Technical and Bibliographic Notes / Notes techniques et bibliographiques

The Institute has attempted to obtain the best original copy available for filming. 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 filming, are checked below.

L'Institut a microfilmé 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 filmage 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
- ☑ 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
- ☐ Blank leaves added during restoration may appear within the text. Whenever possible, these have been omitted from filming/ 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 filmées.

- ☐ 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
- ☑ Continuous pagination/ Pagination continue
- ☐ Includes index(es)/ Comprend un (des) index

Title on header taken from:/ Le titre de l'en-tête provient:

- ☐ Title page of issue/ Page de titre de la livraison
- ☐ Caption of issue/ Titre de départ de la livraison
- ☐ Masthead/ Générique (périodiques) de la livraison

☐ Additional comments:/ Commentaires supplémentaires:

This item is filmed at the reduction ratio checked below/
Ce document est filmé au taux de réduction indiqué ci-dessous.

10X	12X	14X	16X	18X	20X	22X	24X	26X	28X	30X	32X
								✓			

THE ILLUSTRATED

JOURNAL OF AGRICULTURE

PUBLISHED BY THE DEPARTMENT OF AGRICULTURE FOR THE PROVINCE OF QUEBEC.

Vol. I. MONTREAL, MARCH 1880. No. 11.

FALLOW CROPS,

Swedes, Turnips, Kohl-Rabi, Cabbages.

The sowing of Swedes may be said to begin by the middle of May, and continue until the first of July; after which either white turnips should take their place, (the yellow Aberdens are seldom profitable) or late cabbages.

Of the sorts, now very numerous, the best is, the *purple-top, Brassica campestris, napo-brassica, rutabaga,* of DeCandolle. I have always found the *Banghelm* yield well; and as for solidity and keeping qualities it is worthy of all confidence. There is one remarkable property in this root which distinguishes it from all other turnips: whereas a large white turnip is always spongy, and inferior in quality, a swede cannot be too large The fact is, it is not a turnip at all, though commonly called so It is a cabbage with an enlarged stem, as may be easily seen on examination of the rudimentary leaves, which are rough in the turnip, but smooth in the swede. The trivial name among the French-Canadians is much more correct in fact, so is the common Townsbip appellation: *Chou de Siam*, in the one case, Rutabaga, in the other Why, *Siam*, I never could make out: *Chou de Lapone*, is much nearer the mark. We have so lately gone over the various operations connected with the preparation of the land for root crops in general, that, if you please, we will suppose them finished, and the dung ready to be carted out.

And here arises a question. Shall we sow on the drill, or on the flat? As the improved cultivation of this country, particularly in this province, is principally due to the Scotch and Irish settlers, it is not wonderful that all our root-crops appear to be cultivated on the drill system. In the damp climates of Scotland and Ireland it is certain that this is the only plan that can succeed; and for this reason: the grain crops are late to harvest; there is therefore no time to clean the stubbles; the couch-grass (triticum repens) obtains great hold on the land, and would occupy the whole surface, were it not for the opportunity which the raised form of the drills affords of eradicating this pest during the growth of the crop. Again, the very small supplies of manure procurable in past times on most farms rendered it necessary to apply what there was in the most economical manner, in order to promote the growth of the actual crop, without regarding the succeeding one.

Our climate, however, is very different. It is not the excess of moisture that we have to dread, but the excess of heat. Couch-grass is very easily got rid of; the autumn, or the spring ploughing reversed will settle it, if a little careful harrowing follow. As for the question of manure, it is to be hoped that, before another year expires, pulverised phosphate of lime will be so cheap in Canada that there will be no difficulty from that source.

Now I think, these two objections being disposed of, it will be apparent, to any one who will patiently and without prejudice, consider the question, that, in a climate like ours, flat culture should be preferable to sowing on the raised drill. In the South-Eastern parts of England this system has been successfully followed out for many years. On the majority of the farms on the Chalk it is invariably practised, and for two reasons: there is seldom enough depth of earth to form drills, and if there were, the innumerable flint stones would hinder the machine from being used to deposit the seed in rows, consequently it is sown by the hand, and no horse implement is used for its after cultivation.

You will not suppose for a moment that I wish to recommend this mode of treatment on our soils. Far from it, it is only advisable where no other system can be pursued. But I have remarked that, when a hot summer occurs, (and in that S. E. corner of the island we do have, sometimes, a very hot summer) the flat-sown turnips grow more freely from the first start, continue to grow more freely during the season, and are invariably freer from our great enemy, mildew, than those in their immediate neighbourhood which have been sown on the raised drill.

This mildew seems to be caused by a cessation of growth. The leaves flag in the middle of the day, there is an apparent bluish look about them; and, when the root is cut into, the flesh will be found converted into woody fibre. Hence our Southern swedes are so inferior in quality, that they are incapable of doing any thing more than keep sheep and cattle thriving. fat them they won't. The injury is more mechanical than anything else; the roots are stringy (*cordées*). That the defect is in the climate, and not in the soil, is certain from the following considerations. All along the Sussex coast towards the East stretches a line of chalk hills, sloping gently down towards the sea. At the bottom of these hills lies a flat space, varying from one mile to a mile and a half wide. On this latter soil the turnips never mildew, and, in quality, equal those of Scotland, whilst the swedes grown on the upland are as coarse as usual. Why? The sea-fog hardly ever allows the moisture on the lower land to evaporate, and the growth is constant from germination to harvest.

Now I think it would be advisable to try in our climate this one experiment fully, recollecting that a bulky crop of inferior roots occupies more room in our by no means extensive cellars, and is much more costly to draw, top and tail, and carry home, than a smaller crop of sound, succulent ones.

Spread what dung you can spare broadcast, and plough it carefully in. Harrow with light harrows to avoid pulling out the manure, and, when the top is sufficiently fine, sow the bone-dust, superphosphate, or any other artificial manure you prefer, and, giving one stroke of the harrows, finish the job by passing a light roller over the whole.

The seed can be sown, with perfect ease and regularity, by any of those useful little garden drills which are now so cheap and satisfactory.

I cannot recommend less than 3 lbs. of swede seed, and 2 lbs. of turnip seed, per acre. It seems monstrous indeed, when we consider that, if 19,360 plants of Swedes occupy one acre

of land, at the usual distance of 27 inches by 12 inches· 1387 seeds of Swedes weigh one drachm; therefore the waste of seed is as 27 to one. We must consider, however, that many grains die, some are already dead, insects and birds devour others, and abundance of plants, we know, will always encourage growth, and bring the crop quickly to the hoe.

As to the distance between the rows, the question is easily settled by another: what is the narrowest space the horse-hoe can work comfortably in with out clogging up, or choking itself with weeds? In England, with our great Garrett's, or Smith's, hoes, covering 3 or 4 rows at a time, we have no trouble in managing carrots and parsnips at 15 inches apart. But here, where we must be content with a drill-grubber, and take only one row, 24 inches is the nearest interval that will be found convenient; if, in practice, this be found sufficient, it would be wise to adhere to it, as all the later weighings of roots in Britain tend to show that moderate size and great numbers produce the greatest weight per acre.

Formerly 12 inches was the distance in the rows between plant and plant of swedes, now 10 inches are considered enough.

Need I say that, whatever implement is used to cultivate the rows, it should be kept going as long as the leaves are not smashed?

I should make only two rules as to the time of sowing swedes; sow whenever, after the 15th of May, the land is ready; and don't sow after the 1st of July, except the soil is very rich, and in fine order, when another week may be granted. Many a time have I seen the hateful "fly" devour the early sown, and leave the late untouched; many a time have I seen it neglect the early sown, and devour the late. It is a pleasing little animal, this *Haltica nemorum*, but I wish it had always remain in its original *habitat*, the *groves*, though I don't believe it ever could have been happy there, it is so fond of destruction; its name, literally translated, means "*The active one of the woods*"; and its activity is indisputable: e. g. Saturday, August 7th 1871, sowed white stone-turnips. Tuesday evening, turnips coming up. Thursday evening, turnips all gone! It was the quickest work I ever saw. The turnips were well out of the ground 78 hours after sowing, and the fly had destroyed every one 48 hours afterwards.

Is there no cure for this constant loss? Wood ashes and sulphur mixed will stop them, but the first shower washes the powder off, and the mischief begins again. Plenty of seed and artificial manure to start the plant, and run it rapidly through its first stages of growth, are the best safeguards. It is ten times as bad here as in England; for there, when once the plant is in its second leaf, the *beetle*, (for it is a beetle, not a fly) leaves it; but here, it is never safe until the bulb begins to form. I have an idea that is very likely a wrong one: can there be in this country another, and a rather larger beetle, that follows the *Haltica*, and puts a finishing stroke to his work?

It is possible that the steeping the seed in *carbolic acid*, diluted of course, might have the effect of driving off the little abomination; or, perhaps, watering the plants when up with it might have some effect.

It is a remarkable fact that all *turnips* are lighter than water. *Swedes* are heavier; and this would go to show that the former contain a large proportion of air. In the very valuable table, contributed by Mr. McEachran to the February number of the Journal, we find that the value of swedes is to that of Mangols as 7. 5 is to 7; in other words that a ton of swedes is worth $30, when a ton of mangolds is worth $28. Of course they never fetch such prices, but it will serve for a comparison. I find however in a more extended table, by the same analyst, made one year later, that the relative values of swedes, mangolds and white turnips, are respectively, 15, 12, 11; and this, I take it, is very much nearer the truth. A great deal will depend upon the season when the analysis was made, mangolds are much more valuable in June and July than in November; but in May, swedes are puffy, and begin to lose their nutriment. The tables are worth studying, as they afford a good idea as to the *relative* value of the different sorts of feeding stuffs, and give a good not ion to the farmer as to which of his crops he should sell, and which he should consume on the premises. For instance:

Oats equal in feeding value, per cental.	$0.98
Barley " " " "	0.95

But the brewer will give me 75c. a bushel for my barley, or $1.50 a cental, therefore I should be an idiot to sell my oats. Again; Linseed is worth, per cental $2 47, Linseed cake, $1.72, the question is, at what price will it pay me to sell my linseed and buy cake, always remembering carriage, and the expense of crushing and boiling the former. The value of Brewer's grains, malt-dust &c., may be easily arrived at in this way by any one who can do a simple sum in proportion.

To return. I think a few white turnips should be sown to begin the season with; as there is no doubt that they are of better quality in October than is generally supposed. The tops may be given to the older cattle, if they have plenty of dry food, never to calves, as they always caused scouring, and, in the autumn, that is a dangerous business with growing stock. The best sort is the old *Green-round;* the modern kinds, though quicker growers, are not so firm. The *Orange jelly* a small yellow turnip of intensely rapid habits, promising to be a favourite some 25 years ago; but I have never seen it here. For storing, white turnips are valueless, as they become spongy and hollow in no time.

Kohl-rabi: This valuable plant used to be called the "turnip-rooted cabbage." It has many peculiarities; it likes heat and drought, it prefers a clay soil, it bears storing better than swedes; but it has one drawback: it must be transplanted. Not but what it will grow from seed; of course it will; but so will the cabbage: the crop however, is inferior in both cases. I propose to treat of these two plants under the same head, as they are of the same sort, and require just the same treatment up to the time of harvesting.

