eggs, one cupful of sugar and half a teaspoonful of salt well together; pour the milk, when boiling, into this, and add a piece of butter the size of a hickory nut. Turn into a pudding-dish, and bake fifteen minutes. These custards are very wholesome and nutritious.

TO WHIP CREAM.

Cream may be easily whipped when it is about 24 hours old, of the proper consistency, not too thick nor too thin, and perfectly cold. Turn it into your whip-churn, which should also be cold; turn the handle slowly and continuously for about two minutes. If you are without a whip-churn put the cream into a bowl, stand it in another of ice water or cracked ice, and use either an egg-beater, a wire spoon or an ordinary syllabub churn. Skim off the froth as it comes to the surface.

THE FLAVOR OF EGGS.

Good feeders have long known that certain kinds of food would greatly improve the flesh of animals for human consumption. The feeding of roots improves the quality of mutton; artichokes improve the quality of pork. Enterprising duck farmers have found that the feeding of celery improves the flavor of their birds, and chestnuts are fed to fattening turkeys to produce a game flavor. Green cut bone is fed to chickens for the same reason and to increase the size of the fowls and to increase and improve the flavor of their eggs. Careful experiment and practical experience have proved beyond any question of doubt that the liberal feeding of green cut bone will double the egg yield from a given number of hens. Green bone is the cheapest egg food on the market to-day, and in many places can be had for the mere asking. In those places where it has acquired a commercial value it can be bought for 25 to 30 cents per 100 pounds. This is much cheaper than wheat, which is the best of the cereal egg-producing foods. Green cut bone has such a potent force in increasing egg production that it will be found especially

helpful in winter, producing large quantities of eggs when they are of greatest value.

PRESERVED FRUITS

As we understand them, are made from fruit and sugar pound for pound. You may keep them in large or small jars; the opening will not make the slightest difference. Canned fruits and vegetables must be used as soon as opened. If only half a can is needed, turn the remaining quantity from the can into a bowl.

There is no doubt about it that nothing will whiten the teeth so thoroughly and give such a delightful taste in the mouth as a fresh strawberry, and from the time they appear in the spring until they have said their good-by, every woman should use one instead of, or in connection with, her favorite dentifrice. The strawberry is rubbed over the teeth until it is entirely crushed, and then the mouth is rinsed with tepid water so that none of the tiny seeds get between the teeth. For an invalid there is absolutely nothing more refreshing than this strawberry mouth-wash. In buying a toothbrush, do not choose one which is too large, and which will not get into every part of the mouth and permit you to brush your teeth up, down and around. Brushes are now cut in such a way that they reach to all parts of the teeth; the old-fashioned straight-cut bristles are comparatively little used.

DRIED FRUITS.

I often wonder why it is that we do not avail ourselves more than we do of the different sorts of dried or evaporated fruits which are now imported in such quantities. Such fruits, if properly cooked, may be made almost as nice as fresh ones, and would furnish a delicious change from the more or less solid winter pudding. The great mistake, and one which tells against the popularity of dried fruit, is this: it is not cooked long enough to restore to it the water which has been evaporated from it. Our French neighbours understand this better than we do, and simmer their dried fruits, such as prunes, apricots, Normandy pippins, and a whole host of others, for hours. All dried fruits should be first washed, then soaked for twenty four hours. Afterwards cook them in the liquor in which they have been soaked, adding sugar to taste. Lemon rind or a little cinnamon may, if liked, be added to the

fruit. Cheaper kinds of dried fruits should have at least three hours' simmering. When they are done—which may be ascertained by the swollen appearance of the fruit, or by the fact that a skewer will penetrate them easily, remove each piece carefully from the saucepan and place in a dish; boil up the juice to a syrup, with a little more sugar, and pour carefully over the fruit.

MUSHROOMS.

Here is a capital receipt for that most delicious of all sauces, mushroom ketchup:—Take a peck of freshly gathered mushrooms; put them in a deep pan with salt freely sprinkled over and in between. After six hours "mash" with a wooden spoon, and let stand in a cool place for four days, stirring well twice a day. To each quart of strained liquor allow $\frac{1}{2}$ oz. cayenne, $\frac{1}{2}$ oz. allspice, $\frac{1}{2}$ oz. ginger, and half a teaspoonful of powdered mace. Put all in a jar before straining, cover closely, stand in a saucepan, of boiling water, and boil for three hours; then turn the contents of the jar into a saucepan, boil for half an hour, turn into a basin, and let it stand in a cool place for twenty-four hours. Then strain off, without squeezing the mushrooms, and bottle, putting a few drops of brandy into each bottle before corking and sealing down.

PEOPLE

In the country who are annoyed by flies should remember that clusters of the fragrant clover, which grows abundantly by nearly every roadside, if hung in a room and left to dry and shed its fragrant perfume through the air, will drive away more flies than sticky fly-papers &c., will ever do.

The Farm.

THE DRAINAGE OF GRASS LAND.

PART II.

Water logged land.—Benefits to grass.—Washing out of fertilisers.—Conditions of drainage.—Wooden and stone drains.—Tile drains.—System of drains.—How to lay drains.

A water logged surface is not only injurious to plant life because there is too much water in it and too little warmth, but because neither rain nor the atmosphere can enter from above, nor mineral plant food be drawn from down below.

Drainage sets all these natural forces in motion, and they open the soil and disintegrate its particles for the benefit of the plant life upon it.

Again, drainage is always beneficial in promoting the early and late growth of grass, and this is of enormous value in feeding stock. The early autumn and late spring frosts do not stop growth on drained land so quickly as on that which is sodden with moisture. And on the latter there is also the additional injury which the hoofs of cattle inflict on the grasses.

Thus one of the effects of drainage is to produce a continually growing crop. It is often said, and with perfect truth, that from arable land manures often washed into drains, especially in wet seasons, and that in draining, a farmer may be providing an outlet for manure which he has placed on the surface at a good deal of expense. But it has been proved by experiments that the loss of fertilisers by means of the drains is practically nil when a green crop is on the ground.

Therefore, the grass farmer is protected from this particular loss as the arable farmer cannot always be. The only exception is the possible loss of lime. This very necessary constituent of plant life is one of the substances most easily lost by the drains, and it accounts for the necessity of applying this mineral from time to time on drained land which happens to be deficient in it.

It may be accepted as a general truth that grass land should not be drained so deeply as arable land, and there is no doubt that grass can advantageously take more water than grain crops. Besides, the roots of most grasses do not penetrate very deep, and therefore it is desirable to have the water somewhat nearer the surface than on the arable part of the farm.

The manner in which drainage should be carried out in any particular case depends on soil, climate and other considerations. The difference in the rainfall of the particular district and the kind of land, will regulate the nearness of the lines of drains and the size of the pipes to be used. But these differences do not touch the main question whether to drain or not to drain.

All soils which rest on a porous subsoil certainly do not need it. Other land may be retentive, and yet lie so high, or at such a steep inclination, that the water is discharged with sufficient rapidity without artificial aid. Indeed, drainage may always be considered unnecessary where the best natural grasses thrive and grow luxuriantly.

With these exceptions, all clay land, whether the clay is only in the subsoil or rises to the surface, and all peaty and boggy soils, and in fact all land which is habitually saturated with water, must be effectually drained before a pasture worth having can be properly established.

The prejudice which often exists against the adoption of a system of drainage can generally be traced to some instance where the workmanship has been bad and consequently the result has been unsatisfactory, (1) or where no care has been taken afterwards to maintain the efficiency of the drains.

As draining is usually put out to contract, great care should be taken by the farmer or land owner to see that the work is done in a proper manner, otherwise disappointment will ensue.

It is a safe general rule not to make any single drain too long, and plenty of fall should always be given or the drain may not work well after it has been laid some time.

