Technical and Bibliographic Notes / Notes techniques et bibliographiques

Canadiana.org has attempted to obtain the best copy available for scanning. Features of this copy which may be bibliographically unique, which may alter any of the images in the reproduction, or which may significantly change the usual method of scanning are checked below.

Canadiana.org a numérisé le meilleur exemplaire qu'il lui a été possible de se procurer. Les détails de cet exemplaire qui sont peut-être uniques du point de vue bibliographique, qui peuvent modifier une image reproduite, ou qui peuvent exiger une modification dans la méthode normale de numérisation sont indiqués ci-dessous.

- ☐ Coloured covers / Couverture de couleur
- ☐ Covers damaged / Couverture endommagée
- ☐ Covers restored and/or laminated / Couverture restaurée et/ou pelliculée
- ☐ Cover title missing / Le titre de couverture manque
- ☐ Coloured maps / Cartes géographiques en couleur
- ☐ Coloured ink (i.e. other than blue or black) / Encre de couleur (i.e. autre que bleue ou noire)
- ☐ Coloured plates and/or illustrations / Planches et/ou illustrations en couleur
- ☐ Bound with other material / Relié avec d'autres documents
- ☐ Only edition available / Seule édition disponible
- ☐ Tight binding may cause shadows or distortion along interior margin / La reliure serrée peut causer de l'ombre ou de la distorsion le long de la marge intérieure.

- ☐ Coloured pages / Pages de couleur
- ☐ Pages damaged / Pages endommagées
- ☐ Pages restored and/or laminated / Pages restaurées et/ou pelliculées
- ☑ Pages discoloured, stained or foxed/ Pages décolorées, tachetées ou piquées
- ☐ Pages detached / Pages détachées
- ☑ Showthrough / Transparence
- ☑ Quality of print varies / Qualité inégale de l'impression
- ☐ Includes supplementary materials / Comprend du matériel supplémentaire
- ☐ Blank leaves added during restorations may appear within the text. Whenever possible, these have been omitted from scanning / Il se peut que certaines pages blanches ajoutées lors d'une restauration apparaissent dans le texte, mais, lorsque cela était possible, ces pages n'ont pas été numérisées.

☑ Additional comments / Commentaires supplémentaires: Continuous pagination.

THE JOURNAL OF AGRICULTURE AND HORTICULTURE

VOL. 3. No. 3 — This Journal replaces the former "Journal of Agriculture," and is delivered free to all members of Farmers' Clubs. — AUGUST 1st, 1899

THE

Journal of Agriculture and Horticulture

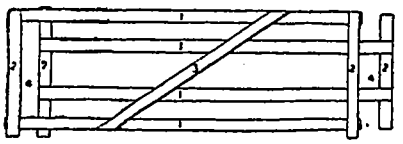
THE JOURNAL OF AGRICULTURE AND HORTICULTURE is the official organ of the Council of Agriculture of the Province of Quebec. It is issued Bi-monthly and is designed to include not only in name, but in fact, anything concerned with Agriculture and Stock-Raising, Horticulture &c. All matters relating to the reading columns of the Journal must be addressed to Arthur R. Jenner Fust, Editor of the JOURNAL OF AGRICULTURE AND HORTICULTURE, 4 Lincoln Avenue, Montreal. For RATES of advertisements, etc., address the Publishers

LA PATRIE PUBLISHING CO.,
77, 79 & 81 St. James St., Montreal.

Subscription: $1.00 per Annum payable in advance.

Table of Contents

Notes by the Way.



Portable Hurdle Fence.

The above figure represents a moveable hurdle fence used on the farm of Theodore Louis, Wisconsin. It is used for hurdling swine, but is equally valuable for sheep and cattle. The width between the bars and the height of the hurdles may be made to suit the sort of animals to be kept by it. Description: (1) Fence boards, 12 feet long; (2) one by three-inch or four inch slats; (3) two-inch slat. Observe that the slats (2) are alternately reversed. The open space (4) must be one-inch wider than the slats (2). The fence stands worm or zig-zag fashion, the right hand end of one panel protruding through the left hand end of the next panel, and so on throughout the whole fence. If required stakes may be driven x fashion to hold the fence firm.

Charlock.—It seems, from all we can gather, that a dry spring is favourable to the growth of that abominable weed, *charlock*, i.e., wild mustard. Here, on the Island of Montreal, the young grain-crops were almost overpowered by the foe, and the brilliant gold-colour of the flowers was visible for miles along the route of both the C. P. R. and the G. T. R. In England, in which country, especially on the chalk formation of the S.E. counties, the weed was more plentiful than usual, the spring was as dry as it was here, and as the modern legislation on education has entirely put a stop to

the employment of gangs of children that, under the supervision of a "Ganger," or contractor, used to be seen, literally, *running* about the fields in Essex, Cambridgeshire, etc., plucking up every visible plant of *cadluck* by the roots, since, we say, this practice has become absolute, the farmers there are at their wits' end to know how to combat it.

Most earnestly are the different Colleges of Agriculture striving to discover some dressing that, while not injuring the young grain-plants, will destroy the mustard, and partial success seems to have crowned their efforts. Thespraying with a solution of sulphate of copper is decidedly the best remedy as yet discovered, if the spraying is done when the mustard is in its early stage. The first solutions tried were evidently too weak. To be successful, the entire charlock-plant must be destroyed, and this, when the plant is strong and in flower, requires a strong dose. That sulphate of copper kills charlock without injuring the grain is true enough, but too many plants escape, even after double spraying, so it is clear that further experiments are needed. Cannot, in the mean while, something be done by a judicious process of cultivation in the early spring? Something in this form :

Suppose we have a piece of land, fall-ploughed, in preparation for barley, a crop that does not so peremptarily demand early sowing as do wheat, oats, or pease; why not pass the heavy harrows over it as soon as the land is dry enough? The seed of the charlock, recently brought under the influence of the air would soon sprout, and the subsequent cultivation in sowing and covering the barley would destroy the young plants. This was our constant practice in the old country and must have been effective, as we were but little troubled with charlock in our barley. Why is fall-wheat seldom infested with the weed? Probably, because the young plants are killed by the frost, and there are no more seeds brought up from below to supply their place. There is no doubt about certain soils being choke-full of charlock-seed, a fresh supply of which is brought within the influence of the air by every ploughing.

Principal Wrightson, of the Salisbury Agricultural College, says, in reference to his promise of giving any information in his power concerning the success of the experiments on spraying :

"Of the trial with the Strawson sprayer made in my neighbourhood, it is impossible to speak positively. The spray killed a good deal of charlock, but the effect for some reason was not complete, and the too numerous survivors are going to seed. The oats on which the experiment was conducted are not injured. The interruption to work at a busy season is also a drawback to spraying because it involves water carts and horses. This would not be grudged if the destruction of the charlock was complete. On the other hand, the experiments at the Uckfield College were very favourable. The conditions of farming are so various, that results, even in a case of this kind, cannot be trusted in their application in other districts. It is not what we read, but what we know to be practically certain in our own circumscribed little area that affects us farmers."

Since we wrote the above, we have received further information on the subject of the destruction of charlock by spraying with solutions of sulphate of copper or of iron. No end of experiments seem to have been tried in England this spring with it, and, on the whole, not unsuccessfully. At all events, the following results are to be depended upon :

1. That the efficacy of the treatment with copper sulphate depends upon the dryness of the season.
2. No solution capable of injuring the charlock has proved uninjurious to the barley.
3. No solution, though used at the rate of 40 to 80 gallons an acre has effectively destroyed the charlock.

When, at the South-Eastern College, Wye, Kent, spraying was tried for the first time, the weather was dull, and a shower followed within 30 hours; result: the barley was injured, the charlock not hurt.

Later, a perfect distribution of a solution of copper, iron, arsenic, sulphuric acid, sul*phate* of ammonia, and crude gas-liquor (containing the very pungent car*bonate* of ammonia), at the rate of 40 gallons an acre, with which every individual plant of charlock was wetted, did not kill one plant outright.

A third trial—weather hot and dry—; marked injury to the grain by all liquids that injured the charlock, but in no case was more than 10% of the latter actually killed past recovery.

The upshot is, that if the plots experimented upon are examined soon after the spraying, the effects seem to be enormous; but the plant is so full of vitality that, after having lost all its leaves,

it will send out a bud from the *axils* (just as tobacco does after being disbudded), and this, taking the place of the original flower-truss, will produce plenty of seed to stock the land for a dozen more crops.

Flax.—Our Glo'stershire friends are still persisting in their practice of growing flax. Lord Bathurst has, at his own cost, erected a retting-vat, and seeding, breaking, and scutching machinery at North Cerney, in the above county. The great lesson has at last been learnt: a large crop of well-ripend seed cannot be grown in conjunction with a fine, even quality of straw for manufacturing purposes.

The frequent heavy showers of the middle fortnight of the past month have certainly freshened up the pastures, such as they are, on the Island of Montreal, but the hay-crop was past cure, and there is literally no clover to help with its second cut. Those who allowed this second crop to die on the ground last summer, would gladly welcome its presence in their barns just now. Hay must be dear next winter, more especially as the straw of all grain is very short indeed.

Improved practice.—We are glad to see a good deal of improvement in the practice of this neighbourhood. On the 17th of July, we were delighted to see a piece of land; that had just been stripped of its crop of tares and oats for green-meat for the cows, which, wanting it, must have been hard put to it to live, let alone to give any milk; ploughed, harrowed, sown with buckwheat, re-harrowed and then rolled. The next day, too, an adjacent acre, or so, of early potatoes was taken up for market, the land harrowed, ploughed, harrowed again, rolled, and sown with white-turnips. All this, particularly the rolling, on a farm where last year there was no such implement as a roller, was very pleasing to our eye. We may as well mention that, on the farm in question, every piece of grain was rolled as soon as sown, a practice especially necessary on such a light soil.

Another thing, that naturally greatly pleased me, is, that the second crop of clover, last year, that was treated after our English plan of cutting early and letting it *make itself*, turned out very well, the leaf being still adherent to the stalk, instead of having been left in the field as it usually is when the common practice, of letting clover stand till the heads are brown, then turning it about, cocking it and breaking it abroad out of the cock before carrying, is followed.

To-day, July 19th; the mower is at work on the first piece of timothy, very little of which is present, but the bottom has profited greatly by the showers, and there may be half a ton to the *arpent*.

The grain ripens very slowly; oats, that have been out in full ear for three weeks, have not yet begun to turn colour. (1)

Swedes and carrots that last year were sown in the drill, this year were tried on the flat. (2) As the land is a dampish sand, and the dung was not allowed to heat, the weeds were rampant, and the hoeing must have cost a fortune. *Corn* looks fairly well.

The Poultry-Yard.

WYANDOTTES.

The Wyandotte is another of the general-purpose fowls, and is rated next to the Plymouth Rock. From the first, it sprang into popular favor, and has continued so to the present time. Its origin is comparatively recent, dating back less than twenty-five years. It came originally from the Dark Brahma, Silver Spangled Hamburg, and the Breda, a French fowl. Not a few authorities say that the Wyandottes have Cochin blood in them from the fact that their ancestors produced single combs and feathered legs.

