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THE ILLUSTRATED Journal of Agriculture

Montreal, September 1, 1896.

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COMPETITION OF DAIRY-PRODUCTS Under the Management of the Department of Agriculture of the Province of Quebec.

GENERAL DEFECTS. Excess of fermentable matters; bad flavour; white stains, greasy butter, irregular salting; bad colour, defective packing.

REMEDIES: -Regular, continuous fermentation of the cream; perfect cleanliness, attention to the churning, washing, working and packing. Report of M. Pabbé Choquette.

Concerning the competition of butters which took place at Quebec, June 25th, 1896, the Department of Agriculture was now in its possession,

1. The special and general reports of the judges, MM. A. A. Ayer and J. A. Vaillancourt, exporters of dairy goods, who examined the butters sent in to this competition.

2. The report of M. Pabbé Choquette, director of the St. Hyacinthe Official laboratory, who analysed the said butters.

3. The report of M. J. D. Leclair, Superintendent of the St. Hyacinthe dairy-school, and Inspector-general of the creameries of the province, who examined the exhibits for the purpose of ascertaining the causes of the defects noted by the Judges.

These documents show, 1. the defects relating to the making, properly so called, of the butter; 2. the defects pertaining to its general appearance and the packing of it; 3. the remedies and modifications that should be introduced into the work in order to obtain products of the very finest quality, that would also make the best appearance on the market.

Each exhibitor will immediately receive a private letter informing him of the defects observed in his exhibit, and the causes of such defects.

The following is an abstract of all the documents above mentioned: it will be sent to the creameries of the province.

DEFECTS NOTED

1. Some butters contain too much sugar of milk, casein, and other fermentable matters capable of, in time, developing in these butters a disagreeable flavour and of injuring its keeping qualities. The best butters—those that won prizes—contain an average of 1.32 p. c. of these matters, while other inferior butters contain as much as 2.89 p. c. This excess is caused, generally speaking, by the bad ripening of the cream, and by the careless washing and working of the butter.

2. Some butters have a bad flavour and aroma, confirmed au reste by the chemical analysis. Several causes are recognised of this defect: 1. too rapid ripening of the cream; 2. the use of bad milk in butter-making; badly treated, dirty milk contains a host of germs that develop in the cream and, afterwards, even in the butter, when they set free certain acid gases, called volatile acids, both the taste and smell of which are eminently disagreeable; 3. want of cleanliness in the creamery and its surroundings, as well as in the machinery, implements, and utensils used therein. In this case, it is not alone these implements but also the atmosphere of the factory which is more or less infected by the injurious germs which enter into the milk, the cream, and the butter, there becoming developed and disengaging still more of the volatile acids we have just mentioned;

1. the too long exposure of the cream or the butters to the air, heat, and bad effluvia, as well as their too lengthy sojourn in icehouses or rooms the air in which is not pure; 5. the pasturing of cows in fields that contain certain plants that give a bad flavour to the milk, or feeding the cows on foods that are known to produce the same effects.

3. Many butters are injured in quality by white veins and spots that often arise from unstrained cream, badly ripened, or poured into the churn without being uniformly cooled. This defect, which must be strenuously contended with, is a very serious one, for the English market will have nothing to do with butter that is not uniform in colour, and, unfortunately, many tubs are affected by this defect.

4. Some of the butters were absolutely deprived of their grain, which had been crunched up by working it too severely and for too long a time, or by having been worked in too high a temperature. Another cause of this defect is the use of ice in the churn, and churning at too high a temperature.

5. A very striking defect is the want of uniformity in the salting of butter. Some butters have nearly 4 p. c., salt in it, others only 1 1/2 p. c. The difference is too great, and it is very desirable that all makers should use about the same percentage.

6. We have still the following defects to note: too much water in some butters and too deep or too pale a colour in others.

7. Lastly, we have to note the carelessness of most makers in packing their butter. Many of the boxes and tubs are dirty; too full or not full enough; have no parchment-paper, or that paper badly fitted; too much salt on the top of the tub; boxes badly made; hoops wanting, or badly put on, etc., etc.

These are the chief defects that caused many marks to be lost by several competitors, and which are the most injurious to the good repute of Canada butter in the foreign market. We draw the attention of makers to them, and add some hints that may aid them in getting rid of them.

Hints to be followed as to the cure of the above mentioned defects. In order to avoid having any excess of sugar of milk, casein, and other fermentable matters, in butter, the cream must be ripened uniformly and regularly the butter must be churned at a fairly low temperature, and the washing and working done thoroughly, but so as not to destroy the grain of the butter.

As to the bad aroma and flavour, we have first of all to warn the maker to clear out, disinfect, and ventilate as much as possible the whole creamery, particularly the icehouse and the rooms in which the cream or butter has to stay for any length of time; to give the dirty water an easy chance to run off, and not to allow it to remain in the immediate neighbourhood of the factory in pools or tanks, covered or uncovered; to make the floors, whether they are of wood or stone, so staunch that the foul water of washing up cannot leak through and stay under them; to carefully sponge every day the oil in the machinery, and not to let the oil remain too long in the holes and hollows that are often found in the foundations of the engine, etc., to thoroughly cleanse all the utensils used in butter-making; not to grudge for this purpose the daily use of steam, which we specially recommend for the maintenance in good order of the churns. The sieves and the cloths for washing up, must be daily cleaned most care-

fully. The most minute cleanliness in the whole process is the first requisite for making butter of good aroma and flavour, butter that will keep for many a day. Refuse, without hesitation, any foul, badly aerated, sour milk taken to the factory by careless patrons.

The ripening of the cream must be very uniform both as regards the duration and temperature, and not be left at the risk of the varying temperature of the creamery. If these means do not prove successful, which would be surprising, a good ferment, procured from a good maker in the neighbourhood, may be tried.

As to the grain of butter and the white veins, if the cream is strained and uniformly ripened, and if the churning, washing, and working are done at not too high a temperature, there will probably be no trouble about these points. Working the butter at twice might be tried, leaving it quiet at a low temperature between the two workings, which ought to be done quickly and carefully. The whole of these two workings should not occupy more time than one ordinary working.

As to salting, at present the market requires 3 p. c., or a half ounce of salt to the pound of butter. It ought to be mixed in carefully by means of the butter-worker, but care must be taken not to make the butter greasy by breaking the grain and thereby destroying the aroma. Before the salt is added, the greater of the water and the buttermilk should have been expelled.

A fine pale-yellow colour is the favorite in the market.

The boxes or tubs must be well made clean, and lined all round the sides and at the bottom with parchment-paper. Fill them as full as possible, and, smoothing the top thoroughly, cover it with a double sheet of parchment-paper. Quite useless to put salt on the top of the box or tub.

All novices in butter-making, and those who are not thoroughly up to the manipulation of the goods and the secrets of the trade, should feel it their duty to attend every year the courses at the St. Hyacinthe Dairy-school, and continue to do so until they are able to make butter of the finest quality.

We strongly recommend for perusal the following very interesting report from M. Pabbé Choquette.

(Signed) G. HENRY, Secretary of the Competition.

COMPETITION OF BUTTER

Held at Quebec, June 25th, 1896.

NOTES BY THE ANALYTICAL CHEMIST.

WATER:—In the great majority of samples, the percentage of water is by no means high; these butters are comparatively dry. There is, however, on this point, a source of error that the chemist can not control; it arises from the fact that the taster when thrust into the butter drives before it the water on all sides, and the sample compressed anew in the taking of the piece for analysis, allows a few more drops of water to escape. I calculate that the correction of this error would increase the amount of water in the analysis by one or two units.

BUTTER:—On the other hand, the percentage of butter, properly so called, is high. The correction mentioned above would lower this by one or two units.

These figures are wonderfully constant. They are indications that the manufacture is uniform, a very desirable point as regards the export-trade.

SALT :—The salt varies in the report from 1½ to nearly 4 per cent: by far too great a difference.

CASEIN, SUGAR OF MILK, ASH, ETC. :—The figures of this column are a clear proof of the general care with which the making is conducted. No invariable analogy between these figures and the quality of the butters can be established, but it may be as well to notice that the prize butters are among the number of those that contain the least waste matter. It is probable that the keeping quality of Canada butter is due, in a great measure, to the relative absence of these so eminently fermentible products.

VOLATILE ACIDS :—I attach great importance to the determination of the volatile acids. The figures give the number of cubic centimetres of "solv-normale" soda required to saturate the volatile acids of 5 grammes of butter.

All these figures, with one solitary exception, are higher than those exhibited by the choicest European butters, such as the Issigny butter, in which the average varies from 24 to 28 for the extreme limits. This wide difference deserves a special investigation to which all those interested should lend their support.

Three causes, in my opinion, may produce this effect: too active fermentation of the cream, too long exposure of the butter to the air, and skimming by the separator. Under the influence of these three causes, together or isolated the acid ferments, by far the most numerous in this process, develop themselves very rapidly to the prejudice of the other ferments.

AROMA, ODOURS :—The volatile acids furnish besides valuable indications concerning the aroma and the various scents of butter. Distillation disengages from the fatty matters and the salt all the volatile principles. These, in that state, lend themselves in the happiest manner to estimation and differentiation. It is very desirable that the judges could thus examine the volatile acids before settling the number of marks to be given for aroma. Under this head I have inserted figures that are by no means comparative "relatifs" and only the results of my personal estimation. The number 10 is at the top of the scale. The absence of this number leads one to conclude that in none of these samples did I find a pure, perfectly agreeable odour. A double notation of 2-9, 7-8, or 4-8 is the sign of a positively extraneous odour, the source of which the maker, if he will try, will probably discover. I found, in most cases, that peculiar, invariably nauseous flavour that the judges took note of.

It is as well to observe that this flavour is almost invariably due to special bacteria that are developed in the ripening of cream. Makers studious of their good reputation will correct this defect by sterilising, by steam at a pressure of 10 lbs. to the square inch, the utensils, jars, cloths, etc.; by keeping up a uniform fermentation both as to duration and temperature; or perhaps, if these attempts turn out unsuccessful, by procuring a ferment from a good maker in the neighbourhood.

I think that the competitors, as a whole, should be satisfied with this their first attempt. It is indisputable that this system of competitions, by

grouping together the efforts of all, and systematising the facts brought out, will produce beneficial results.

(Signed) The Director of the Official Laboratory.

COMPETITION OF DAIRY-PRODUCTS.

Chief defects—remedies—report of M. l'abbé Choquette.

The competitions in cheese that took place; the first, at St. Hyacinthe, June 27th, and the second, at Quebec, August 6th, as already reported, have brought to light some special facts an acquaintance with which may be of the greatest utility to makers of cheese, and to which we would draw their most earnest attention. By applying a remedy to the defects we are about to point out, they will be in a position to obtain higher prices for their cheese.

The following is a list of the chief blemishes noted:

1. Bad flavour, caused either by the want of cleanliness in the factory or by the bad quality of the milk. The milk may be bad owing to the want of careful treatment, by its being the product of cows feeding on meadows in which grow grasses likely to give it a bad taste, or from its being yielded by ailing cows.

2. Cheese too moist and too acid.
3. Cheese too soft.
4. Cheese too full of holes (trop ouvert)
5. Cheese too hard.
6. Bad colour.
7. Butter-spots.
8. Too small cheeses, not level, with ties or bandages too large and badly fitted.
9. Bad boxes.
10. Cheeses sent out too new.

Now, here are some pieces of advice showing how these defects may be avoided: makers will do well to remember these counsels.

In order to escape bad flavour, the maker must:

1. Keep his factory scrupulously clean; as in the case of butter, this is the principal condition of success. The whey vat, in particular, must be cleaned out at least two or three times a week; the floors must be very substantial that no water used for washing-up may filter through them, stagnating and rotting below, and spreading a bad smell and injurious germs throughout the factory. The washing-up water should find its exit far from the building, and never be allowed to hang about the factory, the surroundings of which must be kept as clean as possible.

2. He must never accept milk that is not of the best quality, well aerated, perfectly clean, without any bad flavour, and quite sound. The maker must be very firm in his reception of the milk; still, before offering advice to the patrons, he should set them the example of keeping his factory in the most perfect state of cleanliness.

If cheese is heated up to a temperature too low, it may turn out too moist and too acid.

Open (ouvert) cheese is caused by a want of acid in the whey, or by an omission of working it "en bloc."

Hardness in cheese, is derived from working it too long in the whey, or by over-heating.

The colour of cheese, as well as a bad look, is caused by excess of humidity and acidity that often arises from want of sufficient working in the whey. But-

ter-spots are often derived from too much acid, or from too long working in lumps (en bloc).

The cheeses in these two competitions were, in general, not heavy enough. Dealers prefer, for export, cheeses weighing 70 to 75 pounds to smaller ones, and we cannot too strongly advise proprietors of cheeseries, when they are renewing their apparatus, to buy larger moulds.

The moulds must be quite level, and without ties. The bandages must not be too large, and should be well fitted on. They are not to be folded more than from 1 to 1½ inch over the top and bottom of the cheese.

The boxes should be more carefully made than they generally are, and large enough to let the cheese in easily, but not so as to let it joggle about.

Cheese must not be sent out too green. It is better to keep it till it has acquired a good deal of its best qualities.

In this report, we can only point out the already well known defects that are usually found in our cheese; and, as well as regards butter-making, those who are not skilled in the practical part, ought to follow a fortnight's course, in the St. Hyacinthe Dairy-school, every winter, until they become thoroughly capable makers.

We advise makers to read the report of M. l'abbé Choquette. (1)

Prizes: Cheese—Silver-medals.—Jean Girard, St-Dominique, Chicoutimi, 98½ marks.

Joseph Desgagné, Chicoutimi, Chicoutimi, 98 marks.

Bronze Medals.—Ls. Archambault, Grondines, Portneuf, 96 marks.

Jos. Bouchard, Les Eboulements, Charlevoix, 96 marks.

Money Prizes.—G. Sam. Dugal, St-Alexandre, Kamouraska, 95 marks, \$10.00.

J. J. Wales, East Dunham, Missisquoi, 93 marks, \$8.00.

J. E. Udon, Hébertville, Lac St-Jean, 92½ ma. s, \$6.00.

Georges Roy, Arthurville, Bellechasse, 92½ marks, \$6.00.

H. Guertin, Ham North, Wolfe, 92 marks, \$4.00.

Augustin Jacques, St. Joseph, Beauce, 91 marks, \$2.00.

Butter.—Silver-Medal.—W. Bourbeau, Ange-Gardien, Rouville, 98 marks.

The remarks made in this report do not apply to all the cheese, and we are happy to be able to state that some of it was of the very finest quality; indeed, no fault could be found with it. Besides, many cheeses were, if not first-class, still, very good saleable cheese; so that it is to be hoped that, with a little exertion on the part of the makers and patrons, the province of Quebec will very soon occupy the first rank in the manufacture of Cheddar-cheese.

(Signed) G. HENRY.

Secretary of the Competitions.

THE DAIRY COMPETITIONS.

The dairy competitions inaugurated by the Provincial Agricultural Department, and some of the results of which have been lately published, are conducted on a novel principle. Those entering are notified, on an uncertain day fixed by the judges, to send at once a package of butter or cheese, which the department pays for at current market rates. The article in competition is thus the ordinary product of the fac-

(1) This report arrived too late for insertion in the present number; it shall appear in our next.—Ed.

tory, and the prizes, it is calculated, will go, under ordinary conditions, to the maker of the best merchantable goods in the course of regular operations. The quality may not, of course, be as high as if special pains were taken to produce an exhibition article; but the general effect in raising the standard of the factories' output is expected to, and should, be greater. The competing operators, not knowing when the goods will be submitted to judgment, must be always prepared for it, and, if they expect to be successful must maintain a high standard of general excellence. Premiums won under such circumstances should be a better guide to the buyer than the special excellence of a single package of goods prepared for a competition. The Agricultural Department's idea is a good one, and should have the effect in raising the quality of the average products, which is the thing especially to be sought for, because, whatever the market conditions, there is always a demand for the best goods.

MOORE ON THE FARMING OF ARGENTEUIL.

Montreal, Augt. 4th 1896.

G. A. Gigault, Esq.,
Deputy Com. of Agriculture
Quebec.

SIR :—

In accordance with your directions, I have visited certain parts of the County of Argenteuil and have the pleasure of submitting to you the following report.

I am Sir,
Yours very respectfully,
GEO. MOORE.

ARGENTEUIL.

Historical—Descendants of old settlers—Good farming tells—Old Agricultural Society—Moving sand—Wine, butter, &c.

The County of Argenteuil, historically considered, affords many excellent object lessons for farmers. In it are to be found a great many of the descendants of the earlier settlers of the Province of Quebec, and when these have begun well and their successors have faithfully followed their lead, the comfort of their dwellings, the out buildings, the neatness of their fences, abundant crops, and thriving cattle, testify to the fact that honest, persevering effort will always be rewarded. The prosperity of the present occupants is shown by the comfortable dwellings and large and well arranged barns recently built or in course of erection.

Of course some complain of the present close competition and low prices but the majority of those with whom I conversed do not look upon this state of affairs as by any means ruinous. The faithful, pains-taking, systematic farmer is not the "croaker" it is the shiftless otherwise "old foggy", who keeps in the old net, who grumbles and is discontented.

Agriculture seems to have received a good share of attention in the early days of the County. A general meeting of the inhabitants was called in 1826 and the county Agricultural society was formed at St Andrews. The records of its transactions were unfortunately not kept for many years, but the society,

continued to exist, holding annual Exhibitions, and ploughing matches, which have always been very popular.

In 1869, the keeping of records was resumed, and these show a steady advance, both as to membership and the premium list, which now amount annually to upwards of \$1000. Mr. Gavin I. Walker has been the indefatigable Secretary for over 20 years and has contributed, by the great interest he has taken and the work he has done to bring the society to its present position, popularity, and usefulness.

The roads, in this county, are as a rule, in excellent repair, although, owing to the strong nature of the land in some places, and the sand in others, they must be somewhat difficult to keep so.

St. Andrews was erected into a Parish in 1892 and it was here where the first settlers located, and many of their descendants still occupy honorable positions in the locality. St. Jerusalem d'Argenteuil, or East settlement, is a fine agricultural section, the farmers are prosperous and intelligent.

I was greeted at this place by a very interested audience, accepting with evident pleasure the suggestions as to progressive farming I had the privilege to propose. The crops here, especially the oats, were looking very promising but alas! were being attacked by grasshoppers which threatened to destroy them, but I have since heard that timely heavy rains, together with a parasite which attacked the insects, killing them in great numbers, have done much to avert the dreaded catastrophe.

This season the effects of poor cultivation and the pernicious practice of grazing the meadows in the autumn, are very marked. Where the land has been well tilled crops are good, but where this has not been done they are poor, and where every bit of the aftermath has been eaten off, leaving the roots of the grass without any protection from the frost, or fertilizing material to aid its growth, the results are most disastrous; in some places the hay crop is not worth gathering. The poor cattle will suffer in such cases, because the trouble usually occurs with men who have not forethought enough to plant any supplemental forage crops.

Another circumstance, that proves the necessity of economy as regards manure, is the fact that, where the farm yard was seen with all the dung scraped up and applied to the land, the crops of that farm were good; while, where a heap was left under the barn eaves where the liquid was suffered to run away or undue fermentation to take place, the crops were poor.

When will our farmers be taught the absolute necessity of carefully husbanding the manure.

At Brownsbury, where the first settler Mr. Brown, from England, established himself in 1818, are some well ordered farms and the corresponding prosperity of their owners bear witness to the fact that farming has been, and can yet be, remunerative.

The soil in St. Philippe is heavier and more fertile than the surrounding neighbourhood. The farms are admirably tilled, and the beautiful homestead and the magnificent church testify to the thrift and public spirit of the people. In the Priest's garden are some very healthy looking apple-trees, which prove that the locality is good for them, hence others are being planted; so potent is the power of a good example.

I noticed also, at Mille-Isles, that fruit-trees looked very promising where planted on high land, and in this place I had the pleasure to offer some instruction as to their care as regards the des-

truction of insects, fungi, spraying pruning etc., which seemed to be much appreciated by the owners of orchards.