A good fall renders drains to a certain extent self-cleansing, and the small drains should not enter the large drains at right angles, but always obliquely, so that the water may retain the momentum it has got in its previous course. (2)

Then the occasional flushing after a sharp storm will prevent the pipes from becoming choked. Where land has been drained in this province of Quebec, the greater part of the work has been done by means of stone or wooden drains. These are old fashioned methods nowadays and it will be found far more effectual and cheaper to use tile drains. These pipe-tiles are made of burnt clay. There are two or three different shapes made but the best appear to be the round ones since in laying them they can be so turned as to make close joints. Tiles are usually about 13 inches long but now longer ones are often used. (3)

In ordinary drains pipes from two to three inches in diameter are employed ; but in some drains they are used a good deal larger. (4)

In draining land we generally have a system of drains consisting of main drains, submains, and laterals.

(1) Oh! very true indeed.—Ed.

(2) Capital advice.—Ed.

(3) A foot is long enough.—Ed.

(4) Lots of land, in England, we drained most perfectly with $1\frac{1}{2}$ in. for side, and $2\frac{1}{2}$ in. for main drains.—Ed.

The main drains lead up the lower part of the field and receive the water from the submains and laterals.

In any drain, the utmost care should be taken to have the bottom of uniform grade or inclination. This is necessary in order to produce an unchecked flow of the drainage water and so prevent the collection of mud and earth.

The submains should ascend the smaller dips in the field.

The laterals are the smaller drains and are joined with either the main drains or submains.

As to the depth at which the pipes should be inserted, and the distance between the rows, no definite rule can be laid down.

Experience has proved that in heavy land they must be near together, and not too deep; (1) but in lighter land the lines may be comparatively far apart.

About three feet deep is the usual proportion, but care must always be taken to have the tiles below the reach of frost.

As to the distance apart at which drains should be sunk there is no fixed rule. The distance will depend upon their depth and upon the "stiffness" or "openness" of the land to be drained.

In a very light soil, a single drain at a suitable depth may serve to control a large area; whereas, in a stiff clay, the drains may need to be laid only 15 feet apart and not more than 2 feet 9 inches below the surface. (2)

In practice, 33 feet is an ordinary distance apart on heavy land, with a depth of 4 or 4½ feet. On light lands the width between drains may be extended to about 66 feet.

Main drains should be 3 inches lower than the submain and lateral drains, and the outlets should be placed at the lowest possible position, and be brick or stone faced with a grating to obstruct the entrance of any vermin. If the end tile is of glazed or vitrified ware it will better withstand the action of frost. The number of outlets should be as few as possible, and every outlet and in fact all the drains ought to be marked on a plan of the farm, so that anyone of them can be traced whenever necessary.

Very good indeed, except as to the depth men-

(1) Wrong: 4 feet in the "London clay" formation is a capita' depth.—Ed.

(2) Parkes, the great drain-engineer, never laid a drain, unless under peculiar circumstances, less than 4½ feet deep.—Ed.

tioned in the text 3 to 3½ feet, which we have taken the liberty to alter, is too little. See the editor's articles our drainage, in the 2nd volume (1880) of the "Journal of Agriculture."—Ed.

WALTER S. G. BUNBURY,
Compton Model Farm.

STATE OF THE CROPS

To the Editor of the Journal of Agriculture

DEAR SIR

Allow me to congratulate you on the new dress of the Journal. I think it is quite an improvement on the last one, or the small one if you will, looked rather insignificant, the type in the new one is plain and a good size. I wish you all the success you deserve.

CROPS

Wheat. This crop is looking remarkably well and there is quite an acreage sown—in a few days it will be time to harvest it. I see that in Ontario the new crop has been on the market for some weeks, but the crop there is mostly fall wheat.

Oats. Are a grand crop this year, I have not seen much rust so far. Although there may be some in a few sections, quite a few farmers have already cut oats and in a few sections they have threshed, they are much better quality than last year, the season for harvesting is quite advanced in many sections.

Pease. This crop has not proved a great success this year, the season, say, about six weeks ago, was generally wet, and they did not do well. I think most farmers do not cover this grain deep enough, they should to ensure a good crop be ploughed in 4 inches deep.

Barley. Has done well and has matured early, in some cases has been cut in about 80 days after sowing, showing the rapid growth here in Canada: it will yield fairly well and a good color.

Rye. Has done well but very little has been sown this year, we do not grow much of this grain in the Province of Quebec.

Buckwheat. Quite an extensive acreage has been sown this year, so far the appearance is very good, but it is impossible at the present time to say what the yield will be, so many things come into play: too great heat when in blossom, early frosts, &c, &c.

Corn. In some sections this crop is the all important one, as by means of the silo farmers are enabled to keep far more dairy cattle. The dairy

interests of Canada now amount to something : by this means the fertility of the soil is kept up, by the judicious saving and handling of manure the farm can be gradually enriched by means of the cow ; so that taken all in all the corn crop is an important one. This year, as I said in my last notes, corn in some sections had not done well, but during the month of July we had genuine corn weather ; heat ; it has done remarkably well, while the frost on the 10th July did some damage, take the south western portion of the province it did not do much harm. I should say that corn on the whole will be a fair crop.

Potatoes. Early planted have done exceedingly well while later planting got too much rain in many sections, the timely showers we have had during the last week will help to increase the size of the tubers.

Other roots have done well ; in fact, all sorts of garden stuff such as onions, cabbage, tomatoes, &c are doing well.

Hay and clover. The crop of hay and clover has been abundant, and the greater portion has been well saved. The weather was, generally speaking, ideal weather for saving it. I have not known of such a crop as this one, for many years, indeed I am not positive if ever there was as much hay saved in Canada as this year. The reports from most sections of Ontario are very good also. The people in Canada ought to be able this year on Thanksgiving day with a full heart to thank the Giver of all good gifts, for the bountiful harvest. We certainly have plenty for both man and beast, and some to spare to others also. The second crop of clover has already come out in blossom, I have seen a few fields only, lately, that had not been cut yet the first time, what a loss, when will farmers learn to begin in time ? Last year it was the wet weather, this year, well, it was, what ? perhaps the dry hot weather that prevented them from finishing in time.

Pastures were good through June and an immense flow of milk, but now the cry is on that the cows are drying up. How many are feeding green fodder to their cows just now ? Not more than one tenth that should do so. Some say that cheese and butter are so cheap it won't pay to feed the cows ; I can assure all such that it certainly won't pay to starve the cows, when there is such an abundance to feed them on. Those who cut their crops of clover early in July should now have a good second

crop to cut for the cows, some, no doubt, will turn the cows on to save the trouble of cutting, but in that way lots will be wasted, I feel satisfied it would pay better to cut and feed in to the cows, than to allow the cows to feed it down.

Butter and Cheese. The receipts of butter still keep away ahead of last year, and so far the creameries have paid a fraction more for milk than cheese factories have done. The price lately has been rather dull after the reaction of the June speculation, our June butter is nearly all here still in Canada ; a bad state of affairs, as it will have a tendency to keep future prices down below where they should be.

Cheese. The receipts from the first of May to date, are some 130,000 boxes less than last year, this shortage is principally in fodder cheese, not a very desirable article. In the province of Quebec we have made less cheese than last year, even in June and July, and we made no foddors at all. Ontario made few foddors, but the make in June and July in that province has been enormous. Should our factories here in Quebec continue to make butter ; and there are some 400 that can make either butter or cheese at will ; cheese should be good property during the next month. The price of both butter and cheese at present writing is rather firm. The farmers in this Dominion have no great reason to grumble.

Fruits. The crop of small fruit, while not abundant, has been good, those who took care of the bushes, such as currants and gooseberries, will have fair yields. Cherries and plums are better than for many years.

Apples will not be so plentiful as at first anticipated. They blossomed well but the cold damp weather affected them. There will not be near the crop we had two years ago, but I believe a fair average one with it is hoped more profit than that one gave us. In some parts the caterpillar has eaten all the foliage from the fruit trees, and in some cases, attacked other trees, where the spraying was attended to there are no caterpillars.