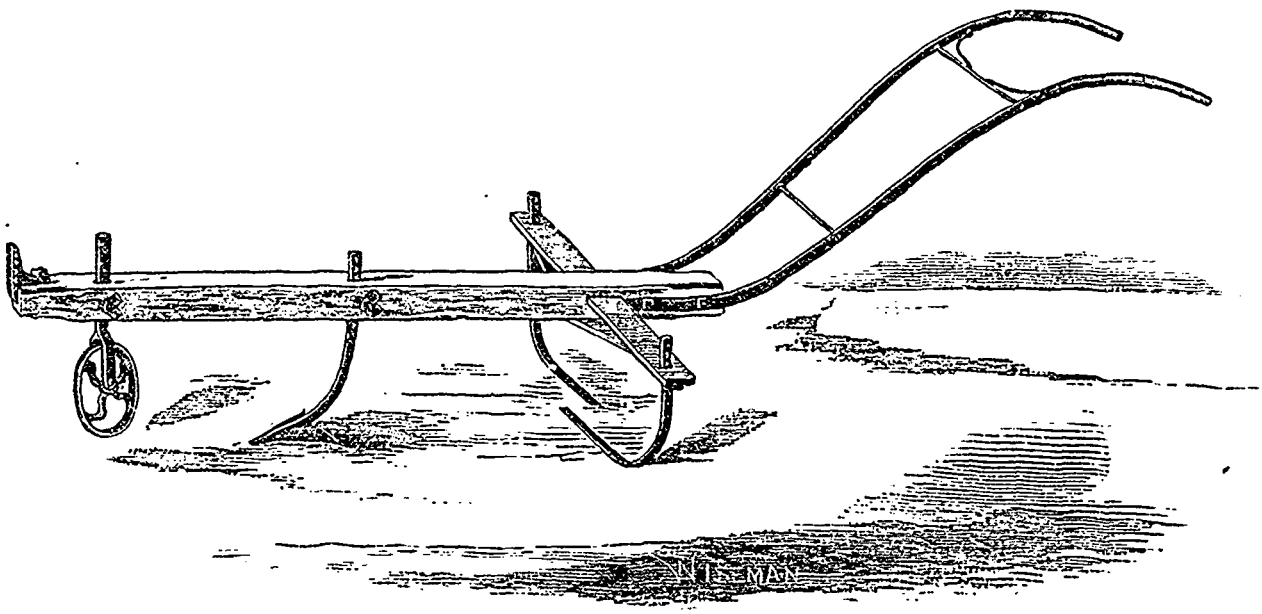
There is not the least necessity for a hot bed. Prepare a nicely dug spot, in a sheltered corner of the garden; make it rich with well-rotted dung; rake it, and having got it as fine as possible, sow the seed, in rows about a foot apart, burying it not more than half an inch deep, dropping the seed thinly, and rolling down the soil firmly when finished. The thiner the sowing, the stubbier the plants. As this can generally be completed by the first week in May, at the latest, there will be plenty of time for the plants to grow before the 10th to the 15th of June, which is the best time for transplanting We will suppose the field where you intend to have your *Kohl-rabi* and *Cabbages* dunged, ploughed, harrowed, artificial-manured, and rolled: in fact, ready to receive the plants.

The first step is to mark out the rows, and as I decidedly prefer the flat culture for these crops, this may be done with the garden seed-drill to a great nicety; 24 inches apart will be quite enough. Now, about an hour before beginning to transplant, water your seed-bed copiously. Lift, with a sharp spade, its breadth of one of the rows, taking care that the tool goes lower than the roots of the plants. Place this gently in a wheel-barrow, and go on until you have as many plants as you are likely to want. Take them to the field, and, separating them as carefully as possible, place them, one

by one, in a flat basket, or a flower-pot saucer, being particular to leave as much earth adhering to the root-fibres as as possible. Make a hole with a short dibble (a sharpened handle of an old spade is handy enough) not thicker than one's finger; having dropped the plant carefully in, press the earth *very firmly* all round it. Never mind the inferior plants; you ought to have plenty without them, as 40 cents worth of seed will plant a large amount of land; only be careful not to knock them about Two men, or a man and a sensible boy to lay down the plants for the planter, ought to set an acre in three days. The best distance is 12 inches apart for cabbages; and 9 or 10 inches for kohl-rabi. Dull, showery weather is the best; but, on heavy soil, the work must stop the moment the land feels *sticky*. The horse-hoe should go to work as soon as the plants have recovered from their removal, and should be kept on as long as the whippletree does not injure them. One thorough hand hoeing should be enough, as the land ought to have been sufficiently cleaned during the preparation.

As for sheltering the young cabbages, that will be found quite unnecessary, if these instructions are attended to. Where land is in a rough, lumpy state, shade may be wanted; but I see, every summer, all round Montreal, thousands of plants set out in a broiling sun, and they recover and grow all right. I have planted as many as 6,000 myself and never had any trouble. I always used my finger as a dibble; but then I don't mind hurting myself: it makes a smaller hole, and does not lose time in putting down, and taking up.

I have not had much experience in growing kohl-rabi here, so I do not like to mention anything about the probable crop, except that, judging from the yield of a small space, I should expect more, on heavy land, than from any crop of swedes.



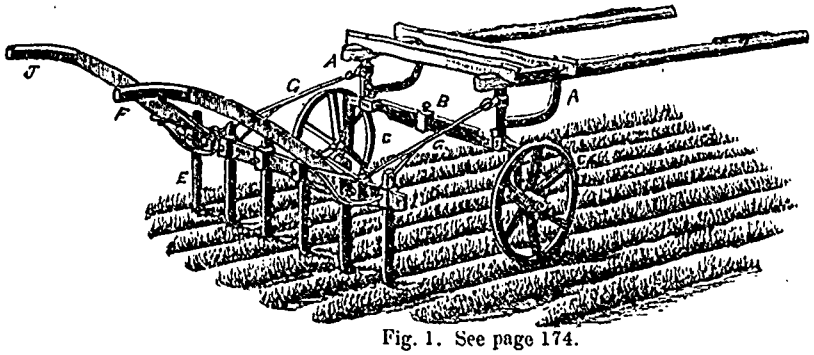
As for cabbages, the yield is enormous. If we consider that, at 27 inches by 12 inches, there are 19,320 plants on an acre; and allow only 5 lbs. per cabbage (a very moderate one will weigh, leaves and all, 10 lbs) we see, at once, that the gross weight will be 96,600 lbs. now, allowing 25 lbs. as a good ration per diem for a cow, here we have, on one acre, 784 days keep for one cow, or, in rough numbers, a whole winter supply of hearty, succulent food for 4 cows. And food, too, that occupies no cellar room; no mean recommendation. The storing of cabbages is simple enough, let them stand until the cold weather is well advanced, draw them out of the ground, and turn them, head downwards, in rows of a dozen wide, then, on this lowest row, pile another lot 8 wide, and again another 4 wide, throwing earth all round the outside.

If the leaves are left on, the hearts and all will keep sound: they may freeze if snow does not fall, but throwing into a tub of cold water will soon thaw them. A couple of poles stuck in the ground will mark the site of the store, and render it easy of access in case it should be covered with snow. By no means use straw; it is sure to rot them.

The best sort of cabbage, both for table and for cattle, is the St. Denis. There is no better keeper and it grows with a firm, compact head and a short stem. On heavy land the double-mould board plough may with advantage be passed between the rows after the last horse hoeing. We give a sketch of a simple horse-hoe, very light, but perfectly effective, except where there are large stones. It will be observed that the first hoe *pitches* slightly, to give it a better entrance into the ground. The side hoes have a peculiar curve for which I must take credit to myself: its object is to pare down the sides of the drills so that the plants are left standing on a space about 3 inches wide; the rest of the drill being levelled, well broken, and mixed. This implement can be made in wood and iron by any country tradesman; it should not cost more than $7 00, including the wheel; and less, if an old plough beam and bridle be used. An engraving of Smith's horse-hoe is appended. The wheels shift to any required width. Fig 2 represents the hoes used for roots, *on the flat*, at 18 inches between the rows, hoeing three rows at time, the horse, of course walking in the middle row. Price, in London, England £6. The steerage acts independently of the horse, and the implement is very good and simple. In 1853 I hoed with it 83 acres of wheat, 24 of barley, and 14 of oats, the seed was put in with a *Woburn steerage* drill, and the hoe fitted the drill exactly. In this way 8 or 9 acres may be done a day; but unless the drill is

made with a steerage and the hoe fits the drill exactly, any attempt to horse-hoe grain crops will end in a failure, and it is owing to this not being understood, that so many disappointments have occurred. I do not hesitate to say that, in Ontario, deep sowing, and subsequent horse-hoeing and rolling the fall wheat crop, would add 5 bushels an acre to the yield. In Quebec, the crust which forms after the heavy rains of early spring could be broken by these means, and the air let in, the roots receive their liberty again, and the scalding of barley (échaudé) be prevented.

ARTHUR R. JENNER FUST.



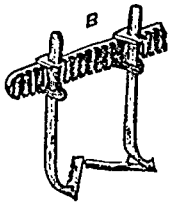


Fig. 1. See page 174.

Manufacture of Butter.

The first requisite, for successful dairying is good dairy stock; but who is competent to say what breed is best, when these are so many, and all have their advocates? The Jerseys are, no doubt, the butter cow, but are objected to by many on account of their size; being almost worthless for beef, when their usefulness for the pail is past. We must ride no hobby, but select a *butter cow*, of whatever breed; having more regard for quality than quantity of milk, and this matter can be easily determined, by the use of the Lactometer, or milk tester, which shows the exact percentage of cream in each cow's milk.

We must use the milk tester, and know for a certainty what each cow is; and those that do not come up to the standard must go to the buteher, or be sold to our *good neighbors*.

To make a nice article of butter, the best of feed is necessary, and, as our pastures furnish the most of the feed for our dairy stock during the summer, it is for our interest to have good pasture; but I am bold to say, that our pastures are deteriorating every year.

What are they to-day to what they were twenty years ago? When a piece of land is worn out it is turned out to pasture. Noxious weeds, and grasses have crept in, and the pastures, as a whole, throughout this fair old Missisquoi are in a terrible state. If every dairyman in the county would make a practice of summer fallowing, and reseeding a few acres of pasture each year, we should soon see a change for the better, and not only see, but feel it, in dollars and cents. Soiling is now practised by the best dairymen, to a much greater extent than a few years ago; and much more across the "border" than here. Various crops are recommended, but Southern corn seems to be the main dependence.

Any one that has once given it a thorough trial is loth to do without it, for it fills a gap between spring and fall feed, and often in dry seasons determines the question of profit and loss, and makes the account balance on the right side of the Ledger. It not only increases the quantity and quality of milk, but it puts flesh on the cows, and brings them to the stable in good condition; which, every dairyman knows, goes a long way in wintering.

Our dairy stock selected, and our pastures in good shape, the next step in butter making is driving the cows to be milked, which should be done without the aid of dogs; but rather, send the laziest man on the farm to do that chore, for *I know*, that a nervous quick tempered man, one that will make them walk up on time, will, in an ordinary dairy of twenty cows, *drive his wages out of them every day*. Milking must be done quietly, quickly, and cleanly; not only milk clean, but be clean when we milk, and also see that the cows bag and udders are freed from all impurities, even if we have to use a cloth and warm water to accomplish it. The milk when drawn should not be left standing in the hot sun, or in any foul smelling place, as it is very susceptible to bad odors. It should not be strained hot from the cow, but may be cooled by setting in a vat of cold water, or an open doorway where there is a draft, and stiring occasionaly to remove the froth and the animal odor, which should be got rid of as soon as possible

The cooling must be done outside of the milk room. And now how shall it be set? With the army of patent pans that have sprung into existence within the last decade before us, who shall say which is best. All have their advantages, and all, their faults and imperfections.

Some favor deep setting, and some shallow; but in my estimation it makes very little difference, if we can maintain a proper temperature in our milk rooms, which should be light, and well ventilated, and must be kept perfectly clean and sweet. Just here we must remember, that "constant vigilance is the price of success." One word about pans with coolers outside, and I will leave others to decide upon their merits. They will become foul, and it is a task to keep them clean, and we do not need to use water, that dead air space holds the heat from the milk, and, in my estimation, is so objectionable a feature, that I have removed mine entirely, relying on keeping the room cool, for which purpose I use ice, with a draft over it into the room. Skimming should be done as soon as the milk sours, or just before. It is useless to expect cream to rise on sour milk.

It is a common practice to let it stand until thick, as it skims better, but if it stands until the whey starts, or white specks appear, you may be sure decay has commenced, and you may also be sure it will not stop there. Cream should be kept at a temperature of fifty eight to sixty-two degrees, and be thoroughly mixed before churning.

This is easily accomplished by turning the churn a few times around, and then let it stand a few minutes before commencing Begin slow and increase the speed as you go on.

As soon as possible after the butter comes, wash in pure cold water, but we must be sure that the water is pure, for

it had much better go unwashed, than be put in water containing any foreign mater.

If water is known to be impure, it can be very easily and cheaply filtered. Changing the water two or three times will usually accomplish it; that is, it will wash the buttermilk from the outside of the lumps, but it will have no effect on the buttermilk contained in the lumps, the salt must do that, so that the less it gathers before washing, the less salt will work out with the buttermilk. Butter must be salted to suit the taste of the consumer, or buyer, and not to keep the butter, containing buttermilk, or butter that has absorbed any taint, at any time during its manufacture, even in its incipient state, milk, when first drawn from the cow; and no doubt that the taint, its germ of decay, is often taken into the cows' system by drinking impure water, or even from the smell of unburied carrion in pastures. Working butter requires great care; for not enough is bad, but too much is still worse, breaking the grain, or butter globule, thus making it salvy, or greasy, instead of waxy as it should be.

Working in the salt (say one ounce to the pound, by actual weight, and *not by guess work*) is usually sufficient for the first working. After standing twenty-four hours it is ready for the second working; which is best accomplished on an inclined plane, with a lever hung at the lowest point. A sponge wrung out in cold water, and wrapped in thin muslin, is a great help to take up the buttermilk that does not run off freely. The hands should never come in contact with butter during any stage of its manufacture; there is no one cold blooded enough to work butter by hand power, without more or less perspiration. Think of it once, and then use the ladle. Many still use the hands for working butter, because their mothers did, and who has ever eaten such bread, and butter, as our mothers made for us in child-hood; not one of us.