In a district near Lachute, white sand, very fine and powdery, is continually being blown from its bank, by high winds, entirely destroying many acres of crops, and rendering otherwise valuable land unapt for tillage by covering it, to the depth of many feet. I am not sure whether the Reed, "Arundo arenaria," the mat grass of Great Britain would answer here; it is used there to prevent the sand of the sea beaches, in some parts of the coast, from encroaching upon the land, by planting it so that the roots form a dense mass and thus prevent its removal; but I think the experiment would be well worth trying here upon a small scale, if some seed could be procured.

I noticed that a good many cheese factories are closed, and the farmers are making butter, having come to the conclusion that cheese at the present price does not pay because scarcely any by product remains, they are looking anxiously to the action to be taken as regards cold storage, quick transit, and proper inspection and are turning their attention to the making of the finest quality, whether at home or in the creamery.

I took a special pains to point out to them the advantages of winter dairying; my remarks were well received, and I have reason to hope will be acted upon in many cases.

Respectfully submitted,

your Obedt Sert.

GEO. MOORE.

CROPS IN BRITISH COLUMBIA.

Grain—Hay—Roots—Fruit.

The following particulars of the crops in British Columbia have been recently received by Dr. Saunders director of Experimental Farm from Mr. Thos. A. Sharpe, Superintendent of the Experimental Farm at Agassiz:

The spring opened well with timely rains, which gave the crops an early start, but the cold wet weather and lack of moisture which prevailed from the middle of May until near the middle of June had the effect of stunting the growth. Since the middle of June the weather has been unusually hot, with an almost entire absence of rain, which has hurried the grain crops along and, in some instances, lessened the yield by a premature ripening.

The hay crop was a very fair one. Clover on the Experimental Farm averaged over two tons of cured hay per acre. Fall wheat was well headed and had made a good stand before the hot weather came, and the yield is very fair. Spring wheat and barley are yielding less than the average, but the oats promise well. Harvesting is proceeding rapidly and will be well advanced by the end of the first week in August. Root crops and potatoes are all suffering from the long continued drought, but turnips promise better than other roots and with timely rains may yet give good crops. Pease promise a fair return and Indian corn is doing well.

Owing to the cold, wet weather which prevailed during the blossoming period, strawberries did not set well and the crop was light with a considerable proportion of imperfect berries. Raspberries and blackberries promised a full crop but owing to the prolonged drought the fruit has been small. Red

and white currants were very plentiful and the size was above the average. Black currants have given a light crop and gooseberries have suffered more than usual from mildew.

The bloom on fruit trees was very heavy, but owing to the cold, wet weather which continued throughout the blossoming period, none of the larger fruits set well. The cherry crop has been below the average, although the sample has been good. The crop of apples, pears and plums will be below the average.

On Vancouver Island the crops are said to be better, also on some of the lower valley lands nearer the ocean; but on the ranges in the interior, although the cattle wintered well, the pastures are now poor owing to the long continued drought. At last reports the air was full of smoke, in the Fraser River Valley, from fires, which are still burning in many parts of that district.

The Dairy.

GENERAL PURPOSE COWS.

Judging cows—Digestion—Constitution—Guernseys—Escheteons, &c.—Poor pastures—Summer and winter food—Pease, linseed, &c.

We all think we know a good cow when we see her; but, in spite of our supposed knowledge of the animal, there are very few good judges of cows to be met with, or else we should not see such extraordinary decisions at our cattle-shows. You know that the desirable qualities of cows vary with the uses they are intended to serve. It would be absurd to look for the points of a shorthorn in a Jersey, or the form of a Devon in an Ayrshire. Each has its own peculiar beauties, and the man who breeds the one is often prejudiced against the other. All breeds are good in their way—one for stall-feeding, another for grazing, a third for milk, and, again, a fourth for butter; and of these several kinds, we must each choose for himself the sort best adapted to the land he occupies and the food he has at hand. It by no means follows, however, as we shall show further on, that because we happen to farm inferior land we must be contented with inferior cattle, for a very small outlay for additional food will make our second class pastures equal, nay superior, to the best grass-lands in the province.

Now, in judging of general purpose cattle, what are the principal points to be determined? And, first, of the cow: if her digestive powers are imperfect, she won't be worth a farthing. The signs of good digestion are the same in all animals: a large stomach, broad hips, deep loin, and well-rounded ribs; the brisket should be moderately deep and broad, to afford play to the lungs and heart. But, here, we may note, that, where food is scanty and much ground has to be gone over to find it, the brisket will be narrower than in the reverse case. Thus, for example, the South-Downs on their native hills are much narrower before than the same race fed within hurdles (folds) on the turnips of Cambridgeshire and Norfolk, and the brisket of the Devon on the wild moors of Bodmin is a very different thing to the brisket of the shorthorns of Underley or Compton (1).

A good constitution is indicated by several unmistakable signs: a "kind" head with bright, calm eyes; fine, lustrous hair, and a pliable but not too thick a skin—a very different sort of handling skin to that of the pure shorthorn.

As you will probably want to fatten your cows for the butcher, when they have done their duty in the dairy, you had better not fall too much in love with the "wedge" form. (2) Some of the delicate little Ayrshires to be seen at our shows in the autumn, are perfect models of this style: I do not counsel you to keep this shape in your eye, when you are starting a herd of general purpose dairy cattle. A visit to any good herd of Guernseys will amply repay you for the trouble of a journey, and an hour's study of two or three of the best cows will, if your memory is good, keep you from making mistakes in buying cows for the rest of your life.

The udder—well, if you have an eye for form, your own taste will guide you in this point. It should be square, broad, well up before and behind, not fleshy, and yet not harsh to the feel. The teats should be equi-distant from each other, and of moderate size.

If you intend to sell milk, the colour of the skin of your cow need not trouble you; many perfectly white-skinned cows are marvellous milkers. But as you probably intend to make butter, it is as well to know that a yellow-skinned cow is, almost invariably, a butter-producer.

Look inside her ear, on the point of the shoulder, on the skin covering the bones at each side of the tail-head; and if these points are yellow, or, preferentially, orange-coloured, the cow under examination will seldom turn out unprofitable to the dairy. We have, as have often stated in this journal, our own ideas as to the best style of cow for the general farmer, and we hope to have an opportunity of "showing" what is meant by this before very long. Escheteons, milk-mirrors, and dished faces, we do not bother you about; colours are utterly unworthy of attention—a white shorthorn, in England, fetches as high a price as a red one, if other things are equal; in the States, a white or light-roan is almost unsaleable; and the black Ayrshire in the Rougemont herd was by no means the worst of the lot. The raving madness for whole-coloured Jerseys, with black tongues, and black switches, to the almost total neglect of other more important points, has done inconceivable injury to the breed. Mind, I am speaking to you as to men who look for profit from the herd, not to amateur farmers, whose desire is more for beauty and uniformity of appearance.

But the pedigree of your stock is worthy of deep attention. Don't imagine that this is a fanciful point. The old milking families of shorthorns still retain their pre-eminence, (3) and we strongly recommend you, wherever it is possible, to find out the milking power of the dam and granddam of every cow.

(1) When we say that the brisket of cattle, on poor land with a great expanse to be gone over before sufficient food can be got to fill the belly, will be narrower, we mean that each succeeding generation will decrease in this point, until what may be termed the normal width is reached.

(2) Please recollect that we are speaking of general purpose not of purely dairy-cows.—Ed.

(3) The first "Duchess" gave 18 pounds of butter a week!

you buy. This, in your case, is "peddler's greed," and only fools, and men bigoted in the ways of their ancestors, deride it.

With the bull, you must exercise the same care before purchasing. He must be thoroughbred of his kind, never on any account bred from your own cross-bred male animals, until at least four generations of heifers have been topped by pure bred bulls, less, however, in the case of Dutch-cows than where beef is the object.

We are curious to see how long it will take, on the ranches of our Western prairies, to bring up the produce of the Montana and Texas cows to the stature and form of the shorthorn, polled-Angus, and Hereford sires employed there. You see, the importance of these pure bred males lies in their power of transmitting the qualities of their ancestors to their descendants, vulgarly called pre-potency. For our part, we will back the shorthorns to exercise the most influence of the three. The Herefords have been carelessly bred until lately, and the polled-Angus, too, was not much looked after until Mr. McComb's time. Yes, it is probable these half-bred shorthorns will show their descent most.

But to return to our subject, what sized cattle should we keep? Most people would tell you that the question is a simple one, that the quality of your land must be your guide. We differ entirely from this response, and we will tell you why: the quality of your land is just what you please to make it. If you have a farm of poor soil and choose to keep it so, you must be satisfied with cattle of an inferior sort, little mis-uses, such as we saw not many miles from Montreal a few days ago, weighing about four hundred pounds apiece. No doubt, the owner of these rats was wise in his generation: he was very poor, and farming, on shares, poor, sandy soil, a most pitiable man, to our mind, though he appeared happy enough. We know, without seeing, what the state of these animals must be from the first of July till the stubbles are ready. Nothing but a few dried up grass-roots to be torn up for food, when once the little flush of grass is over, except a few potato-peelings, and the dish-water of the house (ugh!) when they come home at night to be milked. Decent sized cattle would of course perish from starvation on such keep.

You, if you mean to farm in this fashion, must be contented with the same sort of stock; but we hope better things of you. Common sense will tell you that it is better to employ what means you have in cultivating a moderate number of acres well, than double the quantity badly; and in this country, where food is relatively cheap and dairy produce relatively dear, the best and cheapest way of raising the quality of your land is by feeding your stock as it ought to be fed.

And no great outlay will be necessary for this. Fifty cents-worth a week, per head, during three months, will make your poor pasture equal to very much dearer land, the yield of milk will be enormously greater, and the soil of the whole farm will, in a very few years, be improved to double its original value.

Your cows will of course run the pastures from the usual time of grass, say, the 25th May to July 1st. About the latter date, the grass will, in most years be pretty nearly gone, and on the soil we are speaking of, it hardly ever does much good afterwards; the cows fall away in their milk as well as in their flesh, and become utterly unprofitable. Nothing is so expensive as bringing

back condition when it has once been lost, except bringing back a flow of milk when it has once begun to decrease. Before it comes to this you will do well to try the following mixture.

One bushel of linseed
Two do corn
Two do pease

These are to be all ground up together, made into a thick mash with boiling water, and four pounds to be given to each cow at night when she comes home to be milked. The cost is about seven cents a head.

One bushel of linseed..... 90
Two do corn..... 1.00
Two do pease.... 1.20

—
\$3.10

The five bushels of mixed grain will weight about three hundred and two pounds, which will make it cost as nearly as possible, a cent a pound, a trifle must be allowed for milk's toll. The linseed is high in price, but very cheap in reality. Never tiddle away money in cake when you can get the seed. In spite of all that the pseudo-scientists used to say, oil does make fat, and therefore, butter. Try this mixture for one month, and we do not think you will ever leave it off.

Again, though on account of the uncertainty of our seasons we do not think it would answer to depend entirely on what is commonly called "soiling" for our cattle during the entire summer, still, there should be at all times, after the beginning of July, one or more green-crops ready for the scythe. A piece of vetches, some oats and peas, or "gabourage" as our French-Canadian friends call this mixture, but sown much thicker than in their practice—two bushels of pease and two of oats to the acre are not too many—above all, in the light soil we are speaking of, an acre or two of lucerne near the stables, these, with a piece of clover left after haytime, and a trifle of Hungarian grass, to come in towards the middle of October, will send your cows into winter-quarters in good condition, never troubling themselves, or you either, whether their normal weight be six hundred pounds or one thousand two hundred pounds.

You can't do all this at once; but the sooner you begin to attempt to provide additional food for your cow-stock, the sooner they will begin to pay. For the first few years, the pasture on this light soil will, after June, be nothing more than a promenade for your cattle, but the improvement will soon show itself, and you will find that extra condition of the land will not only produce much more grass, but it will enable, in some mysterious way, that grass to withstand the scorching rays of a Canadian sun.

We shall probably be regarded as a visionary by many who read this article; but if they had seen, as we have seen, the Saturday trains on the Eastern Counties' Railway, in England, bringing up their thousands of big, ripe-bullocks from the sandy soils of Norfolk, Suffolk, Cambridgeshire, and Essex, which, fifty or sixty years ago, produced nothing but rye and long-legged, black-faced, heath-sheep, they would perhaps, think us a prophet rather than a dreamer of dreams. We have persuaded more than one Montreal milk-man to try the mixture of linseed, corn, and pease, and they speak highly of its effects, as indeed, if fairly tried, everybody must, as it is in accordance with practice as well as with theory.

Whatever produce, beef or skin, wool or mutton, milk or suet, you expect to draw from your flocks and herds, you

must first give to them in the shape of food.

Does your cow toss her horns as she leaves the stable? In doing so she expends a certain amount of energy, and that means a certain amount of food; no movement is made without expenditure of food. We must beg you to impress this very firmly on your minds, for if you can ever convince yourself of the truth of the proposition, you won't send your cows a couple of miles to pasture, neither will you let them be driven fast by dogs or boys. Heat, again, you know, is produced by food. If a cow drinks water at 35° F., that water has to be warmed up in the animal's interior until it reaches 90° F., and this warming up is an expenditure of heat, i. e. food. The best temperature for cattle is 60° F., and if the water troughs are kept full, their drink will always be comforting and pleasant to them, their rest will follow immediately after food, and there will be no staring coats on them.

As to feeding in general, the first thing to be observed is that a certain quantity of food is necessary to keep a cow, or any other beast, in a certain state of condition a state in which the animal neither improves nor falls back is stationary, in fact. From the amount of food equal to keeping a cow in this condition you must not expect any milk. Judging from what we see, the idea, here, is, that cows can be kept poor all the winter and give the same amount of milk in spring as if they had been well fed! According to many trust worthy experiments, it requires two thirds of a full ration to keep a cow in fair condition what is commonly termed "food of support" before any milk is yielded; that is to say, two-thirds of the food are expended in keeping the cow alive. Up to that point, all is expenditure, there is no return. What is a cow? As regards dairy-work, a cow is simply a machine for producing milk, just as a steam engine is a machine for producing power and motion if the boiler is supplied with just enough fuel to keep the water at 212° F., no power is gained, as you very well know; the boiler must receive extra fuel to produce extra heat before any work can be done.

Would you keep a boiler going which required 25 p. c., more fuel to get up steam than other boilers? By no means—you would soon make a change. And so with cows. If a cow gives only one thousand two hundred quarts of milk a year, she is not paying you may be sure. A good cow, well fed, should give three thousand quarts a year, that is, she should average ten quarts a day, for 310 days, and the cost of this great yield will be only a trifle more than the cost of the bad cow's yield. You see, now, why we insist so much upon the food "beyond the food of support."

You will observe that we have great confidence in pease, as a food for milch-cows as well as for young animals—in fact for every creature on the farm young or old, fat or lean—in England we used beans, or lentils, according to market price, but the principle involved is the same in all—nitrogen! Pease contain of albuminoids (compounds containing nitrogen) about 24 p. c., oats only 12½ p. c. Our favourite linseed, so scornfully treated by the pseudo-scientist, contains only 20½ p. c., of albuminoids, but 35 p. c., "of digestible fat." (Corn we have very little practical experience of: we prefer buying it to growing it; its chief use in the mixture is to supply the digestible carbohydrates, of which it contains 60 p. c. Now, without bothering you about nutritive

ratios or any deep calculations, we must ask you to believe that from practical experiments carried on by yourself on the one side, and by the Webbs and Jonases (1) on the other, the most prejudiced of men confessed that seven pounds of our mixture (two of linseed to five of pease) with one bushel of turnips, was fully equal in effect to twelve pounds of linseed cake and two bushels of turnips. We here substitute corn for half the pease, but, only as a concession; for in our own practice, we should still use all pease for fattening animals.

Stops will tend to produce milk, but unless dry food is given in abundance with them, the health of the cow will suffer. Brewers' grains is a famous milk food.

Two to three pecks a day is enough for a cow. Malt-dust, or cumulus, the roots trodden off the malt after drying, makes good milk and healthy cows: compare its digestible nutrients with those of bran—20,483; malt dust, 20,439. It contains double the albuminoids, almost as much carbohydrates, and only falls short in fat; and yet people used willingly to pay \$20 a ton for bran, and could hardly be got to draw away the malt-dust for nothing. If you try malt-dust, pour "Lolling" water over it, with a dash of salt in it. Look after the digestion of your cows, if you don't use linseed, that is, for, with it, healthiness will be the rule in your herd.

You need not fear shortening the life and usefulness of your cows by high feeding, if you balance their rations judiciously; but keep their bowels always loose by too much linseed, or always constipated by too many pease, and you will soon find out that, as with human beings, a proper diet is the main source of health.

Ventilation we need no trouble you much with. It would be an insult to suspect any one, now-a-days, of neglecting this matter. One thing we must remind you of: ventilation must not be carried out at the expense of warmth.

We are troubled in our mind about exercise for cow-stock! When the cattle are all in loose-boxes there need be no anxiety on this head, moving about in freedom in the eight feet or so square allotted to each beast is exercise enough. But we can't afford the space yet in our stables for this most desirable plan. Cows must for a long time be tied up by the head from the middle of November to April—four months and a half of strict confinement, poor things—and yet, we cannot bear the idea of turning them out of the stables into the open air, when the temperature is at or below zero of Fahrenheit. Shall we compromise for half an hour out of doors when the sun is shining or the weather pretty mild? The young stock there can be no doubt about plenty of exercise in the open air, and perfect freedom, must be the rule for them.

FEEDING MILCH COWS.

Variety—Pasture—Winter-food—Regularity.

I believe the true way to feed milch cows for profit, and profit is what we are all after, is to feed the proper food for the production of milk, to the full extent of the animals power to digest,

(1) The two leading families of farmers on the borders of Cambridgeshire and Essex, in England.—Ed.

assimilate and manufacture these foods into milk.

To do this most profitably the cow must have the greatest possible variety of foods. Her appetite, her likes and dislikes, should be catered for as much as can be consistently.

In summer, her pasture should contain if possible a variety of grasses, it should also be divided into three parts and each one fed alternately, and when brought to the stable to milk should be fed a little grain or some clover hay, and when the pastures begin to fall, as they generally do about the middle of July, some green food should be given and continued during the remainder of the summer. Tares, peas and oats, second crop of clover, and then green corn sown at different times will be found to about fill the bill with a small ration of ground grain and bran added.

Now as to the winter feed we have ensilage, clover hay, sometimes a little straw and ground feed, composed generally of about 13 each of peas, oats and bran by weight, but with regard to the ground feed, each feeder must calculate for himself which is the cheapest feed to use, and the one best suited to balance his rough fodders and home ground grain.

Chemists and experimentalists have given us very useful tables of analysis of the different foods and fodders in use and their approximate value as food and also as manure (which must in no wise be lost sight of) so each one, by a little calculation, can compound a ration to best suit his individual case.

As to how much to feed I find it difficult to tell, as each cow has her own individual capacity, which must be studied by close observation before the feeder is able to do the best that can be done.

In feeding milk cows the utmost regularity must be observed, not only in time but also in kind and quantity of food given at the same time every day.

The way we generally feed is at 5 o'clock in the morning about 20 pounds of ensilage to each cow with about 5 lbs of mixed ground feed spread on it dry in each cow's manger, my reason for not mixing in bulk is that you have not the same control of the amount of ground feed you give to each cow, and as there are always some of the cows that you do not wish to feed as heavily as the others, so by taking the ground feed in a separate box, you can easily give each one what she will eat up clean and at the same time give a profit for. After that is eaten up we give a small feed of clover hay. At noon, about 20 lbs of mangels per cow, as I believe a small feed of roots acts as an aid to digestion and by so doing is actually worth more for that purpose than for actual feeding value. In the evening we feed same as in the morning, water is always in a trough in front of the cows so as they may drink as they please, we also put salt in a small box in a corner of the stall for them to lick at as they please.