Bad weeds. In my last note, I mentioned Chateauguay, Terrebonne and Assomption as having a good crop of weeds, I must now add the counties of Rouville and St Hyacinthe. What a rank growth there is this year of bad weeds. Near where I live, the sweet clover grew to between 7 and 8 feet high ! A friend said to me the other day,

when I mentioned to him the height of the sweet clover, the farmers will have to furnish step ladders to the cows in order to get up to eat that clover.

Yours truly,

Chateauguay,
27th July 1898:

PETER MACFARLANE.

NOTE—If farmers would only attend to Mr. MacFarlane's advice about clover! The waste of this most valuable crop is positively shocking to a man who knows how far superior it is to any fodder grown.—ED.

FEEDING FODDER PLANTS

By T. C. WALLACE (WALLACE & FRASER),
Toronto, Ont., and St. John, N.B.

Feeding cattle for milk and butter, and feeding young stock bred for the dairy, is an important branch of dairying at which very few in the business excel. In fact it may be said that the great majority fail in this connection. It is quite common to see cows that have made excellent records with one dairyman utterly fail when transferred to the charge of another feeder. The buyer of such animals never thinks of questioning his own feeding, he accuses the seller of deception. Even when a farmer sells an animal which afterwards turns out a record maker in the hands of a capable feeder, he simply says he always knew the heifer would develop something uncommon. Dr. Stewart in his excellent work on feeding has done much to improve herds by teaching farmers much of the value for various purposes of the grains and fodders, based on analysis. But there is something deeper than the mere analysis of ordinary crops, and the combining of them in such quantities as to make a ration for milk, butter, or beef. The value of the fodders and grains on farms differs very materially, and this great difference is caused by another kind of feeding, the feeding of the soil. As by well-balanced rations and good fodders we improve the quality of the produce of the stock, so by proper rational attention to the requirements of the plants to be fed in the soil, we improve the quality of the produce of the land as food for the animal in performing its functions. During recent years it has been quite clearly demonstrated that the feeding quality of the grasses and all fodders and grains can be more than doubled in flesh and fat-producing constituents, as well as in bone and muscle forming elements. This is tremendously important

and should engage the earnest thought of every feeder of cattle, as it opens the way to more economical feeding by reducing the feed bill, and possibly confining the ration to home-grown stuff, on which he has the full profit of a producer. And this is of equal importance to the hog raiser and breeder of horses.

The horseman aims at producing perfect bone and developing the muscle of his animals. This can be done more economically and perfectly by the production of fodder containing a high percentage of bone and muscle-forming elements. In this connection the pastures should be more carefully attended to, so that the quality of the grazing may be improved, as a great saving is effected by having pasture grasses of full feeding value instead of the poor run out herbage on which animals usually graze. If we depend upon the silo for our winter fodder, we should aim to have ensilage of the highest possible feeding value. It is this feeding value of fodders and pastures which often turns the scale for or against the farmer, while he is puzzled by the comparatively poor yields of his stock.

The effect of feeding better fodder is also marked in the quality of the butter, milk or cheese obtained, for even with the use of the best methods of manipulation of the milk the very finest quality of milk or cheese is not produced from poor feeding stuff. There is a field in Connecticut which is noted for the quality and quantity of milk and butter produced from cows fed from it. It has also been noticed that cows changed to other fields very soon show a deterioration in the quality of their milk.

It is then an important part of the dairyman's work that he should give great care to the feeding of the plants he grows for fodder.—*Farming.*

The Dairy.

CALCULATION OF COMPONENTS OF FEED RATIONS.

COMPTON MODEL FARM.

Let us suppose that we have at our disposal the following common feeding stuffs: Fodder corn, clover hay, and wheat bran, and that we want to know how much is required to keep a milch cow of 1000 lbs. live weight in good condition and to secure a maximum yield of milk. We will feed

14 lbs. of fodder corn, 6 lbs. of clover hay, and 10 lbs. of wheat bran. According to the Wisconsin Bulletin table, these quantities contain the following number of pounds of digestible matter :

	ORGANIC MATTER	DIGESTIBLE		
		PROTEIN	CARBOHYDRATE	ETHER EXTRACT
	LBS.	LBS.	LBS.	LBS.
14 lbs of field-curved fodder corn	9.35	.52	5.66	.17
6 lbs. clover hay	4.71	.39	2.09	.10
10 lbs. wheat bran	8.24	1.26	4.41	.29
Total....	22.30	2.17	12.16	.56

This ration falls somewhat short of the feeding standard in total organic matter and digestible substances. To bring it nearer to the standard, we add a couple of pounds of some concentrated feed. In selecting the foods and deciding the quantities to be given in each case, the market prices of the feeds must be considered. We will suppose that a lot of corn-meal is available in this case, and will add two pounds of this feed to the above ration :

	ORGANIC MATTER	DIGESTIBLE			NUTRITIVE RATIO
		CRUDE PROTEIN	CARBOHYDRATES	ETHER EXTRACT	
	LBS.	LBS.	LBS.	LBS.	
Ration as above....	22.30	2.17	12.16	.56	1 : 6.4
2 lbs. of corn meal	1.75	.14	1.25	0.8	
Total....	24.05	2.31	13.41	.64	1 : 6.9
American feeding ration for milch cows.....	24.5	2.2	13.3	.7	1 : 5.4
Wolffa feeding standard, german ration.....	24.0	2.5	12.5	.4	

The ration now corresponds very well with the American feeding standard ; there is a small deficit of organic matter and of digestible fat ;

but there is no necessity of trying to follow any standard ration blindly, as they are only intended to be approximate gauges which the farmer may use in estimating the quantities of nutrients required by farm animals in order to do their best, cost and product both being considered. (1)

In constructing rations according to the above feeding standards, several points must be considered besides the chemical composition and the digestibility of the feeding stuffs ; the standards cannot be followed directly without regard to bulk and other properties of the fodder ; the ration must not be too bulky, and still must contain a sufficient quantity of roughage to keep up the rumination of the animals, in case of cows and sheep, and to secure a healthy condition of the animals generally. The local market prices of cattle foods are of the greatest importance in determining which foods to buy ; the conditions in the different sections of our great continent differ so greatly in this respect that no generalizations can be made. Generally speaking, nitrogenous concentrated feeds are the cheapest feeds in the South and East, and flour-mill, brewery, and starch-factory refuse feeds the cheapest in the Northwest.

WESTON PARRY.

FEEDING FOR BUTTER.

Opinions differ both here in Canada as well in England as to how far feeding cows on different kinds of food affects the quantity and quality of milk. Not without reason many maintain that breed has much more to do with the quality of milk than food, and experiments have proved that to a very great extent the quality of the milk depends upon the cow and not at all on the food.

Now we hear of elaborate experiments made by Mr. John Spier since 1893, in the feeding of dairy cows, with a view to satisfactorily solve the question. In 1893 he fed cows on different foods and ascertained the effects these foods had on the qualities of milk yielded and the percentage of fat in the milk. Last year he started a new series of trials with a view to ascertain how far different foods affected the quantity of butter produced from the milk of each cow. I cannot here give all the details of the rations, but suffice it

(1) Very good and sensible remarks.—Ed.

to say that a table in which the results are summed up shows that the percentage of fat was down to 3.6 when the cows were fed on vetches and grains and up to 4.87 when they had cotton cake. The ration containing oats gave the good percentage of 4.26, and between oats and cotton cake came linseed cake. The quantities of butter obtained from 100 lbs of milk were in similar proportions in relation to the four diets named, while the butter from cotton cake and oats was firmer and altogether superior to that made from vetches and brewers grains or linseed cake. Oats gave the lowest and cotton cake the highest percentage of solids other than fat. The greatest quantity of milk was obtained by feeding with brewers' grain and also, strange to say, from a cotton cake ration. The experiments seem to show that changes of food are likely to be followed by an increase of fat in the milk, but that there is a strong tendency for the milk to return to what may be call its normal condition. An increase of oil in the food does not seem to give an increase of fat in the milk, and the remark is made that the effect of food is more marked in the quality of butter produced than in the quantity. Furthermore, some foods seem to produce milk from which a greater percentage of fat can be recovered by churning than others. A most noteworthy observation is that the greatest difference in the effects of the foods was seen in the quality of the butter. In fact most foods seem to have some effects on the flavor and on the melting point or keeping qualities of the butter produced by their uses. The butter from the use of linseed cake had a rancid smell by the third or fourth day, while that from the consumption of cotton seed cake did not reach the same stage till about ten days later. Also, some foods seem to produce butter which retains much more water than others. Because some of these experiments failed to show any decided increase of fat in the milk from the use of certain foods it does not follow that a good cow may be fed on almost any food and yet yield a profitable supply of milk.

