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THE
Canadian Agriculturist
 AND
 JOURNAL OF THE BOARD OF AGRICULTURE
 OF UPPER CANADA.

VOL. XV.

TORONTO, APRIL, 1863.

No. 4.

HINTS FOR THE SEASON.

The advent of Spring is welcomed by all classes of people, and brings with it to the farmer an incessant round of activity and care. The vigours of winter have now passed away, and the daily increasing solar action is awakening up the vegetable kingdom from its long winter sleep, and even animals experience the influence of renewed vital power. Let not the farmer, however, suppose that in regard to his domestic animals the spring time brings no anxiety or care; for it often happens in this climate that early spring is the most trying and critical period of the whole year. The stock of provender too frequently becomes all but exhausted, and great difficulty is consequently experienced in sustaining cattle in a thriving condition before the pastures are ready to receive them.—Horses require more generous feeding as their work increases; and greater attention should be paid to grooming, cleanliness, and regular supplies of food, consisting, as much as possible, of a mixed character. A few carrots, turnips or mangels given daily to a horse, at this season especially, will be found to have a very beneficial influence on his general condition, and greatly aid his power of enduring the extra toil to which he is now subjected. A little extra attention to these matters will very much tend to facilitate farm operations at this busy period, and will likewise preserve the health and increase the strength of this noble and useful animal. Roots will also be found equally beneficial to other classes of his stock. They not only

impart a large amount of nutritious ingredients to the animal, by which ordinary waste is restored, and growth promoted; but they operate beneficially in producing a healthy action of the stomach, and in purifying the blood. Cows, either before or after calving, when kept in the byre, are greatly benefitted by a small daily supply of roots, and the remark will also apply to young stock that are too commonly destined to live, or rather sometimes starve, on inferior hay or straw, only suited for litter. Sheep will now require much attention, especially ewes that have lambed or are about to do so. Protection from wet or cold, particularly during the night, is still requisite; but great care should be shown to sheep in allowing sufficient room for exercise and plenty of fresh air. In the coldest weather sheep will suffer, and the foundation of fatal disease be laid, by keeping them in too close a situation. Happy that farmer who has a supply of well kept roots at this season of the year. A little linseed or oil cake also will be found of inestimable advantage; and it would be well for every farmer to grow a small plot of flax, if only for the seed to help his stock fairly through the winter. By making timely preparation in reference to these matters, the ordinary hay and straw will be greatly assisted and improved for feeding purposes.

The prudent farmer will be in readiness to put the plough into operation as soon as the frost is out, and the ground sufficiently dry. Not a day should be lost in our short seasons in preparing the seed bed, that sowing may commence at

the earliest practicable period. Early sown grain will be found to produce the heaviest sample and consequently the best quality. No precise time however can be absolutely laid down for the performance of these important operations. Much must depend on the character of the season, and the nature and condition of the soil.— Though early sowing as a general rule is to be recommended, we must wait till the soil is sufficiently warm and dry, or the seed will not germinate, and much of it may perish. It is a sound practical rule, also, not to plough or otherwise work land when in a wet state; far better wait for a more favourable opportunity. By working land while in a wet state, its condition is more or less injured, and rendered unfavourable to the growth of the crop during the whole season. It will be seen that the precise time for ploughing and sowing must not depend on the day or the month, but upon conditions that are more or less variable; and consequently what is considered late in one season, might be regarded as particularly early in another of a different character.

From what has already been said it will be seen that the raising of root crops forms an important feature in every good system of modern husbandry. To the stock farmer roots and green crops constitute his sheet anchor. Now then is the time to commence preparing land for turnips, mangels, carrots, &c. Under this head also may be included flax, the culture of which is gradually making progress in many parts of Canada, and which promises, if persevered in with judgment, to add materially to our provincial resources. For these crops we strongly urge our farmers to make good and timely preparation. If the land has been deeply ploughed in the fall, incorporating farm-yard manure, all the better; but this circumstance will not make spring cultivation less necessary. It would be well to look to the thoroughness of preparing land for these kind of crops, than to the mere extent of culture. One well prepared acre will often produce as much as two inadequately treated. Liberal treatment of land for all kinds of crops, is no doubt the best paying in the long run, and in case of roots this holds specially true. We may just remind the farmer that great relief may in some places be given to winter wheat by inspecting the fields at this season, and opening any obstructed water furrows, there-

by preventing injurious stagnation. In short, it should be the constant effort of the farmer, particularly in spring and fall, so to arrange the surface furrows, as to allow water freely to pass off into the adjoining natural outlets. Even in well underdrained land this precaution cannot be dispensed with.

THE PROGRESS OF AGRICULTURE IN CANADA.

MESSRS. EDITORS OF AGRICULTURIST:—I am induced, after much consideration, to take up my pen, from the perusal of an article that appeared some days ago in the *Leader* newspaper, questioning in some measure, the propriety of the University Commissioners to abolish the chair of Agriculture in the Toronto University, and commenting in general terms upon the present progress of agriculture in western Canada.

I have been expecting every day since, to see in that paper, by a practical agriculturist more able than myself, a refutation of several assertions and impressions set forth in the article which are practically untenable, made doubtless under erroneous information by a very able writer, but who, nevertheless, is somewhat out of his depth on the all important subject of agriculture, or in other words, as broad as to the present status of agriculture in this Province, I allude especially to Upper Canada.

The article, upon the whole, is undoubtedly a very able one, and although I can account much that the writer says regarding the different cultivation of a part of the soil, at the present time, in some sections of the province, and lament as much as any one the paucity of science employed as a necessary adjunct to the successful carrying out of agricultural operations, I cannot conceal even to the doubt of whether we are progressing or retrograding in that truly important industry, or as to the propriety of abolishing the chair of Agriculture.