After feeding many different ways we have come to the conclusion that this is the way best suited to us for profit.

JERSEY CATTLE SOLD.

Mr. Reburn's Herd at Ste. Anne's Under the Hammer,

Many prominent breeders from the United States and Canada attended the sale of the Reburn herd of Jersey cattle, which was yesterday offered for

competition by Mr. H. J. Ashman, at the Bay View Farm, Ste. Anne's.

The following were the prices realized for the cattle sold:

Fawson, L. P. Bailey, \$80; May Pogle, P. Stevenson, \$55; Snowdrop, S. R. Bradley, \$55; Lady Anne, Mrs. Jones, \$60; Isle Eva, A. Garth, \$10; Iolite Fawn, Mr. E. Sully, \$75; Pet St. Lambert, H. Masson, \$120; bull calf, C. E. Delorme, \$30; Iolite St. Lambert, Mr. Sargeant, \$55; Rousseu's Iolite, Mr. Sargeant, \$47.50; Hugo's Iolite, A. Garth, \$45; heifer calf, Mr. Savage, \$30; Combina, H. J. Snell, \$48; bull calf, A. Garth, \$40; bull calf, Mr. Anderson, \$47.50; Hugo's Pet, J. Maxwell, \$120; bull calf, E. Sully, \$20; Pearl, Mr. Sargeant, \$47.50; Nora, Mr. Penfield, \$45; Rosalie, Mr. Penfield, \$7.50; Ponceess, A. E. Villeneuve, \$125; Lily White, H. Masson, \$55; Ruby of Ste. Annes, L. Labelle, \$45; Snowdrop, J. P. Dawes, \$45; Joile Lisgar, E. Rafter, \$45; Gypsey Hugo, Mr. R. Pope, \$60; Victor Hugo, A. E. Villeneuve, \$70; Lady Anne, Mr. R. Pope, \$95; heifer calf, three days old, Mrs. Jones, \$30; Joile Juliette, Mr. R. Pope, \$35; Queen Vis, Mr. R. Hope, \$70; Fawson Lady, L. C. Bailey, \$105; Countess, Mr. R. Pope, \$57.50; Combination, young bull, R. A. Mainwaring, \$30; Dora, J. P. Bradley, \$110; Frontenac, C. E. Delorme, \$30; Queen Vic, Ste. Anne's, L. C. Bailey, \$155; heifer calf, Mr. R. Pope, \$60; Victoria, C. E. Delorme, \$50; Dora, E. A. Villeneuve, \$57; heifer calf, L. C. Bailey, \$60; Rubina, Mr. Savage, \$45; Pet's Fawn, Captain J. G. Grant, Philadelphia, \$65; Beauty, Captain, J. G. Grant, \$67.50; Iolite Ruby, Mr. Sully, \$40; heifer calf, Mr. Bradley, \$42.50; bull calf, \$80, Newfoundland Agricultural Society; aged cow, \$47.50, Mrs. Jones, Brockville; yearling bull, \$40, J. Magor; aged cow, \$40, W. Ralph; yearling heifer, \$47.50, W. Ralph; yearling bull, \$40, E. Sheridan; yearling heifer, \$35, J. P. Dawes; cow, \$62.50, J. P. Dawes; cow, \$135, A. E. Villeneuve; cow, \$45, A. Ralph; cow, \$40, S. Bolwell; cow, \$77.50, Newfoundland Agricultural Society; aged cow, \$75, C. A. Caldwell; cow, \$42.50, W. E. Smith; cow, \$90, J. L. Foster; cow, \$200, Geo. Reburn; cow, \$100, A. Ralph; cow, \$60, Mrs. Jones; calf, one week old, \$25, W. Labelle; calf, ten days old, \$42; W. E. Smith; calf, one week old, \$27, Mr. Ball; calf \$35, H. Hogan; calf, 14 days old, \$50, Mr. Freeman; bull calf, \$30, F. Tice; bull calf, \$40, W. Morris; cow, \$100, Mrs. Jones; bull calf, \$45, Mr. Freeman; aged cow, \$30, Mr. Ralph; aged cow, \$40, Mr. Ralph; aged cow, \$38, Mr. J. Grier; bull calf, \$30, Newfoundland Agricultural Society.

Seventy-six lots averaged \$50.50 a head. Twelve or fourteen years ago, some of the same herd were selling at from \$500.00 to \$700.00 a piece!

The Horse.

Canada horses—Uniform Lots—Fest—Hackneys—Blood—Trotters vs. hackneys—Lucerne.

Ste. Therese, Aug. 8th 1896.

DEAR SIR,

I enclose that portion of the summary of the High Commissioner's trade reports with Great Britain (dated 3rd February 1896) which relates to the growth of the horse importation from Canada.

It is amusing to see, that now, that Canadian horses have established a good reputation in England, every

horse imported across the Atlantic is called a Canadian. A point of great importance, mentioned by Mr. Galbraith in the last number of the Journal, and to be attended to most particularly by intending shippers of horses, is to have all the animals of any consignment as near to a uniform type as possible. Buyers of that type then attend a sale in numbers and competition follows. When a consignment of all sorts arrives, no great attraction is opened to any special class of buyer, and competition is slight, and in consequence prices are unsatisfactory.

A propos of the Canadian horses not standing the wear and tear of feet, as well as the Scotch bred horses of the same grade, I would venture to suggest that these so called Canadian horses, are probably American bred horses from the Western States, Ohio, etc, fed of Indian corn, instead of oats, and as soft as butter.

You need not send them to Scotland, to find out how little work they will stand on hard roads, they go to pieces, at once in New-York.

A dealer, once of Montreal not of New-York, told me, a couple of years ago that he had given up buying horses in the Western States, as, although he could get them very cheap, and they were very nice horses to look at, they gave out, in a very short time in the city of New-York.

A Montreal dealer, who shipped some horses to England in the spring, informs me that Canadian horses have made their mark as hunters in England and that many a Canadian hunter, will be sold in England now, as an Irish man.

Let our farmers, more especially those of the Eastern Townships, and north Eastern portion of Province of Quebec, generally, get rid of the idea at once, and for ever, that a nondescript animal without substance, size, or symmetrical shape, even if he can trot a mile at a fabulous rate of speed on a dirt track harnessed to a sulky, is of the slightest use, in producing the sort of harness horse, that is saleable in England.

A few notes on the Hackney of to-day, and his usefulness in contributing to the production of a class of harness horse readily saleable in England may be useful to those who have not any very accurate ideas of his good qualities or his shortcomings.

What the English Hackney of former days was, I shall not attempt to describe, although I can well imagine what he was like.

The English Hackney of to-day is essentially, what one might define as a short harness horse, an animal with which to win prizes at Horse-Shows, or to drive under circumstances where, as our friends across the border, might call it, the exhibition of much solid splendour is required.

He is of course, useful for the keeping up of his own breed, and for crossing with other breeds for the production of harness horses of different grades especially those of high class. He has bone, substance, handsome shape for a carriage horse, great docility united to high courage, and the most attractive high, showy and stylish action possible.

The Hackney of true type should never be over 15.2, with plenty of substance and bone, standing on short legs, with weight considerable in proportion to his size. His head is not a very handsome one, nor does it show a great deal of that kind of quality denominated thoroughbred, but it has a certain

stamp of quality of its own, which is very similar and uniform in all Hackneys. The barrel is very round and rather long, while the neck is rather short, and thick, though with a good bend, the hindquarters, round and smoothly turned, though not very high, but there is never any appearance of an approach to a goose-rump, the shoulders, though well placed, are thick, and the withers low. The legs are generally very straight, neither bowed nor calf kneed, the pasterns moderately sloping, and neither too long nor too short, the feet, inclining to be large, and very well shaped.

Should Dr S. Webb, as announced, send some of his Hackneys to the Exhibition next month, and especially should he send a foan mare called Syrie, by Matchless of Londesborough, our farmers will have an opportunity of seeing what a good looking Hackney is like, and of stereotyping the shape in their minds for future reference, when they are looking for a stallion, to put to a mare, for the purpose of raising a carriage horse.

The Hackney of to-day, is not however by any means, as one might suppose by his name, a good hack, or saddle horse. He may, and often does win prizes at shows, as a Hack, and he may occasionally be used in the Park, but nobody, who knows anything about him, would buy one for that purpose; certainly not for a (1) covert-hack, supposing that, in these days of easy training to the meet, he is wanted for that purpose at all. Most people get there most by a train, or in a trap.

I do not think that anybody who has been accustomed to ride a thoroughbred horse, as a hack, would willingly ride any other kind, for choice, afterwards.

Many people, who ride regularly prefer a half bred one, but my conviction is that if the weight be not too heavy and we can ride at all, that we should go in for blood, instead of bone.

A "blood un" will canter along the road with you, five miles an hour, and you may fancy you are dancing on the waves; while a coarse bred one, will be moving like a ship in distress and making noise enough to wake the parish. A blood one, will do all that you ask him to do, and more, indeed, he will probably down you if you don't sit back. Some readers may say that a thoroughbred horse, as a rule, has no action, that often he has a bad mouth, and that, when fresh he may buck his rider off. There is something in these arguments, especially in the last, that is the real reason why many men do not ride a blood horse—all this by the way, merely to prove, that as we must have an ideal, to work up to, to compare things with, and establish a relation of values, the action of the thoroughbred horse, being the ideal one for a hack, the better bred, and the nearer to the thoroughbred, any horse is, the better hack he will make.

Although nobody wants to canter along the "ard iron road", it is nice to be able to canter over a green strip, by the side of it, if you feel so inclined.

But a hackney does not know how to canter; he has only one accomplishment, that is, to trot, out and on, in the most dashing, fascinating manner possible to look at, but very unpleasant to sit. A useful bit of exercise, perhaps for a gentleman with a liver, but, as a means of pleasurable conveyance on the back of a horse, not to be compared to the slower and lower

(1) A horse, ridden to "the Meet," and there exchanged for the hunter.—Ed.

trot of the thoroughbred or well bred hack.

The Hackney has been a very hardy breed. Is it so now? There has been some controversy, as might be expected, between Hackney breeders and trotting horse men in the States. A sort of competition test for endurance between the two breeds was proposed, but it never came off.

The trotting horse men wanted their trial, on a track, with very light road waggons, while the Hackney men naturally held out for English traps of the ordinary weights, and an ordinary road, and it never came off.

Nothing can be more attractive in general appearance, shape, style of action, than high class English harness horses, whether pure Hackneys, or nearly so, as anyone who has ever seen any of the annual sales; Sir Walter Gilbey's, or other high class harness horse breeders in England.

That the Hackney of to-day, is considered to be softer than he was formerly, is evident from the enormous petition on the part of Irish hunter breeders, not to send Hackney Stallions for the use of the congested districts in Ireland. The great and sole objection being that, by introducing an element of softness into the breed, it would work injury to the Irish hunter, now known for his endurance and stamina. Both the Editor of the Field and many writers in it, in England, apparently well informed, and competent to judge, have completely assented to the reasonableness of the Irish demand in this matter? After all has been said and done, the breeders of the Modern Hackney, have sacrificed almost everything else, to the one great desideratum of incomparable action.

This action however must be well balanced and level all round. It is better that a Hackney should have inferior all-round action, than that he should step faultlessly in front and drag his hind legs behind after him. Breeders of Hackneys attach so much importance to action, as to have somewhat neglected excellence and beauty of conformation. Consequently, in breeding carriage horses, it is often advisable to look to the Hackney Stallion for action alone, and to trust to the mare for conformation.

I am cutting lucerne now for the third time. It is rather short, but very sweet and the horses like it very much. I shall have to give it a rest now for a little while. I have not got quite enough of it; with another acre or two I think I should have enough.

I mean to start a thorn hedge, in October. I shall transplant thorn trees about 3 or 4 feet high, and see how they will do.

C. F. BOUTHILLIER.

A LARGE TEAM FOR FARM WORK.

"Eds. Country Gentleman"—The advantages of large horses on the farm, as recently advocated in your Journal, are so great that I believe they may be profitably emphasized by a second article. I have used large and small horses. By large I mean a horse that will weigh above 1400 pounds in working flesh, and by small one that weighs less than 1100.

It is the man-power on the farm that requires the large outlay, so that any plan by which the time of a man can be made more efficient is in the line of wise management. Foremost among

the provisions in this line I place a strong, fast-walking team. It has been my experience that these qualities cannot be gotten in a satisfactory degree in less than a 1500 pound horse. For the man who is content to plow not more than one and a half acres a day, a team of 1000 pound horses may do. But when one desires to plow six inches or more, and the work to be done makes it necessary to plow two or two and a half acres a day, (1) at least 3000 pounds of horse power are required; and I think it much easier to harness it with two sets than three.

Then, as a rule, the larger team can walk faster—a most important consideration. In so many kinds of farm work the quantity done in a day depends directly on the walking speed of the team. I have no use for the large, clumsy horse; but I can find a type of high-grade Percheron that combines action and size. I do not mean action on a trot; I care very little about that. The farmer cannot make much money on the road, and has not much time for pleasure driving. If he has much driving to do, I think it well to keep a horse specially for the purpose.

I know it is often said that a heavy team is needed for plowing, but that a lighter one can do the cultivating. We find that in harrowing and rolling, as well as plowing, the work accomplished is in proportion to the size of the team. We find that a heavy team will run a six-foot cut mower, a binder, draw a hay-loader behind a wagon, and do many other things without overtaxing them, that our lighter team cannot do.

I cannot say that the heavier horses will not require more feed. We find they do. I believe it a principle in feeding that animals require quantities in proportion to their weights. But this varies greatly, owing to peculiarities of animals, so that some large horses may require no more than some small ones. But I would never urge the adoption of large horses on the expectation that more power is to be gained from the same feed. I urge it rather on the ground that the greater power now needed in farm work is more conveniently handled in two than in three horses.

H. P. MILLER.

"Delaware County." O.

Notes by the Way.

WEEDS.—Harrowing for the destruction of weeds soon after a crop is a hoarse ground is not a bad practice if carried out with judgment. It all depends upon the crop sown and the depth at which it is sown. Barley we should not care to harrow at any time, as it is very tender in the blade, but wheat will stand a good deal of hard usage, particularly if sown at the depth we recommend, namely from 2½ to 3½ inches, so as to allow both the coronal and germinal sets of roots to take a firm hold of the soil. Fall-wheat, in our English practice, is almost invariably harrowed in early spring, and the crop is greatly improved by the operation, as the tillering sets to work at once. The Sorel folk were wonderfully shocked when they saw some of our friends harrowing wheat then some three inches high;

(1) Will any one say that 2½ acres of land can be "ploughed" by a pair of horses in a day? One acre and a-fourth is quite enough for any thing but skinning.—Ed.

but the piece won the first prize that year, in spite of the harrowing. Light harrows are the best for the job, on spring sown crops, as all ours are here. Oats, like wheat, may be treated in the same way, not as the practice of Mr. Safford, mentioned in the subjoined extract, seems to be, "with a four-horse drag, but with the ordinary harrow used after the drill.

HARROWING CROP WEEDS.—Mr. Safford, of Kelso, N. D., whose experience of harrowing over recently sown grain crops is referred to on page 209 of the November issue of "The N.—W. Farmer," has since made further explanations of his methods as follows: I usually harrow wheat, barley and oats three times. The first time, if the ground is not too wet, just as the grain is coming up, then I like intervals between, of about one week each, but if the harrow would cover too much grain and hold it down and kill too much I wait for it to get a larger growth. The early harrowing seems to kill more weeds and helps the grain more than the later tillage. My wheat this year, in twelve inch rows, was harrowed first with a common four horse drag with upright teeth, when the grain was coming up. As the ground was very soft, having been disced just before seeding, I did not dare to use the same harrow later, but harrowed between the rows twice with slanting teeth. I think it was harrowed too early the second time and too much wheat was covered and killed, but the crop, about 35 bushels per acre, was quite satisfactory.

FEEDING CATTLE.—How many kinds of grasses, clovers, etc., Dr. Daubeny found in one square yard of old pasture we forget, but the number of them in old grass, in England, is very great, and this variety is one reason why cattle do so much better on really good pasture than on any artificial food given in the house. And so we may learn that, however true theoretically the idea of a "balanced ration" may be a varied ration is even more desirable. Says the Rural New-Yorker on this subject:

A "balanced ration," when composed continuously of the same kinds of food, is not so appetizing as when the foods are changed in character, preserving at the same time the proper balance. For some unexplained reason, animals, as well as man, like a change of food, although the constituents of the food or the ration may be virtually the same as those used before. I suppose that this desire for change is due to physiological laws, and is founded upon the aromas or peculiar tastes which the foods have. After the salivary glands and digestive organs have become accustomed to any particular volatile oils or flavors they become, as it were, immune, hence stimulation is diminished. Now if a change of food, preserving the balance, can be introduced, we get a new kind and quality of volatile oils or flavors. These rouse the stomach to better action, hence there is no doubt that a change of food other things being equal and the change not being too radical, is beneficial.

THE BREWERS' EXHIBITION (England).—The annual exhibition of barley at this show was very excellent. The number of entries this year was 151, 42 of which were of foreign grain. The Champion-prize was awarded to a sample of Bohemian barley, it

being the finest bushel of malting barley exhibited in any class. Gloucestershire, Herefordshire, and, strange to say, Norfolk, were very successful in the cider-classes, but Devon was not by any means prominent. Norfolk has never been a cider-country, but men of science have of late been studying the art of cider-making, and have discovered that the proper management of the fermentation is of far greater importance than the quality of the land in which the apples grow. Mr. John Watkins, of Hereford; Harper and Sons of Stroud, Gloucestershire; and Crymer and Son, of Attleborough, Norfolk, have produced a thoroughly palatable drink, which has no ill effects, and of which the medicinal qualities are very considerable.

CONSUMPTION OF MEAT IN ENGLAND.—Not many months ago, a statement was made, at a public meeting, that the labouring man in Great Britain hardly ever ate meat more than once a week. This must be a mistake, as we shall endeavour to show.

In 1891, the population of England and Scotland was, in round numbers, 31, 000,000, and the consumption of meat was 3,255, 000,000, or 105 pounds a head. Now, the quantity of meat consumed in a family of the wealthier class is, on an average, half a pound a day per head, including men, women, children and servants. In such a household then will be a good deal of waste; meat for soups, will be largely used, and the men-servants are not economical feeders. One hundred and five pounds a year is equal to 4½ ounces a day, the quantity of meat remaining for the labourer, operative, etc., after all said and done, i. e., half of the quantity consumed by each head in a wealthy family, no deduction made for infants and paupers, who number at least 3,000,000 souls, or rather, bodies.

CORNSTALKS.—In the States, and in some parts of Canada, a machine has been in use of late that takes in the whole stalk of the corn, ears and all; threshes out the grain, and smashes the stalk all to ribbons, after which operation the grain is sifted out, and the shredded stalk, mixed with straw in alternate layers, is piled away in the barn.

SHREDDING CORN.—J. S. D., p. 594, asks as to the best methods of using corn stover. In view of the fact that I have used a shredder for corn to feed brood mares and colts, I will tell him my experience. The machine I used was manufactured by the St. Albans (Vt.) Foundry Co., with one of their internal double-geared two-horse powers, and has given me splendid satisfaction. We cut our corn when it was almost ripe, just as the kernel begins to dent, and began using it at once. After we were through with the work on the farm, the corn was hauled from the field and ricked just outside the barns, the carrier from the shredder through a small doorway deposited the shredded stover into a feed room, thus economizing labor. Our horsepower, while not giving as many revolutions a minute for the best work to be done by a shredder, still enabled us to cut enough fodder in two hours to last us easily for five or six days. It was shredded in splendid condition and the horses ate it eagerly, leaving the best hay for it. We think from our experience last winter that it would be better to leave the stalks in the

field until they are needed, as the work then comes on in the time when the hands are not employed, and two men can easily haul and shred enough in one day to last a month. Some little of the rick spoiled, as it was not very well made, but with hay at \$20 a ton, what we fed was an enormous saving. We think that in the future the people in the South will save all the corn instead of pulling the fodder and breaking off the ears. "Country Gentlemen."