It is hardly necessary to say that putrifying food of any kind should on no account be given to milch cows. In Germany barley straw has been found to influence quite perceptibly and unfavourably the flavor of butter. The most suitable foods, and those which have the most favorable action besides good grass and hay, are the grain of cereals, especially oats, and the dif-

ferent kinds of bran, especially coarse wheat bran. All kinds of roots, especially chopped turnips may be mixed with the eighth part of their weight of good cut straw and potatoes, with about half their weight of straw. Where roots are used care should be taken to measure exactly the quantities which are daily given. As soon as the rations are no longer eaten by the cows with appetite and the roots are no longer perfectly digested, both the flavor of the milk and the milk fat are in danger of being affected by the root feeding. The following conclusions from practice are well worthy of attention even if they are not invariably to be depended upon. Butter-fat becomes hard in its texture in the case of feeding with peas, vetches, rye, linseed cake and cotton seed cake. Butter-fat becomes soft when rape cake, oats, and wheat bran are used. When cotton-seed cakes are used it should be a rule not to give more than 2½ lbs per head of cattle. In winter rations which consist largely of straw and potatoes, a pound of rape cake should never be omitted. Finally, in the production of excellent and good keeping butter, the best results may be most certainly obtainable by using for the winter feeding of cows good hay and oat straw, with moderate quantities of beets or carrots, and with oats, wheat, bran, and rape cake.

W. R. GILBERT.

ADDRESS OF MR. PETER MACFARLANE
Inspector of Cold Storages.

(From the Report of the Dairymen's Association.)

My Friends,

I am about to address you in French ; but to speak fluently in that language, demands constant practice, and, unfortunately, I had but little chance of practising it during the past summer, for I passed it in Ontario, where I did not hear a word of French spoken. I met there several Canadians, but they all spoke English ; the same thing occurs in this province, where one meets men whose name is English, but who cannot speak a word of that language. So, during the whole ten weeks I passed in Ontario, I had no chance to keep up my French ; wherefore, if I speak it unintelligibly now, you will accept the will for the deed, and excuse any blunders I may make.

The Government.—I am not about to talk polit-

ics, ah! no; no politics here; the Government has been trying to place our cheese on a sound position in England; and I will relate to you a fact that will prove to you that it has succeeded. Two friends, on a trip to England, were passing a shop in which cheese was sold; entering, they asked the owner if he had none of their country's cheese to sell. What is the name of your country, asked the tradesman? America, replied one of them. We have no American cheese, said the man; it is not good. Asking the other of the two friends whence he came, and hearing that he came from Canada: Ah! said the shopkeeper, Canadian cheese is good! The English, as you see, do not know much about the geography of our country, but they are fully aware that very excellent cheese is made in Canada. We are Canadians, and that is the reason why makers should always brand their boxes and the cheese itself with the word, "Canadian."

But, though our cheese occupies a good position on the English market, it is not so with our butter. We now have to give a hoist up to our butter. Every maker ought to have a nice little cold storage; not too large a one, lest he be tempted to keep his butter too long. This cold storage should be so made as to be susceptible of preserving a temperature of 38° F. Then, he despatches his butter in refrigerator cars to Montreal, whence it is shipped in cold storage steamers to London. Butter thus kept cool will reach England in good condition, and gain a good reputation there.

Mr. Fisher, who made a grant to such creamery proprietors as have built a cold storage for butter, told us some time ago that he had only received some 70 applications for this grant, out of which only 50 had fulfilled the conditions and been paid; the others had failed to construct their storage properly, and so lost their right to the grant, but of the 50, two-thirds are Quebec men, and this shows that the Province is not lagging behind.

Mr. Fisher tells us that a grant of \$100 is to be continued for one more year. He thinks that there are not enough creamery men who have profited by the advantage offered last year, so he gives them another chance.

The Province of Quebec is not lagging behind in the race. I took a trip through Ontario last summer and the people there thought me crazy when I told them that, in butter-making, Quebec

beat Ontario; still, it is the case. We here, do not believe this; no, we fancy Ontario leads in everything. We are wrong; in the West there is not a single separator!

Capital cheese is made in Ontario; there, they are leading, but we make better butter. In many places in Ontario the cream is fetched from the farms, and the woman who delivers it is not always too careful in her toilette (1), consequently the cream collected in this way is not always so fragrant as it might be. Such a state of things does not exist in Quebec.

Now, allowing that the Ontario people know how to make cheese, it often happens that they do not know how to sell it. Here is a circular sent out by an Ontario maker, offering for sale 1,900 boxes of cheese of September and October make. I could have sold this at 9½ cents a pound, but the maker would not let it go under 10 cents.

In Quebec we do not speculate like this, except in the Eastern townships, where something of the kind was tried to the great loss of the speculators. The best plan is to sell the cheese as soon as it is fit to leave the factory and to leave speculation in cheese to others. Why not sell at once, instead of keeping our cheese such a time? Why, this maker who refused 9½ cents has not sold his cheese yet, and is only offered 8¼ and 8½ cents for it! Here, at home, we never keep our cheese like this; our fault, if we have one, is that we do not keep it long enough. Excuse me, once more; I could go on talking, but I think I had better hold my tongue.

Mr. Clément—I should like to hear Mr. Macfarlane on "cold storage."

Mr. Macfarlane—Many people fancy that \$400 must be the least expenditure to give them a right to the grant, but they are mistaken. It can be done for very little. Suppose you have a staunch weather-proof chamber in your building; even if it be not quite staunch, at an outlay of \$25 to \$30 you can so repair it as to keep the heat from entering. It is not so much spending a lot of money that is wanted as prudent expenditure of the necessary sum; for I have seen a factory that cost \$6,400, and when I was in the cold storage, I could see the sun through the gaps in the boards. The owners were trying to find out why they could not keep their cheese cool in it! The reason was the sun could get into the chamber with ease.

(1) I dare not translate literally Mr. Macfarlane's strong expressions.—A. R. J. F.

You can make your chamber close with paper ; use only lumber enough to hold the paper firmly ; there is nothing beats paper for keeping the air out. I do not advise the boards to be tongued-and-grooved ; it is needless to spend four or five hundred dollars to get a grant of one hundred. You can in this way make your storage-chamber large enough, but not too large. There are many people in Ontario that have fine, roomy storage-chambers in which they can keep butter for a month or six weeks ; they say : It is a good thing, this cold-storage plan to keep butter. But, when we asked them why they wanted to keep it, they replied : Oh ! perhaps the price will go up. That is not the line of conduct we must imitate. And for this reason, I say, do not make your cold-storage too large ; with only a small one you will have to sell your butter quickly to get it out of the way.

A large chamber is much more troublesome to care for than a small one. You have, for instance, a little one, in a corner, 12x18 feet ; that will not be difficult to keep cool. You need not have an ice-house in your building ; keep your ice in the usual way.