For general purposes the Wyandottes have proved a success, being of medium size, weighing on an average a pound less than the Plymouth Rocks, hardy of constitution and prolific layers. They are easily cared for and bear confinement well. For table purposes they are of superior worth; their flesh is sweet, juicy and tender, making excellent broilers and roasters. As layers

(1) But a marvellous, almost miraculous change has supervened. Though the grain will not be multiplied by the fine rains, the oats look likely to yield a great crop of straw.

(2) Pity to grudge seed, especially of carrots; for they were a perfect failure here this season in consequence of too thin seeding. Ed.

they are among the best, averaging from twelve to fourteen dozens a year and as winter layers they do well under ordinary circumstances. There are five varieties of the Wyandotte breed, and it is only a matter of opinion as regards the choice of the best. The general characteristics are the same in all, the difference in color of plumage being the only distinguishing marks. The silver laced Wyandotte is of a silvery-white plumage, with regularly marked white lacings on the breast and a generous distribution of white and black throughout the entire body. The cock has a silver-white head, a rose comb, silver hackle, with a black stripe down the centre of each feather, silvery white back; saddle same as hackle; breast black, with white centre, tail black; wings half black and half white, or rather black edged with white; when the wing is folded there should be a well-defined bar accross it; shanks and toes rich yellow, free from feathering. The silver-laced variety is marked similarly to the male, excepting the back and wing, which are whiter in male than in female. The breast of the female is of much importance in breeding good birds; the lacing should be large and distinct and the white centres of each feather free from black and brown pencilling.

The Golden Wyandotte is marked like the Silver, excepting that the color is golden bay and black instead of white and black. The white variety is perhaps the favorite, from the fact that it is not so difficult to breed to feather, the plumage being pure white throughout. It is for this reason the more practical fowl for the farmer, or those who keep poultry for market. The Buff Wyandotte is in color a rich, deep clear buff, uniform in shade throughout, except the tail, which is of a deeper buff or copperish-bronze color. The Blacks are of a rich glossy black, with greenish sheen, excepting breast primaries, secondaries, tail and fluff, which are pure black.

The standard weight of cocks is 8½ pounds; hens 6½ pounds; cockerels 7½ pounds; and pullets 5½ pounds. S. J. ANDRES.

Live-Stock.

COMMON DISEASES OF FARM-STOCK.

Indigestion, with its common consequences especially in young animals, was discussed in my last article. Adult animals do not however enjoy any immunity, and if the effects of indigestion are not so widely fatal as they are when young animals are attacked, they are in many cases associated with loss of condition and general disturbance of the nutritive functions.

As in the case of young animals, so in regard to adults, it may be remarked there is a general disinclination to apply the term or to treat the disease as indigestion. Horses are often said to be in bad condition. With a ravenous appetite, they continue to lose weight; the skin is adherent to the tissues beneath; the coat is rough, in spite of good grooming; a dry, harsh cough is present, and very often an eruption of very small pimples occurs on different parts of the skin, associated with light discharges and loss of hair. Chapped heels, grease, and thrush are also in some horses particularly likely to occur under these circumstances.

When the question of treatment arises, the owner is very much disposed to select one of the symptoms and deal with it as the disease. This "out of condition" as indicated by emaciation is a common complaint, and certain remedies are sold for it under the name of condition balls or powders. The derangement of the functions of the skin is called hidebound, and is, or was once, treated as a specific malady, for the cure of which, in the olden time, force was used, in order to disconnect the integument from its attachments. Eruptive diseases are looked upon as surfeit, and are treated as original disorders of the skin; and the same may be said of grease, cracked heels and thrush, even when they are merely symptoms of a generally disordered state of the system, and not the consequence of local derangement.

If it should happen, as it often does, that parasites, bots or round worms, are expelled by the sick animal, they are without hesitation accepted as the true causes of the animals' bad condition, and worm powders are selected as the appropriate remedy. It is hardly necessary to add that cracked heels, thrush, and grease are always

looked upon by horsemen as local affections, and the only question with them is as to which of the various lotions and ointments in use are best adapted for the purpose of curing them.

All the phases of disease referred to are continually occurring, and every owner of a horse, and certainly every man engaged in attending upon animals, is familiar with them, and is armed with specifics, which he is inclined to estimate at very high value as curative agents.

It must however be evident that as the symptoms described are often due to defective nutrition, they can only be effectually dealt with by a course of treatment, which is directed to the cure of the derangement of the organs concerned in the process of nutrition, and therefore the very common disorders, loss of condition, hidebound, constipation, diarrhœa, surfeit, and other disorders or the skin and its appendages, are not to be treated empirically as temporary local disturbances, but demand a careful inquiry as to their origin before any attempt at cure is made.

An expert would naturally commence an investigation by an examination of the sick animal, and it is possible that he might at once detect symptoms which would enable him to determine the nature of the disease, and the part of the digestive system which was implicated. Certain signs—for example, a yellow tint on the surface of the skin, and the visible mucous membrane—would suggest disorder of the liver, and the physical character of the dung and the urine would afford further evidence of value.

An irritable state of the skin, either with or without eruptions, dry cough, irregular appetite, with a predilection for indigestible food, are signs which indicate general derangement of the mucous membrane of the digestive system. Hidebound is a state which suggests defective action of the secreting organs.

In seeking for the causes of any form of indigestion, the inquirer can hardly avoid suspecting the food or water, or both ; and in this matter the experienced man is careful not to trust to statements made to him by the attendant, nor even by the owner, as both may, in perfect good faith, make remarks which, if accepted without question, may lead to a false conclusion. It is not at all unlikely that an inquiry as to the food which is given, will be met by the positive statement that all the horses have been fed on the same provender for months past, and that all the rest are doing well ; whereas a critical investigation might lead to the discovery of the fact that, while all were fed on oats, hay, and bran, the sick horses had been fed on a particular lot of provender which may be found to be of very different quality to the rest.

A very remarkable case, which occurred many years ago, on a breeding farm of repute, will illustrate this proposition. A number of valuable Shorthorns belonging to a well known breeder died in quick succession with symptoms which indicated acute disease of the stomach and intestines. No solution of the mystery was apparent. It was roundly asserted by the breeder and his men that the food and water could have nothing to do with the matter, as all the cattle were fed in exactly the same way, and no fresh oil-cake or other article of food had been brought to the farm for some time. At length, on an analysis of the rumen of one of the cattle which died being made, mustard seeds in large quantities were found ; and on this evidence the whole system of feeding was subjected to a careful scrutiny, and it was at once discovered that a special parcel of oil-cake, which had been brought on the farm with the general store, had been put into a particular shed, and had been exclusively used for feeding the lot of cattle which had died. An analysis of a sample of the cake which remained proved that it was adulterated with mustard seed, and, after the use of the adulterated cake was discontinued, no further cases appeared. This example is interesting, as an instance of accepting a verbal statement of the persons who are engaged about the sick animal, instead of instituting a careful inquiry into the whole system of management, and a close inspection of every article of food.

The character of the water is always a matter of importance, but no useful information can as a rule be gained by merely looking at the fluid. Perfectly bright water may contain poisonous ingredients, and a somewhat dirty fluid may be quite harmless, so, that the aid of the analytical chemist is necessary to determine whether it is good or bad.

To remove the cause of disease as soon as it is detected is a reasonable precaution, which can generally be adopted when a horse is concerned. In the case of cattle and sheep on pasture, it is not always an easy matter to provide a totally new food supply, even when it is known that the animals are suffering from the quality of the

provender on which they are forced to subsist.

Removal of the cause is an important, but not the only measure which may be necessary. An animal suffering from indigestion may not recover at once upon the cessation of the cause, without the aid of medecine to correct the mischief which has been done. Purgatives are useful agents in such cases, if only for the purpose of clearing the alimentary canal. Alteratives as they are called, including agents which excite secretion, as nitrate of potash, and sulphate of soda, are valuable agents and may be given in the animal's food or drinking water. Moderate diet and gentle and regular work will complete the method of treatment. W. R. GILBERT.

The Garden and Orchard.

(CONDUCTED BY MR. GEO. MOORE).

PUBLIC PARKS.

There is no way in which the health of the inhabitants of large cities can be maintained like giving them fresh air. If those who are confined in close factories or stores can have a chance to breathe the pure air of Heaven frequently, they will be less liable to physical disease and mental depression, and will be better men and women, morally and intellectually, better husbands and fathers, better members of the body politic, less likely to find fault with their rulers, because more contented with their lot in life.

The Americans have happily not lost sight of of this and have provided all their large cities and towns with public parks and recreation grounds, sparing no expense for this purpose.

The Parks-system of Boston is really a marvellous undertaking, extending as it does many miles into the surrounding country, it makes the old "Hub" the centre of a vast pleasure ground easily accessible in all its parts by electric cars for very low fares; also by other cheap conveyances by those who wish to go to long distances, or by means of the bicycle, or on foot to those who prefer keeping nearer home.

About 35 years ago I remember what is now the Newton Boulevard as a barren waste, and the other day I travelled through the district by Electrics for 10 miles along an avenue, planted with double rows of elms, two roads for carriages, on either side one; and, between them, a double trolley track with the land between the rails covered with grass, kept cut short like a lawn. Mansions, villas, cottages and terraces are built on every available spot, and the locality is just hilly enough to make the scene one of artistic beauty, except at least (from my point of view) in one particular, and that is the total absence of fences. Of course it is the carrying out of the democratic idea, but to my mind it imparts a baldness and unfinished appearance to the landscape which would not exist if there were low, well kept hedges of some suitable shrub round each homestead, and especially on the road-side. It is said that an Englishman's house is his castle and so a New Englanders may be, but his grounds without a fence are not fortified. No offence to our American cousins but, by all that is homelike, give me a fence!

The Boston Park-system up to the present time has cost $15,196,320, $6,540,138 for land and $8,656,182 for constructions. The area occupied is 2,308 acres and of its ponds and rivers 126.9 miles.

The department of Parks of the City of Boston expended, last year, for land $49,495, construction $484,068. maintenance $140,000, total $673,563. What a grand example to those cities who can scarcely scrape up enough to keep their little squares in decent order. GEO. MOORE.

SMALL FRUITS.

There is no reason why every farmer should not have a supply of small fruits, at least for family use, either fresh or preserved, throughout the whole year, and thus add to the value and the comfort of the home. Any land that will grow a crop of potatoes will grow small fruit, as currants, raspberries, strawberries, and blackberries. Neither will as many as will supply the wants of even a considerable family, occupy much time or space to produce them, and an inconsiderable quantity of manure.

Small fruits really need occupy no appreciable space, because they can be planted in rows amongst the vegetables in the kitchen garden, and the cultivation necessary to one crop will help the other.