STABLES.—Mr. W. Morris, Sherbrooke, writes word that he is anxious to know how to build a "stable and carriage-house for 4 or 5 horses." We have unfortunately, no sketches of anything of the sort, but perhaps some one of our readers who has built stables of late would be good enough to send us the plan of such an erection.

Mr. LOUIS SIMPSON, General Manager of the Valleyfield Mills, desiring to set about growing lucerne, wishes to know how to prepare the land for the crop, how much seed to sow, and the quantity of seed required for an acre, or for an arpent, the measure used in this part of the province.

There is nothing simpler than growing lucerne, if the land suits the plant. To begin with, the existence of water near the surface is fatal to all hopes of success: lucerne hates to have its feet wet; shade it abominates; a free circulation of air and a deep loamy soil, not heavy, are its favourite feeding ground.

Preparation of the land for lucerne is just the same as for any other seeds: after a well manured, well cultivated crop of roots or potatoes, an autumn furrow, cross-ploughing or twice grubbing in the spring, with plenty of harrowing, and rolling if cloudy, will make the land in perfect order for a crop of barley, with which you may sow your lucerne seed at the rate of 18 pounds to the arpent, if the seed can be thoroughly depended upon, if not, 20 or even 25 pounds should be sown, as we are convinced that many of the failures of lucerne we hear of are attributable to the use of inferior seed. The sowing should be invariably done broadcast, as, although in cheap labour countries lucerne is frequently drilled and hoed, labour is too dear and too unskilled, as a rule, here, to allow of such treatment. The seed should be covered in with the light harrows, unless you are fortunate enough to have a set of chain-harrows; these do the work better than any implement. A rolling completes the job.

Do not be persuaded to mix the barley crop. Many people fancy seeds of the clover, etc., do better sown alone, but we have seen so many successful crops of lucerne grown with a "nurse-crop" as it is commonly called, without one failure, that we see no reason why the profit of the grain-crop should be thrown away. The frequent failures of red-clover are due not to the nurse-crop absorbing the moisture to the detriment of the clover, but to the too frequent repetition of the clover-plant on the same land.

The after treatment of lucerne is as follows. After the grain-crop is carried, a good dressing of farmyard manure should be applied: how much, do you ask? As much as can be spared, never forgetting that a crop that can be mown for green meat at least three times in the season is worth a few loads of dung.

The following spring, as soon as the land is dry, harrow the lucerne with the

chain-harrows or the bush-harrow, and roll it a few days afterward. Keep sheep off lucerne, for they nibble the very heart out of it, and cattle will probably give you a great deal of trouble if they are allowed to graze it, as nothing "blows" stock more rapidly than lucerne with the dew on it: therefore, keep it for mowing. Begin to cut lucerne whenever you want it for food: it should be ready about the 12th of May, and the second cut will come in by the 20th of June or so, depending upon the weather.

When the autumn is near its close, say about the middle of October, take the medium harrows and pass them over the lucerne-field along and across. Don't be afraid of pulling the plants up; they are well rooted by this time; roots grow downwards, in length and in bulk, in proportion to the growth of the stem, etc., above ground, and this is the reason why, as has often been observed in England, red-clover mown twice for hay, gives a better crop of wheat after it than if fed off by sheep.

Before the third winter, after the last mowing, harrow the lucerne till the land looks like a fallow and then top-dress it with rotten dung. There is no fear of the pulling the plants about doing them any damage. If the land is suitable, the roots by this time are some three or four feet down below the surface, and out of danger, and the crown is a mass of close-set-shoots that will stand anything; indeed, we consider the lucerne-plant, after the first season, to be the sturdiest, ruggedest (as our E. Townships' friends would say) plant that the farmer grows.

When the lucerne from the first field shows signs of exhaustion, you will, we are sure, have prepared another piece to succeed it; for, no man who has once been successful with this crop; that is, no man who has ever sown it properly on suitable soil and treated it well afterwards; no man, we say, has ever given up growing it.

THE HOT WEEK!

Temperature, by our own thermometer, in the shade—Lincoln Avenue, Montreal—at 3.30 P.M.

August—	
Thursday, 6th.....	88o
Friday, 7th.....	88o
Saturday, 8th.....	88o
Sunday, 9th.....	89o
Monday, 10th.....	92o
Tuesday, 11th.....	94o
Wednesday, 12th.....	92o
Tuesday and Wednesday, at 4 A.M.,	78o and 73o.

TRADE WITH GREAT-BRITAIN.

Grain, pulse, &c.—Hogs—Packers—dairy-goods—Poultry—Fruit—Horses.

The High-Commissioner's Report—hints about the grain, cattle, horse, and meat-trade.

Canadians advised to send split peas, split lentils, pearl-and pot-barley. The making of oatmeal has greatly improved lately. One mill in Scotland makes over three tons of pot barley a day: why should not Canada have a larger share in this business? The imports of Canada barleys have ceased.

The imports from Canada of cattle etc., in the years '93, '94, '95, were as follows:

	1893	1894	1895
Oxen and bulls	81,232	80,450	95,747
Cows.....	1,690	1,868	234
Calves.....	3	5	12
Sheep.....	3,589	135,622	214,310
The values were:			
	1893	1894	1895
Oxen and bulls	£1,436,479	1,315,779	1,589,934
Cows.....	1,144	4,411	511
Calves.....	13	13	32
Sheep.....	6,782	236,103	387,181

The SHEEP in '93, it will be noticed fetched nearly \$10.00 a piece; in '95, they sold for about 30 cents a head less. Mark the immense increase in number. As we are writing, a flock of lambs is just passing down Guy street; most of them uncastrated males. If these go to England they will not sell well, as no first-rate butcher there will buy ram-lambs. No wonder Canada sheep are low in price if this is still the farmers' practice.

BACON sent to Britain is still too fat. "Canadian bacon—Wiltshire—cut-enters into competition with Irish and Danish, but at a lower range of prices." Still, it is satisfactory to know that it has "quite driven the American Wiltshire cut bacon out of the market", and no wonder, for Canada bacon has, generally speaking been largely made from pease-fed hogs.

The reasons of the inferiority of the Canada Wiltshire cut in price to the Danish and Irish are:

"That the Canadian farmers will continue making their hogs too fat, while the trade prefer, and are always willing to pay a premium for, lean bacon, and have to be tempted by a lower price to buy the fat bacon.

"American packers make their fat hogs into other cuts, and the best of these are exported to the English market: at price that preclude the Canadian packers from competing with them, because the price of hogs is generally higher in Canada than it is in the States, and also because the hogs in the latter country yield 14 per cent. of lard compared to only 6 or 7 per cent. in the former, and this makes the shrinkage between live and dead weight tell heavily in favor of the American hog, and in these heavy cuts the superior quality of the Canadian meat does not command the relatively higher price as it does in the Wiltshire-cut.

"The second reason is that the public taste is for mild cured bacon, and it seems to be impossible during many months of the year to lay down Canadian bacon in the English markets, cured as lightly as either Irish or Danish bacon, on account of the nearness of the latter countries, and the great distance of the former, from the place of killing to the consuming point."

Messrs. Bamford Brothers, of Liverpool, also writes a very satisfactory letter:

"We are in receipt of your circular letter re Canadian produce and on reply, beg to state that we handle a considerable quantity of Canadian bacon and hams. Our experience is, that a great improvement has taken place in the cut, cure and quality of the meat during the past twelve months.

"It is very desirable that every effort should be made to keep the quality up to a high standard.

"Regularity in packing is very important, viz:—to have lean meat packed by itself and distinct from stout stuff. By doing so packers get the fullest returns for their shipments, and if they exercise ordinary care in selecting, curing and packing, we look for the trade making considerable headway."

Messrs. William Tittle and Sons, of Bristol write:—
"Bacon. We have had a large quantity of sides and hams this season, and it is a trade that will grow, as the quality generally has been very good, and the meat is leaner than that cured in the States.

Corn, and other soft food, does very well for pigs on clover and slops, but to finish off a hog as he should be, pease, for the last month, should be the sole feed, if the English market is to be the sale place.

For CHEESE, the market of 1895 opened with very low prices. The summer make of Canada cheese was not approved by the British consumer, consequently stocks accumulated, and the demand never came up to the supply. There was a great quantity of cold storage cheese, which did not keep nearly so well as in previous years. The fall cheese was better in quality, as, of course, it always is.

The great danger to Canada in regard to cheese is "the magnificent quality of the cheese now arriving from New-Zealand."

BUTTER, in '95, was very low in price. "Corcks" were quoted at 65s. the 112 lbs., the lowest ever known. An unreasonably large quantity arrived from Australasia and the Argentine, so much so that a glut occurred, and the losses on this article were so great that the experience of '95 will probably work its own cure, and shippers will find out that goods cannot be shipped right across the world, refrigerated, and bear heavy charges, without entailing serious losses.

Canada butter, all the dealers seem to agree, is growingly appreciated in England. "But, says one of them," and Argentine men are reckless opponents, likely, at any time, owing to the position of the gold premium, to flood the English market and so cause heavy losses. Shipments from Canada should be regulated by the daily cable advices, and small, regular consignments will be the wisest plan. Great care must be taken in salting and in removing the moisture from the butter, as well as in packing it. "But shippers of Canada butter are living in a fools' paradise, if they think they can jump largely into the English trade. Bear in mind that the competition is growing from all parts of the world and act with caution.

POULTRY AND EGGS are increasing in demand, but only a few isolated shipments of the former arrive about Christmas, with proper refrigerating accommodation on steamers a great development of this trade may be expected. There is plenty of cold storage in the leading markets of Britain.

EGGS, from Canada, as they become better known, will probably be in greater demand. The total imports into Britain of this article last year amounted in value to upward of twenty million dollars.

APPLES of course paid the exporter fairly well in 1895. The fruit was, in general, in good order when it arrived and "there was an absence of that reguish packing called, in the trade, "deaconing."

The following figures give some idea of the growth of the "horse" importation from Canada; the observations that succeed are from the pen of Mr. Hunting, J. R. V. S.:

	1893	1894	1895
Stallions.....	12	40	12
Mares.....	354	1,095	3,927
Geldings.....	1,449	4,289	8,969
The values were:	1893	1894	1895
Stallions.....	£ 480	1,490	500
Mares.....	13,086	37,429	107,657
Geldings.....	58,488	142,160	261,100

Mr. Hunting, J. R. V. S., one of the most eminent authorities on this subject, is quoted in the report as follows.

"The horses imported from Canada continue to give great satisfaction to purchasers. They possess good limbs and sound constitutions, and stand the test of hard work.

"The most useful and saleable class is the "light vanner," suitable for work in omnibusses and mineral water vans.

"Persons acquainted with the English market and the value of horses here, may be able to buy in Canada cheap horses and sell in England at a profit. Other persons venturing to send horses, should avoid the lower priced horse and consign only what are readily saleable. The nearer all the animals of any consignment are to a uniform type the better. Buyers of that type then attend a sale in numbers, and competition follows. When a consignment of "all sorts" arrives, no great attraction is open to any special class of buyer, and competition is slight. Whether a consignment consist of "vanners," "cabbars," or heavy-draught horses, it should be limited to the one class, so as to offer the greatest attraction to buyers.

"During the past year many good horses have come from Canada in addition to the "light vanner." A smaller horse, suitable for cab-work, has given great satisfaction after trial, and will find a good market here again in the spring. March and April are the best months for their arrival in London, but few are wanted after the end of May. The horse should not be more than 15.2 in height, short-legged, with courage and a sharp, active style of moving.

"I have always thought that the heavy waggon horse, suitable for town drays, and coal waggons could not be supplied from Canada to compete with our Shire and Clydesdale horses. This opinion I am inclined to modify in view of some of the big horses sold in London during the last year. If a profit can be obtained on Canadian horses which sell here by auction at from £40 to £50, there is a market. This price is, however, not obtainable for the narrow, long-legged animals, which have predominated amongst the heavier class imported. Such horses have been sold for £30 or less, and even then are not easily sold. This draught horse should stand 17 hands high, have good feet, and short legs. The nearer he approaches 18 cwt. in weight, the greater the chance of his being profitable to the importer.

"Now that Canadian horses have established a good reputation for themselves in Britain, every horse imported across the Atlantic is called "Canadian." It is very important that this reputation should not be injured by any unwarranted accusation against the health and stamina of the animal. Twice during the past year glanders have been discovered in imported and so-called "Canadian" horses. In both instances inquiry has resulted in tracing the disease to horses bought at Chicago. This is a subject for the consideration of the authorities, and suggests the advisability of careful inspection at the port of embarkation.

The Poultry-Yard.

How to manage the laying stock—So that they will moult early—How to feed so as to bring on early moulting—Some points to study.

The month of September should see the laying stock well over their moult and how such a desirable result

can be obtained has been partly explained in a previous number of this paper.

As the older stock begin to moult, egg production to a very great extent ceases, and eggs, that is, new laid eggs become scarce and dear. At this time the eggs packed away begin to be unloaded and they continue to be placed on the market all during the period of high prices. It is often a question I am asked, "How can eggs be best preserved?" and I reply that the aim of the farmer should be to obtain a supply of new laid eggs all the year round, if possible. I know it is the general practice to put away large quantities of eggs during the season of low prices to be sold when prices are higher. Indeed, to advocate a different course of procedure is very like attempting a revolution in an important department of trade. Nevertheless, my advice to the farmer is to allow the dealers and speculators to collect the eggs at time of low prices and put them away in large quantities. If the farmer will only put the new laid eggs on the early fall and

want from among the sitting varieties. These will be early sitters and will give him early chickens. These chickens will give him early cockerels for market and pullets which will make him "early layers." The latter will begin to lay when the older hens begin to moult and so a supply of new laid eggs will come just when they are beginning to fetch a paying figure.

SUMMER MANAGEMENT OF LAYING STOCK.

The brooding hens which are not required for sitters can be broken up and will soon become layers and will continue to lay, until July, when egg production will perceptibly slacken. Now is the time to allow the hens a run in the fields and at the beginning of August feed cut bone or meat in liberal quantities, if insect life is anyway scarce, and give a warm mash fed in a crumbly state three times a week. Feed grain for last feed and at such times as mash is not fed. Be careful not to overfeed or to get the layers too fat. In response to

brooders as the market gardeners use hotbeds to produce their early market stuff, to bring them the gilt edge prices of the early season.

And I would certainly advise the farmer or poultry raiser to keep the male bird or birds, to be mated in the spring with the best hens, separate from the stock being stimulated to lay. It has been said before and the statement will bear repetition that the male birds should be kept away from the laying stock. The stimulating diet fed to the hens will make him so fat that he will be ruined as a breeder. And the male bird should be kept away from the moulting hens. But of this more may be said again.

STUDY THIS OUT

What the farmer requires to do now is to weed out all hens over two years of age and get the remainder over their moult as quickly as possible. A little care and any extra expense now, will be amply repaid by an egg yield when prices are high.

Science.

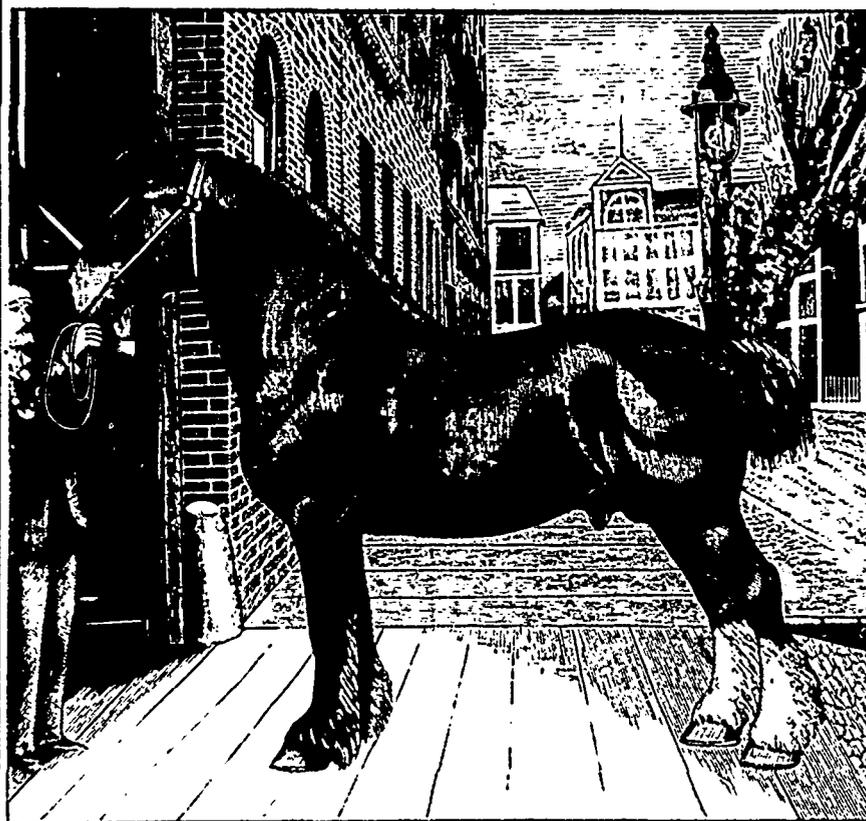
HUMUS IN THE SOIL.

(By Prof. Shutt, Exp. Farm, Ottawa)

Prairie soils—Whence derived—How plants feed—Nitrates—Beneficial action.

The amount of decaying vegetable matter present in a soil has of late years been shown to be indicative of the degree of the soil's productiveness; providing the climatic conditions are favourable to plant development, a soil rich in this constituent is sure to be fertile. With very few exceptions, virgin soils of great fertility, containing (as shown by field and laboratory experiments) ample stores of available nitrogen, phosphoric acid and potash, are rich in humus. This fact is particularly noticeable in our prairie soils of Manitoba and the North West Territories and in the alluvial soils of the river valleys of the British Columbian coast. These are soils capable of giving large yields, and analysis shows their high percentage in vegetable matter accompanied by liberal amounts of readily available potash and phosphoric acid.

A careful consideration of this question reveals why this decomposing organic matter should act beneficially, both chemically and physically, in soils. First, as to its origin, and hence its composition. It has been derived, as a rule, from the partial decay of many generations of plants, under circumstances which assisted in preserving from waste those elements once derived by growing vegetation from the air and soil. Plants can only absorb or assimilate their food from gaseous or water-soluble forms, it follows, therefore, that those elements which have once been collected and, as it were, digested, by plants, and now present in their remains, are in a condition extremely valuable for crop use. We are fully aware that the soil's store of the mineral constituents, phosphoric acid and potash, is not all available for plant growth. By atmospheric agencies, extremely slow in their action, and by the exudations of rootlets is this store rendered assimilable. It is food of this soluble character that results from the decomposition of vegetable matter, and thus from a chemical standpoint is explain-



The Sweepstakes Clydesdale Stallion, The Royal Standard [2221] (imp.).

The property of Messrs. Graham Bros., Claremont, Ont.

winter market he will always obtain a good price and at any time the new laid article will command a higher price, for eating, than the preserved article, which is principally used for cooking purposes.

TWO IMPORTANT QUESTIONS.

And now come the questions "What is the cause of the scarcity of new laid eggs in Fall?" and "What the remedy for the scarcity?" To answer those questions properly I should have to cover more ground than space will permit in a single article so I will attempt to briefly explain. "That hens of proper age moult during the Fall months and while moulting egg production to a great extent ceases. Again a great many of the farmers hens become broody during the hot months and hatch out broods of young chicks. To a certain extent this curtails the output of the new article. The remedy is to be found in the farmer keeping no layers over two years of age and so managing as to make them lay during the period of high prices viz. the winter season. By so doing he will find on the approach of warm weather all the sitters he will

this treatment the farmer will find his layers shed their old feathers and get their new ones and be ready to begin laying again for the high priced months of the fall and winter. Some one may say, "but the hens will be idle during two, or three months viz. part of July, all August and September and part of October?" and what if they are? If they have laid from October of the previous year steadily and hatched out your early chicks, surely they are entitled to a rest and we try to so manage that the rest is given during the moulting period and during the months eggs are at their lowest value. A little study of the subject will make the course of procedure clear to the intelligent and enterprising farmer.