Notwithstanding, I am willing to admit that the older cultivated farms generally speaking, are not in every case being supplied or renovated sufficiently with proper and needful fertilizers, so indispensably necessary in producing a full and remunerative crop where the land is under yearly cultivation. yet, upon the whole, making due allowance for the last two unfavourable seasons, more especially in the north and north-west part of the province, I do not think it can be said *with any show of justice*, that as an agricultural community we are not progressing. I think far otherwise! and I imagine that I am borne out in this conclusion by what I have witnessed, not only at our late Provincial

hibitions, but by the very extraordinary specimens of grain, roots, and fruits produced at our County and Township Shows, held in almost every part of the upper Province. Does not also the fact of the success of Exhibitors from Canada at the "World's Fair" of other years in London, prove incontestably that we are progressing in our agricultural industry. We have taken there first-class prizes and medals for wheat, barley, oats and peas, and I believe for grass seeds as well, as also for cured meats, cheese and implements: and indeed many articles connected with agriculture. Does this say that we are either retrograding or standing still? Then with regard to the general stock of the country, can it well be faster improving than it is? Thanks to our spirited importers for this, of which I am thankful to say we have many. We need only ask our (just now) unfortunate neighbors on the other side the lines, what they think of our progress; or hear the remarks of old and experienced landlords and tenants, farmers from Great Britain, regarding every class of animals they witnessed both at our Exhibitions, and at the shambles, during their transitory sojourn amongst us, to feel satisfied that we are steadily and substantially progressing in this particular.

Again, respecting the progress of our agricultural machinery, carriages and implements, no one can but allow that we are making great headway. It needs but, in case of any one doubting, to have witnessed the display in these departments at our last two or three provincial Shows, to be thoroughly convinced of the fact! There are I hear, two or three establishments in the province, at the present time, that cannot possibly meet the demand for improved machinery, ploughs, and other agricultural implements. Does this imply that we are unprogressive?

Would these implements, let me ask, be wanted, or would the demand for improved breeds of stock, throughout the province, be made if we were not steadily and surely progressing in our agriculture? Why then, if the spirit of agriculture is thus alive, should there not still be every facility and encouragement continued by the Government of the country to so important a branch of our industry? Will the fact of depriving us of our agricultural chair in the Toronto University, lessening the annual grants to our Societies, in any way affect aught to our advantage, or tend to improve our position, or encourage our future hopes? I trow not! Nor does it follow that, because there are to be found *drones* in the industrial hive, that the *workers* are to suffer from their supineness and indifference. I grieve as much as the writer of the article before alluded to can, that there should be a manifest lack of interest shewn that there is by *part* of the farming community in endeavouring to raise the profession to which

they belong, to a higher or more satisfactory standard.

But, Sir, this in my humble opinion, will be effected only by time. It cannot be effectually accomplished by the present generation, though yearly progress may and doubtless will be made.

The absence of sufficient education amongst the agricultural youth of our country, together with the lack of capital, will for years prove a bar to that progress we could all wish to see made. We need, however, only look back a comparatively few years, and call to mind the very crude state agriculture was in throughout the British Isles, to take courage and assure ourselves that we shall effect more towards the development of the soil in the next ten years, than was accomplished there some years back in thirty! Truly, however, may it be said, they have, of *late years*, made marvelous strides, with the aid of science and *well applied* capital, from which we also must in some measure, reap great benefits.

Why, Sir, it was but a very few years before I left the old country, some twenty years ago, that there were a very few Agricultural Societies existing in England. But the landed proprietors, both great and small, began to find that, not only were their barns and buildings going to waste and ruin, but that their rents were assuming a deficiency that became truly alarming, and then, and not till then was it that the great impetus was given to improve the agriculture of the country by the landowners, taking the bull by the horns in the determination to resuscitate the value of their estates, not only by draining, and sundry other improvements, but by the establishment of Agricultural Societies, thereby creating great emulation amongst the tillers of the soil, and by setting an example themselves, with a desire not only to better their own position, but with a laudable earnestness and zeal to add comfort and prosperity to their tenantry, by a system of improved agriculture.

It needs no argument of mine to point out the many phases under which all, and even more than all, has been accomplished in this respect, that they, the aristocracy of Great Britain, could at that time, in their most sanguine moments, have anticipated. I allude, Mr. Editor, to this fact, to show how much has been accomplished in so few years, and to hope that any one doubting what I have predicted regarding the steady progress we in this country are bound to make in agriculture, will take heart of grace, and put his shoulder to the wheel with a firm determination to master, in some measure, at least, the arts and mysteries of his profession; and thereby greatly add not only to his comfort and prosperity, but also to the material wealth and credit of the province.

This fact should never be lost sight of by the cultivator of the soil, that *capital well*

and judiciously applied upon the farm, if not in the first year, is certain, nevertheless, in the next and following years, to insure an ample return. But do what we will in the use of all the skill, capital and industry we possess, "there are times," as my lamented father used to say in my youth, "when the seasons will make fools of us all; this, however, must not deter us in our best endeavours to overcome difficulties, for there is nothing in this world more truly grateful than the soil, for generous and kind treatment!" This admonition I have never lost sight of to this day, and, in some measure, I hope I have profited by it.

I find, Mr. Editor, that I have somewhat wandered, in part, from the point I had in view, when I recommenced this letter—a refutation of two or three statements in the article that has called it forth.

The writer in that article asks "what new productions are being acclimatized and developed; and what old ones are, in any given district, being increased without bringing additional soil under cultivation."