It is an old and time-honored custom, but must give place to improvement. We are catering for a market already overstocked with inferior grades of butter, and, at the same time the best grades rarely pay for the making. But there need be no fear of overstocking this department. Good butter will always command a paying price. We have left the butter made, and worked ready to pack, which of course is not included in the manufacture, but we shall find it for our interest to pack, in the most thorough, and also, in the most tasty manner, as the surroundings of an article often go a great way in recommending it.

Taking into consideration the existing state of the markets, and the great amount of butter that is being made that is not 1st. quality, what are we to do in the matter; how are we to help ourselves? 1st. by making the very best article we can, and 2nd which is, in my estimation, a still better way, make all our butter on the cooperative plan, as in creameries. Almost every market report we take up, we notice creamery butter quoted, at from 5 to 7 cts. per lb. above the best dairy, and I candidly ask my brother farmers, if the question is not seriously staring us in the face; what shall we do to hold our own? Oleomargine, or artificial butter, has driven, and is still driving the poorer grades out of the market. Bakers and pastry cooks prefer it to poor butter, and they can buy it cheaper. There is no call for anything not first class, and that is a long way behind creameries.

Let us consider for a moment the advantages: 1st taking all the labor away from our homes; 2nd making all the butter in a neighborhood entirely away from the smell of cooking, and the various other occupations of a farm house; 3rd, making all the butter in a given section all of the same quality; 4th marketing the same to first hands, instead of depending on selling to middlemen, and be cured out of the profit. 5th the higher price to be obtained, besides many other reasons that might be adduced, if space permited. Who will take the initiative, and obtain facts, and figures, from the leading creameries, here in this country, and also, over the border?

This society would be doing its members, saying nothing about the county at large, an incalculable benefit, by taking the matter up, and placing it in a proper light before the people.

It is most assuredly a dull subject, with butter at its present price, for a man to rack his brains to write, or even think about; and were it not for the hope, that this might possibly meet the public eye through the medium of the press, and perhaps be the means of giving us the the first slap towards waking up, I should never have attempted it.

St. Armand East. C. A. Deming.

PHOSPHATES.

Very careful and well conducted experiments on the relation value of dissolved and undissolved phosphate of lime have been carried on, during the last year, in Aberdeenshire, by the "Aberdeen Agricultural Association."

The report of the society has just been published; and from the statement made by the active and studious chemist, Mr. Jamieson, we can form some idea of the results brought out by the year's work.

"As to the effects of phosphates on the turnip crop, it appears that;

1 Phosphates of lime decidedly increase the turnip crop; but that farmers need not trouble themselves to know whether the phosphates are of animal or animal origin.

2. "That soluble phosphate is not superior to insoluble phosphate to the extent that is generally supposed."

3. "That nitrogenous manures, used alone, have little effect on turnips, but, when used along with *insoluble* phosphates, increase the crop; that the addition of nitrogen to *soluble* phosphates does not seem to increase the solids or dry matter in the crop; that there is no material difference between the effects of nitrogen in nitrate of soda and in sulphate of ammonia."

4. "That *fineness of division* seems nearly as effective in assisting the braird and increasing the crop as the addition of nitrogenous manures. Hence the most economical manure for turnips is probably *insoluble* phosphate of lime, from any source, ground down to an impalpable powder."

Again, Dr. Aitken, in his report of the experiments carried on by him, at the Hurelaw experimental station of the Highland Agricultural Society, on the application of various forms of phosphatic manures to swedes, comes to these conclusions; that, comparing *dissolved* with *undissolved* phosphates, the former produced the larger crop, yet the increase was due to the greater amount of water in the bulbs, and that the total amount of solid matter per acre was, in reality, less where that form of phosphate was used.

A considerable part of that deficiency was borne by the albuminoids, and thus a marked diminution in the feeding quality of the bulbs was indicated. The estimation of the ash also showed that the decrease of animal food per acre was accompanied by an increased abstraction of animal matter from the soil; and it seemed as if the application of phosphates in the dissolved form to the turnip crop had the effect of hastening the impoverishment of the land without proportionately enriching the animals fed on it.

Now this is all very well, and good news enough for the owners of phosphate lands; but the next set of trials (those on barley) with different sorts of phosphates point to a diametrically opposite conclusion.

The barley was sown, at Pumpherston, the other experimental station of the H. A. S., on the 21st. of May, but,

owing to the cold, sunless summer, was not harvested until the last week in in September. The long period of growth was of course favourable to the action of the *undissolved* phosphates; but the results are very different from what we might expect. Of the plots, those which had received dissolved phosphates ripened first, and this corresponded with what was observed regarding the turnip crop of the former season at both stations. The advantage was in favour of the *dissolved* phosphates in every plot but one, and this was accounted for by that plot having received better treatment than the rest before the station had come under the care of the H. A. S.; so it was of no use as a means of comparison, and must be left quite out of the count.

And now comes the curious part of the whole, the reversal of the experience of the use of phosphates on the turnip crop.

The barley grown with *undissolved* phosphates contained a larger percentage of water and was less regular in its composition; but the increase of solid matter in the barley grown with *dissolved* phosphates amounted to fully 1½ per cent; equal, in an acre, to 182 lb. or 16 per cent of solid matter more per acre than the other!

And so it seems that the question is as much in the dark as ever. More experiments will of course be tried this year, and the Marquis of Tweeddale has announced his intention of carrying on an extensive set of trials on a larger scale than usual. One thing is certain, we shall have the question thoroughly worked out, and we must for the present rest satisfied with this practical result: that a good crop of turnips may be grown with mineral phosphate of lime, reduced to as fine a state of powder as possible, and mixed with a small proportion of nitrogenous manures, either in the form of nitrate of soda or sulphate of ammonia, or, which comes to the same thing, a half dressing of farm yard dung. A. R. J. F,

'Montreal Poultry, Dog and Pet Association.'[1]

The second Annual Exhibition of the of the "Montreal Poultry, Dog and Pet Stock Association" was held in Albert Buildings, Montreal, on the 4th, 5th, and 6th of February, 1880. Formerly exhibitions of Poultry, &c., were held in connection with the Horticultural Society; but exhibitions have been held by the above society for the last two years and have been very successful; eminently so this last year. The poultry were divided into 60 classes, including 4 for Turkeys, 5 for Duck, 2 for Geese, and shown in pens belonging to the Association. Pigeons were divided into 12 classes; Dogs, in 52 classes.

Judges were: Poultry, G. W. Marshall, of River-Village, Mass.; Dogs, Geo. Walton, Boston, Mass.; Pigeons, J. R. Lykens, Toronto. All of whom gave full satisfaction in their several duties.

Among the Poultry, the Light Brahma class were largely represented, and eminently finer as a class than last year. As will be seen, the largest number of prizes were given to residents of Montreal; the exhibitors having evidently tried during the last year to make the exhibits larger in number, and better in quality, than the year before.

Pigeons were a finer class, and larger in number than before.

Birds were shown that had not been seen in Montreal before for years, and some which had never been seen there at all.

Dogs, as a whole, were not any better than at the last exhibition, and very few first class dogs of any variety were shown. (A miserable set indeed. A. R. J. F.)

Birds, Rabbits, and other pet stock were fairly represented. We refer to the list of prizes granted, giving the names of those to whom they were awarded.

(1). This report was kindly supplied us by Dr. Andrews.

List of Prizes, awarded at the Exhibition.

Montreal, 4th, 5th and 6th February, 1880.

Dogs.—Rough deerhound, 1st prize, F Stancliffe. Rough greyhound (bitch), 1st prize, J. C King 2nd, Sam Carsley. White greyhound. 1st prize, James Lindsay. Italian greyhound, 1st prize, P E Doyon; 2nd, A C. Senécal; (pup bitch), 1st prize, A. C. Senecal Foxhound, 1st prize, F Stancliffe Spanish pointer bitch), 1st prize, J Lymer. English pointer. 1st prize, W. H. Rintoul. 2nd, H. H. King, (bitch), 1st prize, H H. King Double-nose pointer, (bitch) 1st prize, W S Evans. English setter, 1st prize. F Stancliffe; 2nd, John Ryan. (bitch), *1st prize, W. Prendergast; (pup), 1st prize, F* Stancliffe; 2nd. W Hughes Irish setter, 1st prize, W H Rintoul; 2nd, R. McG Stewart. Montreal. Gordon setter, 1st prize. Dr J. S. Niven, London, Ont. Clumber Spaniel, 1st prize, Wm McGibbon, 2nd, Joseph Hickson; (bitch), 1st prize, Joseph Hickson Cocker spaniel, 1st prize, Jas. Cunningham; 2nd, M Holmes, (bitch). 1st prize, Geo. D McDougall; 2nd, Geo D McDougall English shepherd, 1st prize, Joseph Hickson Rough coated colley, 1st prize, James Tait; 2nd, N Prefontaine, Montreal, (bitch), 1st prize, Alex Chambers, River Beaudette; (pup), 1st prize, Dr. S. J. Andres. Smooth-coated colley, 1st prize, Thomas Irving, Montreal; 2nd, Thomas Brown, Petite-Côte, *Montreal; (bitch), 1st prize, James Tait; 2nd,* Wm. McGibbon. Pomeranian (or Spitz). 1st prize, J A. Parent, jr; (bitch), 1st prize, J. A Parent, jr. Newfoundland, 1st prize, W Cowie; 2nd, James McCormack; (bitch), 1st prize, R. A. Elliot, 2nd, W. O'Hara Mastiff, 1st prize, Richd Fletcher; 2nd, I J. Rice; (bitch), 1st prize, G McNider Mount St. Bernard, 1st prize, Joseph Hickson, (bitch), 1st prize, E. Videt. French Poodle, 2nd prize, Alex Grant; (bitch) 3rd, Geo Jordan. Wavy coated Retriever, 3rd prize, John Appleton. Bull terrier, (under 16 lbs.), 1st prize, Geo. Jordan, 2nd, J. R McLaren, jr.; (bitch), 1st prize, W. Macbeth; 2nd, J. R. McLaren, jr; (over 16 lbs.), 1st prize, Edw Auld Fox terrier, 1st prize, L. Galarneau, 2nd, Geo. Jordan; (bitch), 1st prize, John Roberts; 2nd, George Jordan; (pup), 1st prize, Thomas Feeney; 3rd, Mrs W Mackenzie. Black and tan terrier, (bitch), 1st prize, W. Cowie; 2nd, John Roberts. Skye terrier, 1st prize, A. H. Bowman. 2nd, D. J. Laurie. (bitch), 1st prize, W. B. Powell; 2nd, James Flood. Yorkshire blue tan terrier, (under 7 lbs), 1st prize, John W. Millen; (bitch), 1st prize, W Cox; (over 7 lbs), 1st prize, John Weir Montreal; (bitch), 1st prize, J and A Black, Point St. Charles. King Charles spaniel, 1st prize, J A. Devine Blenheim spaniel, 1st and 2nd prizes, Jos. Hickson; (bitch), 1st and 2nd prizes, Jos Hickson Broken-haired toy terrier, 1st prize, J Stanford Best pair smooth-coated puppies, 1st prize, John Roberts. Norfolk spaniels, 1st prize, J. B. Kerr. Otter terriers, 1st prize, Dr. J. G Nichol. Bull dog (over 25 lbs.), 1st prize, W Macbeth; 2nd, Etienne Lacroix; (bitch), 1st prize, James Strike; 2nd, W. Benoit. Scotch terrier, 1st prize, Z Benoit; 2nd, John Smith; (bitch), 1st prize, J. Stanford. Smallest dog on Exhibition, 1st prize, John Roberts. Red fox, 1st prize, W Hughes Racoon, 1st prize, W. Hughes. Rats (4 white), 2nd prize. Charles. E. Howard Montreal. Ferrets (pair), 1st prize, Arthur Nichol, Cataraqui, Ont. Guinea pigs, 1st and 2nd prizes, James Smith, 3rd, O. Batch. Montreal.

Special Prizes.

Bull terrier, J. R McLaren, jr. Bull terrier, light weight, J. R. McLaren, jr. Toy terrier, (class 49), J. Stanford; (class 50), Wm O'Hara Skye terrier, A. H. Bowman Fox terrier, L Galarneau. Cocker spaniel, Jas Cunningham. Greyhound, J. C King Rough-coated colley, J. Tait; (pup—bitch), Dr. S J Andres. Best setter, dog or bitch non awarded; smallest dog on Exhibition, John Roberts.