INCUBATORS AND BROODERS.

Of course, where an incubator and brooder are used, all that will be wanted will be early fertile eggs to have early chickens. And it is only a matter of time when farmers and poultry breeders, especially those in the neighborhood of Montreal and other large cities, will use incubators and

ed how humus furnishes to advantage food for crops, its potash and phosphoric acid being much more available than those present in the soil through the disintegration of the originating rock materials. But the chief constituent of value in this organic matter is nitrogen, a high percentage of which always betokens a good soil. Indeed we may say that vegetable organic matter and nitrogen are concomitants, increasing and decreasing together. This nitrogen before it can be of service to plants must first be converted into nitrates, a combination effected through the agency of certain micro-organisms in the soil under favourable conditions of tilth and climate.

The beneficial action of humus in soils, from a chemical aspect, may then be summarized as follows:—

1. It furnishes in the products of its decomposition, (a) available mineral food derived originally from the inert rock material of the soil and (b) nitrogen in a form without difficulty converted into nitrates—compounds readily taken up by plants. In other words, an application of vegetable organic matter means that a considerable quantity of previously unavailable plant food is presented thereby in a condition already digested and easily assimilated by farm crops.

2. Its decay in the soil sets free, among other products, carbonic acid. This dissolving in the soil water, acts as a solvent upon the locked-up stores of phosphoric acid and potash, thereby rendering them of use to farm crops, increasing the yield.

Upon a future occasion we shall consider the mechanical benefits that humus confers upon a soil, and the sources from which a farmer may draw in order to enrich his soil in this valuable constituent.

(To be continued)

ROTHAMSTED EXPERIMENTS.

(Continued)

Figs—Varied foods—Maize-meal—40 per cent of the fat is from the carbohydrates—General results—Weiske's experiments—Recalculation of results.

Here, then, the calculations afford no evidence that fat must have been produced from carbohydrates. But, as already explained, the mode of estimate adopted assumes the whole of the ready-formed fat in the food to have been stored up, and the whole of the carbon of the nitrogenous substance, beyond that in the animal increase and in the urea formed, to have been utilized for fat formation. Neither of these assumptions is, however admissible; and it will be seen further on, when due correction is made in regard to these points, that even in this experiment, with so abnormally high a proportion of nitrogenous substance in the food, it is pretty certain that some of the produced fat must have had its source in the carbohydrates.

In experiment 2 the food consisted of bean meal, lentil meal, bran, and maize meal, each given separately, and ad libitum; and in experiment 3, of an equal mixture of bean meal and lentil meal, also given ad libitum. It is seen that in both cases the proportion of crude non-nitrogenous to 1 of crude nitrogenous substance in the food was even lower than in experiment 1, being in experiment 2, 3.3, and in experiment

3 only 2, against 3.6 in experiment 1. Here again, as might be expected, with so high a proportion of nitrogenous substance in the food, the calculations show that there was more than sufficient carbon available from the nitrogenous substance of the food for the formation of all the fat that was estimated to be produced.

Experiments 4 and 5 show a very different result. In experiment 4 the food consisted of maize meal alone, and in experiment 5 of barley meal alone, in each case given ad libitum. In America, especially, maize meal is largely used for the fattening of pigs, almost, if not quite, alone, and in our own country barley meal is undoubtedly recognized as the most appropriate fattening food of the animal. It is seen that in experiment 4 with maize meal, the proportion of crude nonnitrogenous to 1 of nitrogenous substance in the food was 0.6, and in experiment 5 with barley meal, it was 0, or, in both cases very nearly that which is recognized

fat must have been derived from other constituents of the food.

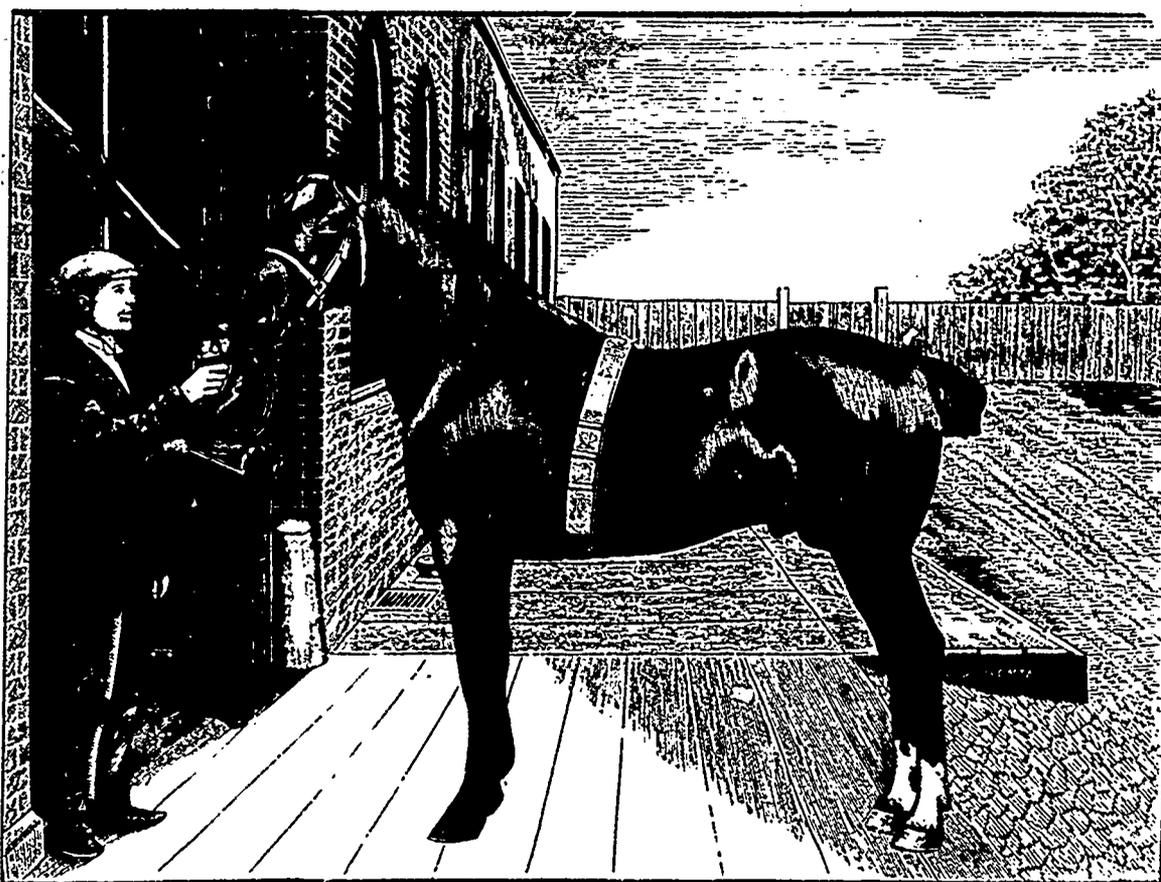
In other words, even on this mode of calculation, nearly 40 per cent of the newly-formed fat must have had its source in the carbohydrates. We shall see further on that even a considerably larger proportion still must, in reality, have been so derived.

The peculiarity of the experiments 6, 7, 8, and 9 was that the food contained less ready-formed fat than in any of the other cases, and that a large proportion of the nonnitrogenous substance supplied was in the form either of pure starch, pure sugar, or both. In experiments 6, 7, and 8 a fixed quantity of lentil meal and bran, averaging 3 pounds 3 ounces of lentil meal and 9 ounces of bran, was given per head per day; and, in addition, in experiment 6, sugar ad libitum; in experiment 8, sugar and starch, each separately ad libitum. Lastly, in experiment 9, lentil meal, bran, sugar, and starch, were each given

The indication is, therefore, that, in each case, a considerable proportion of the produced fat must have had its source in other than the nitrogenous constituents of the food.

The bottom division of the table shows that, reckoned for 100 carbon in the estimated newly-formed fat, in the first case 18.0, in the second 18.8, in the third 25.2, and in the fourth 14.1 per cent, or, on the average, about 10 per cent of the whole must have been derived from other sources—in fact, from the carbohydrates. Nor can there be any doubt that the figures underestimate the proportion of the produced fat which could not have had its source in the albuminoids of the food.

The general result of the whole series of experiments is, then, that when the food of the fattening animal contains an abnormally high amount and proportion of nitrogenous substance, enough of it will probably be available for the possible formation of all the fat produced in the body; but that when the



The Champion Imported Hackney Stallion, Royal Standard (3918).

The property of Messrs. Graham Bros., Claremont, Ont.

as appropriate in the fattening food of the animal.

Accordingly, the calculations show much less nitrogenous substance consumed for the production of 100 increase in live weight, and much less left available for fat formation after deducting the amount estimated to be stored up in the increase. Then, as to the fat, the animals were undoubtedly much fatter than the analyzed "fat" pig. Deducting the amounts of fat supplied in the food from that in the increase, there remained in the one case 52.7 and in the other 58.8 parts formed within the body, requiring in the first case 40.6 and in the second 45.3 of carbon; while the amounts of carbon estimated to be available from the nitrogenous substance of the food were only 24.7 and 27.4 parts, leaving in the one case 15.9 and in the other 17.9 parts to be provided from other constituents of the food. Or, if the calculations are made for 100 carbon in the estimated newly-formed fat, the figures show that in one case 39.2 and in the other 39.5 per cent of the total carbon of the produced

separately and ad libitum. It will be seen that the proportion of crude nonnitrogenous to 1 of crude nitrogenous substance was 4.1 in experiments 6 and 7, 4.7 in experiment 8, and only 3.9 in experiment 9; that is, the food contained a higher proportion of nonnitrogenous substance than in experiments 1, 2, and 3, but considerably lower than in experiments 4 and 5. Accordingly the final result of the calculations is intermediate between that for the other two series.

To go a little into detail, it is seen that, for 100 increase in live weight, the amount of nitrogenous substance estimated to be available for fat formation was, in this series, intermediate between that in the other two. With much less fatty matter supplied in the food, the amount of fat estimated to be newly formed was about the same as in the other cases. The amount of carbon estimated to be available for fat formation from the nitrogenous substance of the food was, in each case, notably less than the amount required for the production of the newly-formed fat.

amount and proportion of such substances in the food are only normal, or low, there will remain a large proportion of the produced fat which could not have had its source in the proteids, and must have been derived from the carbohydrates.

Referring to our results and conclusions as given above, Professor Sit, in a paper which he published in 1869, (1) admits that in the experiments in (1) Ztschr. Biol., 5 (1869).

which there was only a medium albuminoid supply in the food, there was, as the figures stand, a considerable deficiency for the formation of the fat produced, and a still greater deficiency when the relation of the nitrogenous to the nonnitrogenous constituents was lower still, and hence it would appear that in these instances a considerable amount of fat had been derived from the carbohydrates. Still, he says he can not allow himself to consider that a transformation of carbohydrates into fat is proved thereby. He says he has not been able to get a clear view of the experiments from the figures recorded,

and suggests several possible sources of error. He proposed that new experiments with geese and with pigs should be made, and in a subsequent conversation I had with him he expressed his willingness to undertake a conclusive experiment with pigs.

Weiske and Wildt (1) did undertake (1) *Ztschr. Biol.*, 10 (1874)

an investigation with pigs to determine the point. But one animal was fed on food so rich in nitrogen that it suffered in health, and the experiment had to be discontinued; and the other on food so poor that it fattened extremely slowly; and hence, at the conclusion, calculation showed that there was enough of the consumed nitrogenous matter available for fat formation to cover the whole of the fat which had been produced.

Prof. Emil von Wolff in his work on titled "Die rationelle Fütterung der landwirthschaftlichen Nutzthiere auf Grundlage der neueren Thierphysiologischen Forschungen," published in 1874, assumed that albumin was probably the exclusive source of the fat of the fattening Herbivora of the farm. But he made the reservation that the amounts of increase produced in relation to constituents consumed, which common observation showed may be obtained with pigs, and still more the results recorded of some direct experiments with those animals (presumably our own), are almost incomprehensible without assuming the direct concurrence of the carbohydrates in the formation of the fat. Nevertheless, he considered that such evidence was inconclusive, and that experiments with pigs should be made in a respiration apparatus to settle the question.

After the inconclusive results of Weiske and Wildt, and the publication of Professor Wolff's views, as above quoted, we carefully reviewed and recalculated many of the results of our feeding experiments, including some with oxen and with sheep, as well as those with pigs, in order to satisfy ourselves whether any doubt could be entertained of the views we had previously advocated.

The result of this examination, so far as the ruminants were concerned, was to show that, owing to the comparatively small amount of increase obtained with them from a given amount of constituents consumed, the quantity of nitrogenous substance passed through the system for the production of a given amount of increase was, in most cases, so large as to admit of the assumption that the whole of the fat formed might have had its source in transformed nitrogenous matter. As will be seen further on, however, some of the experiments with sheep showed that, at any rate, part of the fat stored up must have had some other source than the fatty matter and the proteids of the food.

The reconsideration of the results with pigs fully confirmed the view that, in many cases, much more fat had been produced than could possibly have been derived from transformed albumin of the food. We concluded, therefore, that we were not called upon to institute new experiments and decided, instead, again to direct attention to the results which had already been published.

Accordingly, I gave a paper on the subject, in the section for agriculture and agricultural chemistry, at the meeting of the Naturforscher Versammlung held at Hamburg, in 1876, at which there were present a number of the chief agricultural chemists of Germany. I discussed the results given in Tables

(3) and 70, and pointed out that, even according to the mode of calculation adopted, which supposes about 62 parts of fat to be producible from 100 parts of nitrogenous substance, the experiments 4 and 5, in which the proportion of the nonnitrogenous to the nitrogenous constituents in the food was the most appropriate for fattening, showed that about 10 per cent of the produced fat could not have had its source in the nitrogenous substance consumed; and that if, according to Henneberg and Voit, it were assumed that 100 parts of albumin can at most yield 51.4 of fat, the results would be much more striking still. They would, of course, be still more so if, as has more recently been estimated, only 42, instead of 51.4 parts of fat can be derived from 100 of albumin.

I next considered what amount of error in the estimates would have to be admitted to turn the scale and to show that the whole of the produced fat might have been derived from the albumin of the food. After going into considerable detail on the point, it was concluded that any such range of error was simply impossible.

(To be continued)

The Farm.

PRACTICAL FARMING.

(by James Dickson)

Cutting oats for horse feed—Top dressing meadows.

Anticipating that proper care is taken to prevent rats from working in the barns, it is an excellent plan to cut a piece of oats, and pack away convenient for horse feed. The grain is more fully masticated than to when thrashed; and it is much less labour and cost than to thrash them. There is also an incentive when straw is plentiful, and hay scarce. When straw is not more than about two feet in length, as it is some years, and in some places, they can be cut with a mowing machine, and fed entire. When the straw is long, and cut with a reaper, or cradle, and bound, or with a binder, it is also much more economical than thrashing. In that case, (and it is preferable to the loose grain) the bundles as required are cut in the middle on a block with a hatchet, or on a bundle of hay with a hay knife.

Fifty years ago when new land oats were always cut with the sickle, until the present time, very rarely have we been without oats in the bundle to cut for horses, and cattle fattening, and when from some special reason that provision was neglected, we felt out of sorts as we do when the turnip cellar is not filled to feed with the butts of the bundles.

TOP DRESSING MEADOWS

This is the time of year (immediately after the hay is cut) advocated by some writers, as being the proper time to top dress meadows.

I am doubtful if there is any proper time to use manure in this way, but if there is a time when it is to be used, it is late in the fall, when there is little evaporation, and a continuous leaching process going on, or, at any time when the juices of well rotted manure can be immediately washed into the ground.

Where objection is raised to spreading manure to the sun and wind, we are confronted in the same strain as when we are told that turnips are of little value, as 90 p. c., is water. And the same in overdrying hay. "What is lost but water"? And so, in regard to top dressing, we are told that scientific experiments prove that manure loses none of its virtues by drying. "Nothing lost but water! Those experiments however, do not apply in practical farming. There is indeed no analogy whatever. In the experiments the manure is placed in a retort, or furnace, and dried perfectly at once and done with. (1) But that is very unlike spreading manure to the sun and wind, exposed to the rain and dew falling on it, solubilising a certain amount each day, which is again liberated by the next days sun and wind. And I assert emphatically, without fear of result of experiments that manure can be completely wasted away. But with slight wettings, and daily turned over to the sun and wind, that it will waste away until there will not remain a vestige of manure to turn over. And the experience of anyone who has tried to completely rot a pile of straw, will corroborate my experience? An opponent says, "It will also be observed that the odor from the manure is stronger in the night than in the day time;" and this is used as an argument to show that the odor is not caused by excessive evaporation. If so, that the odor would be stronger in the day time when the greatest evaporation takes place.

That however is simply answered. In the night the evaporation does not proceed to the same extent, but the odor is held close to the earth by the heavy atmosphere and falling dew, and is immediately noticed. But in the daytime the juices are attracted higher, and unnoticed float away on the winds, and at night are again brought down with the dew on forests and farms miles distant from the manure.

The rank growth of trees and plants of all kinds in, and around the cities and towns, without manure, is often remarked by farmers. And the more unhealthily the city the ranker the growth, plant life often being festered by the reeking smells which poison animal life. This principle is also observed in cities, which are healthier in which these are many trees, parks etc, which immediately absorb the poisonous gases, and help to rarify the atmosphere. I am answered, as in the cases previously cited. Dew is water. But in practice dew, like rain water, is quite different from spring water. The experience of florists and gardeners will uphold that. So also water which has been kept in a bed room or invalids chamber, is nauseating and poisonous. Still like the dew, it is water, and also like the juices of turnips it may be difficult to detect the difference, but practice proves there is a difference. The question then arises what is the difference and where does it come from? I have endeavoured to answer that, and in the meantime. Farmers, while you are considering this matter, if you are willing that your manure shall be carried by the brooks to the ocean to grow seaweed and oysters, leave your manure scattered about the yards and fields.

(1) By no means. The experiments of Prof. Shutt were conducted very differently. "Well rotted manure was exposed every day to the sun for a month." See *Journal* for March, 1896, p. 313.—Ed.

If you wish to grow blue forests at the Adirondacks, or pea fields at the Saguenay, spread it to the sun and wind. But if you want the benefit of it yourself. Cover it up in the soil.

CONVERSION OF BARREN LAND TO PASTURE

TEMPORARY LEYS

Grain vs. grass—Irish pastures—Rotations—Long leys—Lucerne and sainfoin.

It is a significant fact that, in those districts in England in which temporary, leys of some years duration prevail, the farmers are among the most prosperous at the present time, while those where the shortest are followed, fare the worst. This is almost tantamount to saying that those who went ahead most in matters agricultural are suffering most. It is an unpleasant reflection that the greatest skill and energy should meet with such a reward, but undoubtedly those who, properly, whilst grain growing was most remunerative, kept their land at high pressure in growing grain as frequently as could fairly be done, are those who are worst placed now. The man who took things more quietly, and did not lay out so much money, fared best. Climate undoubtedly had much to do with the matter. Where it was wet, grain did not ripen so well, and less was risked in corn-growing. If grain is not grown frequently the land must lie in grass longer, for there is no other profitable rotation to follow. In dry climates and light soils, long leys do not answer so well as they do in moist climates. In Ireland, in districts where it certainly cannot be said that the knowledge of matters agricultural is great, the low price of grain does not hold nearly so severely as in England, where there is a much greater knowledge. Contrary to general impression, Irish agriculture, on the whole, is prosperous, and it is due to the length of time to which the pastures are left down. Even in the parts where the knowledge of farming is greater, and where more energy is used in the working of the farm, the long leys are also the main source of prosperity. On these farms the outlay is exceedingly small. It may be taken generally that where long leys prevail, agriculture is comparatively prosperous. The natural inference is that more should follow on these lines.