In answer to which, I reply, that within the last two years, in one locality alone that I am acquainted with, upwards of 1500 acres of Flax have been grown, and in other parts of the Province it has also been extensively cultivated, and I doubt not, from information I have received, that the coming summer will produce some hundreds of acres of increase from the last. And all this would have been accomplished much sooner, had the grower known how to treat the crop, and where to find a market when grown. This trouble, however, thanks to your Journal, and to those gentlemen who have taken a great interest in the matter by their individual exertions, is greatly, if not entirely removed. We have much also to thank the Government for, in importing of machinery, and granting the aid it has done in this matter, through Mr. Donaldson, by whose efficiency and persevering exertions, much encouragement has been given to flax growing. The desirability of which, the farmers of this province will, doubtless, soon properly appreciate, especially so, when they have become more familiarized with its proper cultivation and treatment.

Herewith you will find enclosed an article cut from the *Guelph Mercury*, wherein is stated that, the produce of dressed flax, seed, and tow, of six acres, sold by Mr. Hennyberry of Elora, to Mr. John McCrea of Guelph, realized the pretty little sum of \$462,50!

Surely if there should be any farmer at all sceptical as to flax growing *paying well*, the above account will, at once, dissipate any doubt from his mind on the subject. We must too, in this matter, not lose sight of the advantage a change of crop always proves to the soil, more especially where it has been too long under one form of tillage.

Then again, there is winter Barley being introduced in different parts of the Province to which we were perfect strangers only two or three years back. Some farmers, I know, have been very successful with it, though others may not have been, through sowing too late, and from lack of knowledge of the treatment which the plant requires.

Then there is the Alsike clover, being new to the soil, has been very successfully grown in many districts, producing abundant crops where the soil and treatment has suited it. The Millet also has lately been introduced with equal success, and the sorghum, or Chinese Sugar cane is now undergoing a trial in several parts of the province—to say nothing of the many new varieties of Potatoes, which have, of late years, been raised from seedlings, chiefly produced in this country, with great success. And as regards our root crops, the foundation, I maintain, of all good farming, it may be truly said, they are increasing in an extraordinary degree, far indeed beyond the expectation of the most sanguine and energetic amongst us. And root culture, I am glad it is in my power to say, is not confined to one locality only, but, it may be said, is becoming general throughout the province, as our Provincial Shows, *wherever held*, amply testify. And I think I can speak with truth to the fact that, where there was one acre of roots (turnips more particularly) grown, in this neighbourhood when I first arrived here some seventeen years ago, there are twenty now. And I may hope, without taking undue credit to myself, that I was somewhat instrumental in giving an impetus to this branch of agriculture, not only by the example I set for several years in the large yield of turnips that I grew to the acre, but also in setting forth the unmistakable advantage accruing from the root crop, in a lecture at one of our Farmer's Club meetings held in Guelph some years ago. Whether, however, I am right or wrong in this supposition the fact is patent, that in less than five years after that lecture, there were in the neighbourhood ten acres of turnips grown, to one previously. And I think, from a correct recollection of the many inquiries of me, by different individuals almost immediately after, respecting the *modus operandi* in the growth of the crop.—I do not err much in the conclusion I have arrived at.

I have here again introduced this matter more especially to refute the assertion, in the article before alluded to,—“that a prize is given for a sample of wheat, which does not necessarily depend upon good farming at all, it may be, and in this country often is, the result of some lucky accident.”

Now, Sir, from the above extract, the writer evidently intends to imply that the 30 and 40 splendid samples of winter wheat of 23,

bushels each, exhibited for the Canada Company's prize of £25, (say nothing of all other samples in other classes) were produced by mere accident, or without the skill and energy which must have been applied to produce, not only such *quality* of grain, but such *quantities* of it, exclusive of the many thousands of bushels, equally good, that were kept at home!

Can therefore, anything, I would ask, be more fallacious, or unjust towards us as an agricultural community? Never shall I forget the admiration and surprise expressed on more than one occasion, by the more prominent and practical agriculturists across the lines, at the numerous, and to them, extraordinarily beautiful samples of wheat, as well as of other grain at those times exhibited, when they honored us with their company, and the conclusion, (natural enough) drawn and expressed by them, was, "that there had been some extremely good culture, as well as good soil, where such prolific and splendid samples of grain could be produced!"

I cannot but think this conclusion a much more natural, as well as a more just one, than the one arrived at by the writer before alluded to.

Why, Sir, I dare answer for it, that there was not one exhibitor of those samples of wheat, but had carefully and skilfully prepared his soil by fallow for the growth of that crop, or it had been taken after a thorough preparation for a green crop the year before. Does this, and the fact also, that there are thousands of acres yearly in this country, highly and well prepared for roots, and afterwards put to spring wheat and barley, sown with clover and timothy, and in a favourable season producing abundantly, prove that our crops are produced by accident, or at most that the production is a *casualty*?

Nevertheless, I do not mean to say that a season will not occur that a tolerably fair crop of grain, of any kind, may not be grown with but little or no skill in its culture.

But, let me add, such occurrences are rather the exception than the rule, and are something like the angels' visits, few and far between! I think twice only have I had the pleasure, to my surprise, of witnessing such a novelty in the course of seventeen years. How much too, is the opinion of the writer I have alluded to at variance, regarding our agriculture, with a recently expressed opinion of the Hon. Geo. Brown, who, a few evenings ago, was speaking at a church meeting in Guelph, when in allusion to the great pleasure his recent tour had given him in the rural districts of his native country, and in England, said, "that he did not think that agriculture had made much more progress in England than in Canada; there were some highly cultivated lands, and much but middling, and that England was by no means the garden that some supposed

it to be. He saw many enclosures and farms that would have suffered greatly in comparison with the fields and homesteads in a number of places in Scotland and in Upper Canada." Again, in speaking of the display at the great exhibition of Canada's products, he adds, "There was an immense display of machinery, but in agricultural implements, *Canada* was held to *excel* the mother country!" and thus corroborating to a great extent what I have advanced. Will Sir, any one believe after such a declaration from an eye witness, (so recently returned from the old country) of the results of the great efforts which we all know have been made there of late years to improve agriculture, that *we can possibly be the drones* that deserve to be deprived of our agricultural chair, or be denied that succour from the Government grants that have of late years been so liberally allowed. Nor can I be induced to believe that because there are not at the present time, the number of pupils attending the worthy Professor's lectures on agriculture, which we would all wish to see, that that chair should cease to exist!