CATS.

Tiger cat, 1st prize, Jessie A. Shaw Maltese cat, 1st prize, W Winfield Tortoise cat, 1st prize, A J. Dawes. Black cat, 1st prize, W Cowie; 2nd, Lizzie Irwin. Pair white cats, 1st prize, Fred. Greece. Montreal.

Special Prizes. — Pair white cats, Fred. Greece, Longue-Pointe, Montreal Best cat, Wm Winfield, Montreal. Largest, no 1st prize, J. & A. Black, Pt St. Charles, Montreal.

POULTRY.

Light Brahma, (fowls), 1st prize, J. F. Scriver; 2nd, Thomas Costen; (chicks), 1st, 2nd and 3rd prizes, J. F Scriver. Montreal Dark Brahma, (fowls), 1st prize, Arthur Nichol, Cataraqui, Ont.; 2nd Joseph Hickson; (chicks). 1st and 2nd prizes, Thomas Hickson, Montreal; 3rd Arthur Nichol, Cataraqui, Ont. Partridge Cochins, (fowls), 1st and 2nd prizes, W. Crowther; 3rd, Jos. Hickson. Black Cochins, (fowls, 1st prize, Jos. Hickson; (chicks), 2nd, Jos. Hickson; 3rd, James Hooper. White Cochins, (fowls), Jos. Hickson, Montreal;

2nd, Arthur Nichol; (chicks), 1st prize Arthur Nichol Buff Cochin (fowls), 1st prize, Arthur Nichol, Cataraqui, Ont.; 2nd, Jos. Hickson, Montreal; (chicks), 2nd prize, Arthur Nichols, Cataraqui, Ont. Colored Dorking, (fowls), 1st prize, Matthew Jeffrey, 2nd, Thos Irving, (chicks), 1st prize, Thos Irving; 2nd, Math. Jeffrey Silver grey Dorking, (fowls), 1st prize, Patrick Lynch; 2nd, Thos. Irving (chicks), 1st and 2nd prizes, Thomas Irving White Dorking, (fowls), 1st prize, J A Devine, Montreal Silver spangled Hamburg, (fowls), 1st prize, Arthur Nichol, Cataraqui, Ont.; (chicks), 1st prize Henry Joyce, Chambly, Q; 2nd, John Price Silver pencilled Hamburg, 1st prize Jos Hickson Montreal 2nd, Alex Chambers Black Spanish, (fowls), 1st prize Robt A. Elliot, River Beaudette, Q 3rd prize John Bedlow; (chicks), 1st prize, John Bedlow, Brockville, Ont; 2nd, T. Daye, Cornwall, Ont.; 3rd, Robt. A. Elliot. White Leghorn, (fowls), 2nd prize, J. A Thompson; 3rd, Joseph Hickson; (chicks), 1st prize, H. H. King; 2nd and 3rd, Thomas Hall. Brown Leghorn, (fowls), 2nd prize, A G Mitchell, Montreal; (chicks), 1st prize, John Bedlow, Brockville, Ont.: collection of chicks, 2nd prize, A G. Mitchell, Montreal.- Houdan, (fowls), John Bedlow, Brockville, Ont; 2nd, James Smith; 3rd, Thomas McEwan; (chicks, 1st prize, Thos McEwan; 2nd, James Hooper White crested black Polish, (fowls), 1st prize, John Price; (chicks), 1st and 2nd prizes, J and A Black; 3rd, H Price. Silver Polish, (fowls), 1st prize, W J. Price (chicks) 1st and 2nd prizes, Thomas Price. Golden Polish, (fowls), 1st prize, J. and A. Black, Montreal; 2nd, Arthur Nichol, Cataraqui, Ont.; 3rd, Thos. Price, (chicks), 1st and 2nd prizes, Thos. Price, Montreal; 3rd, Arthur Nichol, Cataraqui, Ont. White crested Polish, 1st prize, W. J Price. Montreal Silver Polish, 1st prize, John Bedlow, Brockville, Ont.; 2nd, J. and A. Black, 3rd, Joseph Hickson; (chicks), 1st prize, J. and A. Black; 3rd, Joseph Hickson. Golden bearded polish, 1st prize, Joseph Hickson; 2nd, Wm. Cox; (chicks), 2nd prize, Wm. Cox Yellow duckwing game, 1st prize, Wm McLean, 2nd, C. M Allan; 3rd, Wm Mclean; (chicks) 1st prize, J and A Black; 2nd, Wm. Mclean. Silver duckwing game, 1st prize, Dr J C Nichol; (chicks), 1st prize, J and A Black White pile game, 1st prize; and Red pile game, 1st and 2nd prizes, J & A Black (chicks), 1st prize, Dr. J. C. Nichol; 2nd, W H Masterman Brown red game, 1st prize, J and A Black; 2nd, Dr J. C. Nichol, (chicks), 1st prize, Dr J C Nichol; 2nd and 3rd prizes, J & A Black Black red game, (fowl), 1st prize, J & A Black; 2nd, Dr J C Nichol 3rd, W Cox (chicks), 1st prize, J. & A Black, 2nd, Wm. Cox; 3rd, W. Winfield. Montreal. White game, (chicks), 2nd prize, John Bedlow, Brockville, Ont. Blue Philadelphia game, 1st prize, W H Masterman, Montreal Spangled game, (fowl), 1st prize, E Moir, Cornwall Blue red game, (fowls and chicks), 1st prizes, H. H King, Montreal Grey game, (fowl), 1st prize, John Bedlow, Brockville, Ont Black Hen feathered game, 1st prize, W Cox 2nd, J & A Black Philadelphia game, 1st prize A J Taylor. Plymouth Rock (fowls) 1st prize, Thomas Costen; 2nd, Robert A. Elliot 3rd, R J Taylor: chicks) 1st prize, Thomas Costen; 2nd, Jos Hickson, Montreal; 3rd, John Bedlow Brockville, Ont Dominique, (fowl), 1st prize, J A Devine, Montreal.

BANTAMS — Black red game, 1st prize, R McG. Stewart; 2nd, H. Stewart; 3rd, W Nixon; (chicks), 2nd and 3rd prizes, Jos Hickson Red pile game, 1st prize, J. S. Allan; 2nd, Richd. Price, (chicks), 1st and 2nd prizes, Jos Hickson. Brown red game, 1st prize; (chicks), 2nd prize, J. & A Black. Silver duckwing game, 1st prize; (chicks), 1st prize, Wm. Cox; 2nd, J. & A. Black. Yellow Duckwing game, (chicks), 2nd prize, Richd. Price. Montreal. Golden Sebright, 1st prize, John Bedlow, Brockville, Ont; (chicks), 1st prize, Joseph Hickson Silver Sebright, (chicks), 1st prize, J & A Black White rose comb, 1st prize, Jos. Hickson Black rose comb, (chicks), 1st prize Wm Crowther Montreal. TURKEYS, (pairs) —Bronze turkeys, 1st prize, John Price; 2nd, Thos Samuel. Wild turkeys, 1st prize, Jos Hickson. Black turkeys, 1st prize, A. Chambers; 2nd, E.Vinet, Buff turkeys, 3rd prize, A Chambers Montreal. PEA-FOWL —Best pair pea-fowl, 3rd prize, E. Vinet, Montreal GEESE — Bremen geese. 1st prize, Thos Irving, 2nd, Thos Samuel. White China, 1st prize, Jos. Hickson. Montreal. DUCKS —Rouen ducks, 1st prize, Arthur Nichols, Cataraqui, Ont.; 2nd, Thos. Irving: 3rd, A. Grant. Montreal. Pekin ducks, 3rd prize, John Bedlow, Brockville, Ont. White crested white ducks, 1st prize, W. J. Price; 2nd, James Price. Labrador black ducks, 2nd prize, E. Vinet. Muscovy colored ducks, 2nd prize, Jos Hickson. Montreal.

SPECIAL PRIZES

Light Brahma (fowls and cockerell), J F Scriver, Montreal. Dark Brahma (fowls), Arthur Nichol, Cataraqui, Ont, (cockerel), Thomas Hall Partridge Cochin, (cockerel), Thos Hall. Montreal. White Cochin (cockerel), Arthur Nichol, Cataraqui, Ont. Colored Dorking, (cockerel), and Silver grey Dorking, (cockerell), Thos Irving, Montreal Silver spangled Hamburg (cockerel), N Joyce, Chambly, Q. Brown leghorn (cockerel), J. Bedlow, Brockville, Ont. White Leghorn (cockerel), H H. King, Montreal. White faced black Spanish, (cockerel), J. Bedlow, Brockville, Ont Blue red game (cockerel), H. H King. Brown red game, Red pile game (cockerels), Dr J. C. Nichol Golden spangled Polish (cockerel), T. H Price Montreal White crested black polish, Silver bearded Polish; Yellow duckwing game; Silver duckwing game; Black red game, (Cockerel); Best game cock, any kind, J & A Black, Pt St Charles, Montreal. Partridge Cochin (cock), Wm Crowther. White Leghorn (cock), J. R. Thompson. Montreal Pair Houdan fowls, J Bedlow, Brockville, O. Pair White crested black Polish (chicks), J. & A Black, Pt St. Charles, Montreal Pair Dorking fowls, M Jeffroy, Cote St. Michel, Montreal. Pairs: Black Spanish chicks; White rose combed Bantams, Black breasted red game Bantams, J Bedlow, Brockville, Ont Pair Black breasted red game fowls, J & A Black. Black Spanish fowls; Plymouth Rock fowls, Thos. Costen, Montreal —Bronze turkeys, (pair), John Price Wild turkeys, pair), Jos Hickson Montreal. Black turkeys (pair), A Chambers, River Beaudette, Q. — Bremen Geese (pair), Thos Irving, Montreal. — Rouen ducks (pair), Arthur Nichol, Cataraqui, Ont

PIGEONS

Pouters: red, 1st and 2nd prizes, solid white, 2nd prize; black pied, 1st prize, James Hooper; blue pied, 2nd prize, Henry Price; silver pied, 2nd prize, James Hooper. Fantails: white smooth head, 1st prize, A Gianelli, 2nd, James Price Montreal, 3rd, Arthur Nichol, Cataraqui, Ont.; white crested Calcutta, 1st prize, R G. Taylor; black, 1st prize, James Price; blue, 1st prize, R. A Elliott; yellow, 1st prize; mottled, 2nd prize, R. G. Taylor. Tumblers: almond, 2nd prize, James Hooper, black bald heads 1st prize, R G Taylor; Birmingham Rollers, 1st, 2nd, and 3rd prizes, Fred. Whitley, Montreal. Barbs: black, 1st prize, Arthur Nichol, Cataraqui, Ont., 2nd, R G. Taylor; white, 1st prize, W H Masterman, Montreal, 2nd, Arthur Nichol, Cataraqui, Ont. red, 1st prize, A. Gianelli; yellow, 2nd prize, James Lumsden. English Owls, blue, 1st prize, T. H Price. Montreal, silver, 1st prize, Arthur Nichol, Cataraqui, Ont.; yellow, 1st prize, R G Taylor. 2nd, A. Gianelli African owls: white, 1st prize, W H Masterman. Montreal Turbits: red, 1st prize, Arthur Nichol, Cataraqui, Ont; blue, 2nd prize, W H. Masterman; black tailed, 1st prize, James Price. Jacobins: black, 1st prize, W H. Masterman; red, 2nd prize, John Drysdale; 3rd, Arthur Nichol, Cataraqui, Ont.; white, 1st prize, R. G. Taylor, 2nd, A Gianelli; 3rd, W H Masterman; yellow, 3rd prize, James Price; blue, 3rd prize; Swallows: yellow winged, 2nd prize; red winged, 2nd prize, Magpies: black, 1st prize; red, 1st prize, W H Masterman Trumpeters: solid white, 1st prize, R G. Taylor; 2nd, A. Gianelli; 3rd, W. H. Masterman; solid black, 1st prize, James Lumsden; 2nd; mottled black 1st and 2nd prizes, W H. Masterman; 3rd, James Lumsden; russian mottled black, 1st prize, R G. Taylor; 2nd, W H. Masterman, black, 1st prize, James Price Nuns: black headed, 1st prize, R G Taylor 2nd, W H Masterman Antwerps: blue checkered, 1st prize, Dr S J Andres 2nd, J. B Gossens; blue, and silver, 1st prizes J & A Black red checkered 1st prize, Fred Whitley; 2nd, J. & A Black Archangels: light, 2nd prize; dark, 1st prize, R G Taylor Dragons blue, 2nd prize, James Price. Starlings, 1st prize, W H Masterman Moore Caps, 1st prize, James Price. Montreal.

SPECIAL PRIZES.