Currants are perhaps the most easily grown,

and occupy as little time and attention as any fruit of our northern climate. They thrive upon almost any land, and are thoroughly frost-proof, require no winter protection, and very little pruning, except trimming out the branches, and a few minutes of care and attention at the right time in the application of a little white hellebore powder will rid them of the worms which eat the leaves and are about their only serious enemies. Then, a little rotten manure, dug in about their roots will be all the cultivation they need. As preservers of health, currants are held in high repute; their acidity is a good help to digestion, and they possess medecinal qualities which purify the blood. They can be canned or bottled without sugar if subjected to about 120 degrees of heat and corked or sealed up tightly; and, after being kept for years, will come out with as good a flavor as if just plucked off the bush.

They make less rich but more wholesome preserves when just put up with sugar in the usual way than either raspberries or strawberries, and wine made of them is most delicious and refreshing. (Oh! Ed).

Raspberries and blackberries require a little more attention than currants as to their cultivation; and need protection by covering them with the earth in which they grow, removing the dead canes, and trimming out and staking the fruit-bearing ones.

Strawberries require more care, time, and attention. The system of their cultivation I will not attempt to describe in this article but ask my readers who have land at their disposal to read and study it. They will find it interesting and may make their knowledge useful and profitable. If the men of the household would undertake the heavy part of the work such as digging and manuring the women would find the lighter part; especially gathering the fruit; an open air recreation which would be pleasant and profitable and not too laborious. Husbands, encourage them by doing your part cheerfully. Wives spare a little time, with your children, from your household duties to attend to the fruit garden, and you will all be benefited by the change of work and profited by its results. Geo. Moore.

THE SAN JOSE SCALE COMMISSION

The San José Scale Commission held a series of meetings in the penisula between Lakes Erie and Ontario in the last week of June. At three points —Niagara-on-the-Lake, St. Catharines, and Windsor—orchards have been destroyed on account of the scale. A general review of the evidence shows that orchardists who have had trees burned are pretty unanimously in favor of remedial treatment. Outside of those thus directly affected the only witness who took strong ground in favor of this course was Mr. Martin Burrell at St. Catharine's. He has taken much pains to study the situation, and gave his evidence in such a manner as to make a strong impression. He quoted Prof. Slingerland to the effect that proceeding on our present lines would destroy very many of out again and again. At Fonthill and Grimsby, indeed, it may be said that all the fruit-growers of that district not in the immediate vicinity of scale-infested orchards are strongly in favor of going on and burning infested and suspected trees. Some advised going on even if it cost a million or more, others would continue for a limited time—two or three years. Those who are now so fiercely opposed to the Act said that they were in favor of it a year ago.

The Niagara on-the-Lake growers contended that it is too widely distributed and to firmly established to be got rid of now by any means; that, like the potato-bug, it is here to stay, and that the wiser course is to try to find means of controlling and remedying it. They held, too, that it is not so destructive in Canada as it is reported to be in the longer and warmer season of the Southern States, and in support of the opinion pointed to the fact that although it had been in their neighborhood six or seven years it had done less damage in the whole township than the scale officers had done in individual orchards. Those whose orchards are merely suspected claim that the scale inspectors coming from infested orchards are liable to bring scale with them on their hands and clothes. Several of the Niagara growers urged that inspection should cease from the 1st of July to the end of October, the peroid during which the young lice are running over the trees, because the inspectors could not avoid, if a few trees are affected, carrying it to the other trees in the orchard. They pointed to examples, one of which was the case of a lot of young peach trees examined; four were found in

fested in the spring and burned, in the same lot in the fall twenty-seven were found to have it.

The insect is extremely minute in size, except when moving in the larval stage and shortly after settling, ii is not greatly unlike the bark of the tree in color, and it may be on any part of the trunk, branches, or twigs. These facts indicate what laborious work searching a tree must be. Mr. Benn said that he estimated each inspector occupied on his apple trees about a half-day to each tree. He computed that it would take the staff of twelve men at present working in Niagara 400 days to examine the apple trees in that township, not to speak of the far greater number of other kinds of trees.

At Winona the difficulty of distinguishing the San José Scale from other kinds that closely resemble it was brought to the front. Mr. Foran testified that what the inspectors had pronounced San José Scale the official entomologist had called Forbes' Scale. Two hours' unsatisfactory reexamination of marked trees in a condemned peach orchard belonging to Mr. Geddes to obtain authentic specimens of the insect emphasized the difficulty.

Almost without exception the witnesses favored larger compensation for destroyed trees than one-fourth of the official valuation. The maiority tought the valuation should not be left entirely to one man. A few favored the raising of part of the compensation by taxing fruit, or orchards, or locals municipalities concerned.

The nurseymen approved of fumigation and the continued prohibition of nursery stock from the United States. Two of them thought they have notice some injury to young trees from fumigation, one an instance on cut-leafed birch, the other by resetting fumigated stock and unfumigated stock of the same varieties alongside each other and noting that the latter made more vigorous growth. They generally favored official inspection of the process of fumigation at it was liable to be neglected or slighted by some nurseymen who feel sure that their own stock is free from scale.

It appears that the San José Scale Act was passed at the urgent sollicitation of the provincial fruit-growers. Everyone heartily approved of its purpose to stamp out the pest if possible. A good deal depends on the co-operation of the owners of orchards. Some of the Niagara people argue that its measures are so drastic that owners will try to conceal the presence of the insect in their orchards, even with the prospest of compensation, whereas, if remedial measures were substituted, they would hasten to report the discovery of it to the inspectors though no compensation were expected.—*Farming.*

Household Matters.

(CONDUCTED BY MRS. JENNER FUST).

CARE OF THE TEETH.

People who possess a good set of teeth, are naturally proud of them (1) and should take the greatest care of what Nature has bestowed upon them so lavishly.

Unfortunately, possesion of a good thing often leads to carelesness on the part of the owner, and neglect leads to many troubles.

Neglect of the teeth causes toothache, the agony of which can only be realised by those who have gone through that torture.

On the first sign of any trouble with the teeth, the cheapest way is to consult a dentist at once, whose bill will show you what value he puts on these neglected members.

In the meantime, every care should be taken to keep them in good working order, by never indulging in too many sweets, or acids; never to get up in the morning, or go to bed at night, without spending a few minutes on the teeth, however hurried one may be. After every meal, the mouth should be very well rinsed with water if there is no time for anything else; at night particular attention should be given, so that no particle of food be left between them to cause fermentation which leads to decay.

THE HORSE'S TEETH.

One of the duties of a groom is to sponge out the mouth of the animal daily, and naturally if anything is out of order it will be seen and attended to at once.

Neglect of this matter was brought home forcibly to me, on meeting a friend riding one day. After a little chat he remarked that his horse was not in condition, said he ate well but did not thrive on when he ate.

My husband examined the mouth to find out his age, and very soon asked the owner what sort

(1) De te fabula narratur. HOR.

of a groom he had, not to have found out a large lump of tartar stuck fast to the teeth preventing the closing of the mouth and of course hindering the proper mastication of food. A smart tap with a hammer would soon dislodge this impediment, and enable him to thrive well on about half rations, and at the same time relieve him from the charge of gluttony.

Sheep who lose their teeth are called broken-mouthed, (1) and are as quickly a possible converted into mutton, being unprofitable to keep owing to not being able to well masticate their food.

THE CROCODILE.

So much depends on the teeth, that Nature has taught this horrid monster, after a feast, to lie with open mouth, on the banks of the river in its native climate, where he will soon have a troop of willing scavengers come in the shape of small birds, who will quickly cleanse his teeth from every particle of his late gorge, and thus leave the teeth free to clutch the next victim coming down the river, be it man or beast.

TO WASH WHITE WOOLLEN DRESSES.

Thin white woollen dresses, such as nuns' veiling, crêpes, whether cotton or woollen, should be washed in cold soapsuds. Have the suds well mixed and the soap well beaten to a lather, then wash the material, rinse it out in clear absolutely cold water, and without wringing or even slightly pressing out the water, hang it up to dry, as wet as it comes out of the tub. The weight of the water running out of the material will help to stretch it and keep it very materially from shrinking. In linen dresses, the linen would probably shrink, but an unlined bodice washed in this way will stand many washings with an almost imperceptible shrinkage. Skirts are apt to shrink a little the first time, but if the hem be undone before the washing, it can be turned up a little narrower afterwards, and a facing ought not to be necessary until after several washings. Crêpes should of course never be ironed ; a smoother thin woollen may be pressed with moderate irons on the wrong side while it is still damp.

(1) Ewes in the like predicament are called in East Anglia, *crones*. Ed.

CAMBRIC AND MUSLIN BLOUSES.

Do not dry any cambric and muslin. After they have been very well rinsed, put them in a thin cold water starch, and then roll in a sheet or towel, and iron while they are damp. Tussore blouses look lovely done this way, of course, omitting the starch, as silk would not require to be stiff.

A WASHING HINT.

Before sending your linen out to washed, or washing it at home, look carefully over the table-cloths and napkins ; pour boiling water through the fruit stains, and moisten the grease stains in ammonia water. All coffee and tea stains should be moistened in cold water, rubbed lightly between the hands, then boiling water to which a few drops of ammonia have been added, poured through them. The stains, if not removed before hand will more than likely be "fixed" by the boiling and become permanent.

THE CRAVAT.

This is an article of feminine attire upon which much attention is being bestowed. It is just a smart little touch which transforms a simple dress and make it distinguised looking. Sometimes the cravate is of silk, or again of mirior velvet, and it is worn with anything and everything, either fronts, vests, shirts or bodices. Just a plain gown or face cloth opening to show a vest of lace with a bright silk cravat will look very smart indeed, but remember the toque and cravat must be alike in colour and contrast prettily with the colour of the cloth dress.

CARE OF MILK.

Perhaps it would be well if it were better known that milk possesses great absorbent properties, and should therefore be kept away from all volatile substance likely to contaminate it and so render it dangerous to health. If you want to see for yourselves how milk will take up any flavour, place it by an open vessel containing turpentine, and you will find that it has taken up the flavour and tastes of turpentine. The same thing occurs with all strong-smelling substances, such as tobacco, camphor, or paraffin. Seeing, then, the great capability of milk to absorb things, the prudent

housekeeper and mother will keep her mill away from the vicinity of the kitchen sink, or any place where there is any possibility of sewer gas which may communicate germs of typhoid or scarlet fevers. It is to the younger members of our housenolds that the danger of contamination comes in; we who are older and not so susceptible. I think many obscure cases of sickness may be traced to contaminated milk. Another word of caution may not be amiss. Never let anyone drink milk which has been exposed in a sick room; but make a virtue of necessity, and, however wasteful it may appear, pour it down the drain immediately it comes downstairs.

CHEESE SALAD.