In a few years, it is possible that the reverse may be the case: at any rate, the subject is fraught with such vast importance to the present and future interests of the agriculturists of this country, that it ought to be approached with the greatest caution and consideration so grave a subject demands. And most sincerely do I agree with the writer of the article I have so often alluded to, when he says, "before we abolish the chair of agriculture, *let us be sure that we get something more effective in exchange!*" In that same article, the writer in endeavouring to show the inutility of fattening animals to the extent that is sometimes practiced, quotes, *as he imagines*, very high authority on that subject, to support him in said opinion, which is no less a personage than the lamented and talented Lord Macaulay, who says: "a prize poem is like a prize sheep. The object of the competition of the agricultural premium is to produce an animal fit, not to be eaten, but to be weighed. Accordingly he pampers his victim into morbid and unnatural fatness; and when it is in such a state that it would be sent away in disgust from the table, he offers it to the judges. In general, prize sheep are good for nothing but to make tallow candles; and prize poems are good for nothing but to light them."

The late respected Lord Macaulay, was undoubtedly, a highly talented and clever man. No one will dispute that, but in this respect, his ideas of the value of a fat sheep cannot be our guide star, and he evidently was much more at home in Literature and History, than in agriculture. We all well know, who know anything about the matter, that a sheep or any other animal, is not made unseemly fat, especially for the table, but for the purpose of

showing what high blood, and skilful and liberal feeding combined, will accomplish; and to such an extent has this sometimes been carried, that many a breeder has been induced (injudiciously as I think) to sacrifice his best breeding animals in the accomplishment of it; but which enabled him to show to the world the extraordinary disposition of his herd, or his flock, to make weight in a short space of time, with high feeding, or with only ordinary food, and thereby to induce purchasers of his stock.

This has been the chief object of owners of improved breeds, in fattening their animals to such prodigious weights. Besides, there was a time, more particularly so than now, when the fat from these animals was more valuable than the lean, and, in fact, it is so in part, even at the present time. Coal oil was not then heard of, and other oils were beyond the reach of the million, and before we were in the enjoyment of gas, the tallow from fat sheep and cattle was as necessary to our use in "lighting our darkness," as other substitutes are now.

And even at the present time, there are many uses found for the surplus fat of all animals in this country, as well as throughout the world.

I do not therefore see the utility of discouraging the feeding of some animals to extreme fatness, by withholding prizes from them, for most assuredly, *we have far more of the lean kind than of the fat.* Though extreme feeding, like many other extremes, is often carried too far! I do not however err when I say that thousands of others, as well as myself, prefer the lean of a well fattened animal to that of a poor, and half fattened one. Let not, therefore, I should say, the breeding and feeding of fat animals be discouraged by withholding premiums from them. Let the high-blood have a chance of showing itself, and my word for it, the saying of the "good old Duke," in choice of a charger will be verified "an ounce of blood any time, against a pound of bone!"

Besides, breeders can never know the real value, or constitution of their stock, unless they do *occasionally* try what they can produce by high feeding.

I shall only just briefly allude to one other subject immediately connected with the progress of our agriculture in this province, and then bring this, already too long a letter, to a conclusion, and which I think will go far to show how little ground there is for any one to infer that there is little or no good tillage of the soil, or that we are not progressing as we ought, considering we are but a new country. Not, but what there are doubtless many farms slovenly managed; no one can controvert that; but, let me ask, are there not num-

bers in England, Ireland and Scotland, as well as amongst our cousins across the lines? Undoubtedly there are, and there always will be.

The one subject more, that I am about to revert to, is, that of our ploughing matches in western Canada.

Does not the emulation of our farmers in this branch of our industry speak volumes? Where else will you find such work done, and such teams shown as at these exhibitions in so young a country? The work executed on these occasions, would do credit to any country, and it is an extremely gratifying reflection that the zeal and energy of the *youth* of the province, in this particular, yearly increases, as I have myself seen. Much of their work on many occasions, being little, if any inferior to the senior ploughmen. Such teams, such ploughing, and such bone and sinew of the country as have been shown at the Scarborough, Markham, Whitby, and other ploughing matches may fairly vie with any country in the world, to say nothing of what takes place in other counties. Why, it was but the other day, a few miles from Guelph, that a similar gratifying scene was witnessed, when upwards of *sixty ploughs* started for competition! and the amount of premiums awarded was, I think, little short of two hundred dollars! It is hardly necessary to say that by every ploughman the work was most creditably done.

I trust, Sir, that if this letter should meet the eye of the writer of the article to which this is somewhat of a reply, he will *feel* that he has unwittingly misrepresented facts, and has in a great measure, underrated the efficiency and persevering energy of the tillers of the soil in this favored country. Even bearing in mind that the high rate of wages here has operated, and will for years to come, operate disadvantageously in no small degree, to the desired advancement of agriculture.

I would gladly, and at length, allude to the great stride our twin sister, *Horticulture*, is making amongst us, but as my letter is already far too long, I must only say, that towards it, in some districts, the *Farmer* very materially adds his quota, and, every year, this much desired branch of our industry is greatly increasing amongst us. And to those professional and amateur gentlemen, who have been for some time past taking the lead in this important matter, our best thanks are due for the liberal and kind manner in which their experience and knowledge is conveyed to us, *without stint*, by you, through your valuable journal. This, too, will go some little way to show that we are not a stand still community.