Blue checkered Antwerps, Dr. S. J. Andres, Montreal. Blue Antwerps, James Black, Pt. St Charles, Montreal. Dragons, James Price. Trumpeters, R. G Taylor Collections: Swallows, and Jacobins, W. Masterman; Fantails, R. G. Taylor, Pouters, Jas. Hooper. Best collection of pigeons; largest number of prizes for pigeons, W. H. Masterman. Montreal.

BIRDS.

Canaries, Scotch fancy, 1st and 2nd prizes, Robt. Ahern. Collection of Canaries, 1st prize, James Cox; 2nd, G C. Philpot; green, 1st prize, Mrs. W. MacKenzie Parrot, grey, 1st prize, W Crowther. Lark, English, 1st prize, Wm Cowie Blackbirds, English, Wm. Stanford; 2nd, Wm Cowie. Goldfinch, English, 1st prize, Mrs. W. MacKenzie. Mocking bird, 2nd prize, J. McKenzie. Montreal.

SPECIAL PRIZES.

CANARIES. — Scotch fancy (pair), Robt Ahern Collection of Canaries, Mrs. MacKenzie. PARROTS — Grey parrot, H. Price; best parrot, Wm. Crowther. — Weaver bird, Mr. Johnson, Montreal.

RABBITS.

Lop eared: (buck), 1st prize, Richd Price; 2nd, Thomas Hall. (doe), 1st prize, Richd Price; 2nd, Chs Willison. Angora: (buck), W J Price; 2nd; (doe), 1st prize, Richd. Price; 2nd, W. J. Price. Himalayan: (buck), 1st prize, (doe), 1st prize; (pair young), Richd. Price Silver grey (buck, and doe), 1st prizes, W. J Price. Common rabbits (buck), 1st prize, C. A. Willison, 2nd, (doe), 1st and 2nd prizes, A. State. Montreal.

SPECIAL PRIZES.

Angora rabbits, best, and second best, W. Price. Collection of rabbits, Richd. Price. Montreal.

VETERINARY DEPARTMENT.

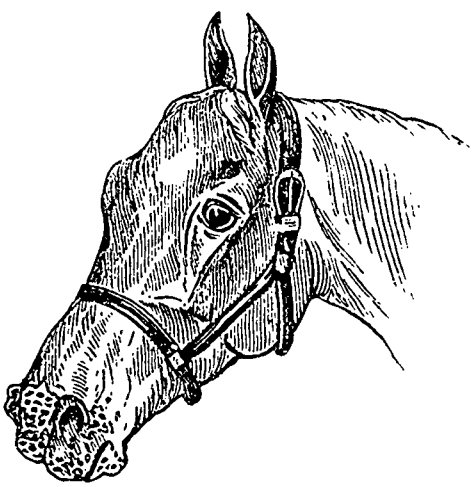
Under the direction of D. McEachran, F. R. C. V. S., Principal of the Montreal Veterinary College, and Inspector of Stock for the Canadian Government.

Horse Pox.

Variola Equina.—The prevalence of this disease in horses, in the city of Montreal and surrounding districts, in an epizotic form, renders it of more than special interest to our readers; hence, we present them with some remarks on the disease, accompanied by a few rough diagrams, to show the parts of the body on which it occurs.

That the disease is not new there can be no doubt; we are not aware that it has ever been described in Canada till we published an amount of its existence, in 1877, during which year it prevailed nearly as extensively as now.

By some authorities only two forms of variola are supposed to exist, viz. small-pox in man, and in sheep; an idea which, strange to say, was brought forward at a meeting of medical men recently held in London, England, to discuss animal vaccination. The February number of the "Veterinary Journal," refering to this meeting, says: "Veterinary pathologists will be rather startled to hear that there are only two kinds of variola, human and ovine! that vaccinia is only human variola modified by the cow, though all attemps at producing the former by inoculation with the virus of the



latter have failed in latter days, though it was easily accomplished formerly; and that horse-pox was only observed by incompetent foreigners."

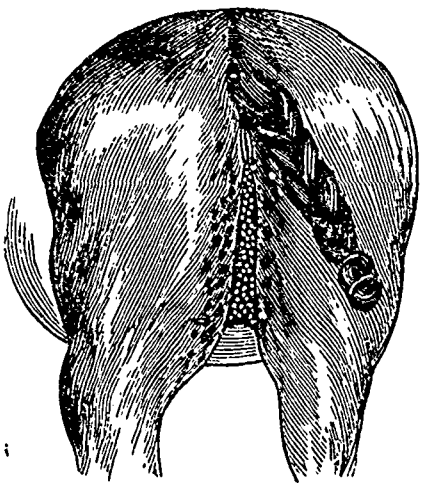
That true variola is seen in most of the domestic animals is well known; that there are distinctive and peculiar types essentially varioloid but differing in character and symptoms in the different species, seems not to be generally understood among members of the medical profession. It is a fact nevertheless.

True the disease in horses and cattle is of a much milder form, and not so fatal or contagious as the human and ovine variety; yet the true varioloid nature of these diseases is quite as distinctly marked.

The idea of the equine form of the disease being merely human small-pox modified by the peculiar organization of the horse, is quite untenable. The celebrated French veterinarian Chauveau, has refuted this idea by experiments. He has inoculated cattle with human small pox, obtained popular pustules quite different from horse or cow pox, and re-inoculation of man with lymph obtained from the pustules, has produced small pox on man.

Lymph from horse pox or *vaccinia*. The distinctive features of vaccinia and its true varioloid nature are amply proved by the successful prevention of small pox by its influence on the system by vaccination.

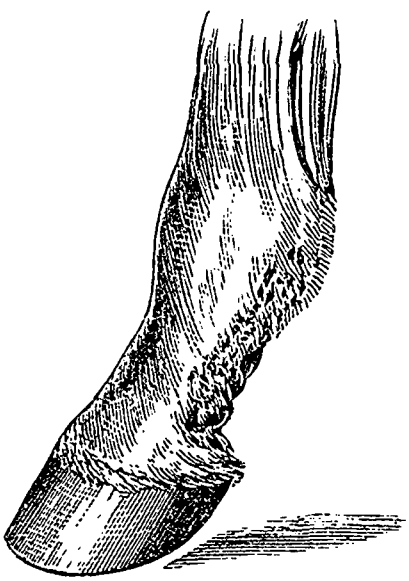
Horse pox is communicable to man and other animals; it is easily produced in cattle by inoculation; the number of grooms to whom the disease has been communicated, and the



distinctive features and regular course and termination so closely resemble vaccination, as to leave no doubt as to its nature being variolous.

The period of incubation. — The time elapsing from the introduction of the virus till the manifestation of the symptoms varies from three to eight days.

The initial symptoms are slight dulness; disinclination to exertion and, usually, a swelling of one or more of the limbs, with a slight fever evidenced by a quickened pulse, and elevated temperature. The part of the body on which the



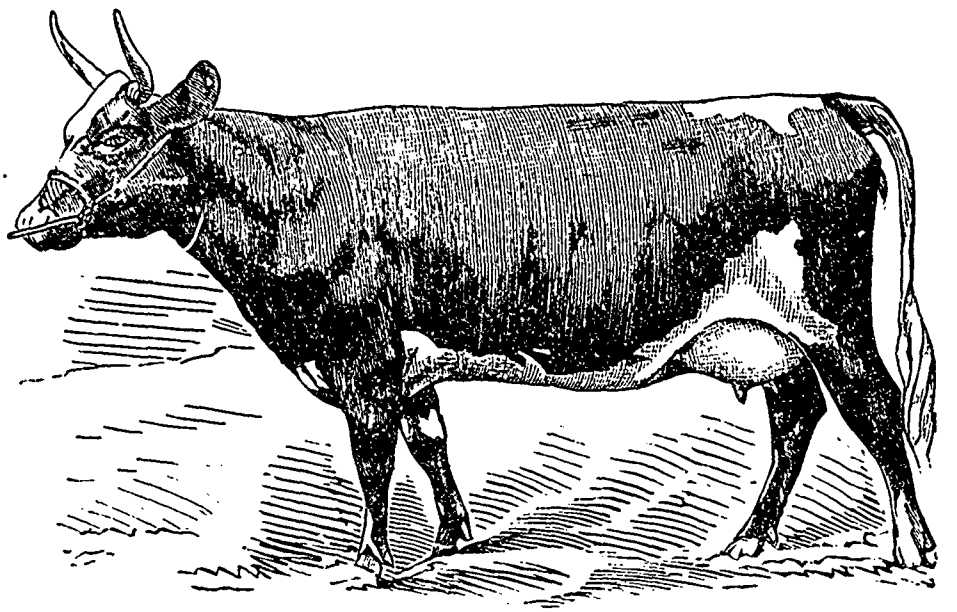
eruption is about to take place is swollen, painful, the skin when colourless is red the hair bristly, and it feels rough and nodulous At this time the fever is high, and the animal moves reluctantly, the swelling being painful to the touch. The appearance of a vesicular eruption which soon bursts,

and discharges a glutinous straw coloured serosity, emitting a very strong and characteristic smell, enables you to recognize the disease as soon as you enter the stable With the eruption, in most cases, the fever subsides considerably.

The characteristics of this eruption differ with its seat. — When occuring in the hollow of the pastern, which it does in about ninety per cent of the cases, the vesicles, at first, are distinctly marked; but, owing to the contagious nature of the discharged lymph, self inoculation ensures the extension of the eruption in the course of its gravitation. The movements of the leg, the flexion of the joint, displace the scabs, and thus aggravate the affection, so that in the hollow of the pastern we usually find an extensive confluent condition of the pustules, extending to the hoof, at first covered by a clear or amber coloured offensive smelling lymph, which agglutinates, forming crusts more or less adherent in places, the swelling often extending up to the body, the pain and fever being considerable. This condition may exist in one leg only, or may affect two, three, or four; but one is usually worse than the others.

In some cases, the eruption and swelling are inconsiderable, in others, where by ignorance of its nature attempts are made to heal it by poulticing or astringent dressings, large pustules, and extensive suppuration of the lymphatic glands in the groin ensue, which usually result in permanent thickening of the leg. When the eruption occurs in the hairless skin between the thighs, its vesicular, and subsequent pustular characteristics are distinctly marked. If the animal is kept at work, the friction destroys the vesicles, pustules, and dessicating pock, and we may find it more or less confluent, and accompanied by considerable swelling of the udder, in the mare, and in the sheath of the male animal; often extending along the belly to a considerable extent.

In some cases, the mucus membrane of the mouth and



Mr. A. Montgomery's Prize Ayrshire Cow, "Fancy of Drumlanrig."

nostrils is the primary seal of the eruption, when the vesicles are well marked, but never reach the dessicating condition, owing to the fluids of the mouth or nose washing them off. From rubbing the affected leg with the muzzle, the mouth, lips, and nose frequently become inoculated Several very well defined cases of this kind have occurred within the last few weeks, and are now under treatment.

In all these cases, we generally find diffused eruptions running up the legs, and over the body. In some, the inside of the ear has been the seat of the eruption; in fact, while the hollow of the pastern would seem to be the principal seat of the disease, no part of the body is exempt from it.

When the disease is allowed to run is course without interruption, it attains its intensity about the ninth day; after which it gradually dessicates, brown adherent scabs form, which, in ten or twelve days more, will separate spontaneously and drop off, or may be washed off, leaving the surface completely healed but decidedly pockmarked.

Where horses are kept too long at work, or improperly treated, by which means the regular course of the disease is prevented, or interrupted, the skin and deeper tissues become highly inflamed, extensive sloughs, and deep fissures are formed in the heels which are tedious and troublesome to heal, recovery is thereby protracted, and is always more imperfect, as thickened skin and hairless patches are produced

The disease is never fatal, and, properly treated, especially if not too much interfered with, it will run its course in about three weeks, leaving the animal none the worse for it.

In the grooms, and one of the students of the Veterinary College, who were accidentally inoculated, it produced symptoms which were identical with those of vaccination. Most of them were affected on the hand For about three days they complained of lassitude, itchings and swelling of the hand, with a vesicular spot with a diffused red aureola; the swelling in most of them extending up to the arm pit. On the maturing of the vesicles the fever subsided, and the regular stages of vesicle, pustule, and dessicating pock, followed one another in regular succession, the scab falling off about the tenth day from the appearance of the vesicle, leaving a well marked depression of the cuticle resembling in all respects that produced by vaccination.

Figure 1 represents the usual seat of the disease in the heels. Fig. 2, the appearance in the thighs. Fig. 3, as it is seen on the muzzle and nose.

The above diagrams are illustrative of cases now under treatment.

THE SUPPLY OF PURE BRED BULLS.