The alternations in systems of farming must chiefly affect those who up to the present have not adopted long leys. The rotations which provide for only one grass crop in four or five years, are those which require the greatest attention. Except, where great care is exercised in selecting seeds, leys do not hold well in dry districts on thin soils, for more than one year. In Scotland, where moisture is fairly constant, rye grass is a more valuable crop than in the dry districts of the South of England.

On soils where the rye grasses do not hold well, more responsibility is thrown on the clovers, and to insure better results a large portion of cow-grass, trifolium pratense perenne, and alsike should be sown, as they will make a good show in the second year. It is probable that on these hot soils, it would be found better to go in for more frequent seedings than attempt long leys. Where the climate and soil permit longer leys, they are, of course ad-

vantageous, the chief drawback being that the greater length of time they are down, the fouler will the land become, as small pieces of couch grow into large patches, which, if very bad, require a great amount of work to destroy them. Long leys also encourage insect pests. Leys afford great harbourage to insects, such as wireworms, and several kinds of moths. These, however, are minor evils, and do not seriously affect the value of leys.

In moist climates, longer leys may become more possible, and for some years will show a profitable return. In some parts of Ireland can be seen good leys at five years, although the mixture sown has included nothing more than eye-grass and red, and white clover. Such leys, however, have been on good limestone soils, where the white clover has established itself thoroughly, and has appeared to have become permanently fixed. Conditions are not so favourable as a rule, and the difficulty of making the ley stand, has to be met by seeding with grasses, which are of a more perennial nature than those employed in a one year's ley.

Timothy and cocksfoot, or orchard-grass, are the most suitable as they take a strong hold on the ground, and produce big crops. The seeding must also be thicker. In the case of a three-year's ley, foxtail and hard fescue may be added, where land is in good condition. Yellow trefoil helps to fill in the bottom in the first season, and answers well. Where long leys are intended, the land must not be exhausted too much by mowings but they must be fed off by stock.

Lucerne and sainfoin allow special opportunities for making long leys, as where the soil is favourable they possess the property of holding the land for a number of years. Lucerne does not do particularly well in mixtures intended for long leys, as it is liable to be crowded out by other grasses. A little surface stirring does it good. It does best when considered as a crop of arable land.

It is an accepted fact that there has been an enormous extension of late, in the quantity of lucerne seed sown. Even where it has never been grown before, it has been sown freely. One great point in its favour, is the power it possesses of withstanding drought. That is due to its deep rooting, and its success or otherwise is largely due to the nature of the sub-soil, in which it feeds to a great extent. Any open sub-soil, containing a large quantity of lime, whether in the form of limestone, is suitable, and the plant will establish itself. It becomes a matter for manuring subsequently, and this should not be spared as the plant is able to give an enormous return, because of the crops it produces in a favourable season. Hitherto, it has been considered in England as essentially a crop of the chalk soils, but it has been shown to be well adapted to a much greater variety, and it would be highly advantageous for it to be more frequently grown.

W. R. GILBERT.

MOISTURE IN THE SOIL.

Soils—Capillary attraction—Hoing—Mulching—Humus—Claying, &c.

In the season of growth it is very essential that the plants have a reasonable amount of moisture if we are to have good crops. How to supply them with moisture should be carefully studied by the husbandman, and it should

be his aim, more especially in dry seasons, to so order the processes of cultivation that the plants may have a constant supply of moisture, so far as it is in his power to furnish the same.

Some soils have much more power than others to retain moisture which falls upon them, and also to draw up supplies of moisture from below. Clay soils have much more power than sandy in both of these respects. Hence it is that clay soils ordinarily suffer much less than sandy in time of drought. And hence it is, also, that when the surface of clay soils is frequently stirred they retain the ground moisture better than sandy soils.

There is a constant upward movement of moisture in the soil. This arises from that power in water which enables it to rise under certain conditions, on the principle of what is known as capillary attraction. It comes up through the little interstices, or air spaces, in the soil, that is, between the particles of the same, and the smaller the air spaces the more easily does it climb. In clay soils, therefore, the ground moisture comes up to the surface much more readily than in sandy soils. In the latter, the spaces are so wide between the particles that the water cannot readily ascend, but it does ascend to some extent. Now, if some means are not adopted to prevent it, the ground moisture will come right up to the surface of the earth, and will escape into the atmosphere. The aim should be to try to arrest it as much as possible, and thus prevent its escape. It will then be taken up by the roots of the plants.

Several methods of doing this may be adopted, which are more or less practicable according to conditions. The most common of these is to stir the surface of the ground as frequently as possible during the season of growth. With grain crops this cannot ordinarily be done, but if it could be done without injuring the grain it would be beneficial to the crop. Because of this, it would be greatly beneficial to the crop if some form of cultivation could be given to grain crops, and more especially until these are far enough advanced to shade the ground, by which time they would help it to retain moisture, not only by hindering surface evaporation, but by changing the character of the surface soil as a mulch does. It has been observed by all who have tried it that when the surface of the ground is stirred often where a crop of corn or potatoes is growing, the growth of these crops is much promoted. (1) Now, one of the principal reasons for the promotion of growth is found in the fact that the ground, in consequence of cultivation, has been able to hold much more moisture than it would have held had it not been so cultivated.

A second method of retaining moisture is by mulching. This process so changes the character of the surface soil that it holds the moisture. Those farmers in the far west who attempt to grow trees have found it necessary thus to use mulch. But mulching can only be done to a limited extent, because of the scarcity of materials. However, in this fact those who live in dry areas may get a pointer as to the best ways of applying coarse manure. It would seem to be good practice in those areas to apply much of it on pastures by simply spreading it over the surface of the ground.

A third mode, which is very effective is to try to keep humus or vegetable mat-

(1) And more: the succeeding grain and grass profit by it.—Ed.

ter in the soil. Because of this, we should try to plow under green crops to the greatest extent possible. (2) The more fully we can do this the better we can succeed in retaining moisture.

Vegetable matter arrests moisture which falls from above, and holds it near the surface, and, like fine clays, it also holds that which comes up from below. The success or failure of a crop may, therefore, depend very considerably on the amount of vegetable matter in the soil. But in dry areas it would be easily possible to turn under so much vegetable matter, more especially in the dry form, that it would keep the land so open that it would soon be so dried by the atmosphere that plant life upon it would die. And in dry climates this danger has to be guarded against.

Coarse, leachy soils may be improved in texture by the application of fine clay, of wood ashes, plaster of Paris, marl, and salt. These substances fill up more or less the interstices between the particles of sand, and, moreover, some of them have much power to draw and to absorb moisture.

"Farming."

STATE OF THE CROPS.

Hay—Clover—Grain-crops—Pease—Corn—Silage—Potatoes—Roots—Fruit—Dairy-goods.

Since my last report the hay has been all cut; it has turned out a little better than was anticipated. The quality is very good, and that will make up some for the deficiency in quantity.

Clover, as I said before, was almost a total failure, hardly a piece to be seen anywhere.

WHEAT:—The wheat crop is nearly all harvested and looks well. There is not a great average of this cereal grown.

Oats are a grand crop, parties have harvested and threshed out some of the new crop; it is turning out well. In some sections there is an attack of rust very light, the likelihood is it will damage the straw more than the grain.

BARLEY:—Is a good crop and has been pretty generally well saved. For feeding purposes it does not matter very much about the color, but there is a vast difference for malting, it is wanted a light bright color; in fact they will not buy dark colored at all.

PEAS:—This crop has been rather a poor one for the last few years, but this year seems to be quite an exception, they have done well and the return will be a fair one.

The foregoing 4 kinds of grain and pulse include about all the grain grown in this province, an odd crop of rye, and some buckwheat, the former is all harvested and the latter is not far enough advanced to say much about it at present.

The corn crop was rather a slim affair for some time during the early part of the season, but with this great heat corn is growing vigorously; corn needs and must have heat to grow, and for some time we have had just the right kind of corn weather.

Corn for ensilage purposes has increased in a very marked degree. I should say that in 5 years it has increased 10 fold. I do not know of a cheaper food for cows than corn, either dry or for ensilage there is no crop that you can pro-

(1) All very well, but with seven months of in doors feeding, we can hardly spare them.—Ed.

duce more of per acre, not even half as much, for dairy purposes corn is the only hope of the farmer. I would say to those who are not growing corn, make your preparations, for at the present prices of both butter and cheese you must, in order to live at all, reduce the cost of your milk to the lowest possible limit, it will be easier for you to do this than to raise the price of butter and cheese.

POTATOES.—Are an excellent crop dry and mealy, no signs of rot appearing as yet. New potatoes are offering in the market at 25 to 30 cents per bag.

ROOTS.—All kinds of root crops are doing well; turnips were bothered somewhat with the fly, but mangels and carrots have done finely; there should be some great yields this fall.

APPLES.—Are very plentiful, in fact the trees are hardly able to bear up with their heavy burdens, early fruit is selling very low, fine duchess apples have sold as low as \$1.10 per barrel, which, after paying freight, commission, and the barrel, does not leave much to the grower for his apples.

BUTTER AND CHEESE.—There has been considerable butter made this year in fact, more than ever before, and the probability is Canada will go out of the cheese business soon, if the relative prices of the two staple dairy articles does not change. So far this season, butter has paid fully as much per 100 lbs of milk as the cheese factories, and the difference between whey and skim-milk is equal at least to 1 lb of pork per 100 lbs, so that if the relative prices of the two should continue another year, as at present, the majority of the factories will be making butter. The price of cheese has advanced about 1c per lb from the lowest point, it is now 7½ to 7¾, (1) butter is selling from 17¼ to 17½. Both prices are low, but better than they were 4 or 5 weeks ago.

The shipments to date are quite an increase in butter, with a small reduction in cheese. The make of cheese in this Province will be small this fall. The farmers have got discouraged and have neglected to provide food to make out the short pastures and many of the small factories are already closed.

PETER MACFARLANE.
Chateauguay, 5th August, 1896.

PLOWING UNDER GREEN-CROPS.

Object of it—What plough to use—Roll first—Bad economy—Make hay of the peas.

"Eds. Country Gentleman"—Fifty acres were sown with cow peas with the idea of plowing under as a green manure. It has been suggested that such a heavy growth of vines plowed under in summer may sour the land, and the immediate result be an injury instead of a benefit. The soil is badly in need of vegetable matter; responds most kindly to the lightest dressing of stable manure. Would you advise me to make hay of the vines, turn stock on them, plow under green, or wait till after frost? T. H. "Amherst, Va."

(The foregoing was submitted to Prof. I. P. Roberts of Cornell University, who favors us with the following reply.)

If the prime object is to improve the land, plow under the peas, as there is no danger of their souring the land, since they break down very rapidly. On wetish clay lands danger of this kind

(1) Now, August 25th, 5¼ cents.—Ed.

rises when a heavy crop of rye or sown corn, both of which decompose slowly, are plowed under late.

Do not defer plowing too long, as the opportunity which may be given by fairly early plowing to compact and fit the soil and give time for the peas to rot, will be worth more to the succeeding crop than a little more growth of peas.

If the winter forage crop is short, then it may be economy to harvest the peas, cutting them rather high, and add to the land some commercial fertilizer, or better in this case, farm manures, to make up for the peas removed. The disposition to be made of the peas must depend very largely on the circumstances present, but the management should be such in any case as to give two to four weeks of opportunity to compact and fit the soil between the removal of the peas and the sowing of the wheat.

The term "plowing under" is somewhat indefinite, for there are plows and plows. Some of those in use in the central South are so small and so ill provided for plowing under a heavy crop of forage that all they really do is to shove the mass to one side, burying a little and leaving the rest to protrude from the top of the furrow. In all such cases, if the soil is dry and little or no rain falls, damage may be done to the succeeding crop. To do the work as it should be done, a plow that will cut a furrow of from 12 to 14 inches wide, supplied with a jointer and a chain attachment, will bury out of sight a very heavy crop of almost any material. It is often of great assistance to roll first in the same direction that the plow is to take, and it is also important that the ground be compacted with a harrow and roller, after it is plowed to conserve moisture, for without it the peas will not decay, in which case damage instead of benefit to the first succeeding crop may result.

(Almost precisely the same inquiries subsequently reached us from another correspondent in the same State (P. H. H. Staunton, Va.) and with the object of obtaining the views of a southern correspondent, it occurred to us to send his letter to an observer of considerable experience, Mr. W. F. Massey, horticulturist of the North-Carolina Experiment Station at Raleigh. It will be seen from his answer which we give below that he recommends a quite different (1) course.)

"We advise you never to plow under a green growth in warm weather, at least in your latitude, as the danger is great that the organic acids evolved will make the land unproductive. (2)

We do not think it is good economy to plow under a crop that can be used for food for stock, and the greater part of the manurial value recovered in the droppings. The feeding value of the peas is far greater than the manurial value of the tops direct, and if the manure is carefully saved, you get the greater part of the manurial value after all. Another reason why we would not plow under the peas, is because the mass of growth will make it impossible at the late period when it is safe to turn them under to get the land in the compact state necessary for the best success with wheat. We would not say that the turning under of the ripe tops will do not good, but as the greater part of the benefit from the peas comes through the nitrification by the agency

(1) And, in our opinion a far wiser course.—Ed.

(2) Is this really likely? Will Professor Slutt please answer.—Ed.

of the microbes in the root nodules, most of the nitrogen is fixed for a while as a nitrate in the soil, and the tops are of more value as forage than as manure. Mow the peas and make them into hay as soon as the first pods are mature. You will have to handle the hay nicely to save it in good order. They should be allowed to fairly wilt and then be raked into winrows, and left there for twenty-four hours. Then open and put them into sharp cocks, and leave till next day. Then haul in while still limp and pack in a tight mow, and do not disturb them while maturing, as they will, and they will cure nicely, but if you get scared and open them to the air they will gather mold. There is no better cow hay to be had than pea-vines well cured."

"FRIENDS."

Forces of Nature—Domestic animals—Driving cattle—Governments, professors, &c.—As farmer's friends.

Lately we took a few notes of some of the enemies with which the farmer has to contend and it will be well to remark that he also has friends more potent than these, if he makes the right use of them. In the first place the forces and elements of nature are his friends, the refreshing dew, the general shower, the glorious sunshine, the earth, the air, and the water, each charged with the various gases and chemicals necessary to promote the growth of the vegetation which sustains animal life, all of which it is the farmer's privilege to study and use to the best advantage.

Then the animals, which have become domesticated, are the farmer's friends, and should be treated with the consideration due to them as such.

The noble horse, ever ready, when well used, to drag the weary plough or heavy load, or to carry his rider, as on the wings of the wind, on an errand of mercy, or in the hunt, the race, or the battle. He who cheats the horse of his due amount of forage, overloads, overdrives, heats, or otherwise ill uses him, is as much a fiend in human form, as the overseer in the days of slavery who cruelly treated his fellow creature simply because he had the power, and does not deserve to enjoy the services of one of God's noblest creatures.

The gentle, uncomplaining cow, what a friend is she, when due attention is paid to her wants, well pastured in summer, well housed and fed in winter, treated with the care due to her as a faithful friend, she will repay all our consideration for her welfare, with the overflowing pail of delicious milk, and at last, (alas that it should be so) will yield herself up to the butcher's cruel knife.

The other farm animals, even the wallowing swine, should be treated as friends, and they will well repay all efforts of kindness in their behalf.

But the most faithful, intimate, and intelligent brute-friend of man, is the dog. No farm should be without a yard and house dog to guard the household and the poultry yard. A well bred and well trained collie is also useful on a large farm, he has a wonderful, natural instinct with regard to sheep and cattle and will keep them in order, while not ever running them or otherwise abusing them. I would rather have cattle driven by a good collie than by a bolsterous boy with a stick or goad; the dog will

be the more gentle and often shows the greater common sense. But to have cattle driven by a miserable yelping cur, who does not know his business, in an abomination not to be tolerated.

Among the higher friendships a good man will soon find his position.

Men, in general, despite all we hear of the depravity of human nature, appreciate right doing, and one who acts uprightly will never lack a friend among his neighbours.

The farmer has also a friend in the fostering care which most governments in civilized countries now apply to Agriculture. The well conducted Journal is his friend. The Agricultural Association, the Farmers' club or institute, Agricultural Colleges, Experimental farms, lecturers and professors are all friends each should endeavour to profit by. The inventors of labour saving machinery are the farmers' friends, as are all gentlemen who take an intelligent interest in husbandry.

No doubt the list might be greatly extended but suffice it to observe that, if the farmer is faithful to duty, and is willing to put all his trust in Him, he has an Allwise and Allpowerful friend who has promised that "seed time and harvest shall not fail," has given us all the earth and the fulness thereof to enjoy in this world of beauty, and the hope, sure and certain, to the righteous of one.

Where everlasting spring abides,

And never withering flowers.

GEO. MOORE.

FARM-WORK FOR SEPTEMBER.

Harvest—The pea-crop—Stable-cleaning—Bye—Horses, &c.

A very merry harvest-time is now pretty well over, and, with the exception of hay, the yield of our fields seems to have been above the average. Not much wheat grown, but oats, barley, and pease have produced good crops, through, in some districts, the custom of repeating the pea too often in the same piece has borne its fruits. When we hear of that legumen being sown as often as sixteen times in as many years on the same field, it needs not a man of science to tell us that, ultimately, the land will refuse to yield a remunerative return. Besides, the penetrating roots of the plant render the soil so loose, that the succeeding grain-crops will easily go down before they have filled their berries. As we have observed before in this Journal, we always found, in England, that unless a crop of turnips or rape were grown between the pease or tares, and fed off by sheep, the succeeding wheat was sure to be laid, even if the heaviest roller was used to compress the soil. Even Crosskill's clod-crusher did not answer that purpose as well as the tiny pointed feet of the sheep.

Stable-cleaning, with grubber, harrow, and horse-rake should be still kept going, until every grain-field, except those in which grass-seeds were sown in the spring, has been thoroughly worked. A piece of fall-rye might be sown for the sheep to run over in October, and again in late April or early May, after which, roots can succeed it: seed, $2\frac{1}{4}$ to $2\frac{1}{2}$ bushels an arpent. Thin sowing is never profitable when fodder-crops are the object. We saw, in an American farm-paper, 2 bushels of mixed oats and pease recommended as the proper seeding for an acre of land for fodder!

Just half the proper quantity.

There ought to be plenty of green-meat for all the stock this month. If the horses are kept at work, as they ought to be, grain they ought to have in addition to their other keep. Sheaf-oats, passed through the chaff-cutter will do well for them. Take them in as soon as the nights begin to get cold, and do not let them get run down before their permanent stabulation for the winter begins.

Milk-cows every one knows how to treat this month, and so with young stock, sheep and pigs. Feeding them is very little trouble in September, provided there is, as there usually is, a fair lot of dripping weather and no early frost.

Try and caponise a few young cockerels this month. Poultry is generally very low priced in the fall, and good capons would fetch their value in December, and not cost much, either.

WHY I LIKE THE SHORTHORNS.

"By Walter Lynch, Westbourne."

General purpose—Horses—Wool and mutton—Holstein, Jerseys, &c.—Simmenthals—Angus and Gal-loway polls.

I like them because I believe them to be the best general purpose cattle we have or ever had, and I believe any article that will serve two or more purposes well is better than a similar article that will only serve one of these purposes a very little better. Take our clothing as an illustration. A fine piece of cloth makes a very nice dress suit, and a sheepskin with the wool on makes a very good coat in which to face a blizzard; but who will say our tweeds are not more useful than either the broadcloth or the sheepskin, or both together.