One word to the would be destroyers of our cherished and valued University, and I have done. That their scheme will be frustrated by the honesty and good sense of Par-

liament, the Government, and the country, they may rest assured; and, believe me, such is the earnest wish of your obedient servant,

LEICESTERENSIS.

25th February, 1863.

HOW FARMERS CULTIVATE WEEDS.

[The following lecture, recently delivered by Professor Buckman on the growth of weeds by the farmer in the cultivation of his crops, before the Berkeley and Thornbury Association, England, will be found of no small use to our readers. Professor Buckman has paid special attention to this subject for a number of years; and many of his suggestions will be found equally applicable to this side of the Atlantic as they are to the other.—EDS.]

Farmers, often unwittingly, cultivate weeds in one rotation. I shall attempt to point out to you that farmers grow weeds under the following circumstances:—

1st.—In their general tillage operations.

2nd.—From manure heaps.

3rd.—They sow weeds with their crop seeds—that is a very fertile source of weed cultivation.

4th.—They allow weeds to seed in their fields.

As regards the cultivation of weeds in tillage operations I will just draw your attention to the natural history of the common thistle.

The plant crops underground, and in so doing produces long under-ground stems, which sometimes reach to a very great distance. The plough in going through the soil cuts these stems into pieces, and they are not generally picked up. Every one of these pieces contains one or more buds, each capable of producing a distinct plant. This is the creeping underground thistle. I have seen in one spot two or three of these centres from which radiate the underground stems, covering a space as large as half the circle of this room; and I have seen these continue to spread underground until the whole field has become covered with thistles, owing to the stems being cut up into little bits in the ordinary tillage operations; these little pieces not being picked up, the harrows go over them and regularly distribute them all over the field. And exactly the same thing occurs with regard to the colts-foot. I have frequently heard farmers say thistles do not grow from seeds at all, which is a fallacy. In proof of this I have performed some experiments. I obtained some thistle seed, and planted 10 of them in a place where I could watch them. They all came up; and it became a curious question how farmers ever arrive at the notion that thistles do not grow from seed. I conceive it is just this; that the thistle is at first a very little plant, which dies down entirely towards the autumn; but in the meantime it has sent out a couple of buds near

the roots, which stretch out, and put out fresh buds, so that in the next year a plant that was so small as scarcely to be seen, will spread and cover a circle of some 6 or 8 feet. The notion that thistles do not seed probably arose from the fact that the seed is frequently eaten by a little weevil, the down of the seed being alone left. This was a most fortunate thing for this country, otherwise if every seed were uninjured we should have what they have in Tasmania, namely, a plague of thistles. Our thistle has been transported to that country with our emigrants, as have been so many other weeds of the mother country to our colonies; but, fortunately, we have the weevil here, which destroys large numbers of the seeds, but which has not accompanied the plant to Tasmania, probably from the climate not being suitable, and consequently they have a plague of thistles. For their extermination laws have been instituted, which are rigidly enforced. In many parts of the island it is found impossible to grow crops on account of the extraordinary development of the thistle.

Let us look again at another case. There is the weed known as the coltsfoot, which we treat in the same way as the thistle.

It increases in the same way as the thistle by sending out lateral buds or shoots, which, on being separated from the parent stem, or broken up, will grow into a perfect plant. Thus we may see whole fields covered with coltsfoot, having spread from centres in this way. Let us look a little more closely at the natural history of the coltsfoot, and then we shall see how serious are the injuries caused by it. In the early part of the year it has little inconspicuous flowers, and no leaves, and the farmer therefore when he sees them amongst his corn thinks very little of them, and allows them to remain. By-and-by, when the usual period for wheat-hoeing arrives, the hoe is busily engaged in chopping them. The blossoms have by this time ripened their seeds, and the plant has the underground stems I have referred to in every direction. Every one of the blossoms whose seeds are scattered by the hoe plants 150 new plants, each seed having a parachute by which it flies about, and is planted somewhere or other. So that in the usual farming operations, without knowing it, the hoer takes care that every coltsfoot seed shall be very nicely and delicately planted. I am quite sure that the more you reflect on this matter, the plainer will you see the truth of what I am stating. But had these flowers been cut down before the seeds ripened, you would have prevented the possibility of the seeds it afterwards contained from being planted.

It is the same with regard to couch, which is perhaps "cultivated" to a greater extent on the Cotswolds than it is here. On one or more sides of many fields on the hills there is a wall, and under that wall there will be a piece of ground the plough cannot get at. These are the places where weeds grow, and flower better than anywhere else, and the seeds become scattered over

the land. The roots of the couch and other weeds run from these places into the cultivated ground, where they are cut up into little bits by the plough, and extensively propagated. Couch can be picked out of land when there is a single plant or so in it; but it is exceedingly difficult to pick up all these small pieces, and they remain to become centres from which fresh plants are sent out to choke the growing crops.

2. With regard to our second point—the propagation of weeds by manure heaps—it is a very important question how farmers grow weeds from the seeds being scattered in the manure heaps.