You can lower the temperature of your chamber to 26° ; it is easy to keep it at 38° ; so with such a margin there is no danger. It is still better if it can be kept at 34°. At 26° it is very good, but so low a temperature is not needed. Everyone who wants help for this purpose can get it by applying to the Government. You have only to write to the Department of Agriculture, and you will receive all the plans and explanations needed to show you how to construct your cold-storage. Do not hesitate about it ; it will cost you nothing.

(From the French)

CORRESPONDENCE

Richmond July '98.

To ARTHUR JENNER FUST, Esq.

Dear Sir :

The Ministers of Agriculture and their assistants, both Dominion and Provincial, have done good work for the farmers throughout the Dominion toward securing for them the best market for their produce, and also in assisting them in establishing creameries and cold storage for the better manufacture and preserving their butter and cheese. In addition to this I believe it is contemplated to establish model farms all over the country. This

I think would be a mistake, as there are already men in most of the farming communities, who carry on their farming on improved principles, but are very seldom copied. Improvement, to many, is thought to be so much extra trouble. Farmers should now rely more on their own exertions, and instead of pastures with inferior grasses, or raspberry bushes and wild plants which give poor, ill flavored milk and begin to fail the beginning of July, at this time the farmer should begin to feed, in nearly dark stables, which would be free from flies, green fodder once or twice a day. I know of two dairies where this is done and the cows are in fine condition. It would take less time than driving the cows to and from pasture. The fodder should consist of, first, clover, next green oats mixed with peas and vetches, then rape or corn, after this the oats and vetches again, which feed can be kept up until snowfall or after, with a little care. This fodder can be cured and kept for winter use, the cows keeping up a good flow of milk. In this way butter of superior quality can be made during the winter, enabling the producer to compete more successfully in any market.

When in England and Ireland last year, I made every enquiry respecting the different breeds of cattle kept at the great dairy farms. I found that the short-horns were invariably kept. It is evident that the Agricultural Department intend doing all they can for the advancement of the farming community. They should turn their attention to the introduction of superior milking stock. The short-horns and their grades have three times out of every four at the great London exhibition of dairy cows, beaten every breed in the production of butter. The s. h., last year I think it was, gave four pounds five ounce and the best Jersey gave three pounds and eight ounces. There are two other breeds in Ireland that it would be well to introduce ; they are unknown in Canada. One is the little Kerry cow, commonly called the poor man's cow as they live on poor pastures, on the hills. Their greatest admirers, could not advise a general adoption of the Kerry as a dairy stock, as on really good land, the slight, deer like, and generally picturesque appearance is soon lost, and her progeny, reaching heavy weights, become more valuable for beef production than for milk.

There is another very valuable breed in Kerry called the Dexter short-horn. Major Barton owns

a small herd of these cattle, bred from Dexter foundation cows, with five or six crosses of pure short-horn sires. Under the rules, these animals are eligible for entry in the s. h. herd book, and yet they are distinctly different from short-horns. They are beautifully shaped, wide chested cattle, little over half the weight of the s. h., yet so wide and full of muscle or flesh, as to make them the very type of cattle our butchers look for. The cows of this cross are deep milkers, and it is not uncommon to find these small cows giving eighteen or twenty quarts of rich milk a day.

Thanks.—Ed.

AYLMER.

The Grazier and Breeder.

FEEDING THE MARE AND COLT.

The Horseman reports the following experiment:—Three mares were fed heavily, and the colts fed nothing but grass. The mares got three times each day a plentiful ration of oats, bran cut hay, and sometimes roots moistened and fed warm two out of three times per diem. Three other mares got nothing at all but the grass they picked, but their colts were fed as the mares described above. Another lot of four mares were fed about half as much as the first three, and their colts were given just the same feed as those in the second lot; another lot of two mares and their colts were run together in a field by themselves, getting no other food of any kind. All drank from the same pure water supply. When it came time to compare results in the late autumn, the two colts which got no feed themselves, and whose dams got no feed, were the poorest in point of growth and condition. The four that were fed, and whose dams were fed, were quite a bit the best, and the colts that were fed, but whose mothers were not, were better than the colts that were not fed, but whose dams were given grain three times per day. That teaches that it is best to feed both the mares and colts something extra in summer. The extra feed given the mares makes the milk more nutritious and plentiful.

The revival of horse breeding this spring has found the country short of good suitable stallions. Every man who has a stallion on the road reports a good season so far. There are not enough horses to meet the demand. While this is true of Canada, it is also equally true of the United States, where there are not enough stallions to go around. The

result has been a demand upon the studs of Britain, Germany, France and Belgium. But the breeders there have felt the revival of good times and have materially advanced the prices of their horses, so that it is altogether likely that stallion fees next year will be higher than they are at present.

As the bicycle increases in popularity, it increases the demand for horses. Thousands of people who have had a wheel for a year or two get a horse and buggy as the natural advance, since our horses and buggies are so cheap. They are within the reach of all, and there are many more horses in cities and towns than when street cars were drawn by horses. Riding is also becoming more popular in this country as in England. A riding-school teacher says: "Thousands of people took to riding exercise through the bicycle who might never have taken any exercise at all, or who fought shy of a horse, perhaps, through nervousness. A bicycle is an excellent preliminary to the horse. Bicycle-riding induces confidence and dispels nervousness, and these are two effects which go to make capital horsemanship."—Ex.

CATTLE.

STAMINA IN LIVE STOCK.

The meat-making animals of to-day stand in strange contrast to the meat-makers of two or three centuries ago, and the same is true of the average dairy cow. The new and improved breeds of American swine are a wonderful advance in comparison with the razor-backs of a hundred years ago. But there is one respect in which there has been retrogression all along the line. We have good reasons for the belief that the average improved animal of to-day will not compare in stamina with the average animal of former centuries. While breeders have improved the form and the character of the digestion they have paid all too little attention to the improvement of the lung power and the action of the heart. There is no denying it; the average of the improved herds and flocks of to-day are delicate. In some instances they are held firmly in the grip of weakness; hence they go out into the land not to effect improvement but the transmit inherent weakness. Take, for instance, the average Shorthorn of to-day. In comparison with the average grade it is delicate. Take the average dairy herd of pure-bred cows and it is in many instances seething with tuberculosis. Take the average Poland-China and with all its ex-

cellence in feeding qualities, its breeding qualities, its bone, and its all-round stamina are not equal to those of its ancestors half a century ago. The bugler of the vast army of improvers of live stock, therefore, should blow a loud blast that will call a halt in some of the methods practiced by breeders of pure-breds the world over. Two or three leaves they must tear out of the book of past practices and they must begin again. One of these is the leaf of in-and-in breeding, a second is the leaf of selection, and a third is the leaf of environment.

Take first the leaf of in-and-in breeding and give it a savage tear. True, in-and-in breeding may

flocks were the most radiant, and at length there came a time, and usually in the life of the improver, when the average of the herd or flock was something less than in the former years. Is that not true even of the famous Sittyton herd of Shorthorns, which was less inbred than the herds of other renowned and earlier improvers?

Take next the leaf of selection. Cut it out and supply it with another. In the past, selection based upon performance in the ancestry for several generations back has been given first place in the creed of all improvers. It should not be so unless accompanied by strong evidence of vigorous performance



Sheep Shearing

be used as a short cut to improvement when breeds are being evolved. It may be given a place temporarily now and then in the practice of wise breeders, but the average breeder of pure-breds has no business to tamper with it. Its effects when long continued are only baneful with both animals and men. Take the lordly high-caste families of Shorthorns, for instance, that were so much in demand fifty years ago. Where are they now? They have been pushed almost entirely out of the show-rings. They lie in scores in graves dug by tuberculosis. They live mainly in the flickering, waning glory of a departed past. By in-and-in breeding men quickly brought their herds and flocks to the front, but let it be noticed the early periods in the history of such herds and

in the ancestry given in the animal selected. No matter what the performance of the ancestry has been if the individual is a weakling. And that performance may have helped to make it so, as, for instance, when it has come by direct descent from a short and brilliant line of prize-winners whose stamina has been consumed by unnatural forcing in food and environment of a character calculated to weaken. In selection, therefore, place stamina first and not last. Do not be dazzled by the brilliant record of a near ancestry that has helped to make a weakling of the progeny. I would not be misunderstood. I am not urging that performance in the ancestry is to be ignored. It is of great account, but only when accompanied by individual vigor in the progeny. Of what avail

will renown in the ancestry prove in a young bull reeking with tuberculosis?