In discussing the question of the sources whence pure bred bulls are to be obtained, it has been remarked that, owing to the long period of quarantine to which imported stock are subjected few breeders will resort to the British markets for improved blood.

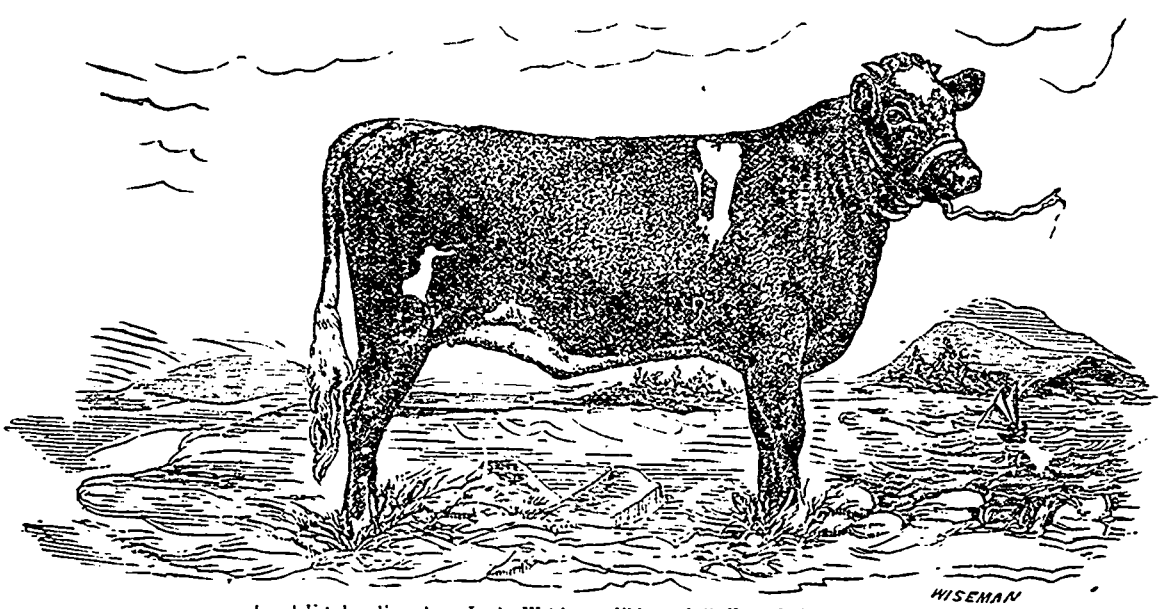
On this point we will merely remark in passing, that the regulation referred to is a very necessary and important one, and cannot be relaxed without running the risk of importing the destructive Lung Plague, which has ruined the British farmers, and will drive hundreds of agricultural families to our Provinces during the coming spring and summer. We think it is better by far to lessen materially the importation of stock, than to risk losing what we have.

Fortunately we have so far escaped, and we are, so far as stock is concerned, in an independent position. As was illustrated by the Exhibitions at Toronto, and Ottawa, during the past autumn, we have in the Dominion herds of the various breeds of cattle which compare favourably with the best in Britain.

In Short-horns, Canada occupies no mean place; Hillhurst, in Quebec, and Bowpark, in Ontario, can boast of representatives of the different families equal to any to be found elsewhere. Herefords, Polled-Angus, and Devons, can be found equal to any, at Guelph, Ontario; Messrs. Stone, McCrae, and Rudd. having imported largely, and bred with judgment.

Ayrshires can be had on the island of Montreal, equal, in form and pedigree, to any imported stock. The names of Dawes, Irving, Drummond, Sommerville, Rodden, and many others, are well known as successful breeders of the famous milking race.

The different breeds of Channel Island cattle, Jerseys, Guernseys and Alderneys, can be found in perfection, at Mr Romeo H. Stephens' farm, St-Lamberts', Hon. J. J. Abbotts', M. P., St-Anne's, Whitfield's model stock farm, Rougemont. At the latter farm also may be found the once famous old Irish "Kerry Cow," now kept more for ornament than use. It will thus be seen that we have within our own country ample sources of supply of pure bred animals of the various breeds, from which our farmers can purchase



Lord Fitzhardinge's "Lady Wildeyes Fifteenth," First Prize at Kilburn.

bulls of pure pedigree at moderate prices, far cheaper than they could be imported, without the risks at sea, and entirely free from all risk of contagious disease.

No prizes to be given for "Grade Bulls."

We congratulate the Council of Agriculture on the wisdom of the resolutions passed by them at a recent meeting forbidding the societies receiving goverment grants to give prizes for Grade Bulls.

We learn also with pleasure that the regulation has been favorably received by the societies, many of them having passed resolutions not to award prizes to any but pedigreed Bulls. This is as it ought to be, and will have a beneficial effect on the stock of the Province.

We are not of those who discard individual points of excellence in breeding animals. We are aware that many grades present individual points of excellence equal to any pure bred animal; but the transmission of individual points is very uncertain, except defects, and none but a pure bred sire can be relied upon to transmit the characteristic peculiarities of the race. Our farmers will do well to bear this in mind in selecting breeding stock.

The necessity for such a regulation, or other means, not only in this Province but in the others as well, came forcibly before us during the past summer, while inspecting stock for exportation; the large number of mongrel bulls which were bought from farmers and shipped to England surprised us. Farmers, study your own interests, by breeding from pure-bred male animals only.

The Transportation of Animals.

The subject of the Humane Transportation of Animals has been bought before our notice by the energetic Secretary of the S. P. C. C., who submitted for our inspection a model of a car described and recommended in the February number of the S. P. C. A. Journal, published at Halifax.

As this is a subject which directly interests our readers we gladly bring it before their notice.

It is well know that the conveyance of live stock in this country, owing to the length of the journeys and the severity of the climate, both during summer's heat and winter's cold, has been attended with more or less suffering and injury to the animals, which in a great measure is incidental to the necessity for conveying them such long distances. We have long been of the opinion that much of the injury and suffering could be saved, by the invention of some mode of conveyance which would obviate the risks of over crowding, being trampled upon, or subjected to the risks and cruelties so common in unloading and reloading a train of stock for the purposes of feeding and watering them. To the cattle shipper such an invention will prove a great boon, not only in the greater safety with which his animals can be shipped, but in the saving of expense.

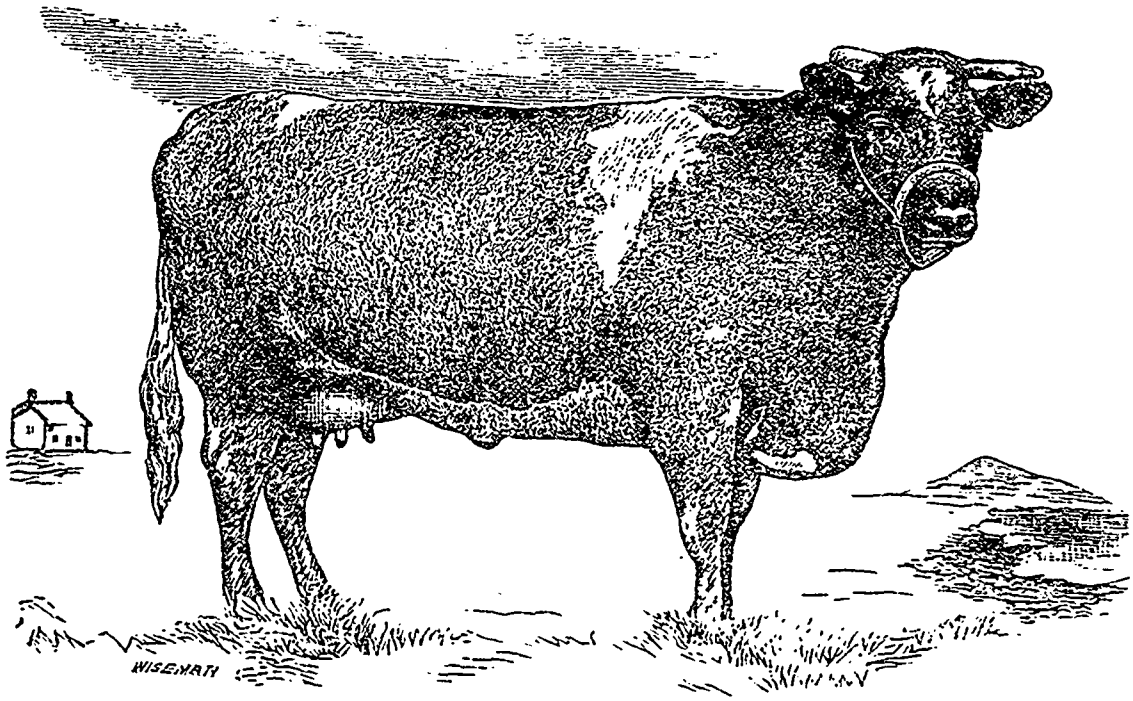
The following is the description given on the above journal of a car invented by Mr. Clark of Truro, N. S.

HUMANE TRANSPORTATION OF ANIMALS.

"At a special meeting of the Nova Scotia S. P. C. A., held in Halifax, on the 22nd of January, for the purpose of considering the capabilities of an Improved Live Stock Car, as submitted by the inventor, the following resolution was passed:

"The Executive Committee, and members of the Nova Scotia Society for the Prevention of Cruelty to Animals, with other gentlemen interested in ameliorating the treatment to which animals are subjected during transportation by rail, met in the Y. M. C. A. Hall this day, to examine a model of improved live stock car, invented and patented by Mr. Thomas Clarke, of Truro After a minute examination of the model, and hearing Mr. Clarke's explanation;

Resolved, That in our opinion the said car is admirably adapted for the purpose for which it is designed, namely the conveyance by railway of live stock, without suffering, injury



Rosalba, Short-horn Heifer, 2nd Prize at Kilburn. Bred by R. Stratton.

or any deterioration. That we recommend the invention to the immediate attention of kindred societies and of the Minister of Railways and Railway Companies, with a view to its immediate adoption.

That the Secretary be directed to forward copies of this resolution to the above-mentioned parties."

CLARKE'S IMPROVED LIVE STOCK CAR.

This car is so constructed that horses, cattle, sheep and pigs can be carried at the same time, keeping each kind of animals separate as well as providing a feed bin capable of containing at least five days' feed, and three days' water, for each stall or pen. A separate water tap is provided for each animal or pen of hogs or sheep, and the car can be washed out in a few minutes, without removing or in any way disturbing the animals. If the car is filled with horses or large cattle, each animal has a separate stall, and also a separate feed or water trough, or, if the car be filled with sheep or hogs, the car is divided into pens of four feet square, and each pen has both feed and water trough.

The bottom of the car is so arranged that the spillings from the animals run from the car, or if the car is washed, no water can lodge on the floor.

Provision is also made for the brakesman and attendant by affording shelter and protection to them, so that the former will be no longer required to risk his life by running on the top of the cars, but can pass through the whole length of the train from one car to another with more speed and less obstruction than through an ordinary passenger train.

We cannot describe in detail the interior contrivances, beyond stating a few facts The animals are separated by partitions that are connected or unhitched in a moment. Each animal is tied with a sliding ring and chain, from each side of the neck, so that the animal can raise and lower its head with perfect freedom, but cannot turn round. When the car is being emptied of its living freight, as each animal

passes out, the partition and head-stall fold completely, thereby offering no obstruction to the animal whose turn comes next.

The car being empty it can be washed out in a few minutes by the use of a hose attached to the water tank, and, if it is desired to use the car for carrying other freight than live stock in ten minutes everything can be removed, thus leaving four bare walls, and to all intents and purposes, an ordinary freight car, without a single obstruction.

Now let us look at the saving such a car will effect to railroads in time and expense; to shippers in the saving of expense in feed and attendance upon the animals; and lastly the saving of property by the comfort and humane treatment of the animals.

1st. To railroads With the car under consideration, there need be no delay. The train can proceed without loss of time to its destination, and no stoppage is necessary as far as the comfort of the animals is concerned; thus a train of cattle may be shipped at San Francisco, and delivered in New York or Halifax, with only one stoppage for taking in feed which would not exceed one hour.

2nd. To shippers At present a staff of 6 to 10 hands is required to attend to the cattle on the way, to get them in and out of the cars, and carry feed and water to the animals, not to mention the immense expense to shippers in having to buy feed (such as they can get) for the animals on the way.—With this car, a shipper puts cattle on board and puts his own feed into the bins, and sends one man to attend to a whole train of twenty cars. Unless the journey occupies more than five or six days, the animals will reach the end of the journey before the feed is consumed. There is no waste of feed, no torturing of the animals; but instead of having to be taken out of the car every twenty-four hours and fed in a snow bank or mud-heap, and then to be driven back into the car by means of sticks, spears and whips for another twenty four hours run, when the same brutal treatment has to be re-enacted—the animals are just as comfortable as if in a clean and well ventilated barn, except that they have not quite so much room, but they can lie down with as much ease at least as on board ship. Seeing that any cattle car at present in use can be converted—carrying the same number of animals—to the above principle for the small sum of $200, it is only reasonable to suppose that Railway Companies will adopt the patent on the score of economy, if for no other reason."