Some two or three years ago I was on a farm upon which the farmer had commenced the growth of flax. In that flax was a quantity of black mustard seed—not the common charlock (*sinapis arvensis*), but that charlock with the smaller seed and flower, and usually a smaller plant, *sinapis nigra*. This is much more general than the other. I saw that there could not be a ready market for this flax, from the prevalence of the black mustard. The seed was thrashed out, the charlock seed was separated, but it was not burnt or destroyed as it should have been, and some of the refuse seed got into the fold yard, and it was mixed up in the manure heap. It is commonly supposed that if weeds are put into a manure heap, they will rot and decay; and so most plants will, but there is a vital principle in the seed that will resist decay (for it is the principle which is to bring about the new plant) longer than any other portion of the plant. The result was that in this case, where the manure containing the seed was carried and spread over the land, the next year it was quite covered with this charlock, while the other portions of the land were clear. But now what is a very remarkable circumstance respecting that farm is this: that whereas the common charlock was formerly the rule over that farm, now it was the black mustard. And this is easily explained when you remember that the common charlock will only produce some 4000 seeds, whereas the black mustard is so prolific as to produce about 8000 seeds to a plant; thus the greater fecundity of this plant enabled it to gain the entire mastery. If you take almost any crop you have threshed, barley, for instance, and having separated the barley, examine the tail barley that is left, you will find a quantity of seeds of weeds. I got a sample of tail barley the other day from Wiltshire, and counted in it no less than 20 different species of weeds: some of the black mustard, some of the common charlock, some of the climbing buckwheat, &c. I was brought to ask, "What became of this refuse?" "Well," said the farmer, "there's a quantity of barley in it, and it don't do to throw it away, so I throw it about the farm yard, and let the fowls pick it up;" and the result of that was that it got after all into the manure heap, and from thence the seeds were regularly and systematically planted over the farm. To give you some notion of the quan-

tity of weeds that may be found on a spot where manure has been placed, I will mention a striking fact. In Berkshire in 1859 I went into the middle of a grass field, and in a small spot upon which a manure heap had stood, I counted no less than 30 species of weeds which had taken root. Now what would a farmer usually tell me with regard to this? Why, that the weeds were natural to the soil. But the fact was, they were taken there with the manure. There were the common sow thistle, and the corn sow thistle, the grousel, nettles, poppies, two or three species of chamomiles—in fact all the common agrarian plants, and not meadow plants. On another occasion I recollect going into a field that ought to have been turnips, but I could not see a turnip at all; the whole field had been taken possession of, from one end to the other, by the stinking chamomile. I was naturally curious to know how it got there. It was just this:—The manure heap from which those turnips had been manured was an old one, and on the top of it the stinking chamomile had been growing. This plant will grow better on the top of a manure heap than elsewhere; and each one will actually develop from 60,000 to 70,000 seeds. These, shed on the top of the heap in autumn, were regularly scattered and planted over the field. This shows how without care weeds may be scattered over our fields. If we know such facts as these, we have only to avoid such a means of weed cultivation.

3. Let us now consider the third point—the growing of weeds with crop seeds. I believe until I commenced investigating this matter its value was scarcely understood.

Very frequently with the seeds you buy at market from different seedsmen, you buy quite sufficient weed seeds to become a crop, and cover the ground; you will see that this is a very fertile source of weed cultivation. In one of six samples of clover I have sown I found 21 seeds of common weeds would be sown in every square yard; in another 32; in another of Dutch white clover, usually a foreign seed and very dirty, 66; and in another the enormous number of 174. Suppose you parcel out a square yard, and take 174 seeds, or a quarter of them, and dot them about, and when you are told that some of these will occupy several square yards to itself if it grows well, you can hardly expect a crop to grow, and you see plainly how you must be growing weeds. In order to show you that I do not speak without book I will give you some cases. I have entered very minutely into this matter. I took the trouble of taking pints of various kinds of clover (and a great deal of trouble it was), and ascertained by counting the number of seeds of weeds they contained, and the results arrived at were somewhat remarkable. Multiplying these pints into bushels gave some surprising figures. Here are six samples of red clover. In a bushel of one kind I found 1,085, 415 weed seeds; in another 2,524,160. Without troubling you by going through the whole

of this table, I may state that a sample of white Dutch clover contained the highest number of weed seeds I have observed in any sample, and this, too, came from a seedsman labelled as genuine. In a bushel of this I found no less than 7,680,000! Here, then, is the case of this white Dutch clover. With every square yard that was sown of this seed would be sown 174 weeds, which would of course be quite enough to stock any land for some years to come with weeds, however careful you may have been in weeding in previous years. Let us take ryegrass, a more fertile source of dirt than almost anything else. I have examined various samples of ryegrass. In one sample of Italian ryegrass, for example, I found 261,110 weed seeds in the bushel. These seeds are very much like ryegrass—couch grass very often; and some very inferior species of grass. As far as I have seen, with regard to ryegrass, there is not a more fertile source of couch grass than imported ryegrass seed. In a bushel of this seed will be found quite enough couch seed to stock your land, if it has been cleaned ever so much previously. Then, again, there is the common imported Italian ryegrass. The example I have here is one of the dirtiest I have ever found, for it contains 450,560 weed seeds to the bushel. The weeds consist, among other plants, of the creeping crowfoot, one plant of which will occupy several feet if it grows well, which it is almost sure to do, and if it starts amongst seeds, will grow them out in a very short time. Another of the weeds is the heavy lop grass, with no feeding properties whatever, and perfectly useless amongst ryegrass, or, if not useless, it is a grass the seed of which it is too bad to call upon the farmer to pay for, as it entails work upon you for years and years to get rid of out of your fields. There cannot, I am sure, be a more fertile source of weed cultivation than is offered in our common seeds. My examinations of flax seeds also show that you sow weeds very generally when you sow flax. I got several samples of the seed as ordinarily sold. If used for crushing, its value is reduced as much, or perhaps more, than if sown. In one sample of Tulsit linseed, in 100 parts I got 40 parts of flax seed, 44 parts of weed seeds, and 16 parts of dirt. Thus 60 parts were dirt and weeds. In Odessa linseed I found 66 parts flax, 20 weeds, and 4 dirt. In some Black Sea linseed 80 parts seeds 19 weeds, and 1 dirt. In Bombay linseed 95 seeds, 3 weeds, and 2 dirt. So that these show you that, though if you buy cheaply you may get some kinds very dirty, yet that it is possible to get almost pure flax seed in the market. If any of these dirty seeds is used, you get as a result a large number of weeds on your farm. Weeds which you never cultivated or saw will be obtained from those bad foreign flax seeds. Weeds are thus taken to various parts of the world in carelessly collected seed. Our emigrants in India and North America have thus taken our agrarian weeds with them. At one place in the neighborhood of Saratoga Springs