I believe in general purpose animals of all kinds, just as I believe in mixed farming and the general purpose man. I believe a man who can feed a pig, milk a cow, take care of a team and plow a good furrow, who is engineer enough to run a pump and mechanic enough to build a hen coop, and who has enough general intelligence for a road-master or member of Parliament, is a more useful man on a farm as a servant, and more likely to be a successful farmer on his own account, than a man who can do only one of these things, even if he can do that one thing a good deal better. I believe a horse that can haul a good load and make a good appearance and good time on the road is a better farmer's horse than a draft horse weighing a ton, or a fast horse that can only make fast time on a race track before a racking cart. What is the use of a farmer keeping a horse that can haul a great many tons at a load when he only wants to haul one. And what is the use of him keeping a two-minute horse to drive 8 or 10 miles an hour. I believe a sheep that will clip a fair fleece of wool, and at the same time make a good carcass of mutton is better than one that will give only one of these returns, even if it should be a good deal better. And I believe a rooster that will lay lots of good big eggs and that can be palmed off on a confiding public for a young turkey, is a better bird than one that can crow twice as loud and lick as many like him as you like to fetch on. Granting

these premises to be correct how would the case stand? If our general purpose man should prove a fitter man for Premier of the Province than any of the special purpose men? If our general purpose horse should prove stronger than the draft horse, and handsomer and faster on the road than the special driver? If our mutton sheep should give a fleece worth nearly as much as the special wool sheep? And if our rooster in addition to his capacity for eggs and turkey should prove able to lick the other one on his own dunghill and crow louder afterward? That is about where the Shorthorn is. They are a general purpose cattle, with a well developed tendency to down the specialists in their own specialties.

In speaking of special purpose cattle we usually divide them into two classes, but there are really three: one class is good for beef, another class is good for the dairy and the other class is good for nothing. Their specialty is to consume the largest possible amount of food for the least possible return of any kind. With this latter class the Shorthorns have nothing to do. They are on entirely different ground. But it is an undoubted fact that they do occupy the ground between the other two classes, and pretty well overlap them both. If you will take a stock-journal of to-day and compare the stock cuts in it with the cuts of a few years ago, you will see the prize winning animals of to-day other than Shorthorns are more like Shorthorns than they are like their ancestors of a few years ago. I have before me as I am writing, a picture of a famous prize winning Holstein bull, that would pass for a very fair Shorthorn, and even some of the crack Jersey bulls of to-day would almost pass for Shorthorn stags. Now, why is it these other breeds are so rapidly approaching the Shorthorn type? I'll tell you. These specialists are not at all afraid of the specialists of the other class, but they are all terribly afraid of the Shorthorn, that is so likely to get on top of them, and who has been on top of them so often, he has impressed himself on their imaginations, and they are working away with the very limitable hope that some day their cattle will be as good as Shorthorns and look like them. If I could show you a picture of the new general purpose cattle, the Simmenthal and Normandy cattle, whose calves are advertised at \$500 each at one month old, I should not need to tell you why I preferred the Shorthorns to them. These are the conclusions I have reached regarding Shorthorn cattle, and I will now give you some of the reasons that have led to them. In the first place I have been breeding them for a long time myself, and I have not been breeding them for fun. I have been breeding them for bread and butter (as well as for beef and butter) and that makes a man careful about what he handles, and if I found any other cattle giving better results I would not have stayed with them so long. And I feel that a great majority of people think as I do about them. I saw a statement a few days ago that 75 per cent of all the cattle exported from Canada and the United States, were Shorthorns and Shorthorn grades, and I believe if Mr. Gordon or Mr. Ironside were here they would say they were the kind of cattle they like to handle. I have also noticed in all contests between breeds, whether for milk or beef, in Britain or America, the Shorthorn is generally on hand, and if he does not always get

the first place, he is generally so close to it, there is no room for any other breed between him and it. It is true in the milk test here last summer we had to lower our colors to a Holstein, and in Chicago (at the Columbian) to a Jersey, but in neither case was any other breed near enough to trample on them. But it must be borne in mind that Glennie's Holstein that won the test here was a phenomenon, she is said to have the best record of any cow of her age; it is no disgrace to be beaten by such a cow. And it must also be borne in mind that among all breeds of cattle combined there are very few cows that can down her Shorthorn competitor, that Bro. Waugh aptly calls "Lang's Beef Shorthorn." And you will also please take notice that at both these competitions the Shorthorn was first in the class for all beef breeds, and second in the class for all dairy breeds. What other breed can approach such a record? And these were our failures! I have also noticed that at some of the fat stock shows in Britain in the competition between breeds the Shorthorn is barred. (1) And I do not remember an instance of a successful cross-bred animal that was not a Shorthorn cross. What more can you ask. If you want beef they are the best. If you want milk they are as good as the best, and if you want cross breeds or grades they are simply indispensable.

It has been said that no race of cattle has ever been found that was not permanently improved by a Shorthorn cross, and that no race has yet been found that was able to permanently improve the Shorthorn by crossing with them, and that wherever the Shorthorn has once got a footing he has never been exterminated. So you who do not want Shorthorns had better see to it that they do not come within a hundred miles of you, for they are as bad to spread and as hard to get rid of as French-weed. Commencing a hundred and fifty years ago in the north of England, they are spread in every direction. They have overrun England, have driven the Highlander to the hills and strangle the doddies (1) in their own byres. They have captured North America, and are now being sent in herds to Australia and South America. Wherever civilization goes, there goes the Shorthorn. In fact they seem as necessary to each other as a contribution box is to a missionary. They are not found in places that are totally barbarous and uncivilized.

There they are on an equality with the missionary. Both are liable to be eaten, and although they may do some good in that way at the time, their future usefulness is impaired. Among people who worship their cattle and eat their missionaries, the outlook, either for the missionaries or the improvement of the cattle, is not a hopeful one, but wherever they eat their cattle and their missionaries indiscriminately, it is only a question of time and civilization, when a herd of Shorthorn will entirely supersede a herd of missionary. You see the human animal needs to be civilized and cultivated and reformed to some extent before he can appreciate the Shorthorn animal, and the farther he has advanced in that direction the more highly is the Shorthorn animal esteemed. Hence, their status in any country is the measure of that country.

(1) Quite new to us, and sounds like an error.—Ed.

(1) "Doddies," or in Aberdeenshire, the "Humies", are the Galloways and polled-Angus cattle.—Ed.

try's progress in civilization and refinement. If there should happen to be a Scotchman present he will tell you Scotland is the most highly civilized and refined country in the world, and where will you find such Shorthorns as in Scotland? Even our American friends (who make some pretensions to civilization), have very good Shorthorns. It would perhaps be not good taste to speak of ourselves in this connection, but the anxious enquirer is respectfully referred to the record of the Chicago Columbian Exposition for information on that point. Allen, in his history of American cattle, written thirty years ago, speaking of the Shorthorn, says: "Some have objected to them as unfitted for a cold climate. That objection has proved of little weight. Northern England and the Northern Counties of Scotland have produced them in their highest perfection. And in the higher latitudes of America, including Canada, they thrive as well as in the milder climates of Ohio and Kentucky. The severe winters of the north appear to be no bar to their success. How far South they may go has yet to be tried. For the improvement of our native cattle either for the dairy or the shambles, no foreign breed has been so much sought. They appear destined to go into every place where cattle are successfully bred, and good herbage abounds, as being the stock which, whatever may be the merits of others in certain localities, must in the majority prevail. When I was first in England the Shorthorns were confined to a comparatively narrow territory, and that chiefly in the northeasterly and central counties. Now they are seen in almost every part of the United Kingdom where good grasses and the best agriculture prevail. I found them even working on towards the Scottish Highlands, trenching into the homes of the Ayrshires and Galloways, and crossing more or less into almost all the old local breeds. Whether it is because they have become the fashion or are thus spreading on their own merits, I did not enquire, but concluded from the fact of their increasing propagation among farmers where almost everything is made to pay that they find them their most profitable neat stock." In summing up his history of "Shorthorn Cattle" written ten years later, the same author says: "Our history has fully shown that from the earliest period, the Shorthorn cows as a rule were large milkers, and when cultivated with a view to dairy purposes, no animals of any breed excelled and few, if any, equalled them. When milk has been the main object in their keeping, no cows have made larger yields according to the consumption of food than they. In the wide beef producing districts of our country where milk is of little object beyond that of nursing a calf to the proper age for weaning, the milking faculty of a Shorthorn cow has been partially bred out, but is capable of being restored in a few generations by the application of bulls descended from herds where the dairy quality has been preserved. Indeed we have seen wonderful milkers occasionally strike out in herds where the cows were only nominal in their yields. Abundantly testifying that the dairy quality is inherent in their organization.

As a flesh producing animal nothing of the bovine race ever has, or probably ever can equal the Shorthorns in early maturity, rapid accumulation of flesh, fullness and ripeness of points, accord-

ing to the amount of food they consume, and assimilating that food to its most profitable use. A century of experience in Britain and half a century of experience in America, with a rapidly growing confidence in their flesh-taking capacity, have placed the Shorthorn in the foremost rank of all meat cattle. No cattle of whatever race or breed have exhibited more of the qualities of vitality, longevity and fertility than they. We might mention scores of bulls by name which have proved useful to extreme ages, both in England and America." Here he gives a long list of both bulls and cows that have proved useful until 20 years old and concludes, by saying: "All they need is a sufficiency of proper food, not forcing, and sensible treatment in the way of shelter and care, to prove them equals, if not superiors, in fertility and longevity, of any others of the bovine race." Is it possible that all this evidence in their favor is wrong? Hardly! I know it will be objected by some that the general purpose animal is not the best farmer's animal. That is a matter of opinion, and about all that could be said on either side would be assertions and contradictions. I believe myself they are the best, but every one must judge for himself. But this I do know, this is an age of specialties and it is also an age of hard times. But if you are determined to have special purpose cattle, it has been abundantly shown that both the beefing and milking qualities are inherent in the Shorthorn, and both may be cultivated in fair proportions, or either quality may be quickly and easily developed at the expense of the other. These are some of the reasons "Why I like the Shorthorn," and if they do not commend themselves to judgment I am sorry for somebody.

NOR-WEST FARMER.

AYRESHIRE CATTLE IN THE PROVINCE OF QUEBEC.

Sales in Newfoundland—Ayrshire Association.

It is very interesting to note the rapid progress and great improvement that is being made in the breeding of Ayrshire Cattle in the Province of Quebec. From one end of the province to the other, our best breeders seem to favor the Ayrshires and, not in a few places, there are herds which not only have milking qualities but have beauty and high breeding as well, and would do credit even to the County of Ayr in Scotland. Each year, farmers who are looking for the best breed of thoroughbred cattle take to the Ayrshires in preference to any other. The result as was shown in the magnificent collection of Ayrshires at the Montreal Exhibition last year is already evident, for expert judges expressed themselves in the very highest terms regarding this exhibit and stated that it would compare favorably with some of the best in the Old Country. The high reputation which the Province is making in the breeding of Ayrshires is already established, for not a few have been sold at good prices in the United States within the past few months, while during the present month an expert buyer was here on behalf of a leading breeder in the United States and purchased seven head, for which the sum of \$1400.00 was paid. This is certainly a very good showing, and should afford

every encouragement to the breeders of Ayrshire Cattle. Good sales have also been made in Ontario, Nova Scotia and New Brunswick, and a fine herd was recently purchased by the Hon. Robert Bond, Provincial Secretary of Newfoundland.

The Annual Meeting of the Association will shortly be held in Montreal, and the Members will have every reason to congratulate themselves on the high place which Ayrshires are rapidly gaining in public esteem.

Any information regarding the Association may be obtained by addressing Mr. S. C. Stevenson, the Secretary, 76 St. Gabriel Street.

Household-Matters.

Métis people—Farmers and hotels—Vegetables, &c.—Fruit—Recipes.

Ten years out of the last twelve, I have spent the summer on the lower part of the St. Lawrence.

I have noticed the gradual improvement of many of the inhabitants, for they were about as poor as it was possible to be.

Three large Hotels, owned by farmers who were fortunate enough to be just on the sea shore, are now doing a thriving business, they have earned a reputation, and can now fill their houses to the satisfaction of their guests, and to their own profit.

They also have another source of revenue, in being able to supply many of the wants of the Hotel from the farm, thus securing a double profit.

They are building Cottages, too, which can be taken by those who prefer a quiet life to the bustle and confusion of an Hotel.

There are smaller boarding houses cropping up, owned by farmers, and as the greater part of the work is done by the wife and daughters, with a little outside assistance the whole profit is in their own keeping.

Fetching and carrying guests to and from the railway station, and the hire of horses for driving and riding, form no mean revenue for the owners of horses.

Another source of earning money by outsiders is opened by washing for the visitors, and one can meet on Monday a good number of farmers wives driving a buck-board loaded up with linen for the wash.

They are not a bit ashamed, but are glad to earn the money for the bettering of their belongings in some way or other.

Quite a trade has sprung up selling vegetables, by which the intelligent are doing well.

This is done by the French women, who certainly have the knack of growing flowers and vegetables. Till visitors came, potatoes and onions were the staple vegetables, now, they bring us about as good French beans, pease, and lettuces as can be grown anywhere.

I must not forget swede turnips and carrots, which, are about as good as they can be; a little small owing, I suppose, to want of good cultivation.

Why they won't grow these vegetables and store them as they do their potatoes, and thus be able to make the poor straw the cattle have to live on during the winter a little more nourishing and savoury to the appetite, I fail to see; unless it is too much trouble, they might save themselves from having to call in a neighbour to help to lift up a cow who

is too weak after the winter to get on her feet (sad but true).

The French women are hard workers winter and summer.

The other day, one of them who had milked 9 cows and attended to the dairy and household duties, was down sewing butter and vegetables quite early in the morning; but they all complain that they get so little off the farms, barely enough to pay off the debt contracted during the winter. Gathering and selling fruits where there is a large family forms quite a help, a little fellow told me he made over \$30 dollars last summer; he is one out of 12 and seems as happy as possible when he sells his fruit.

In the outlying districts, the very poor live on salt fish and potatoes, with a little very brown bread.

Is it any wonder that as soon as they grow up and see a chance of doing better they migrate to better quarters.

Many of them drift to the factories in the States, some come back after a time and set the old folks up a little better with some of their earnings.

As a rule the English girls prefer domestic service.

And yet a complaint was sent out last winter that the summer visitors were the cause of nearly depopulating some of the villages.

SEASONABLE RECEIPTS—SHIRLEY SAUCE.—Wash, peel, and slice two dozen ripe tomatoes, four large onions, and four green peppers, not too large; add four tablespoons sugar, one pint vinegar; boil tomatoes and onions first, strain, then boil slowly till done.

CHILI SAUCE.—Twelve large ripe tomatoes, six green peppers, one large onion, all chopped fine, one tablespoon salt, one teaspoon ginger, one of cinnamon, one of allspice, one of cloves, one tablespoon sugar, two cups vinegar; boil till quite thick.

ENGLISH SAUCE.—One pound brown sugar, half pound salt, half pound garlic, half pound onions, quarter pound of pepper, quarter pound ground ginger, half pound mustard seed, one pound raisins, two pounds apples, half ounce cayenne, two quarts vinegar.

The raisins to be chopped, apples to be peeled cut and boiled in one pint of the vinegar; garlic and onions must be chopped fine and well bruised; the sugar made into a syrup with one pint of vinegar. When the apples are cool mix the whole with the remainder of the vinegar; blend well together and put in jars.

THE HAIR AND ITS TREATMENT.

—Constant and frequent brushing of the hair tends to darken it, and washing it with white of egg, though strengthening, has the same effect, and should not be used by those with light hair. This effect is due to the fact that brushing brings out the natural oil. Persons with black or dark hair, especially if it is dry and wiry, could not use a better strengthening; for the egg nourishes the roots and makes the hair smooth and glossy. Indeed, those possessing the kind of hair just described should give it a great deal of brushing. Before retiring shake out the hair, part through the middle and brush each side evenly and carefully, so as not to tear it. Give at least 32 (1) strokes to each side and brush up from the neck and off from the temples.

A DISH WASHING SUGGESTION.

—Baking dishes that become burned in the oven, and plates and platters that

(1) We have a superstitious fancy for multiples of 4.—Ed.

become blackened with the food scorch ed upon them, should not go through the tedious process of scraping. Simply put a little water and ashes in the dish and let it become warm, and the burnt and discolored portions may be easily cleaned without injuring the dish.

A dish of water placed in a hot oven where pies, cakes, or puddings are being baked will prevent them from scorching.

REMOVING AN OBSTINATE STOPPER.—Every chemist has experienced the difficulty of removing the glass stopper of a bottle when it has become fixed—apparently immovable. Of course, one of the best remedies is to heat the neck of the bottle for a while over a Bunsen burner. A serious drawback however, of this old-fashioned method lies in the fact that the bottle must be held in a horizontal position, and the fluid or solution may be easily spilled out of the bottle if the operation is performed carelessly. I have solved this little problem in an up-to-date, efficacious manner by rigging up an adjustable clamp with coils of platinum wires embedded in a strip of asbestos attached to the said clamp. You press the circular clamp around the neck of the glass bottle, then "press the button, and electricity does the rest."

To remove a tight ring from the finger, take a long thread of silk and put one end under the ring and draw it through several inches, holding it with the thumb in the palm of the hand. Then wind the long end of the silk tightly round the finger down to the nail. Take hold of the short end of the silk, and, holding it toward the finger end, unwind it, the silk pressing against the ring will withdraw it.

Place an oyster shell in the tea kettle and it will collect the hard matter that is liable to form on the inside of the kettle. The shells should be washed with a brush before using. Remove the shells every few weeks and replace with fresh ones if the water is very hard.

To renovate old black lace dissolve one teaspoonful of borax in half a cup of rainwater and add one tablespoonful of spirits of wine. Soak the lace in this, pressing it several times, and rinse in a cup of hot water in which a black kid glove has been boiled. Pull out the edge of the lace until it is almost dry and lay it between newspapers, put a weight on it and let it remain two days.

To keep the hair in crimp, take two cents' worth of gum arabic and add to it just enough boiling water to dissolve it. When it is dissolved add alcohol until the mixture is rather thin. Let it stand over night and then bottle. Moisten the hair with it before curling, and it will remain in crimp on damp days. The mixture is not injurious to the hair.

Swine.

THE IMPORTANCE OF SWINE. PRIZE ESSAYS.

Breeds—Variation—Age for breeding—Number of litters—Time of pregnancy—Pure water—Keep pigs clean—Earth and charcoal—weights.

The breeding and management of swine constitutes one of the most important agricultural interests in Canada

at the present time. Of late years, farmers have gone almost entirely into dairying, and as dairying and swine raising must naturally go hand in hand, it is necessary that the most rigid attention be paid the latter that the best results may be obtained.

To be successful, none but the best breeds should be kept on the farm. The fecundity of swine leaves no excuse for holding on to land-pikes, and the descendants of semi-wild breeds that must be run down by dogs and guns only supply a very small quantity of inferior meat when they are killed.

There is no class of farm stock that pays better, as between indifferent and goods breeds, than Hogs, and the wonder is that in some sections of the country, farmers still cling to a breed of grunters that will always greet you with a snort and a boh-o-o, and which no feeding can fill.

Now, the first requisite in keeping improved breeds, or in fact any breed from which money is to be made, is to find out the requirement of the market and select the breed to be kept accordingly. After deciding on a particular breed, great care should be taken in the selection of individuals, as success will depend entirely on the choice made. The new beginner must have some certain type in view and build on a solid foundation.

In breeding swine, no matter how good and perfect the stock is, they will surely degenerate unless the breeder is constantly on the watch.

Many persons wonder why it is that, from the prolific nature of swine, the country is not better stocked with breeds of superior animals. The simple reason is the want of accurate judgment, and care in selection.

In animals that usually only produce one young at a time, the progeny generally partakes of the nature of both parents and are bred with tolerably uniform results. In animals producing a number of young at a time, the progeny will be found to vary considerably in the same litter. Thus, unwise selections will carry the breeder farther and farther from the excellent point to be perpetuated.

In domestic animals it is a matter of common observation that the temper and other peculiarities of individuals are determined by inheritance. Thus quietness of disposition, mildness and tractability or viciousness, courage or timidity are constantly perpetuated in parents and their young.