Take two or three heads of fresh, tender cabbage lettuce, two bunches of watercress, and a good handful of small cress, and after preparing these in the usual manner—that is tearing (1) the lettuce into shreds, rejecting all the stalks of the watercress, and cutting the small cress very short—thoroughly dry the items, and put them into a salad bowl with two tablespoonfuls of very finely-chopped raw-onion, a dessertspoonful of minced parsley, two hard-boiled eggs just roughly chopped, and from ½ lb. to ¾ lb. of any favourite cheese, cut up into very small neat dice; mix these ingredients well with a dressing prepared as below, form the whole into a neatly-shaped pile in the centre of the dish, garnish round the base with slices of raw tomatoes and cucumber placed alternately, and serve. To make the dressing, mix together very thoroughly, and by slow degrees, the yolks of two perfectly fresh raw eggs, a tablespoonful of mixed mustard, a liberal seasoning of salt and pepper, a tablespoonful of fine white sugar, four tablespoonfuls of pure salad oil, and one tablespoonful each of tarragon vinegar and the best malt vinegar; then when these form a well-blended whole, the dressing is ready for use.

A NICE FRENCH SALAD.

Boil separately a pound of French beans and a pint of freshly shelled green peas, then when done enough drain the vegetables thoroughly and cut the beans into small, neat lozenge shapes. When quite cold, put both beans and peas into a bowl with the white part of a dozen spring onions, thinly sliced, a large, fresh cabbage lettuce torn into fine shreds, the leaves picked from a bunch of fresh, crisp watercres, a dessertspoonful of finely-minced, fresh mint, a teaspoonful of chopped parsley, a tablespoonful of fine white sugar, a seasoning of salt and pepper, a light sprinkling of mixed vinegars—tarragon and malt—and a liberal sprinkling of fine salad oil; then mix the whole lightly but thoroughly together, and arrange in a high, neat pile in the centre of the salad bowl. Garnish round the base with raw, ripe tomatoes, cut in quarters, and pleasantly seasoned, and hard boiled eggs cut in quarters lengthwise.

(1) Never cut a lettuce; always tear it. Ed.

In buying a whole ham, one cannot, of course, judge by the colour of the meat, as that is invisible, but a capital plan is to run a clean skewer or a sharp-pointed knife in at the knuckle and also at the centre, and if this comes out perfectly clean and with a fresh sweet smell it is sufficient proof that the ham is a good one and has been properly cured.

PASTE THAT WILL KEEP.

When children are at the home in holiday time there is a constant demand for a little paste wherewhith to stick pictures in albums, etc., and mother has very often to be making this afresh, because it goes nasty and mouldy, and unfit for use. There is, however, a method of making paste which will keep good for some time.

Put one teaspoonful and a half of powdered alum into enough cold water to make a pint of paste, and let it dissolve. After the alum is dissolved, pour it over enough flour to make it as ordinary paste. Let it boil, stirring briskly all the time, and when it is finished add a drop or two of oil of cloves. Alum in paste stops fermentation, whilst the oil of cloves prevents the formation of mould, and gives the paste a pleasant smell.

Swine.

FEEDING THE BROOD SOW.

From a Paper on the "Bacon Hog Industry," Prepared for the Nova Scotia Pork Packing Co., by J. J. Ferguson, B.S.A., Smith's Falls, Ont.

After the sow is separated from her spring litter, she will be able to find a living upon good grass or clover pasture, with little or no additional grain ration. Two or three weeks before she is due to farrow her fall litter, her ration of meal should be increased. We have found a mixture of bran and shorts, equal parts, about the best at this time. The sow should not be made over fat by heavy feeding, but a thin condition often results in weak, puny pigs at farrowing time. After the fall litter is weaned, the sow can be very cheaply carried through the winter upon a ration of mangels or sugar beets. Of these we feed about thirty pounds per head per day, in two feeds, morning and night, with two or three pounds of *whole* oats fed at noon. Turnips can be used, but to get the best results they should be sliced or pulped; our mangolds are fed whole, which is quite a saving in time and labor. Not only is this ration cheap and convenient to feed, but it carries the sows along in first-class breeding condition. This, combined with exercise taken at will in roomy yards, results in a much smaller loss of young pigs, when farrowing time comes, than is usually found where sows are kept closely confined during the winter and fed entirely upon a grain ration.

A month or so before farrowing, the sow should receive a lighter ration of roots and more meal. Large quantities of cold watery roots, fed shortly before the birth of the pigs, may give them such a chill as to result in their death. Roots do not contain sufficient mineral matter to build up a proper bony framework in the litter. The sow should farrow in a warm, dry pen, to which she has become accustomed for some time. A fender should be placed around the base of the walls, projecting out at the foot, and ten inches from the floor, to prevent her over-lying any of the young pigs. For the first week after farrowing she should be fed but a light meal ration of bran and shorts, or bran and finely-ground oats mxed to a thin slop with warmed water or skim-milk. Over-feeding of the sow at this period, or feeding her heavily on barley, or pea-meal, is very likely to cause a milk fever, often resulting in the loss of dam and litter. Her ration during the time she is suckling her litter should consist largely of bran, since this is one of the very best milk-producing foods obtainable. When the young pigs are two weeks old, they should be provided with a supply of new milk in a shallow trough or pan, protected from the old sow. After a time, skim-milk may be substituted, with the addition of a small quantity of ground oil-cake, shorts, or oat-meal. When treated in this way they become well able to do for themselves at seven or eight weeks old, and will suffer no set-back when taken from the mother.

It is a serious mistake to wean pigs at four or five weeks, as is so often done, resulting in their making slow growth during the second month. Every day of lost time on the pig's part means money lost for the owner; they must be kept moving right along steadily from start to finish. The sow and litter should have access to a roomy yard, or, if she farrow in late spring to a small clover or grass patch. When the pigs are ten or twelve weeks old they will make good use of pasture of this kind; in many sections of Ontario the farmers carry their hogs during the summer months almost entirely on clover. Light movable fences or hurdles are made use of to confine the hogs to a portion of the field. When this is pastured off, the hurdles and hogs are moved to a fresh piece. This seems to give better results than allowing the hogs to roam over a large area. In every case, the hogs should have two or three copper rings inserted in their snouts to prevent their changing the face of nature; these will do it effectually. A hundred of them, and a pair of pincers for inserting them, can be bought for twenty cents. It is well to provide a light shelter of boards to protect the pigs from sun and rain.

While pigs will grow and gain on clover alone it is always advisable to give them a light grain ration in addition, one-half or one-third of the amount they would receive if fed on grain alone. Hogs finished on clover alone seem to yield a large number of soft bacon sides than those properly finished on a grain ration, so that care must be exercised not to run to an extreme in this matter. Hogs on clover pasture should have a plentiful supply of clean water available at all

times. If skim-milk can be supplied them, at the rate of six or eight pounds per head per day, it will be found of great advantage. About a month before the hogs are to be marketed the finishing feeding should commence, This is not to be taken to mean "fattening," but rather a firming up or ripening. Much has been said as to the injurious effects of certain feeds in the production of soft bacon. Of this we are satisfied, with the right pigs, good bacon can be produced with greatest certainty by feeding a mixture of the different grains commonly grown upon our farms. No hard and fast rule can be laid down as to what grains to feed, as this matter will be regulated largely by current market prices, and also by the quantities of each which can be grown in each locality. A mixture of oats, peas, and barley, seeded at the rate of one bushel of each per acre, will not only give a larger yield than any of these sown separately, but will be found to furnish a first-class grain ration for finishing hogs. An exclusive diet of any one grain will not give as good results. We now know that corn can be fed to finishing hogs without injury, if they have been fed on a good bone and muscle forming ration earlier in life, and do not at any time receive more than, at most, one-half of their meal ration of it. In all cases it is better to keep the hogs' appetite sharp; he should not have meal food lying almost constantly in his trough. (1) *Farming.*

The Dairy.

THE SCOTCH DAIRY COW.

The modern breed of Ayrshires was started by crossing the compact and comparatively small Shorthorn bulls of milking strain from the northern counties of England on the native Scotch cows and the Dutch cattle, Holstein and Holderness. A little later there was an admixture of Alderney or Jersey blood, probably both. To the Channel Island and Dutch breeds the Ayrshires owe their milking qualities and to the Shorthorn the aptitude to lay on flesh when this is desired.

The breed has the typical wedge shape of high class dairy animals. The horns have an inward curve similar to that of the Alderney. The shoulders are thin and the loins broad and deep. The prevailing color is a reddish brown with more or less white. The udder is large and the teats of good size. The cows are particularly hardy, produce a large quantity of milk compared to their size and thrive on less feed than most of the improved breeds. They produce more milk than the Jerseys, but less than the Holsteins. Some complain that they are not entirely satisfactory as butter makers, as the non-uniformity of the fat globules causes some loss in creaming and difficulty in churning. When set, the milk must be left somewhat longer than that of other breeds. For cheese the milk is considered especially desirable in that the percentage of casein is high. Where the milk is sold for immediate consumption this breed is especially satisfactory.

Ayrshires are particularly valuable in a cold or northern climate. The cows are remarkably neat looking and one of the prettiest classes of cattle. They are also exceptionally gentle and milk to a remarkable old age. Cows 18 and 19 years old have been known to produce milk at a profit. The excellent digestive organs enable the cows to assimilate and make the best possible use of feed. Secretary Winslow of the Ayrshire breeder's association collected some statistics concerning the milk production of this breed. The yield varies quite widely, but the average yearly production seems from this investigation to be between 6000 and 6500 lbs. Individual cows have produced as high as 13,500 lbs. in 12 months. As a rule 1 lb. of cheese can be made from 9 to 11 lbs. of Ayrshire milk. The average butter yield of six cows in the '88 test at the N. H. station was 267 lbs. In '90 tests at the Maine station the average was 204½ lbs. The average for 614 cows in '90 was 221½ lbs. At the American dairy show at Chicago in '89 the sweepstakes prize for the best dairy butter from any part of the United States was awarded to a 10-lb. package from an Ohio Ayrshire herd. An Ayrshire cow produced for 15 years an average of 6000 lbs. Her 12-year-old record was 7082 lbs. In a breed test in N. J., which unfortunately was terminated at the end of 11 months by the burning of the barn and cows used in the test, Ayrshires stood first in cheapness of production of milk. It cost 1.66c to produce a quart of Ayrshire milk, 1.71c Guernsey, 1.75c Holstein, 1.91c Jersey and 1.71c Shorthorn.

Farm and Home.

(1) As we have often mentioned in this JOURNAL, the almost invariable practice in England is to finish of on pease. ED.

A FINE HERD OF CANADIAN COWS.

M. N. GARNEAU'S *farm, at Ste. Foye.*

(*From the French edition of the Journal of Agriculture*).

Early in the month of June, we had the pleasure of visiting the farm of M. N. Garneau, M.P.P., a member of the Council of Agriculture and a laureate of the "Merite Agricole"; the farm is situated at Ste-Foye, close to Quebec.

As at the time of our visit the cattle were just on the point of leaving their winter quarters, we were in a position to judge how they had borne their long period of seclusion in the cowhouse and the winter feeding; in fact, the moment of our visit was that critical one so well known to every farmer of the province.

On entering the cowhouse, we were at once forcibly struck by the comfortable, prosperous air of the herd; the air is perfectly pure and healthy, and thorough cleanliness reigns throughout the establishment; the animals are cleaned and rubbed down with a wisp daily, (1) and not a spot of dirt or a stain from the dung is tolerated.