I counted some thirty species of weeds growing as rampantly as in England, they might have been taken to the farm, and there cultivated in the same manner; in fact a great part of our ordinary weeds have been brought from foreign countries. I am constantly having new plants brought to me. Some of these spread very rapidly. These new plants have been brought to us in foreign seeds, and they ought to be an evidence to us of the manner in which we sow weeds. Suppose we don't sow this dirty linseed, but send it to be crushed for oilcake, and the dirt happens, as is very often the case, to be mustard seed or charlock, both of which are hot and pungent—you will have a cake which is frequently destructive to cattle. The number of cases of cattle being so destroyed is more than you would be inclined to believe. Then again with regard to vetches, I can assure you it is almost impossible to get a genuine sample. The corn cockle is a plant that usually grows with vetches, and the flower being purple, like the vetch, it is not noticed. Here are some seeds of it; they are a little darker than vetches. Vetches are often sold containing more than half of the cockle. And as the vetch is a highly nutritious plant, while the cockle has no feeding properties whatever, when you buy them thus mixed you are paying not only for that which is bad in itself, but which dilutes that which is better. There are very few samples that are entirely devoid of that plant; but farmers will continue to buy vetch seed containing the cockle, leading one to suppose that they do not believe there is any mischief in cockle. I do not want to represent that farmers are not observers, for they are, and are looking so closely into these matters that the keenest students of nature can hardly keep pace with them. But in this case probably the close resemblance of the cockle seed to the vetch may cause them to overlook it; and perhaps a little botanical study may be of benefit even to farmers. I will now call your attention to another crop plant, which you do not grow much in the Vale, but which is more grown on the Cotswolds, and that is the sainfoin. There is a weed much taller than the sainfoin, but with leaves of much the same character, and that is the burnet. In the sainfoin the leaflets are not noticed, while in the burnet they are. I have had to give evidence about this in courts of justice. I have seen crops of sainfoin growing 50 per cent. of burnet. It is a large plant, growing strong woody matter amongst the sainfoin, and is of no use as a feeding plant. Instead of a crop of sainfoin lasting six or eight years, it is not found profitable to grow it more than three or four years, on account of this weed. I have specimens of burnet seed, which is light brown, and of sainfoin seed, and at first sight you would hardly see any difference. Here is a mixture of about equal parts of sainfoin and burnet, and from this you will see the difficulty which some persons would have in observing the difference between them notwithstanding the difference in the shape of two seeds.

In a county court I have seen the seed examined by farmers and handed to the judge, and none could see the difference between them but the expert witnesses who were called. Yet a section of the two seeds presented very different forms, one being quadrangular and the other flat, with a broad back, but both being wrinkled and of the same colour, they were liable to pass unnoticed. The evil was thus introduced, and crops of sainfoin now cultivated in this country are not worth half so much as they were ten years ago owing to the extraordinary prevalence of burnet. The seedsman does not separate it because sainfoin seed would be only worth 10s. without the burnet, while it is worth 6s. with the burnet in it, and, therefore, they do not trouble to separate them, especially as farmers do not see the difference, or as when they do, they say burnet grows a bigger plant than the sainfoin, and therefore they get more for their money.

The lecturer concluded by enforcing the absolute necessity of not allowing weeds to seed on the soil, their growth being extraordinarily rapid.

AGRICULTURAL ADDRESS.

BY MR. CROIL, MORRISBURGH.

(Concluded from last number.)

But there are causes—mighty agencies, other than agricultural societies, that have given an impetus to agricultural improvement. Although I may not dwell upon it I shall be guilty of an unpardonable omission did I omit, upon an occasion like this, to bring before your notice the subject of **TILE DRAINING**, the most important of all the improvements that have been introduced into British husbandry.—The system of under-draining was, we know, practised to some extent by the Romans. A kind of draining by open ditches, and large drains covered in with stones, had long been practised in Scotland. An ingenious system of draining, introduced into England toward the close of the last century, created a great deal of excitement at that time, and even gained for Elington a grant of £1000 from Parliament, in acknowledgement of the benefit likely to accrue to the agriculture of the Kingdom from his discovery. The novelty, however, of this system died away. To Smith, of De-anston, a Scotch practical farmer, belongs the honor of having perfected a system “of thorough tile draining,” combined with sub-soil ploughing, which has resulted in more benefit to agriculture than all the agricultural societies and all the other means of improvement which science and modern practical skill have effected. Already this system has pervaded every county and every parish in the United Kingdom. Thousands of acres of fertile land have been improved in fertility and have doubled and trebled their products. Thousands of acres of cold, wet, inhospitable lands have been render-

ed warm, mellow and fruitful by the mysterious, hidden agency of the insignificant little drain tile, and tens of thousands of acres of bleak mountain steep and dark morass have, by the same agency, been reclaimed from utter barrenness, and become fit for the use of man. This system has ceased to be an experiment.—It has stood the test of more than a quarter of a century, and is as efficacious to-day as it was in 1835. And let me tell you, my brother farmers, that it will prove as efficacious in the level plains and in the swails and swamps of Canada, as it has been in the moors of Scotland, and in the waste places of England and Ireland. And, moreover, let me tell you, it is a system that has already been introduced by our enterprising neighbors to the South of us—by our proverbially slow-going neighbors to the East of us, and by our wide-awake neighbors to the West of us. If then, the farmers of Grenville, and of Dundas, would not be left behind in the march of improvement; if the descendants of the U. E. Loyalists would lay claim to as much enterprize as others, and gain for this part of the Province of Canada a reputation worthy of their illustrious ancestors—they must be up and doing.—It is possible, nay more, it is certain that there are difficulties to be met in the way, but they are such as can be overcome, and must be overcome, if we would win the laurels and wear them. Upon this important subject I would fain dwell, but having already trespassed upon your time and patience, I must hasten to bring my remarks to a close.