Now, from the general law, that like produces like, and the well determined law that variation is a constant integer in all cross-bred animals and from our own observation that it is often intensified in animals having many young at a time, the full force as regards judgment in selection will be apparent. There is no doubt that the fact of the country not being well stocked with superior animals is chiefly due to the want of proper care in the selection of the breeding animals and also from a lack of accurate knowledge and ability in discriminating by the breeder in regard to form, constitutional vigor, and excellent points in the young animals selected as breeders. Absolute accuracy in this respect is in fact possessed by but few individuals in a generation.

There must first be a natural tact inherently possessed, cultivated and matured by years of study and observation.

Now that the foundation has been laid, the next question to consider is what the sow is capable of breeding even months of age and the boar at six but we prefer never to have a

sow farrowed before one year old and it is advisable not to use a boar before the same age. It gives both a chance to develop and in consequence the offspring will be stronger.

A sow may be made to give three litters in a year but two is quite sufficient and many of our best breeders prefer only one litter in a year, so that the sow will have thoroughly recovered from the strain of rearing her young. During gestation which continues about four months or a little less, (1) it will be necessary to keep the sow in fair condition. Her food should be of a healing nature, plenty of roots, we prefer them cooked with a little meal peas one-third, oats two-thirds, with a change to shorts occasionally.

When farrowing time comes, a warm comfortable place should be provided. A most suitable pen would be about eight by ten feet with a railing around about ten inches from the floor to protect the young pigs from being crushed against the wall. If the sow has been properly handled, there will be no trouble. We always remain with her until all the little ones have come, put them to suck and keep her quiet until all is over and the youngsters drinking nicely, after which the danger of crushing is fairly over. Care must be taken the first three days after parturition lest inflammation should set in. She should be fed with bran, with a little skim milk about the fifth day, add one half meal as before described. Let her food be of a sloppy nature to encourage a good flow of milk. It will be necessary to teach the young pigs to eat at two weeks old. They begin to drink milk from a shallow dish, which should be placed in a corner of the pen boarded off so that the sow cannot touch it. At three weeks a little shorts may be added. By this treatment, the mother will be greatly relieved. The young boars should be castrated at two months old giving them time to get over the trouble before weaning.

The young pig is born ready for work, that is, it has teeth that in a short time are competent to grind and prepare food for the stomach. We should wean at six or eight weeks old. (2) Allow the little ones all the skim and butter-milk possible, and after the pigs are ten weeks old, mix with a fair proportion of fine ground grain, as a tolerably thin slop. By this mean the older stock are freed early from the care of the young and become ready for other uses.

Keep rings out of the noses of the young pigs. It is cruel in the extreme. Nature has ordained that they should root and they will derive more benefit from grubbing and rooting that will compensate for the little harm they will do. (3)

By proper care if the pigs come early they may be turned off at Christmas and should have enough weight to make them profitable for the market.

Hogs are not susceptible to cold when fat, but swine like other animals thrive with less expense when comfortable quarters are provided.

Where a considerable number is kept in cold places, they will pile together and over-heat each other, so that the weaker ones are often smothered. Of

(1) Our experience says sixteen weeks to the day. Henry Stephens (Book of the Farm) says sixteen weeks to the hour!—Ed.

(2) Good; but we regret to say too many farmers wean much too soon.—Ed.

(3) This depends upon circumstances.—Ed.

all farm animals, hogs especially, must have plenty of pure water.

Swine breeders cannot too soon disabuse themselves of the idea that swine are dirty or filthy feeders.

There are no farm animals nicer or more fastidious in the food they eat than swine, if allowed to be.

They will not drink stagnant water unless forced to by dire necessity.

The sagacious breeder and feeder will understand this. He will also understand the danger of malignant diseases attacking swine when forced to eat filth and drink impure water. No matter how sloppy the food, they should always have pure water within reach. If they have a clean bathing place in summer it will add much to their health.

Swine in confinement should always have charcoal, bituminous coal, salt and wood ashes within reach. They often suffer from acidity of the stomach, and the remedy being near they will always use it.

In what we have said in relation to feeding in close pens we are not to be understood as admiring the practice. In general there should be plenty of pasture in summer and plenty of roots in winter.

Of all animals the hogs at least must not be allowed to lose flesh from the time it is born until it is killed. When fat, kill at once, unless the market happens so that it will pay to hold for a short time. As a hog becomes fat, it eats less and less and also fattens more slowly. They should be turned off at about ten months old, when they should turn the scales at from three hundred to three hundred and fifty pounds.

We never want an overgrown hog, they are alright for show purposes, when parties have other resources to depend on, but when the hog must pay his own way, we prefer a pig not weighing more than six hundred when matured. (1)

Hogs of the above weight with proper care and economical feeding, we will usually find the balance on the right side of the ledger.

(Signed) Wm. TAIT.
St. Laurent.

SOW KILLING PIGS.

Sir,—In your issue of March 2nd, "Breeder" asked a remedy for sow killing pigs. I may say that I have learned from experience a lesson that may be of use to other breeders. When my imported sow farrowed a short time ago, I, being very anxious about her litter, watched her carefully. When the little fellows were a day old, the sow would lie down, but soon as the pigs commenced to suckle she would jump up as if in pain. This she would repeat as often as they commenced sucking. After a few attempts to satisfy their hunger, the sow jumped up in a rage and grabbed one in her mouth, and would have killed it had I not been there to save its life. I at once surmised the cause, and on examining their mouths, found a number of very sharp, black teeth. These I removed with the pliers, which put an end to the trouble, as she from that time allowed her family to satisfy themselves with apparent pleasure to herself.

GIDEON SNYDER, JR.

(1) Surely a mistake of the copyist.—Ed.

PRICE OF AND KIND OF HOGS WANTED.

Montreal, July 23rd 1896.

G. A. Gignault, Esq.,
Assistant Commissioner of Agriculture,
Quebec, P. Q.

DEAR SIR:—

Yours 22nd inst. to hand.

All hogs that are bought by packers are bought delivered at their market.

We paid to-day four (4) cents for the right kind of hogs delivered East End Abattoir, Montreal.

The right kind of hogs are, as you know, lean bacon hogs weighing from 140" to 190". These are worth four (4) cents.

Heavy hogs are worth \$3.50.

These prices are one to one and a quarter cents above Chicago prices.

Yours truly,

(Signed) The Loring Packing and Provision Co., Ltd.

OLD MIDDLESEX PIGS IN 1850.

Great feeders—Overfat—Pease.

The following description of a pen of three of the old Middlesex breed of pigs, winners of first prize and the champion gold medal at the Smithfield Club Show in 1848, appears in the "Farmer's Review" for 1850:

"These pigs were farrowed on the 18th of June, 1848, and were fed from five weeks old on middlings, boiled potatoes, and peas up to eleven weeks old, when they had barley and peameal and boiled potatoes mixed with water. They consumed in thirteen weeks twenty-eight bushels of meal and four bushels of potatoes. They were tried on milk, but did not thrive so well on it as on water. In consequence of their great propensity to fatten they were blind with fat at sixteen weeks old, and when exhibited their eyes were buried two inches in fat which came over their forehead and lay on the top of their noses full three inches.

"The following is a statement of their weight and age while fattening:(1)

Date.	Weeks Old	Stones Weight of Each (8 lbs. to the stone.)		
		First.	Second.	Third.
July 23...	5	3	3	2½
Aug. 13...	8	6½	5½	5
Sept. 3...	11	10	9	8
" 24...	14	13	12	11
Oct. 15...	17	19	18	17
Nov. 5...	20	25	24	24
" 26...	23	29	28	28
Dec. 6...	{ 24 and 3 days }	28	28	28

"This breed of pig has been very much improved by Mr. Barker (the exhibitor) in the last seven years. They are of a pure white color, of great substance and propensity to fatten. They keep in excellent condition, while stores, on grass, turnips, offal from the barns or garden, and when put up

(1) We used always to reckon that a well bred pig should weigh a stone for each week of his life; thus, a 6 months old pig should weight 208 lbs.—Ed.

to fat in two or three weeks make excellent porkers. (2)

"They are fine in the bone and head and have small upright ear which point a little forward.

"They are of a small size, have good litters, varying from seven to fourteen in number, being very fat while suckling and thus making very good roast-ers."

(There being no record of a distinct white breed known as Middlesex, we fancy these pigs belonged to what is now known in England as the Small White breed.—"Ed. Swine Department.") (1)

(1) Quite right.—Ed. J. of A.

HOW THEY DO IN ENGLAND.

Fat not wanted—Light hogs—Weight of export hogs.

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

Prime stores.	Thickness of fat in any part of the back.	Price per sc.
6 sc. 10 lbs. to 9 sc. 10 lbs.	2½ in. and under	7s. 0d.
Under 10 sc. 10 lbs.	Not over 2½ inches	6s. 6d.
Under 11 sc. 10 lbs.	Not over 2 inches	6s. 0d.
Under 12 sc.	Not over 3 inches	

Any pigs outside these limits at their value. In? truck—12 pigs. Whole truck—25.—C. & T. Harris & Co., Limited, Calne, Wilts.

The above quotation, taken from the "Farmer and Stockbreeder," of London, England, shows the practice pursued in buying hogs at the famous bacon-curing establishment of Messrs. Harris & Co., Calne, Wiltshire, and the following extract from an article in one of our American exchanges bears so pertinently on the subject that we feel justified in drawing the attention of all hog buyers, as well as breeders and feeders, to it:

"The 'Drover's Journal' states that, while the cellars and storehouses are crowded with fat pork, the result of our big corn crop, the packers cannot supply the demand for bacon and cuts of pork made from light hogs, and at considerably higher prices than the Board of Trade quotations. We are not surprised at this, because it is to be expected. Now, let the packers pay a sufficient premium for light hogs over heavy ones, and they will get them. We have no tears to shed over their stores of fat bacon. They have forced the farmer to furnish them with hogs overfat by making too little difference between the prices of bacon hogs and lard hogs. It is a heap cheaper for the farmer to produce fat pork than lean because his carbohydrates are cheaper than albuminoids. If they will but pay the difference in cost, the farmers of the West will soon give them all the bacon hogs they need."

Bravo! Brother Wallace. The very same applies to our trade here in Canada. The packers have been preaching "lean" and "light" hogs to our feeders for the past ten years, but when a mixed ear lot comes in everything goes at the same figure, and generally about the figure the heavy hogs should fetch. We have been loyally backing up the packers in their endeavor to get hogs to suit the trade, but we have over and over again remonstrated

(2) The "prime London porker" weighs 12 lbs. a quarter, and must not be too fat," as our London salesman used to be always writing to us when we were sending some 100 porkers a year to that market.—Ed.

with them on their not discriminating, on a fair basis, between the hogs they need and the hogs they don't need.

From the above market quotations it can be seen that where 130 to 100 lb. hogs, with not over 2 1/4 inches of fat on the back, fetch \$8.50 per 100 lbs., 190 to 210-lb. hogs, with 2 1/2 inches and under of fat, sell for \$7.90 per 100 lbs., and 210 to 230-lb. hogs with 2 3/4 inches or under of fat, only fetch \$7.30 per 100 lbs.

Why cannot we have a similar scale in Canada? We venture to say it would do more towards producing a full supply of bacon hogs than all the newspaper articles that ever were written.

"Farming."

Orchard and Garden.

Montreal, Aug. 14 1896.

To the Editor of the "Journal of Agriculture."

DEAR SIR,

The members of this society are extremely sorry that you could not get down to see our show on Monday last but sincerely hope to have the pleasure of your presence at the second of the series which will be held in the large room of the Natural History Building on Monday evening 24th inst. Appended please find a few notes and the prize list of our late efforts.

Yours truly,

Fred. BENNETT.

Secy. M. F. G. C.

MONTREAL GARDENERS AND FLORISTS CLUB.

SWEET PEAS AND ASTER SHOW.

The first of a series of monthly exhibitions was held in the Society's room Natural History Building on Monday evening the 10th inst. On account of the space being so limited members only were invited. Mr. D. Williamson and Jos. Bennett kindly gave their services as judges of the exhibits and their work gave unqualified satisfaction. The following were the awards.

- 50 Spikes White Sweet peas.
1 Wilshire Bros Florists.
2 P. McKenna and Son, Florists, Cote des Neiges.
- 50 Spikes Pink Sweet peas.
1 Wilshire Bros.
2 P. McKenna and Son.
3 Geo Robinson, Gdnr A. Joyce Esqr Outremont.
- 25 Spikes Mixed Sweet peas.
1 J. Perrin, Mount-Royal Park.
2 J. Eddy, Terracebank.
3 G. Pascoe, Gdnr to R. Reford. Esqr.
- 50 Spikes Mixed Sweet peas.
1 J. Perrin.
2 J. Walsh, Gdnr to W. W. Ogilvie. Esqr.
- Collection of sweet peas (named) 12 spikes of each.
1 Fred Bennett Gdnr to R. Mackay, Esqr.
2 Wilshire Bros.
6 White Asters.
1 Geo Robinson.
2 C. A. Smith, Gdnr to T. A. Dawes, Esqr, Lachine.
12 Mixed Asters.
1 Fred. Bennett.

2 Geo Trussell, Gdnr to J. H. R. Molson, Esqr.

- 21 Mixed Asters.
1 Fred. Bennett.
2 Geo Trussell.
6 Var of Asters, 1 Bloom of each.

1 C. A. Smith,
2 Geo Trussell,
3 Geo Robinson.
Some of the most worthy of the exhibit "Not for competition" were:

A magnificent collection of 17 named varieties of Perennial Phlox from P. McKenna and Son Cote des Neiges, which were the admiration of every one that saw them: a Specimen Gloxinia with 200 Blooms, a collection of herbaceous flowers and some fine zinnias from the Botanic Gdns (G. Copland Gardener). Vases of fine Cannas, Lillium Auratum and single Dahlias from President Walsh, vase of very fine Daybreak Carnations from Geo Trussell, Gdnr to J. H. R. Molson. a plant of a rare Onocidium in flower from J. Mussen (W. Whiting Gardener) 3 spikes of Onocidium incurvorum a yard in length from R. B. Angus, N. Wilshire gardener, a plant of Dendrobium Phalaeopsis from sir W. C. van Horne, J. Holliday Gdnr, a large quantity of Ferns and Palms from Walter Wilshire's nursery, for decorative purposes.

At the conclusion it was decided by unanimous vote of the club to send all the flowers to the city hospitals.

CULTIVATION OF CARROTS FOR FEED.

PREPARATION OF THE SOIL

In the cultivation of carrots for feeding stock it is supposed that the farmer who can grow the largest yield to the acre at the least cost is the most successful at the business. To enable him to do this he must have a soil of a moist nature that will work to a fine tilth and also be clean and free from weeds. The land need not necessarily be very rich, for this reason they can be brought in after a crop of mangels to good advantage. Immediately after the mangels are off, put in the plow and turn over to a depth of at least six inches, clean out the water-furrows well to prevent any water lying on it, then leave it until the following spring. Then whenever the land is perfectly dry get at it with your harrows and cultivators, and work to as fine a tilth as possible, plow it again and keep the harrows and the roller going until you cannot pick up a clod on it, you can now get to work and form the drills: from 24 to 26 inches will suit for width. After you have done this will be the time to put on the manure, from 12 to 15 cart loads of well rotted manure per arpent will suffice to be spread evenly all over, then split the drills and form again passing the roller over them, when they will be ready for the seed.

SELECTING AND SOWING THE SEED

Of all the different varieties in cultivation we rather prefer the improved short white, as we find them as heavy a cropper as any, and they are much easier taken out of the ground in dry weather. Always buy your seed from some reliable seedman when it will generally be found to give satisfaction. Sow with the seed drill at the rate of

2 lbs to the arpent 1/2 inch deep just before rain if possible.

CULTIVATING AND HOING THE CROP

Whenever you can see them in the rows, slide hoe them at once, after they get a little larger cultivate them and hoe again, they will now be ready to weed and thin. A hand weeder which can be purchased from any seedman will be found a useful tool as the work can be done much quicker and better, six inches will be the proper distance to thin them to, you will now be finished with the hand work, but you can keep the cultivator going as often as convenient.

"HARVESTING THE CROP"

After the 15th of October it will be well to get them out of the ground. They can be topped very quickly with a sharp hoe, but perhaps a sharp sickle or a knife will do the work better. A furrow can then be drawn with the plough (as close to them as possible) it will then be little trouble getting them out, place them in piles and cover with the tops, after a week they will be ready to store for winter use.

Carrots cultivated in this manner should give a return of from 600 to 750 bushels to the arpent if the season is at all favourable for their growth.

PACKING HOUSE FERTILIZERS.

Waste-products—Prof. Shutt's valuation.

We were surprised to learn recently from the manager of one of the largest pork-packing establishments in Ontario that they were utterly unable to dispose of the fertilizer manufactured from their waste products in Canada, although they had offered it as low as \$20 per ton in retail quantities, and that consequently they were shipping it all to the States.

On looking over the Government analysis which they had just received we were struck with the large quantity of nitrogen it contained, and taking a copy of this analysis we sent it to the chemist at the Dominion Experimental Farm, Prof. Shutt, and asked him to give us as nearly as possible the values of the different ingredients. The following is a copy of the analysis (Government):

Soluble phos. acid.....	0.64
Reverted phos. acid.....	5.44
Insoluble phos. acid.....	2.11
Nitrogen	8.55
Potash	
Moisture	10.84

and the substance of Mr. Shutt's reply to our questions is as follows:

The values assigned by the Chief Analyst of the Inland Revenue Department to the various fertilizing constituents are as follows:

Soluble phos. acid.....	7 cts. per lb.
Reverted phos. acid.....	6 1/2 per lb.
Insoluble phos. acid.....	
from bone	6 per lb.
Nitrogen	14 per lb.

Using these figures, the value of this by-product is calculated to be \$34.43 per ton.

Nitrogen (of which this fertilizer contains a large amount) is essentially the fertilizer for cereals of all kinds and grasses, especially when associated with phosphoric acid. Soluble forms of nitrogen are required by all plants, and

consequently nitrogen finds a place in the formula of all commercial fertilizers.

"We should not expect this fertilizer to act as quickly as one containing superphosphate and nitrate of soda. In soils, however, neither too dry nor too wet, the decomposition would be more or less rapid, and we should expect the results to be visible for some years.

"The lack of potash, which is of special benefit as a fertilizer to corn, potatoes, peas, and leafy plants in general, might be overcome by the use of wood ashes, which, when of good average quality, contain about 5.5 per cent. of potash, or, if ashes were not obtainable, kainit, or muriate of potash, might be used."

But some of our readers may ask, What has this got to do with the swine department of "Farming?" Simply this, that we want to draw attention to the fact that a very important by-product of the hog industry is being allowed to leave the country at far less than its value, and thus our farmers are not only neglecting to make use of a large quantity of exceedingly valuable fertilizing material that is within their reach, but by compelling the packers to dispose of it at a price that is very much below its value, they are increasing the cost of production of the finished article of which it is a by-product, and so striking a blow at their own interest.

We have no hesitation in saying that the time is fast coming when commercial fertilizers will be used far more extensively than they are now, and we believe our farmers are making just as big a mistake in the case of the by-products of our pork factories as they are in the case of our ashes, in allowing them to be shipped across the line to enrich the lands and increase the crops of our wide-awake Yankee cousins.

As this is not intended as a free advertisement for anybody, we do not give the name of the packing house where the fertilizer referred to is manufactured; but we believe a similar article can be obtained from any large establishment of the kind.

"Farming."

Special Notices.

People with hair that is continually falling out, or those that are bald, can stop the falling, and get a good growth of hair by using Hall's Hair Renewer.

For bilious fevers and malarial disorders use Ayer's Ague Cure. Its success is guaranteed if taken according to directions.

The Purest and Best

SALT

That is being offered to the Trade in Canada is

Windsor Salt

Our plant is specially constructed for, and our whole process is capable of turning out nothing else but a salt of the highest possible grade. Our table, Dairy and Cheese Salts cannot be equalled for purity, color and evenness of crystal, while for farm use it will be found that our fine barrel salt and sack salt costs no more and is much superior to other brands.

WINDSOR SALT WORKS,
Manufacturers, Windsor, Ont.