The milking-herd is composed of pure-bred, registered Canadian cows; uniformly black in colour (barring a brownish streak along the back and a gray or brown muzzle); all bred on the farm, except one cow, bought from another breeder, and evidently carefully selec'ed.

We reckened 12 head of Canadian cattle, of which the following is a list:

1. A two-year-old bull; a splendid beast; so strong and well-furnished that he might pass for a four-year-old. His head is like that of a Jersey, except as to colour.

2. *Brunette de Ste-Foye*, a fine-milch cow, 7 years old, giving *8 pots de lait* (probably, 16 quarts = 40 lbs.) a day; a very striking sample of the breed, having been noticed in *Hoard's Dairyman* in an article published in 1897.

3. *Duchesse de Ste-Foye*, 3 years old; gives 30 lbs. (*6 pots*) of milk a day. She is the daughter of *Azilda de Lévis*, that took two first prizes at the Quebec exhibitions.

4. *Cybèle*, 3 years old; a cow that with her first calf gave 20 lbs. of milk daily.

5. *Cérès*, 3 years old, gives 30 lbs. of milk a day.

6. *Minerve*, 3 years old, 25 lbs. with her first calf.

7. *Marquise*, 2 years old, daughter of *Azilda de Lévis*, daily yield 25 lbs.

Besides these, there are 2 yearling heifers; a big 5 months old calf, that looks more like a yearling, and 2 spring-calves; all promising animals, perfect in form. These are of the third generation, and prove most satisfactorily the result of the good breeding and care exemplified in the attention paid both to the parents and the descendants.

Truly, it is a fine sight to view these animals presenting at a glance, with curious uniformity, the traits that characterise the purest type of the Canadian race of cattle; the same black, supple, massy hide, with its silky, shining hair, indicating every sign of a race of milk-producers in perfect condition.

As to the richness of the milk of these cows, by the analysis we ourselves made, we found the remarkable average of 5 to 6 per cent of fat, in June, i.e., at the conclusion of the winter season.

Compared with the other milk-breeds, all other things being equal, the Canadians offer to Canadian farmers special qualities of the greatest importance. The Canadian cow is hardy, patient, and, relatively, very little subject to the contagious influence of tuberculosis, which is so severely attacking the other less hardy breeds, as is proved by the report of the Ottawa Experiment-farm. The Canadian cow costs but little to keep, and liberally repays her owner for his care by supplying him with plenty of rich milk.

By contributing, with the other breeders of the province, to the redintegration of the Canadian cow, and by proving to our farmers that she deserves their attention; that, in fact, she is the very cow that they need; M. Garneau is doing a great service to the agricultural class, and we congratulate him sincerely on the patriotic work he is pursuing with so much zeal and success.

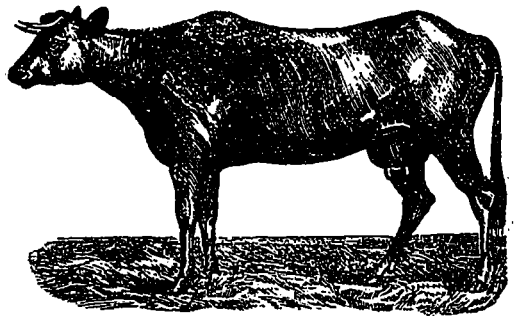
M. Victor Arteau, the farmer of M. Garneau, who has had the especial care of the cattle for the last eight years, is entitled to share fully in our congratulations. (Translated by the Editor).

(1) Far better than the curry-comb or "card," that carries off half the hair. ED.

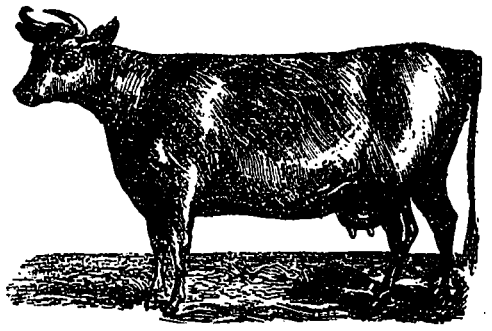
Points of Jerseys.—The two engravings on p. 62 are not new. They were published in the Journal of the Royal Agricultural Society of England for 1849, and there is no doubt about specimens of the *old* style being not uncommon, in some parts of the Island, as late as 1843.

According to Col. Le Couteur, the then President of the Jersey Agricultural Society, the best of this very plain sort of cow gave as copious yields of milk and butter. See *Journal* for July 1883, p. 28.

The "Improved Jersey" is a portrait of "Beauty," 4 years old, the property of the above mentioned Col. Le Couteur, the 1st prize cow on the Island in 1843. As a two year-old, she was awarded 27 points out of a possible 30.



Jersey old style.



Jersey new style.

MORE ABOUT BOILERS.

In continuing this subject this month, I am influenced solely by a desire to impart to creamery superintendents and more especially assistants, a notion or wish to pry into and learn about the intricacies and more complicated theoretical questions which make the production and consumption of steam in connection with boilers a science in itself. To my mind a creamery superintendent should never be satisfied with his standing until he has been examined and received his engineer's certificate, and it is fully worth the extra hours of study and calculation, which will be found necessary in order to satisfy the examiners, who are appointed by the Board of Trade.

Every boiler is built to perform a certain duty. One naturally asks: How can we ascertain the duty of a boiler? Well, as a matter of fact, it is out of the question for any layman to endeavor to do so. But then it has to be done, and to an expert with the proper appliances where boilers are manufactured it is all plain sailing. Now, in conducting a test, the actual amount of coal put into the furnace must be accurately weighed; from this the unconsumable portion ashes, clinkers, etc., must be deducted, the remainder thus being the net amount of "combustible" used. This is necessary, as it is evident that pure coal would give a much better result than coal containing much ash, while the subtraction of this ash places the various qualities of coal as nearly as possible on an equality. The pounds of water evaporated divided by the net consumption of fuel, gives the actual evaporation of water per pound of combustible. But the temperature of the feed-water must also be taken into consideration, as it is evident that water from a heater at 212° would show a much better result than if introduced into the boiler at say 60°. And there is further the question of the pressure at which the steam is produced. Let me say here that the testing of the effectiveness and duty of boilers, etc., has been much simplified by past and present scientists, by the reduction of certain essential and oft-recurring calculations to ascertain formulæ. The formula used in such cases as the above is that of Professor Rankin:

$$A = 1 + \frac{.3(B-212°)+(212-C)}{966}$$

A = multiplying factor; B = temperature of steam; C = temperature of feed water.

Thus, the results are worked out as follows:

Amount of water fed into boiler . . .	21026.00 lbs.
Proportion of moisture	00.96 "
Actual amount of water evaporated .	20824.15 "
Total amount of coal consumed . . .	2268.00 "
Refuse	200 00 "
Net amount of combustible	2068.00 "
Water evaporated per lb. of coal $\left(\frac{20824.15}{2268}\right)$	9.182 "

Water evaporated per lb. of combustible

$$\left(\frac{20824\ 15}{2068}\right) \quad 10.569\ \text{“}$$

Steam pressure 70 lbs. above the atmosphere, giving a temperature of 316. 1° F.

Temperature of feed water . . . . . 55. 12° F.

Multiplying factor for 70 lbs.,

$$1+\frac{212-55.12}{966} \quad 1.163\ \text{lbs}$$

Multiplying factor for evaporation from and at 212o

$$1+\frac{.3(316.1-212)+212-55.12)}{966} \quad 1.194$$

Calculated evaporation of water per lb. of combustible from and at 212° 12.022

So much for testing the duty of a boiler ; as is evident, a somewhat complicated series of calculations, immensely simplified by the use of the proper formula.

In the above example, the result might have been different had the moisture lost in the steam been taken into consideration.

The test for the dryness of steam is somewhat difficult and complicated. The principle of this is to condense a certain weight of steam in a given weight of water contained in a vessel, the temperature of which is thereby increased ; the number of heat units imparted to the water (its weight multiplied by the increase of temperature) represents the amount of heat liberated by the steam in condensing. If the number of these units is not sufficiently great, the steam is wet, and the percentage of moisture is calculated.

Such tests, though absolutely necessary for a reliable result, are extremely rare. Many boilers which show a high evaporation, are simply carrying the water over bodily. Thus one boiler at the Philadelphia Exhibition (I see by the “American Mechanical Engineer”), when slightly pressed, showed 22.48 per cent of water in the steam, which brought down a large apparent evaporation to very moderate limits.

H. Weston Parry.

Obs. A very much needed essay, very painstakingly drawn out. Now, if Mr. Parry would kindly give our readers an equally concise treatise on the consumption of smoke, they would, we are sure, be very much obliged to him.—Ed.

SUB-EARTH DUCT

Its Value in Lowering the Temperature of Curing-Rooms

The following letter addressed by Instructor Morrison to Mr. George Hately, secretary of the Cheese and Butter Association of Western Ontario, furnishes additional evidence as to the value of the sub-earth duct as an aid in controlling the temperature of the curing-room in a cheese factory :

“ In reply to your request for information regarding sub-earth ducts which have been recently added to the curing-rooms in my district, I submit the following report :

Caistorville—The sub-earth duct is completed and in operation. The duct is eight feet deep and extends 118 feet under ground. It is made of three rows of five-inch tile, two rows of six-inch tile, and one row of eight-inch tile, all laid close together with the eight-inch tile in the middle ; over the tile there is a covering of rye straw.

In digging the trench for the tile a spring was found near the factory, The water from the spring runs in the bottom of the trench for its entire length, which possibly somewhat increases the moisture in the curing-room. The in-take pipe is built of galvanized iron, fifteen inches in diameter and thirty feet in height, with cowl on top. The outlet from the curing-room is simply a hole in the ceiling on the opposite side to that at which the duct enters.

On the day on which I visited Caistorville the temperature on the outside in the shade was 85 degrees. Inside the curing-room a strong breeze was coming in from the duct at a temperature of 60 degrees. The temperature of the curing-room did not exceed during the day 69 degrees. The curing-room at this factory is very poor. I am of the opinion that with a reasonably good curing-room the temperature can easily be held at 65 degrees. The moisture in the curing-room was from 80 to 82. There was no mold on the cheese. ”

As we pointed out some time ago, a distinctly forward movement has been inaugurated in the Provinced of Quebec in regard to curing-rooms and curing cheese, and the dairyman of this province will have to be on the alert if they wish to maintain the position they now hold as producers of the finest quality of Canadian cheese. The sub-earth duct furniches a very simple and yet effec-

tive means of very largely controlling the temperature of curing-rooms, as Mr. Morrison's letter very clearly shows, and every cheese factory in the country should have one built. Their construction is not difficult, and a suitable duct could be put into every curing room at comparatively little cost. In fact, if there were no other means of doing so, a few of the patrons, under the direction and with the assistance of the maker, could put one in in a very short time, and its cost would be more than paid for in one season by the improved quality of the cheese and by preventing any loss in weight due to the excessive heat of July and August.