And take that other leaf, environment. It is filled with mistakes. Tear it out and supplant it with another on which are written only correct practices. Three or four years ago the writer had a tussle with your paper over the degree of the confinement to which dairy cows might be subjected. It was a rough-and-tumble tussle, and I suppose both parties were conceited enough to claim the advantage. Well, I have this to say, that I now believe, while I had the best of the argument at the time, your contention was based on the sounder practice. It is only fair to admit that since that time I have veered more and more in the direction of giving stamina first place in our live stock breeding; that is to say. I have veered more and more in the direction of what you then contended for. But in seeking stamina by proper environment let us not go to the extreme of undue exposure. We do not need to expose our animals without food to the rigors of the range to make them hardy. In referring to range exposures, a brilliant ranchman said not long since that he had seen cattle "suffer more in a Canadian barnyard in winter than those on the range." There is one thing about that statement that staggers me. It was a canny Scotchman who made it—a man who all his life has been noted for truth-telling. No, breeders, do not seek that kind of environment to make cattle hardy.

We have reached an era in live stock breeding. We do well to heed that it is so. For good, all-round, useful males of the beef and mutton classes there will undoubtedly be a good demand for years to come. This demand is going to set men breeding them. May the work be properly begun. Let it be placed on a proper basis. Men who begin breeding cattle now have no business to begin on foundation animals that have not been tested, and those who are now breeding are not justified in bringing into the herd a bull that has not been tested for tuberculosis. Not a few of our pure-bred herds are so contaminated with this deceitful disease that to choose sires from them without testing them would be suicidal to the interests of the individual who made such a choice.

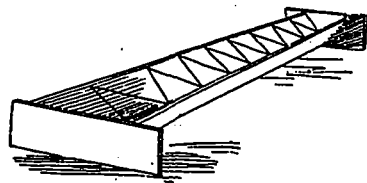
Correct type is a grand thing in breeding animals. But if type is carried to the extreme of bringing along with it delicacy, it is overdone. The sharp crops and the spare form in the dairy cow are very good in their place, but if they are sought so

far as to unduly contract the chest let us have a little less of them. The compact form and easy-keeping qualities in the improved hog are certainly desirable, but if we get these so perfected as to impair breeding qualities and weaken locomotion, let us have a hog a little longer in body, though it should take a little more food. The broad, deep and thick body in the beef animal is good, but if we secure it to the extent of engendering sluggishness, let us call a halt in this direction.

The opinion is common that pure-bred animals are less vigorous than grades, and it is just. But it should be remembered that it is defective breeding and management that have made them so. Stamina may be improved quite as much as form and performance: but in the improvement of the past this fact has been in a great measure lost sight of. In the reconstruction of the good ship of improved live-stock breeding let stamina be the frame-work make all the bolts of stamina, christen the vessel Stamina, and let "Stamina" be painted in brilliant letters on the flag she flies. Thus reconstructed this good ship will bring her cargo straight away into the harbor of success.—PROF. SHAW, IN THE *Breeder's Gazette*.

A CONVENIENT HOG TROUGH.

An exchange gives a very useful way of fixing a hog trough so that each pig can have only his own share of the trough, and at the same time hogs cannot get into it. The wire is not in the way of feeding and prevents the trough from spreading. The trough is made by nailing together, in the usual way, two pieces of plank,



one six inches, the other eight inches wide. Now take a piece of No. 9 wire, or two lighter wires twisted together, and staple one end securely to one side of the trough about four inches from the end. Cross the wire to the opposite side and staple it at eight inches from the end, then back to the first side eight inches from where it was first stapled. This gives each hog eight inches of

trough room, and if securely made will make a good trough.—*N. W. Farmer.*

PIG TALK AT GUELPH.

The Ontario Experimental Farm has many visitors, and besides seeing they have a free talk on various practical topics. Here is a sample. It is Superintendent Wm. Rennie that speaks:—We have five breeds of swine on the farm—Yorkshire, Berkshire, Tamworth, Chester Whites and Poland Chinas. We have found the fashion in hogs change like the fashion in ladies' hats, and we must keep up with the change, if we want to be in the swim. We all know how proud we used to be of our old blocky Berkshires; but we have found it necessary to put them away. What the packers call for is a long, lean side, thin, wedge-like shoulders, like the dairy cow, and as little jowl as possible. A Berkshire sow and Tamworth boar make a very good combination. The Berkshire alone is apt to be too fat in the shoulders and to have too much jowl. The Chester White mother and Tamworth sire also give fair results. For a good, all-around single breed, the pure bred Yorkshire is about the best. One objection to it as it stands is that there is sometimes a little too much jowl. With that bad feature eliminated, the Yorkshire is probably the best of the lot. The objection to the pure bred Tamworth is that there is too long a shank to the ham. A Chester crossed with a Tamworth will give you 200 lbs. of meat more quickly than you can get it in any other breed, but you will not get the number of pigs from a Chester mother that you will from a Yorkshire. The same holds true in regard to the Berkshire. Thin hogs give bigger litters as a rule than fat ones. It is remarkable the number of pigs that a Yorkshire mother will produce. Above all things, keep clear of the broad shoulders and thick, fat bodies. The razor-back, with a sharp, wedge-like shoulder, the same as that of the milch cow, is what the packers call for."

"Is there," asked one visitor, "any difference in the result between taking a sow to the boar when she first comes in heat, or taking her later on?"

"I do not know," replied Mr. Rennie. "We have not experimented along that line."

"I have been told," replied the visitor, "that it does make a difference. An old breeder says that the sow should be taken towards the end of

the period. As an illustration, he mentions the case of an animal which had never given more than six at a litter, and which gave 21 when taken to the boar on the second day of heat."

Jos. E. Brethour, Burford, Ont., is on his way to England to visit the leading shows and make purchases of choice stock for his already noted herd of Yorkshire swine.

By nature the pig is a very clean animal, and likes a good bath in the pond, and takes it if it gets the chance in hot weather. Hardly any other animal on the farm so indulges. And if in winter time it be properly fed and given plenty of clean straw it will keep itself very clean. If it be a white pig its coat will be well nigh as white—perhaps whiter—than the straw.

N. H. Gentry, Sedalia, Mo., reports the death of the Berkshire boar, Baron Lee 4th. For over two years this boar was the property of Snell Bros., Snellgrove, Ont., and left a lot of excellent stock, which has spread all over Canada. The boar was only five years old and died suddenly. He was without doubt one of the greatest, if not the greatest boar of his day. Some old breeders go so far as to say that he was the best Berkshire boar they had ever seen.

During the last two years there has been a steady decrease in the number of outbreaks of swine fever in almost every county in Great Britain in which the disease has during that period been at all prevalent, and in some cases the decrease has been very satisfactory. In Somersetshire, for example, the number of outbreaks, has fallen from 641 in 1895 to 204 in 1896, and 72 in 1897, whilst in the West Riding of Yorkshire the figures have been 658 in 1895, 431 in 1896, and 162 in 1897.

Diarrhoea in sucking pigs may be caused by several things. A very frequent cause is having the sows too fat. Another cause, especially where pigs are fed the refuse from the table of large hotels or institutions, is the excessive amount of fat that is sure to be in such foods. Such foods should be thoroughly cooked, then allowed to cool and the fat skimmed off before the pigs get it. When the little pigs scour change the feed; give a little charcoal, a few cinders, coal or a little charcoal, a few cinders, coal or a little earth. These will be found most beneficial. Sometimes the sow will need a dose of medicine.—*N. W. Farmer.*

The Poultry-Yard.