This car appears to us to meet the requirements of the case. Each animal being secured and isolated from all risks of goring or being trodden on, can be fed, and watered in the car, while cleanliness and comfort are carefully provided for.

The principal objections offered by Railwaymen are that the water would freeze. Well, this is an objection easily remedied. In the first place, it is only during a very few months in winter that this would be likely to happen, when the water need not be carried, but the supply taken in at watering stations, and at once used by the stock

The question of expense is the chief one; the adaptability of the car to the purpose seems to us to be simple enough, and if, as the inventor claims, ordinary cars can be converted for $150 to $200, it must pay any Railway to adopt them.

We refer to this subject as one indirectly affecting our readers, for it is well known that whatever tends to simplify the cattle trade and make it less risky, will also tend to increase its lucrativeness; so that it is of importance to the farmer that everything should be done to improve the system of transportation. The humanitarian is interested, inasmuch as great suffering is experienced by animals in transit, often from long fasts, continued thirst, abuse in unloading and reloading, sufferings, which such an invention is specially intended to prevent.

FOODS.

The nourishing value of a food is determined by two factors:—1. Its composition. 2. Its digestibility.

Composition of Foods.—The average percentage composition of the foods commonly given to farm animals is shown in the following table:

Percentage Composition of Ordinary Foods.

	Water.	Albuminoids.	Fat.	Soluble carbo-hydrates.	Fibre.	Ash.
Cotton cake (decorticated...	10 0	41 2	14 0	18 0	9 0	7 8
Cotton cake (undecorticated)	11 5	24 6	6 2	30 2	20 8	6 7
Linseed cake	12 0	28 1	12 0	30 3	11 0	6 6
Beans	14 5	25 5	1 6	45 9	9 4	3 1
Peas	14 3	22 4	2 0	52 5	6 4	2 4
Oats	13 0	12 9	6 0	53 8	10 8	3 5
Wheat	14 4	11 3	1 5	68 1	3 0	1 7
Barley	14 5	10 6	2 0	65 7	7 1	2 6
Maize	11 4	10 4	5 1	68 5	3 0	1 6
Clover hay	16 0	12 3	2 2	38 2	26 0	5 3
Meadow hay	14 3	9 7	2 5	41 0	26 3	6 2
Bean straw	16 0	6 3	1 0	36 7	35 0	5 0
Wheat straw	14 3	3 0	1 5	32 6	4 0	4 1
Meadow grass	80 0	3 5	0 8	10 2	4 5	2 0
Green clover	83 0	3 3	0 7	7 0	4 5	1 5
Potatoes	75 0	2 1	0 3	20 5	1 1	1 0
Mangels	88 5	1 2	0 1	8 2	1 0	1 0
Swedes	89 3	1 5	0 2	7 3	1 1	0 6
Turnips	91 7	1 1	0 2	5 3	1 0	0 7

The soluble carbo-hydrates in the above table include starch, pectin, and the finer parts of the fibre; these are not soluble in water, but are dissolved by the weak acid and alkali employed by the analyst to separate the coarse fibre.

The whole of the nitrogen present in the foods has been reckoned as existing as albuminoids; this, however, is not always the case, a part of the nitrogen in many foods existing as amides (*e.g.*, asparagin and glutamin) and as nitrates. The true amount of albuminoids has at present been determined in only a few of the foods mentioned in the table. It would appear that in seeds nearly the whole of nitrogen exists as albuminoids, and this is especially true of the kernel of the seed. Thus, in wheat flour, about 90 per cent. of the nitrogen present is in the form of albuminoids, while in the bran which forms the skin of the grain only about 70 per cent. of the nitrogen is in this condition. For the various cakes and grains mentioned in the table the figures given for albuminoids will, therefore, be approximately correct, but for the other foods the figures are undoubtedly too high. In hay it would appear, from the few determinations made, that about 80 per cent. of the nitrogen is present as albuminoids. In potatoes about 60 per cent. of the nitrogen is in this condition. In mangels generally only about 25 per cent. of the nitrogen exists as albuminoids. In turnips the proportion is also but small. The amides, which are largely present in the foods last mentioned, can only have a small nourishing value as heat and force producers; they are incapable of taking the place of albuminoids and forming muscle in the animal body.

The composition of vegetable food is liable to considerable variation, depending on the state of maturity of the plant, and the character of the soil and season. In the case of perfectly matured produce, as, for instance, ripe seed, the variations in composition are not generally considerable, and

an average composition, such as given in the table, will be found in most cases pretty correct. But in the case of immature produce, such as meadow grass, turnips, or mangels, the composition largely depends on the stage of growth in which the plant is taken, and is also greatly affected by the character of the manuring. It may be generally stated that as a plant matures the proportion of water, nitrogenous matter, and ash constituents diminishes, while the proportion of carbo-hydrates largely increases.

The following table shows the composition of meadow grass cut at three different dates in the same field. The first cutting will represent pasture grass fed off in the green state by stock; the second cutting is good ordinary hay; the third cutting is an over-ripe hay, somewhat coarse and stemmy, but well harvested. The composition given in every case is that of the dry substance :—

Composition of Hay Harvested at Different Dates

Date of cutting	Albuminoids.	Fat.	Soluble carbo-hydrates	Fibre.	Ash.
May 14,.....	17 65	3 10	40 86	22 97	15 33
June 9.....	11 16	2 74	43 27	34 88	7 95
June 26.....	8 40	2 21	43 34	38 15	7 34

Young grass in thus much richer in albuminoids, and contains a smaller proportion of indigestible fibre than older grass, and is consequently more nourishing. The same comparison may be made between young clover and that which is allowed to mature for hay Hay should always be cut immediately full bloom is reached; after this point the quality of the crop will considerably deteriorate.

While fodder crops deteriorate towards maturity from the conversion of soluble carbo-hydrates into fibre, crops such as potatoes and mangel improve, the carbo-hydrates produced in their case being respectively starch and sugar, both of them substances of great feeding value.

The influence of high manuring is naturally to increase the luxuriance of a crop; a luxuriant crop will always contain more water than one in less active growth. Very large mangels often contain only 6 per cent. of dry matter, while in the quite small roots, the proportion may be as high as 15 per cent. Luxuriance also retards maturity. A heavily manured mangel will contain, at the same date, a much smaller proportion of sugar than a similar mangel grown on poor soil. The result of high manuring is thus not only to increase the bulk of the crop, but also generally to diminish the proportion of carbo hydrates, and increase the nitrogen, ash constituents, and water. In highly manured crops, a smaller proportion of the nitrogen is probably present as albuminoids, than in crops less heavily manured and more mature.

In the case of hay the composition is further affected by the conditions of harvesting Grass that has suffered from rain during haymaking will contain less soluble matter (carbo-hydrates and albuminoids) than well-made hay; this loss will be greatly increased if the hay has been long in the field, and undergone fermentation as well as washing.

We may now consider the composition of the various foods given in the table.

The amount of dry matter is seen to be tolerably uniform throughout the various classes of dry foods, the foods richest in fat being generally the driest. Among the green fodder and roots, there is a considerable variation in the dry matter, potatoes containing the most, and white turnips the last.

We have already seen that albuminoids and fat are the most concentrated forms of food which an animal can consume; those foods which are rich in albuminoids and fat are, therefore, those which, generally speaking, have the highest nourishing value. At the head of all foods in this respect stand the various descriptions of oilcake; they form, without doubt, the most concentrated food at the farmer's disposal. The leguminous seeds, as beans, peas, and lentils, are rich in albuminoids, but not in fat. The cereal grains are much poorer in albuminoids, containing only about one-half the proportion found in leguminous seeds. Of the common cereals, oats are generally the most nitrogenous, and maize the least. Oats and maize are characterized by containing more fat than the other cereal grains. The special characteristic of all the cereal grains is their richness in an easily digested carbo hydrate, starch.

When we turn to the hay, straw, green fodder, and roots, the general composition becomes a less safe guide to the nourishing value. The nitrogen, we have already seen is here no certain measure of the proportion of albuminoids present. The fat credited to these foods is also largely composed of waxy matters, and we can hardly attribute to it the same feeding value as to an equal amount of fat in oilcake or maize. The carbo-hydrates also include various substances of no feeding value. The same weight of dry matter in crude foods of this class has thus a decidedly less nourishing value than in foods of the higher class previously mentioned, consisting entirely of matured grain. Foods belonging to different classes cannot, therefore, be safely compared on the basis of their composition.

An important element in the character of a food is the relation between its nitrogenous and non nitrogenous constituents, these two classes of ingredients performing to a considerable extent distinct functions in the body. As the non nitrogenous constituents are partly fat, and partly carbo-hydrates, it is usual to calculate the fat into its equivalent in starch (generally done by multiplying the fat by 2 44), and add the product to the other carbo-hydrates of the food; the relation of the albuminoids to the total non-nitrogenous constituents, reckoned as carbo hydrates, is then easily found. The relation in question is commonly kown as the " nutritive relation " of the food. Thus the composition of wheat grain given in the table shows a " nutritive relation " of 1 : 6.6, and the composition of decorticated cotton cake a nutritive relation of 1 : 1 5. Figures thus calculated, are, however, approximate only, as we ought clearly only to take account of the constituents actually digested by the animal. We shall therefore refer to the subject again in the next section."

POULTRY DEPARTMENT.

Under the direction of Dr Andres, Beaver Hall, Montreal

Poultry feeding.

No branch of business connected with farming pays better than poultry; and it is of great importance to know just how and what to give them in order to stimulate egg production.

Both grain and soft food should be given; the latter at least once a day where eggs are sought. Wheat is probably the best grain, especially where fowls are beginning to lay. Corn tends to fatten, and should be given only occasionally to laying fowls. Buckwheat is an aid to egg production and is very warming. Oats make an excellent food, but not particularly valuable for eggs. Barley is thought by many fanciers to be one of the best varieties of winter food. If the grain is ground, a good plan is to grind together equal parts of corn, wheat, buckwheat, and oats. It makes an excellent meal for a warm mash to be given in the morning, but should not be given at night, unless the poultry house is very warm, and even then it is better to give whole grain at night.

A meat diet is very essential to the well being of all fowls during cold weather, when worms and insects are not to be found. This is well known, though very few give the matter the attention it deserves. Those who live within a reasonable distance of a slaughter house, or butcher shop, can secure plenty of scraps of waste meat, and bloody pieces, which are unsaleable, at a trifling cost. Cut them in small pieces, put into a large kettle, with plenty of water and boil them until they are very tender, stirring in meal until it becomes a thick mush, and then cook until done. Turn it out into pans and let it cool, and you have an excellent food for your fowls, which, if put in a cool place, will keep a long time. Green food should also be given occasionaly, as fowls need some coarse and refuse matter to keep them healthy. In the summer they can find this for themselves, but in the winter, when the ground is covered with snow, we must supply this deficiency with cabbage, turnips and onions cut fine, or coarse, as seems to suit them best. Onions are especially valuable for keeping off vermin.

Sunflower seeds are a very valuable food for fowls. They are the best egg producing food known, good for the plumage, and very warming, since they contain a large quantity of strog vegetable oil. If given too abundantly, the fowls will shed their feathers; once or twice a week is sufficient. Fowls should have free access to fresh water at all times; milk will also conduce much to egg production. Land, and oyster shells, should be kept within reach of the fowls, to feed upon, or dust themselves in; a few ashes mixed with them will also be found useful.

E. K. D., in *Country Gentleman.*

Diseased Fowls.

Take one pound of wood charcoal, pulverize it coarsely, and mix with it half a pound of common table salt. To half a pint of this mixture, add one quart of corn-meal and bran, half and half, mix well, and give to about six or seven fowls. Procure some hard coal screenings and place within reach. Give occasionally a few oats. Always keep some old iron in the drinking water; allow all the out door exercise you possibly can, even chase them about a little. Place plenty of straw for them to scratch among for exercise; throw some small grain among this to encourage scratching, but, above all, give pure air, and keep them perfectly clean. I find a little coal oil, the commoner the better, to be a fine preventive of disease, and lice of all kinds; smear this all along the perches, also under the straw in the laying boxes. This is a disinfectant and deodorizer also. On cold days be careful; on warm ones give them air. WM. HORN, V. S.

"Good luck" in Poultry keeping.