Of course a sub-earth duct will not make up for a poorly ventilated and a poorly constructed curing-room. But even the temperature of a poorly constructed curing-room can be very much improved and controlled if it has one of these ducts in connection with it. We would advise every factory to no longer delay this matter. We are just entering upon the two most trying months of the year for curing cheese, and if a factory has not already done so there should be no further delay in getting in a sub-earth duct. Curing the cheese properly is of the utmost importance in enabling Canadian cheese to retain the position it now holds in the British markets.—*Farming.*

The Farm.

ON FORAGE-CROPS.

(*By the Editor*).

Nobody who has thought much upon the subject of farming in Canada can avoid seeing that the probable course of events demands an entire alteration in the system of cultivation on our older lands. We do not propose, in the present article, to speak of those pleasant spots, where, as in the bottom, or *interval* meadows, along the vagrant *Coaticook*, or the rocky-bedded St. Francis, the grass is rarely wanting, even in the driest times; but, as is well known to our readers, there are tracts of really valuable land, where, owing to the shallowness of the soil, or to the poorness of the preparation, the herbage when once eaten bare, refuses to spring again, rain it never so abundantly, until the season is so far spent that the produce of meat, butter and cheese is cut hopelessly short for that year. Of course, the management of the pastures leaves much to be desired, still we think, there are signs of improvement—the subdivision of the fields employed for grazing purposes is one of the chief points. In the great grass farms of Leicestershire and Northamptonshire, England, the opinion, well weighed, and backed by the experience of centuries, is, and we beg to call particular attention to the fact, that, 50 acres, in three enclosures, will fatten as many bullocks, as 60 acres in one piece! Rather an important affair where land is worth from £2.10 to £3 an acre per annum, to say nothing of tithes and taxes and rates which, probably, amount to another pound.

We have, in our mind's eye, as we write, a charming spot not far from Compton Centre: 100 acres of pasture. Into this, every year, in May, used to walk 20 young bullocks; out of this they never escaped, until they were placed in the yard for the winter. Fancy a pleasant dinner of soup, fish, cutlets, pastry, vegetables, cheese and salad, all to be eaten off the same plate! Fancy this renewed, day after day, week after week, for five months, with the agreeable accompaniment of a dozen, or so, of friends poking their noses over our food, in their curiosity to see if any morsel more delicious than usual has escaped our attention! It would require Dean Swift himself to do full justice to the nastiness of the subsequent description, so we won't attempt it. Well, this is, exactly what those poor bullocks have to endure, in their way. We know, from personal observation during two summers, that at least one-third of the pastures are utterly wasted, in this manner alone, through almost the whole of the richer parts of the Eastern Townships.

However, the improvement of pastures and of meadows is not our present business.

Forage crops, in this country, if cultivated systematically, give very little trouble and are immensely profitable.

They give very little trouble, because when once sown, they take care of themselves, requiring no hoeing; and they are immensely profitable, because they supply the greatest void in our husbandry; green, moist and wholesome food in the driest time.

Let us, first, see what the different sorts of forage crops are; and we think they may be divided into two classes, viz, those that are suited to the feeding of horned stock and horses, and

those that are more peculiarly adapted to the wants of the sheep.

Again, of those crops which are beneficial to the cattle, some seem better qualified to produce, when given to cows, superior butter ; others, are, on the contrary, more useful to the cheese factory ; others, to the production of large quantities of milk, poor in quality, but, considered by the vendors apparently, quite good enough for the consumption of the dwellers in our towns.

They are as follows :

Rye, Lucerne, Tares, or vetches, Clover. Indian corn, Hungarian grass,	for horses and cattle.
Rape—for sheep.	

There are doubtless, many others worth a trial, but these we know, from personal experience, to be good, suited to our climate and to our soils, and, if sown at proper seasons, capable of filling up most, if not all of those terrible gaps which, on the majority of farms, occurs but too frequently in the course of three seasons out of four.

Rye.—The rapidity with which this cereal runs its course, from germination to earing, limits its consumption to a very short time ; it cannot be depended upon to last, in the juicy state, more than ten days ; it then becomes hard and stick-like, and is refused by all decently well fed animals. The acreage sown must of course follow the requirements of the stock, but should be, comparatively, small. The land should have been ploughed in the fall with a narrow furrow, well laid up at angle of 45° ; the seed, at least 3 bushels per acre, well covered by the harrows, or what is better, let in with the cultivator, and the land harrowed, until fine, afterwards. Those who are fortunate enough to possess a drill will of course work the land well before using that implement, so that one, or at most two strokes of the harrows will finish the work.

We are inclined to think that half a bushel of wheat added to the rye, although the former is a much slower grower than the latter, would thicken the bottom and give a heavier swath towards the latter part of the season. One thing is certain, horses prefer green wheat to barley, rye or oats. We need not say, that the heavier the ground and the worse the tilth, the more seed must be sown ; in fact, on some of our clays in the valley of the St. Lawrence, four bushels to the acre would not be too much. The poorest land will bear rye, as every one knows.

It would be a good thing to sow a small piece of Rye in the autumn, say about the middle of September, for the sake of the horses. It would come in very early, and would, by judicious use, in the absence of carrots, cool the system of the animals after their long course of dry, hard food. The great London stables consume large quantities of this food in the Spring of every year, and, although the horses go back to their hay, beans and oats after a fortnight or so, it is presumed the owners find their account in the practice.

In sowing rye in the autumn we have found the following plan a good one ; having first ploughed the land, pass the cultivator across the ridges, and, if cloddy, harrow till fine ; then sow the seed by hand, and plough it down with a furrow of 3 inches in depth, and as narrow as possible ; this will put the roots pretty safe from the influence of the alternate frosts and thaws of the spring. The grain will soon make its appearance between the furrows, the crests of which will protect the blade from the wind. Keep the stock off it and roll the moment the dry weather comes in the spring. After sowing in this fashion, the land should not be harrowed, as the rougher it lies all the winter, the better.

Lucerne. — The Medicago of the Romans, is probably the oldest forage plant known to agriculture. The plentiful yield of this sound and healthy green crop, when it meets with suitable soil and treatment, should incite every farmer to give it a trial. When once established it is very forward, that is to say it will be fit to cut, in the average of years, at least ten days before the red clover. If any one should attempt to grow lucerne in rows he would, probably, soon plough it up, as the land, treated in this fashion, can hardly be kept clean by any amount of hoeing. But there is a plan which does away with all manual labour during the growth of this crop, and we will try to describe it as plainly and lucidly as possible.

In the first place, lucerne demands a dry subsoil. Sandy loams, black loams and clay loams, sands and gravels will all suit it ; but on heavy, tenacious clays, with water lying on them in spring and autumn, it would be waste on time to sow it.

After having chosen a piece of well-fallowed

land, near the homestead, and having ploughed it deeply in the autumn, apply a good dressing of manure in the early spring turned down by two ploughs following one another in the same furrow. There is no fear of going too deep, as the roots of this plant have been traced six feet below the surface. We may observe that the proper time for deep ploughing is in the fall, and in preparation for a manured green crop ; *never* for a straw crop ; with this proviso borne in mind, ploughing cannot be too deep, as the wonders of spade culture on the barren sands and clays of the labourers' allotments in England clearly prove. Hops, on the soil of the "Upper Green Sand" at Farnham, Surrey, have been traced 24 feet deep in the shattered semi-rock ; and it is easy to see that, in our burning climate, 12 inches of soil will retain moisture longer than 6 inches.

Twenty pounds of seeds will be required per acre, sown broadcast, with the usual quantity of barley, and harrowed in. After the young shoots appear, a good rolling completes the operation. When the grain crop is carried, a dressing of loose, light manure should be given to preserve the lucerne from the frost. In the following spring pass a set of *light* harrows over it, for the land will be all the better for a stirring, and it will destroy some few weeds that may be showing themselves. About the end of May, the first cutting will, in average year, be ready for the scythe, but the crop *should be* in bloom before it is begun ; still, if "green-meat" is very much wanted, it may be cut as soon as it will give a swath worth carrying home. This, as well as all other forage crops should lie for 3 or 4 hours after mowing, to wilt a little, lest, the cattle suffer from "blowing," or "hoven."

At the end of the season, say in October, the land should be harrowed, with the common harrows, several times. There is no fear of disturbing the roots, as by this time they will be down too deep to be pulled out. This will keep the land clean, if repeated each spring and autumn.

According to the treatment it receives, Lucerne will give three of four cuttings in the season. It is most useful for horses, and, when out in bloom, they will require no oats, if they have plenty of it.

We presume the reason why more *clover* is not sown is that, as *generally made into hay*, it is considered, and with some plausibility, to be of small value. But, as a forage crop, everybody who has tried it must approve of it. The yield is great, and the quality rich. It will bear constant cutting, and strange as it may seem, the greater the quantity carried on the land, the more is the soil enriched ; and for this reason: the roots, which constitute the manure of the succeeding crop of grain, grow in proportion to the growth of the stem and leaves. If the clover is kept cropped off short by sheep, horses, etc., the roots will be short and scanty, but, if the stock are kept off, and the plant allowed to get well up after each cutting, the roots will be long, thick and abundant, and, when turned down in the autumn, their decomposition will afford the most suitable food to the wheat or oats during the following season. We cannot agree with the idea derived, we believe, from the United States, that the second crop should be ploughed in. It seems to us that, in our climate, the practice is most wasteful. The horses will be only too glad of it, and if placed in a good yard, with a shed to run under, will do much better than in the pastures, besides saving their manure.

Clover is, in reality, an annual, but the usual system pursued in its cultivation has converted it into a biennal. According to Von Thaer, clover never fails to show a good plant when sown with buchwheat. This might be worth a trial in this country. In England, many thousands of acres have become, what it technically called "clover-sick." There, the strict "four-course," or "Norfolk" rotation, in which clover was sown every fourth year, has been practised so long, that the soil refuses to grow it, and, in consequence, the farmers have been compelled to substitute Alsike, Dutch, or Hop trefoil, so that, now, the true, or red clover is only sown once in 12 years, to the great detriment of the wheat crop, which, almost invariably succeeds after clover. We incline to thinkt hat a few pounds of "Cocksfoot" or "Orchard grass" (Dactylis glomerata) might be advantageously added in place of part of the 14 pounds of clover seed sown to the acre. Rye-grass, which accompanies it in Scotland, and successfully, in some parts of the east of England has completely ruined the land. If tried here, great caution should be used. Rye-grass is a true *cereal*, and, therefore, necessarily unfits the land for the production of the grain. One of the finest farms in Cambridgeshire, a farm with which we are well acquainted, fell off in yield at least 40 per cent in the grain crop, after the introduction of rye-

grass among the clover. This farm (100 acres) was on a chalk subsoil and averaged, formerly, 56 bushels of barley, and 44 bushels of wheat to the acre, so the loss to the proprietor, who farmed it himself, was something fearful.

Tares, or *Vetches*. (1)—This is the next crop on our list, and well known to every farmer. It will grow well on all soil, but prefers a clay-loam. On sands, or gravels, it demands a fair dressing of manure, but on heavy land, in tolerable condition, it can do without. As tares are inclined to fall down when they are at their best, it is customary to sow 2 or 3 pecks of rye, or oats, per acre with them, but as rye soon becomes uneatable, and horses don't care much for green oats, half a bushel of wheat, at present prices, would be worth trying.