DUCK RAISING A PROFITABLE INDUSTRY.

Duck raising has been developed within the last ten years into a flourishing industry, in the United States.

Artificial incubation and brooding, combined with judicious feeding, have been instrumental in the development of the industry, machinery has enabled the duck raiser to accomplish his ambition of being able to place his stock on the markets when prices are the best, and also of raising large numbers of birds in a limited space of time. The season for raising ducks is about six months—from February to July.

Duck raising may well be recommended to our farmers as a profitable source of revenue; and by a careful attention to the work, as knowledge increases, the scope of the industry may be extended; there are quite a number of farms in the States that are devoted exclusively to raising ducks, averaging from 5,000 to 20,000 ducks as an annual output. Some idea of the proportions of the business may be had from the fact that as high as three tons of feed are used daily by a single raiser during the busy season.

The profits are the very best, and good incomes are made when once the business is thoroughly mastered. But it is not my intention to advise our readers to jump imprudently to the conclusion that these results can be easily obtained. Duck raising is an arduous task; one that requires an apprenticeship and absolute knowledge of the business before success is reached. Those who have been successful in raising ducks have learned the business much as one does any other vocation. The beginner should start modestly in a quiet way and increase his plant as his knowledge of the work increases. The average farmer has all the facilities for raising a goodly number of ducks, and may, with a little outlay, add considerably to his income. It is not at all necessary that ducks should have access to water, to be raised successfully; they grow and thrive as readily without. There are successful plants where thousands of ducks are raised that have no water, save that which is given them to drink. (1)

(1) The Aylesbury duck-men never allow the ducklings to enter water. They often get 10 s. (2½ dollars) a couple for them in the London market.—Ed.

A duck plant should be located on a line of railroad near to and in direct communication with the city markets and not too far from the station. Almost any location will do for the plant and worn out land, that can be bought cheap will do as well as the richer and more fertile land costing many times as much. Sandy soil is to be preferred. The buildings should be arranged to secure good drainage and be convenient to each other that labour may be reduced to a minimum. The labor attached to raising poultry is an item that is overlooked by many, and the cost of it reduces very notably the earnings of the plant. Every department should be so located as to economize the time of the attendants. The incubator cellar should be convenient to the brooder house, the brooding house to the growing house and pens and these to the killing house. The feed house should be located conveniently to the brooder and growing-houses and the breeding pens. The task of feeding the growing stock four times a day, and the breeding stock twice a day, is no small one.

Watering is also to be thought of and arranged for. Houses for ducks are simple affairs, they do not require furnishings of any kind, but be built plainly though comfortably.

A duck is differently constituted from a hen and must be cared for under different conditions. The hen needs warmer houses and drier surroundings than does the duck. A duck does not mind the cold, if she can keep her feet warm; cold feet will affect a duck as a frozen comb does a hen, retarding laying and inducing disease. The feathers of a duck are almost impenetrable and will withstand almost any degree of cold. Again, a duck cannot stand the amount of confinement in a house that a hen can, she is more restless in disposition and is given to ramble in a greater degree than is a hen. Indigestion is not so prevalent with ducks as with chickens; the ducks' ceaseless motion aids the digestive organs and keeps her generally in good health. The food of the duck is both vegetable and animal in nature. In the wild state, it gathers its food from brooks and marshes consisting of flag, grasses, small fish, water insects, etc. When the birds are raised in confinement this diet must in a measure be imitated to get the best results. The three different methods of feeding ducks are:

1. feeding ducks for market (ten weeks old);
2. feeding young ducks to be kept as breed-

ers; 3. feeding old ducks. The first method for the sake of convenience and to explain more fully the composition of the rations, is subdivided into four parts as follows:

1. From time of hatching to five days old, provide the following mixture. Biscuit or bread crumbs and corn meal, equal parts by measure; hard boiled egg, 15 per cent of the total bulk of biscuit and meal; sand, 5 per cent of the total of biscuit and meal. Mix with water or milk and feed four times a day.

2. From five to twenty days old, the following mixture is given: wheat bran, two parts by measure; corn meal, one part; rolled oats, 50 per cent of this bulk; beef scraps, 5 per cent; sand, 5 per cent; green food, 10 per cent. Mix with water to a dry crumbly state, and feed four times a day.

3. From twenty to forty-two days old the following mixture: wheat bran, two parts by measure; corn meal, one part; beef scraps, 5 per cent of this bulk; sand, 5 per cent; green food, 10 per cent. Mix with water to a dry crumbly state and feed four times a day.

4. From forty-two to seventy days old, the following mixture: corn meal, two parts by measure; wheat bran, one part; beef scraps, 10 per cent of this bulk; coarse sand or grit, 5 per cent; green food, 10 per cent. Mix with water to a dry crumbly state and feed four times a day. The hours for feeding are 6 a.m., 10 a.m., 2 p.m. and 6 p.m. In another article, I will give rules for feeding ducks for marketing at ten weeks of age.

DUCKS.

(Accidentally omitted from our last.)

Ducks can be raised successfully almost anywhere. It is not necessary that they have access to running water or a pond, only so they have drinking water. They do better in small runs as ducks are weak in their legs and will not stand becoming fatigued. The most popular ducks are the Rouen, Aylesbury, Pekin and Cayuga. The Pekin takes the lead as a market "broiler" duck. They may be kept under perfect control, grow the largest and mature the quickest. One drake should be kept with 4 or 5 females. The pens are best bedded with straw or shavings which may be removed when it becomes foul and unclean. Ducks will make their nests in the bed-

ding and lay either in the night or early in the morning and should be kept in until sure that all the eggs are laid. Duck eggs are very successfully hatched in incubators. Thousands of eggs are hatched annually by means of incubators on the large American duck farms. Hard-boiled eggs and stale bread crumbs make an excellent first food for ducklings. Cooked vegetables, corn meal, beef scraps, biscuit crumbs which may be bought from the bakers, green food, bread and milk, clover later and cut rye. As they grow older, feed more corn meal and beef scraps. Always feed a little sand.

A duck of the improved breeds will lay from 120 to 160 eggs per year and usually begins in February. If kept in the house until about eight o'clock in the morning they will lay in the house as they lay early in the morning but if turned out too soon they sometimes deposit their eggs in other places and even in ponds. One drake to six ducks is sufficient and if young females are used it is best to have a two year old drake, though sometimes the eggs hatch well from parents of the same age on both sides, and less than a year old.

The keeping of ducks for eggs is the profitable part of duck raising, when rightly conducted and the keeper is within easy access to a city market. During the early spring months, duck eggs bring higher prices than hen eggs, and it is at this season that ducks are the most prolific. To obtain the best results from eggs the laying ducks should be hatched the latter part of the breeding season in June and July. The spring hatched will grow larger and will make better breeding stock but with proper care these late broods will lay as soon, in fact as the early hatched and will not require to be fed during March, April and May. The proper food for such ducks to induce early and prolific laying is well illustrated by a successful breeder who generally winters about 500. He feeds them on equal parts of boiled turnips, wheat, bran and corn meal with a little, say, about ten per cent, beef scraps. This is mixed together perfectly while the turnips are hot and constitutes the entire feed during the winter and spring. About the first of January, or a little later, when they begin to lay, the proportion of bran and meat scraps should be increased. This mess is fed morning and evening and at noon they have a light meal of dry food composed of equal parts of cracked corn oats and wheat.