"You've had prime good luck with your chickens, ha'n't ye?" I was so busy cleaning my hen house that I hardly noticed the coming of my neighbor from whom the voice came. Now, I looked up. "Yes," I said, "first rate luck; raised every chick that left the shell." "Wall" he replied "that just the way, some folks always do seem to have luck, but I never did. Hens lay any?" "Yes," I replied, "my pullets are laying from four to six eggs a day." "Only see," he said, "I must have your breed of fowls." "All right," I replied, "but you must also get a comfortable place for your chicks, and give them the same care and management that mine get, and then I think your hens will lay as well."

As he walked away I fell to cleaning the room again, and to thinking wherein my "luck" consisted. In the first place. I had the "good luck" to have clean, comfortable coops for chickens; second, I had the "good luck" to see to it that they are fed regularly with corn meal, buckwheat, and oats and corn ground together; and thirdly, I had the "good luck" to furnish them clean, pure water, and safe quarters for the night, secure from prowling skunks or marauding rats. The fact is, that most of the "good luck" in chicken raising is simply the result of good management and careful, persistent industry. J. H. SEVERSON, ALBANY Co., N. Y.

A Cover for a Barrel.

When a barrel of flour or sugar is opened, the head should be taken out carefully, and the three parts hinged together, by means of strong linen, glued on the sides, but not the edges of the pieces, or strips of leather, nailed on as shown at figures 1 and 2. The cover is fixed to the head of the barrel, by tacking one of the end pieces of the cover, to the chine of the barrel, and the other parts rest as they are laid down. This makes a good cover for barrels in the house, and also those used in the barns.

FIG. 1.—The barrel.

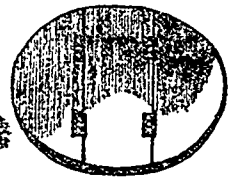


FIG. 2.—The cover.

A hoe is shown in perspective in fig. 1 p 164. where *a a* is the framing, which also constitutes the horse shafts, supported on iron brackets, which in their turn are supported on an iron axle, *b*, as high as to permit the crop hoed to pass under it. The axle, bent down at both ends, works in the wheels, *c c*. These form the carriage portion of the machine. The hoe consists of a bar *d*, which bears the shanks *e*, of six triangular duck footed hoes, or shares, made to embrace as many rows of corn, at the ordinary breath of 7 inches asunder. The handles, *f f*, by which the driver guides the hoes along the centres of the rows, are attached to the bar *d*. The carriage and hoe are connected by means of the rods *g g*, which, at one end, are attached to the handles *f*, and at the other linked on by eyes to hooks in the hind part of the brackets, which support the framing or shafts *a a*. The rods *g* are strengthened by others, passing under the bar *d*, and welded at both ends to the under part of *g*. When the rows are placed wider than 7 inches, the axle is expanded to the requisite width by being slipped outwards through the collar, and fixed at any given width by the pinching screw at *b*. A. R. J. F.

CORRESPONDENTS.

Murray Harbour, P. E. Island,

Mr. Editor,

Judging from the ability of your Journal, I am convinced that any opinions expressed by you, on agricultural matters, are *bona fide*, and are accepted as such by the great body of the people of this Dominion. Under these circumstances, I write this communication for the purpose of ascertaining whether a certain plant known as "Prickly Comfrey," is a genume article or a humbug? Our farmers are just now in a dilemma, and are afraid to invest in this plant, as there are so many conflicting stories afloat concerning it.

Will you be kind enough to publish this letter in your next issue, and express such views upon the subject as are calculated to enlighten the public upon its merits, and oblige. AN ISLANDER.

Answer. — We have not tried the "Prickly Comfrey," and would like to hear from our readers who have given this plant a fair trial. Respectable dealers in seed who advertise this novelty

are very reticent indeed, taking care to state what the *introducer* says of it without giving their own opinion. We read the following caution in several seed catalogues: "Stock has to be taught to eat it by confinement and fasting; the mixing of *chopped* comfrey with grass, *green corn* fodder, a sprinkling of meal, bran, and a little salt." However it is further stated—by a few only—that after such persevering efforts, cattle will come to leave *almost* any food for the comfrey. This, remember, is the testimony of seedsmen who have comfrey for sale. We must frankly admit that we do not feel tempted to try it. However, to such as take a deep interest in the matter, our advice would be: "Try it on a very small scale." The returns are started from 75 to 100 tons per acre, per annum, of green fodder, in six cuttings. Who believes it?

In fact, this seems to us a very dubious matter indeed; but, let us hear from such who have "taught their stock to eat it."

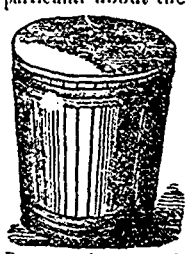
Butter Making.

The following advice on butter making and packing is worth reproducing, and attending to:

IMPORTANT TO FARMERS.

The *poor Tubs* that have been used in some parts of the Township the past few years have hurt the sale of the Butter. A sawn-stave tub is not fit to keep Butter in; it is too heavy, gets dirty quickly, and cannot possibly be kept clean in shipping.

Poor fitting lids, with small sawn rims, are almost worthless, and break up like pipe-stems. All tubs should be made from the best wood, *split staves*, (never sawn on any account), and have tight-fitting covers, with a broad rim. The proper height of a tub holding fifty (50) pounds of Butter, measured on the outside, with the lid on, is fifteen (15) inches. Farmers that will insist on putting their Butter into *cheap tubs* must expect to sell their Butter at a *cheap price*, as the English market is getting very particular about the kind of tubs used.



A *cool* dry room to keep your Milk in, a cool place to churn in, and a cool place to keep your Butter in, are all indispensable for good Butter-making. Remember the bottom principle of good Butter-making is, *even temperature* all through. New pans and new systems work poorly without the above requisites, while most any system works well with them. Better Cows, better feed, and greater care would add much to the profits with little cost. Don't spoil your Butter with cheap fine Salt; "Higgins' Eureka" is the Best.

A. A. Ayer & Co.

Respecting tubs, we are informed that two cts. a lb were made last fall, on a very large lot of butter, by merely re-making the tubs, putting new hoops on, and a new well fitting lid. Well finished tubs would have cost about the same price as the common home-made tubs in question, and two dollars for every hundred pounds of butter might have been saved by the farmers. This is worth remembering!

Cost of raising Sugar Beets.

The following questions and answers may prove interesting to such as intend to grow sugar beets, and to encourage beet sugar making:

Dear Sir,

I am anxious to collect the special and particular facts of the Canadian experiments in beet culture. The blue book, 1878, does not give the cost of growing an acre of the root. Perhaps you could let me have *your own* experience and that of one or two friends who have raised crops.

Answer. — We are not aware that any close calculation has been made, in this Province, as to the cost of growing sugar-beets The amount of expenses would depend considerably on the experience of the grower, the implements at his command, &c Any one who has grown root crops will soon arrive at a fair estimate as to the cost of sugar-beet raising. The advantages are in favor of the latter in as much as no barn yard manure need be used in rich wheat or barley land, and that no ridging is required. A good seed-drill will sow several drills at a time, sugar-beets being *cultivated on the flat.* Harvesting will also cost less than with mangolds, as the crop will be about ⅓ less in sugar-beets. An implement, in general use in Europe, pulls up in excellent manner one, and even two drills at a time with a good pair of horses.

The following estimated cost of sugar beet raising will be near an average:

Rent (from $2 to $5 per acre)	$ 4
2 plowings (1 extra deep), $4; scarifying, $1	5
Seed, $2; drillings &c., $1	3
2 hoeings, and 2 thinnings, &c	8
Harvesting and carting off the field	10
Finely ground phosphate, $4 (or superhosphate, $8)	6
	$36

By 15 tons of sugar beets at $4 .... $60

Average profit per acre, $24

We allow $1 per ton for freight and delivering; beets being worth $5 a ton, at the very least, at the factory.

The average return from such beets as have been grown all over the Province, and analysed by the Department of Agriculture in Quebec would, in ordinary practice, yield about 8 0/0 of the beet in pure white crystallized sugar, although as much as 10 0/0 could be obtained by the best sugar makers, with proper machinery.

We estimate the average crop of sugar beets at 15 tons per acre, but an average of from 2 to 25 tons can safely be reckoned on with carefully cultivation in rich, well prepared soil.

Sir,

I am always pleased to see The Agricultural Journal; although small, yet there is a good deal of information in it which should be of benefit to farmers. I should however like to see a discussion carried on in the Journal, upon our Agricultural Societies. My idea is that they have failed to be of that benefit to the country, which one would be led to expect, from the amount of money that has been granted to them by the Government. The fault no doubt has been in a measure due to the managers, who are not always selected from the most intelligent of the farmers, and also to the system of dividing the amount into as many prizes as posssible, without any regard to the quality of cattle exhibited.

The Board of Agriculture should take the societies more under their supervision, re-adjust their Bye-Laws, and enforce better premiums, and do away altogether with some—for instance: every society gives premiums upon Grade Male Animals; this should be especially prohibited by the Board, as there can be no question, that the use of these animals is an injury to the farmer, and why allow the grant to be so expended? None but thorough-bred male animals of any class should be allowed to compete, and these should have properly certified pedigrees. No written pedigree of the owner or breeder should be allowed, with the exception of young animals, where a correct pedigree could not be obtained in time. The rule issued by the Board respecting prizes for well cultivated farms should also be enforced. The system of choosing judges should be changed if possible. Would it not be a good thing for the Board of Agriculture to employ a few first class men as judges, and pay them, who could go round to every exhibition, and also award the prizes on farms? I know it would cost something, but the object is to do the largest amount of good with the grant, and the subscribers, or exhibitors, would have greater confidence in these judges, than in men who are very often taken from the immediate neighbourhood of the exhibition, and who naturally have their prejudices for some particular class of stock or animal.

Would it not also be better for the Board to insist upon each society, expending some portion of their grant every year on improved thorough bred stock; on the introduction of new seeds and roots, and on the encouragement of fruit culture.

The Agricultural Farms might be made available for the diffusion of improved stock. Here they could be raised under the supervision of the Board, and a moderate price fixed by the Board. This would be making the Government grant to these schools of great value to the farmers, and the farmer would take an interest in the schools, which they do not now. Aylmer.

To A. R. Jenner Fust, Esqr.

Mr. James Doak, of Compton, than whom no more thoroughly practical man exists in the Eastern Townships, writes as follows:

I practise a *mixed* system of husbandry on my farm, which, as you know, consists of 140 acres of good upland soil. I never considered it advisable to seek in a foreign market what I could grow on my own farm; there are no doubt exceptions; but, take it all in all, I believe it is the best and safest plan to follow, and, without boasting, I think I may say that I have been fairly successful.

During 18 years I have kept a herd of from fifteen to twenty cows, the milk from which has been manufactured into cheese, from the first of June to the first of October in each year, in a factory near my place; the rest of the season, butter has been made at home. Our cheese has a good reputation, and usually commands the highest market price; but still, there is room for improvement. I have seen cheese made in Ontario that was finer in flavour, and less porous than ours. I am glad to see that the first prize for cheese, at the International show, New-York, was won by a Canadian. This should stimulate to renewed exertion towards perfection. I notice also that your St. Hyacinthe correspondent says "too much cheese is already made here;" no doubt these is danger of over-production, therefore it would not be prudent to follow the dairy business exclusively.

I breed a few horses; raise a few oxen and steers; keep a small flock of sheep, say 30 or 40 good ewes. With my dairy, of course I keep hogs; consequently, every year, after supplying my own wants, I am pretty sure to have something to sell that will fetch a good price.

I grow wheat, oats, barley and buckwheat: average yield of what has been 20 bushels per acre. Last season was notably a cold, backward one; however, I planted ¾ of an acre of Indian corn, on a grass lea, ploughed in the fall. It was harrowed in the spring, marked out in drills, and a good large shovelfull of hogs' manure put into each hill. It was then planted, and cultivated in the usual way. In the fall I harvested 140 bushels of corn in the cob-100 bushels sound and good; the remaining 40 bushels, not quite sound, were given to the hogs, on which, supplemented with the milk from the dairy, they throve wonderfully. I had 6 bushels of good beans, on the same ground, planted between the hills.

I shall try the culture of the sugar beet if they succeed in starting a factory for the manufacture of beet-root sugar in Coaticook. It will be a great disappointment to many of the farmers in the vicinity, if the enterprise should fail. If I might venture an opinion on the subject I should say that it is not safe to begin on too large a scale at first. New enterprises require careful handling; begin on a moderate scale, and carefully, and work up by degrees to a full business. Success is more sure to follow; and, if there is failure, the consequences are less disastrous.

JAMES DOAK.

To A. R. Jenner Fust, Esqr.