The quantity of seed required is 2½ bushels, when the land is in fair order, but 3 bushels would not be too much in rough ground. There are two sorts, the winter and the spring tares; the seed of the former is small, that of the latter much larger, but the quality of the forage of the winter tares is so much superior to that of the spring tares that, in the East of England, they are sown invariably to the utter exclusion of the other sort. A couple of bushels of plaster to the acre, on the young plant, will materially assist the yield. It is well to observe that nothing is gained by very luxuriant crops of tares, as they always fall down and waste themselves, unless cut at the critical time of coming into bloom.

A very productive mixture for forage is: 1½ bushels of tares, ½ bushel of pease, ½ bushel of horse-beans and ½ bushels of wheat. Of course, the roller must follow the harrow at seed-time, or else the unhappy man who mows the crop will lose his temper, and the Farmer's time, pretty frequently. Two sowings should be made, one 3 weeks after the other; the second will, probably just fill up the interval between the first and second crops of Clover.

As to maize or Indian corn, every farmer in the Province knows more about its value and cultivation than we do, so there is no need for us to expatiate on it, except to say that, in care of general failure of other fodder-crops, like this season, we should recommend, if late, its being sown thick; as the best means of making it come to the scythe rapidly. The quality will not be so good, of course.

(To be continued.)

(1) Erroneously called by the French-Canadians "lentille," which is quite a different thing—*la vesce* is the proper name. ED.

THE BASIC PRINCIPLES OF SUCCESSFUL FARMING.

Mr. D. M. Macpherson discusses Prof. Robertson's and Dr. Saunders' Theories and makes a practical proposal.

To the Editor of Farming:

I have read with considerable interest and amusement the different articles written of late on "The basic principles underlying successful farming," by two of the most prominent professional teachers of agriculture. "When doctors disagree patients should take their prescribed medicine with caution." So when it is so apparent that there is a disagreement and difference of opinion as to the correct diagnosis, and prescribed requirements to discover the causes of loss in farm work, and create new conditions which will increase profits, as defined by Prof. Robertson and Director Saunders, their statements must be taken with caution. Such being apparent it is quite proper that these important matters should be investigated, tested and, if possible, establish who is right and who is wrong. Having carefully perused the writings of these two gentlemen bearing upon these topics I take the liberty of offering a few observations to be printed in your journal if you consider it proper to do so.

The conclusions arrived at as to the difference in theories propounded by these two gentlemen are very small indeed. Both are right up to a certain point, and both are wrong otherwise. Each in their different departments of scientific kill expresses a part of a truth as to the combination of facts which make up the whole truth. Such being the case, a part of the whole truth expressed and discussed is a very difficult position to define as being correct or in error.

The whole truth or basic principles which underlie *maximum*, *progressive*, and *profitable farming* is a combination of scientific principles backed up by natural law practically applied. When fully understood and put into practice they cover a wide field of scientific truth woven into a combination so intricate and ultra-dependent that when one part is omitted or overlooked the whole

effect is deranged, and often to the extent of converting a benefit into an injury.

Strong, vigorous, well-developed seed when sown into the ground does not necessarily produce maximum profit per acre even if a maximum crop is obtained. It is one important factor, but only one of a large number which are necessary to attain this desirable result. A farmer may, and often does, produce and develop a vigorous seed which matures into a maximum crop, yet these conditions and results, if obtained by a financial loss, cannot be called a financial suceess—and yet it may be a great success—as to products per acre or per farm. But this is not what the Canadian farmer wants. It is not a large product of this or that crop that is wanted, but the largest possible profit *per acre*, *per farm*, and *per county*, and the greatest added value given to land from year to year.

Again, it is stated that economizing fertility, good cultivation, early seeding, clover growing, etc., etc., are the underlying principles of profitable farming. In reply to these statements, I would say that they are merely a part of the whole truth. There are many farmers who successfully practise these conditions and yet experience but only a portion of the extent of profit that they should have. All these factors do materially help to promote and successfully acquire large soil products, but do not necessarily produce maximum profit per farm. My experience, obtained from personal practice, has established the fact—and I here desire to state it—that it is not possible for any farmer in any ordinary pursuit to maintain the fertility of his farm by the most careful conservation of plant food within himself, either by the saving of manures, sowing of clover, good cultivation, etc., etc., individually or all combined.

A successful farmer must sell farm products in large amounts to realize sufficient cash to pay his expenses, and have a balance left to pay a profit on capital invested, and therefore in the selling of such farm products he must necessarily sell and lose a corresponding amount of soil fertility, the ingredients of which are potash, phosphoric acid, lime, nitrogen, etc., etc. No amount of care in the saving of straw, chaff, roots, animal manures (liquid and solid), manure drainage, or gases arising from fermentation, will make up for the loss of these ingredients, which are made up in the products which are usually sold off of farms. While it is universally admitted that the growing of clover will reclaim nitrogen from the air, yet it is possible that the labor and expenses incurred in the acquiring of sufficient nitrogen in this way would be more than the same amount could be obtained in other direct ways, and it appears to me that nitrogen in sufficient quantities can be obtained at less cost than by or through clover.

These facts, prove conclusively that in order to obtain a maximum profit from farm work and capital invested in farming it does not depend entirely on vigorous seed, soil fertility maintained, early seeding, good cultivation, etc., etc., but upon a combination of these, along with a proper selection of crop, animal and finished product, which when sold will yield the greatest cash and capital profits per farm, and at the same time prepare an annual condition which will cause these to progress to the greatest extent from year to year, thereby making yearly maximum cash profits and increased value to the land of each farm.

To virtually settle this very important unsettled question, "How can an average Canadian farmer be enabled to make his farm produce the greatest growing profit from year to year and at the same time more valuable each year?" I desire to make this proposal for a demonstration test:

Let the Dominion or Provincial Governments, one or either, select three one-hundred acre farms owned by three average Canadian farmers. The owners being known for their honesty, integrity and industry, and all three farmers and farms be selected under average conditions, known and proved to be similar in all details as is possible to obtain. I propose that Prof. Robertson undertake to direct one, Dr. Saunders direct another and I will undertake to direct the third. The government advancing such means to carry on the three farms as each one reasonably calls for. This contest is to continue for five years, or as long after this period as is found desirable to continue the good or bad work. The director of each farm shall put into execution the theories that each submits to the public at the present time. A careful record of results, financial or others, shall be minutely kept in systematic, business-like form. A careful inventory shall be made out at the start, as well as a balance sheet struck off each six months, also a fertility account shall be minutely kept of all debits and credits in such account. All these three farms shall be under the

supervision of the Minister of Agriculture, and through him a determination made out each year as to the record of results, etc., etc.

In this way a decision on disputed questions or underlying principles of how to make the farm pay would be acquired as far as the present light on the present discussion goes. These results individually would be watched by farmers, business men, politicians, professors, and all men, with the greatest of interest, and who knows but it would ultimately revolutionize the present methods of farm practice, farm values, commerce, trade, general prosperity of the country at large.

Although my undertaking such a task would be a great inconvenience to me and I am sure it would also be to the other two gentlemen named; but believing a great public benefit would be conferred by such practical demonstrations I am quite willing to forego the inconvenience of it, and try my hand to prove whose theory and contention is nearest right. D. M. MACPHERSON.

Lancaster, July 1st, 1899.

ARSENATE OF LEAD as an INSECTICIDE

This preparation is described as follows in the Albany *Country Gentleman*:—"In order to obtain the best results, the poison should be prepared just before using, by dissolving 11 oz. of acetate of lead (sugar of lead) in 4 quarts of water in a wooden pail, and 4 oz. of arsenate of soda (50 per cent.) in 2 quarts of water in another wooden pail. As the acetate or sugar or lead dissolves rather slowly in cold water, the process can be hastened by using warm water. The resulting solutions should then be poured into the spraying tank containing enough water to give the desired proportions. In most cases this will mean turning them into 100 or 150 gallons of water. This poison has been found nearly harmless to all vegetation, even when applied in very large proportions. It remains in suspension much longer than either Paris green or London purple, and adheres to the leaves for six weeks or more in spite of rains. The white colour of this substance insures its ready recognition on green foliage." It is to be observed that the tendency of the poison to remain on the trees is useful before fruit is formed, but would be an objection to the use of the wash later in the season.

A SUBSTITUTE FOR PARIS-GREEN

Arsenite of soda, made by boiling 2 lb. of white arsenic and 4 lb. of washing soda in a gallon of water for fifteen minutes, or until a clear liquid is obtained, is recommended by the Albany *Country Gentleman*, instead of Paris green, as an insecticide, because the latter does not dissolve readily, and needs constant agitation to keep it from settling. A gallon of water is added after the boiling, and, of course, the mixture is still a concentrated one, requiring great dilution before being used. Moreover, it is advisable to use it with the Bordeaux mixture, as when used alone it is apt to burn the leaves of fruit trees, and 1½ pints of the arsenite made as above described will suffice to put with 50 gallons of the Bordeaux mixture.

COMPETITION OF AGRICULTURAL MERIT.

Report of the Judges.

No. 9.—M. AMBROISE HÉTU.

On July 19th we visited the farm of M. Ambroise Hétu, of St. Sulpice. The management is excellent, and it is an honour and an advantage to any parish to reckon among its inhabitants so distinguished a farmer.

The rotation or course of cropping is a good one:

1st year: hoed and leguminous crops;

2nd year: wheat, barley, with timothy and clover;

3rd year: clover;

4th, 5th, 6th year: timothy hay; top-dressed, especially on light land. (Very good practice. ED.)

7th and 8th year: pasture.

The division into fields and the fences are good and in perfect order, as are the buildings, though the latter are rather old-fashioned.

A good ice-house, and a capital cellar; plenty of implements, and the dung is well cared for.

Accounts well kept, and we were delighted to see one of M. Hétu's daughters keeping a very handy set of books. If all young people were to receive such practical instruction, it would be a grand thing for the teaching class.

Draining, or rather water-furrowing, levelling, the carting off of 3,000 loads of stones, and their utilisation, have been of great benefit to the farm.

A sugar-bush of 3,500 maples, in good order and well managed, produces sugar of the best quality.

The stock is fairly well improved, and comprehends 20 good cows.

Crops:			
Wheat.....	4	arpents	(good)
Oats.....	30	"	
Pease	3½	"	
Buckwheat ..	2	"	
Pease and oats	10	"	
Timothy seed.	—	"	
Sugar-beets...	1	"	
Carrots	¼	"	
Potatoes.....	3	"	
Maize	2	"	(for grain)
"	1	"	(for green fodder)
Tobacco	1½	"	
Meadows.....	40	"	
Pasture.....	45	"	
Green fodder.	1	"	

A few apple-trees, plenty of small fruits, and a good garden.

Several lines of domestic manufactures are carried on.

M. Hétu wins, for 90.50 marks, a silver-medal and a diploma of very great merit.

No. 10.—M. Charles Bonin.