Ducks kept for market eggs require no drakes with them. It is true that ducks will consume nearly twice as much food as hens, yet they can be kept very cheaply, if the runs are sufficiently large. A duck requires a large amount of coarse food principally grass and from fifty to one hundred ducks can be kept upon an acre of land if it be in good grass the greater portion of the year with only a small grain and meat ration. The houses for ducks can be less expensive than hen houses the only requisite being that they be warm and dry. For twenty-five ducks a house sixteen to twenty feet long and eight feet wide is sufficiently large and it can be built low and banked with straw and earth for protection during the winter. I find that four feet high by two feet and a half at the eaves with a shed roof, makes a convenient height. By having the house narrow it is easily cleaned; all the inaccessible parts can be cleaned with a hoe or scraper. The house should be as warm as possible. A very convenient house of the dimensions given can be built of tongue-and-grooved hemlock lumber planed on one side and lined with building paper, the frame being made of two by four inches set sidewise so as to form a two inch dead air space between the paper and the outer wall. In the front is a three foot door and two windows two feet six inches by four feet, double glazed, one on each side the door. There are also three small doors or exits with slides which can be closed at night; the floor can be raised above the surrounding ground and may be built on three by six inch sills, so it can be moved easily if desired. If the house faces the south or south-east and is well banked at the rear and ends with straw, corn-stalks or something of that kind and plenty of straw used for bedding, it will be sufficiently warm.

In raising ducks there are five essentials—muscle, water, food, shade and grit—and the greatest of these is muscle. In feeding and raising young ducks begin with the breeding stock, strong vigorous breeders mean healthy wide awake ducklings needing a minimum of attention and easily raised. This being the case you should give the breeders a large grass range with plenty of shade and feed night and morning. Do not feed at noon as ducks on good grass range do not need it. If without grass range, feed all the green food they will eat each day, fodder corn, rye, grass, clover or anything they will eat. Have

water in pails or troughs convenient to feeding places at all times of the day and night, also oyster shell and grit and do not forget to supply shade: they must have it.

In winter, vary the fare by a liberal allowance of boiled turnips mashed in with grain say one third turnips every other morning and with cabbage chopped fine or other green food that can be obtained, fed at noon.

DUCK POINTERS.

Earth floor is best.

Avoid overcrowding ducks as you would hens.

Ducks are good hatchers but poor mothers.

Short hay, leaves, or chopped straw make good bedding.

Charcoal in the food of the young will prevent sickness.

It is a mistake to allow young ducklings an unlimited range.

Medium aged drakes are considered the best for market production.

Ducks kept on land must have fresh water at least three times a day.

Better lay in a lot of turnips, to be fed cooked when other green food is scarce.

The duck is not only a prolific layer but the eggs are richer in fat than are hen eggs.

Half-grown ducks, when overcrowded in a pen, are apt to get into the habit of feather pulling.

Carbolate of lime scattered about the duck houses and water troughs will disinfect the premises.

Mr. Rankin estimates that a young duck can be grown to ten weeks of age at a cost of food of four cents per pound.

At seven years of age the breeding duck is about equal in vigor and productiveness to a hen at four years old.

Clover hay steeped is an excellent substitute for green food.

Cracked oyster shells are placed before the ducklings from the time they are put in the brooder house.

BRITISH LETTER.

AGRICULTURE AT THE PARIS EXPOSITION IN 1900—
THE ROYAL SHOW AT BIRMINGHAM.

London, Eng., July 11th, 1898.

I have just received an early copy of the regulations, etc., under which British and Colonial goods will be exhibited at the Paris Exhibition of

1900. This exhibition is of quite as great importance to the colonies and dependencies of Great Britain as it is to Great Britain itself, and in giving my readers a few particulars in regard to it they have the very earliest possible reliable information.

So far as Great Britain and her colonies are concerned their action is to be regulated by a Royal Commission, and I am pleased to see that, so far as Canada is dealt with, the Dominion is represented on the commission by, to use official phraseology, "Our right trusty and well-be-loved Donald Alexander, Baron Strathcona and Mount Royal, Knight Grand Cross of Our Most Distinguished Order of Saint Michael and Saint George, High Commissioner in London for Our Dominion of Canada." Agriculture will be found at the exhibition in what is designated "group 7," and this group is to consist of "classes 35 to 42," in which may be shown (a) implements and processes used in rural cultivation; (b) appliances and processes used in vine culture; (c) ditto used in agricultural industries; (d) agronomy (theory of agriculture), agricultural statistics; (e) vegetable food products; (f) animal food products; (g) non-edible agricultural products; and (h) useful insects and their products, and destructive insects and parasitic plants.

Concerning "horticulture and arboriculture" group 8 will be set apart for these, and in this group there will be six classes, for (1) appliances and processes used in horticulture and arboriculture; (2) kitchen garden plants; 3 fruit and fruit trees; (4) trees, shrubs, ornamental plants and flowers; (5) greenhouse and hothouse plants; (6) horticultural and nursery seeds and stock.

In group 9, to which it is not necessary perhaps to more than merely allude, will be devoted six classes for matters connected with "Forests, sport, fishing, gathering wild crops." Those desiring fuller details as to the exhibition will be able to obtain them, I assume, from the Dominion authorities either now or very shortly. At any rate, the foregoing will give a general idea what the exhibition is to consist of from the agriculturist's and horticulturist's point of view. I will only further add that in the class (f) for animal food products exhibitors will be enabled to show "(1) edible fatty substances and oils; (2) fresh or preserved milk; (3) fresh, salt, or highly salt butter; (4) cheese; (5) eggs. It seems to me that this is an opportunity which should not be lost by the Canadian farmer—either individually or through the Government—to show his butter and cheese; for it must not be forgotten that, although a large market may

not be possible in France, buyers from all countries will be at the exhibition and not least from Great Britain itself. Much business is sometimes done during the excitement and enthusiasm of an ordinary agricultural show. Much more may be expected at Paris in 1900.

Readers will doubtless be aware by this time that our great annual agricultural exhibition, viz., that of our Royal Agricultural Society—with its 11,000 or 12,000 subscribing members of the highest class—has been held and is over. I do not propose to refer to it in general, as it is much like the ordinary agricultural exhibitions of other countries, except that it is much larger and, perhaps, has the very best live stock which is ever seen. I desire, however, to refer to one or two new inventions which up-to-date Canadians should know about. In the first place, two new cream separators were shown for the first time. One is named the "Melotte," and it is claimed that it is the best in the market. As it was not entered for any of the silver medals given for "new implements, etc.," I prefer to say nothing about it. Possibly it will compete with older makes at coming shows, and then I shall see what it can and can not do. The other cream separator is named the "Centrator" and, unlike the Melotte, it entered for one of the medals referred to and, what is more, won it. It is claimed by the makers (and, having inspected the machine, I see no reason to doubt the claim) that the Centrator is easily worked by a boy (in the smallest sizes); that it is moderate in price; and that it can be easily cleaned. The makers, however, say that it separates the cream so perfectly that in the separated milk there remains only .05 to .09 per cent. of fat. If this is the fact, then the machine has a future, and older ones will have to look to their laurels. Professors Robertson, Dean, etc., would do well to enquire into the matter. The British agents are Messrs. Vipan & Headly, of Leicester, England; but it emanates primarily from, I understand, Sweden, the home of another first class separator.

Another useful, small, and inexpensive article for the dairy farmer was a milk strainer. This is priced at 14s., and I was informed that the sediment, which is arrested, cannot be forced through, whilst the finest dirt is stopped. The makers in this case are the Dairy Supply Company, of London, and, as the strainer received a medal from the judges, the farmer and dairy-bacteriologist may assume that it possesses exceptional merit.

Three other medals were also awarded, viz., to Messrs. R. Boby, Keyworth, and to the Monorail Portable Railway Company. These firms showed respectively: (1) A machine which separates plantain, or rib-grass from clover seeds—a most useful invention; (2) a barrow seed-drill for broadcast sowing, which users of such might find it advantageous to enquire further about; and (3) a very cheap form of railway plant, in which the power required is extremely small.—*Farming*