Our visit to M. Charles Bonin, of Ste-Elizabeth, was paid on the 1st of July. We found this farm on the high-road to improvement. If M. Bonin's health permits, he will be "hard to beat" when, in 1904, the competition recurs in this region.

Good order is everywhere visible, and, as far as his means will allow, M. Bonin carries out every thing to perfection.

There we saw many acres of hoed-crops, among which were 9 arpents of tobacco; a very fine garden; 42 apple-trees of great promise, and several bee-hives

Domestic manufactures largely carried on.

We gave M. Bonin 87.40 marks, entitling him to a silver-medal.

(*Trans. from the French by the Editor*).

HAYMAKING.

Importance of early cutting.—Practically all kinds and species of pasture plants become hard as they grow old, and rapidly deteriorate in nutritive value and digestibility with age. Moreover the maturing of seed very seriously lessens the vitality of the plants by imposing a heavy tax on them; to such an extent, indeed, is this the case that some of the more sensitive and small grasses disappear if permitted to seed while they are young. The loss of vigour entailed necessarily lessens the aftermath, and probably adversely affects the crops of the following year, besides encouraging the growth of weeds. It is our experience that seeding for several years in succession eliminates quite a number of pasture plants, the gaps which would otherwise be left being quickly filled up with indigenous and often worthless species. Hence the grass crop should be cut early in the season, and before any of the plants have produced seeds. There are two objections that can be urged against early cutting, but fortunately both are of small moment. Firstly, the yield may be slightly smaller, but against this must be set the increased bulk of aftermath, which more than compensates for any deficiency; and, secondly, the produce is liable to shrink in drying proportionately rather more than would older vegetation, which is naturally stiffer and more fibry. As a matter of fact this second objection is hardly worth consideration under any circumstances. As illustrating the depreciation of pasture grasses with age the following figures are useful:—When in full and early leaf the nutritive value of cocksfoot—which is, by the way, certainly the best and most nutritive of all pasture grasses—may be represented by the numeral 137, falling to 100 when the plants begin to bloom, to 87 after bloom, and to 70 when the seeds ripen. That is to say, cocksfoot loses approximately half of its net value by ripening its seeds. Again, meadow foxtail, another very valuable species, has a full-leaf nutritive value of 148, depreciating to 106, 89 and 81 at respectively flowering, after flowering and maturing of seeds. Parallel results are obtained by analyses of tall fescue, meadow fescue, yellow oat grass, timothy, rye-grass, hard fescue and rough-stalked meadow grass. Briefly, then, one loses in quantity by too early cutting, and in quality by too late mowing; while late cutting is also prejudicial to the aftermath. The time of mowing is, however, to some extent dependent on the season and crop. For instance, it is occasionally necessary to cut early to prevent specially noxious weeds present in the herbage forming seeds, and also when the crop is laid and so liable to rot. Again, late mowing is often unavoidable in very wet seasons, since hard

and fibry hay—bad as it may be—*is better than* that injured by being made in excessively wet times. Lattermath hay is generally considered superior to ordinary hay in nutritive value; but the succulence of autumn growth and the heavy dews of late fall combine to render its making so precarious that we advocate its much more extended use as silage.

Drying by Sun-heat.—It is customary to spread hay out in the sun to dry as soon as it has been cut, the produce being turned frequently, and carried to the stock from the cork without breaking it out, and at evening made up into cocks, which are spread out again when the dew has evaporated on the following morning. A very heavy dew might cause serious injury were one to occur, so that the advisability of cocking the hay the first night should be apparent. The tedding machine can be freely used during the second day if the weather be favourable, and light or medium crops, which do not contain disproportionately large quantities of leguminous plants, may be carried the evening of the third day as a general rule. When the weather is continuously wet the grass must be left as cut, unless—and this is much the wiser plan—it be carried directly to the silo and converted into ensilage. The leaves of all leguminous plants become brittle as they dry, and if handled over-much they break off, a great part of the nutritive value of the whole crop being thus lost. The produce therefore of this class of plant should be turned as little as possible and only by hand in the swathe. Too early carrying is injudicious, because the presence of much sap in the plants induces heating in the rick, sometimes even actual firing. The old method of testing the condition or succulency of the crop by twisting a few stems into a rope is a good and reliable one. If moisture exudes it is yet too early to carry the crop. Experiment proves that from 25 to 40 per cent. of the dry substance is washed out of clover-hay by rain, so that partially dry hay ought always to be made into rather thick or high cocks when rainfall is expected, so that the least possible quantity of water may have access to it. The hay from cocks that have become heated in this way dries very rapidly when spread out in dry weather.

Clover-hay.—For marketing purposes greenness is desirable, it being justly regarded as an indication of well-made hay, but the colour is not of much consequence if the produce is to be used at home. The brown clover-hays so frequently seen, are specially made with the object of obviating the necessity *for frequent turning and consequent loss* of *leaf*, (1) while sacrificing the colour. This quality of hay, which is in every respect as nutritive and wholesome as green hay, is made by drying the plants in the sun, turning them once only during the operation, until about two-fifths of the water contained in them is evaporated, that is to say until they are nearly half dried, when they are made into large cocks.

AIR AND LIGHT ON THE FARM.

On the farm, are found in greater abundance than anywhere else these primary requisites of health: pure air and sunshine. Yet, owing perhaps to the plentifulness of these bounties, the farmer does not seem to put upon them as much value as he should. Too often he condemns himself and his family in his home, and yet more his cattle in his stables, to suffer from breathing vitiated air. In the same manner, the sunlight which, owing to its purifying properties, should have free access to every farm building, is often only partly admitted by small narrow windows: as if its effects were injurious.

No method of ventilation, however perfect, will avail in a country home if the air is already rendered impure by emanations from filthy surroundings. Too often the air is saturated by some cesspool in which are deposited the washings, slop-waters, etc., from the kitchen. Aside from this inconvenience, the cesspool constitutes a permanent danger, being liable to contaminate the well water by the filtrations which escape from it. Far better is the method of irrigation in order to dispose of slop-water. This needs not to be expensive. An old time roof gutter, perforated at its lower end, with small holes, will convey all slop waters to a piece of cultivated ground near by, if possible to a funser (*sic*) in the garden. If the ground is stirred occasionally, prompt absorption and evaporation will be secured and no bad odors will result. Thus, by this simple process, all dangers of polluting the air or the water of the home are avoided.

Often also emanations from the hog yard or hog-pens, in close proximity to which the house is located, will prevent the air from being absolutely pure. The house should be at a reasonable distance from the piggery, but, yet, no bad smells should arise from the hog pens if these are kept clean. Unfortunately, while the farmer generally bestows considerable care upon the horse-and the cow-stables (2) by cleaning them out every day, he seems to think that the hog pen does not require such care, and cleans it only at odd moments.

(1) Italics are the Editor's.

(2) Why not write: stables and cow-house? Ed.

Sometimes, it is utterly neglected until it has become an abomination of filth and dirt. It is needless to say that hogs will not be as thrifty under this state of affairs as if their pens were kept clean, and such care will prove a great material advantage to the farmer.

The house is not always built in such a way as to insure a thorough ventilation. For instance; if a cellar is not dug under every portion of it, no ventilation will take place underneath; an air close and stagnant will gather and permeate the floors to the rooms immediately above. When a cellar is provided, a current of air will exist all round the house, both in the living rooms and underneath them. All these defects the farmer's wife may remedy by leaving the windows open as long as possible during the day and night. There is no harm in night air, if the surroundings are kept clean.

Ventilation is not only necessary within the home but also all round it. For warm summer days how comfortable it is to feel currents of air round the house. These may be easily induced by a hedge of trees, specially of evergreens. The shade of a grove of evergreen trees keeps the ground cool under them, and this coolness, if the grove is large enough, keeps up a current of air which moderates heat round the home. This hedge, if properly placed, will also form a shelter against the cold winds in winter.

Light is no less necessary than pure air; indeed, pure air cannot be had without it. The effects of light are now well known. Health exists wherever it enters. No germs of disease can withstand its presence, it is the surest disinfector available. Hence, the windows on every farm building should be large and numerous, so that all comers may be bathed in sunlight. To augment yet these effects and add to the cleanliness, the stables should be whitewashed thoroughly, at least once a year.

Little effort is required from the farmer to make his profession what it should really be: the healthiest of all occupations in which men engage. These improvements should be for him a strict duty, for not only the health of his family depends upon them, but the health of all those who draw their supplies from the farm is greatly endangered, should the farm be kept in an unsanitary condition. C. MORTUREUX.

THE IMPORTANCE OF SOIL CULTURE.

By Frank T. Shutt, M.A.F.R.S.C., Chemist, Dom. Expl. Farms

In a previous article (May 15) the writer endeavored to show that good culture should, nay must, precede the application of commercial fertilizers if a profit from these concentrated and soluble forms of plant-food is to be expected. We shall now consider, briefly, how the various mechanical operations of the farm affect the physical condition of the soil, bringing about good tilth, and at the same time increasing its store of available plant-food; for it is to be remembered that drainage, ploughing, harrowing, cultivating, exert a powerful influence in assisting those chemical changes in a soil that result in the liberation of plant-food from inert matter of the soil, as well as in lightening the soil and making it a comfortable seed-bed.

Drainage.—We are all doubtless aware that plants take their food from two sources—the atmosphere and the soil; the carbonic acid gas of the air through their leaves, the soluble soil-food and water through their roots. But it must not be forgotten that roots, as well as foliage, require air. They suffocate and die in a soil filled with stagnant water from the fact that such a soil is destitute of air. Land, upon which the water remains in puddle after a rain-cannot produce good crops. The plants will be yellow and undersized, showing that conditions are abnormal and detrimental to vigorous, robust growth. The yield of grain or roots, as the case may be, will be very small, sometimes nil. Now, underdrainage is for the purpose of drawing the surplus water through the soil, allowing the interstices or spaces between the soil-particles to be occupied by air which beforetime was excluded.

Again, soils which stand in need of drainage are always cold, for the water they contain utilizes the heat of the sun's rays in its evaporation, instead of allowing it to warm the soil. Further, such soils are apt to be sour and acid, and this is a condition injurious to all cultivated plants.

There are some soils—light, loamy soils, for instance, on a gravelly sub-soil—that do not need under-drainage. But heavy clay soils and soils resting on a hard-pan will invariably be benefited by this operation. The appearance of the crop will indicate to the observant farmer when drainage is necessary.

Though it may sound paradoxical, it is nevertheless true that crops on well drained soils can withstand drought better than on undrained soils, for with the former the root system will be deep, whereas with the latter it will be shallow.

Apart from the above considerations, drainage will ameliorate or improve a soil's mechanical texture to a wonderful extent, and this is particularly the case with heavy loams. It destroys the plasticity of clays, making them mellow and friable and easy to work; it enables the farmer readily to "fine" the soil so that germinating seeds may find a comfortable, warm and moist bed, and by lowering the water-table (the level at which the water stands in the soil) permits the roots of the growing crop to find ample and easy room in which to forage for their food.