Another important agency in the improvement of British husbandry, following closely in the wake of tile draining was the discovery and use of the **GUANO** and other important manures. This substance is known to be nothing more nor less than solid excrements of carnivorous sea birds, found in immense quantities on the coast of South America and other tropical countries. Its use in agriculture has long been familiarly known to the Peruvians.—The first cargo of it, however, was brought to England so recently as 1840. The success attending its use created a furor of excitement; the news spread like wild fire of the marvellous effects of this new fertilizer. From almost every port in England, Scotland and Ireland, ships were dispatched to the Pacific for cargoes of guano. The little desert, and uninhabited—save by the wild seagull— island of Ichaboe was surrounded by three hundred British ships at one time, and hundreds of Irishmen with shovels and wheelbarrows were employed in loading them. Suddenly came the stunning news, “Ichaboe has come to an end—the last shovel full of guano has been shipped.” Soon however, plentiful supplies of it were discovered upon other islands and promontories, and private parties bought the right from the Peruvian Government for the consideration of \$40,000. At the end of two years, the trade had increased to such magnitude that the Government cancelled their agreement, and since

that time have retained a monopoly of it. Their Agents, Messrs. Gibb & Sons, of London, are now the sole importers of it, which in a great measure accounts for the exorbitant price which it has hitherto commanded in the market—a price far beyond its commercial value. The chief sources of supply at present are the Chincha islands, off the coast of Lower Peru, which has been estimated to contain the enormous quantity of 45,000,000 of tons; so that for all practical intents and purposes the supply of guano may be said to be inexhaustible. The quantity imported into Great Britain during the year 1854 was 235,111 tons, of which the official valuation in London was £1,231,655 sterling; equal to about £6 10, or \$27 per ton by the cargo. The retail price in Canada of this commodity ranges from \$60 to \$70 per ton. It is used by British farmers at the rate of from three to four hundred weight per acre in addition to the usual supply of farm manure, or in larger quantities when used alone. Like most other special manures, however, it is found to act best as an auxiliary.

Another means of Agricultural improvement may be noticed. Its influence has been largely felt in Canada, and in no one part of Canada, perhaps, so sensibly as in the very County of Grenville. I refer to the introduction of RAILWAYS, with the consequent facilities of transport, not only in conveying our precious carcasses swiftly, comfortably, and economically from place to place—from one end of the province to the other—but in cheapening to the farmer every foreign commodity he has to buy, and enhancing the value of every product he has to sell. With wheat selling at \$1 per bushel, of what avail was it to the western farmer that he could grow 30 bushels per acre against 20 raised in Lower Canada, so long as it costs fifty cents per bushel to convey it to the shipping port. It is evident that the Lower Canadian with the smaller crop realized more money. But when the freight of a bushel of wheat from Toronto, London, or Sarina to Montreal is reduced to a few cents, the distant producer reaps the full benefit of whatever advantage he may possess in fertility of soil or salubrity of climate. And so in the old country.—Farmers in Scotland, formerly shut out from the London market, now find themselves upon an equality with Essex and Sussex.—Beef and mutton, salmon, poultry, and dairy produce, and even eggs for the *Cockney's Breakfast*, are daily conveyed from the North of Scotland to London by rail—while hundreds and thousands of acres of potatoes are planted in East Lothian for no other purpose than supplying the same market by the same conveyance, though at a distance of four hundred miles.

Think, too, of the increase in the value of lands in the neighborhood of this system of transportation; why, sir, it baffles all attempts at calculation. Much as we have heard of the *Four Millions of good Canadian Dollars*

swallowed up in the much maligned Grand Trunk Railway, I question if any one has yet made the calculation, how much has actually been added to the wealth of the Province by the enhanced value of lands within ten miles of that Railway throughout its entire length, or computed in the other direction the direct loss that would result to Canada from a suspension of that Railway communication.

In Great Britain there are 10,500 miles of Railways and they are still being built there at an average cost of £37,060 sterling per mile;—in all £400,000,000 sterling have within the last 35 years been expended upon these works. The United States have no less than 31,800 miles of Railway having cost £7,409 sterling per mile. In Canada we already have 1,826 miles, while it is computed that there are, in the whole world, 66,733 miles of Railways in operation. Whether these railways may have been profitable or otherwise to those who invested their money in them, there remains no doubt but that the agricultural community has been gainers to an incalculable extent.

It has been charged against the Grand Trunk Railway of Canada, that, instead of encouraging settlement it merely carries its passengers through Canada to the Western States. Let it do so.—There is a large proportion of the emigrants who go to the United States, whose presence among us were more real cause of regret than their absence.—Let our Railway catch all the freight it can, but, when a train is formed at Quebec or Portland, freighted with *Republicanism*, it is the true wisdom of Canada, to put it through—by daylight if possible—that no time be lost, until every republican rag-a-muffin shall have been deposited at Detroit. At the same time, every facility should be afforded on the other side of the Atlantic, and on this, to enable intending emigrants to make a wise choice in the matter of their destination.

The use of STEAM POWER in the operation of the farm is another improvement of recent introduction which seems destined to have a very important influence upon agriculture. The first steam thrashing machine was introduced into Scotland in 1820, and at the present time, in Great Britain travel in what direction you may, you will find the tall brick smoke stack towering above the roofs of every farm-steading. This is an improvement we may hope soon to see introduced into Canada.—Steam-engines are now made so portable, so cheap, and so easy of management, that they may be set down almost in our barn-floors, and do our work more economically, and certainly far more satisfactorily, than by that most barbarous of all modern machinations—the revolving platform horse power.

The advancement in mechanics through the agency of steam, has been immensely serviceable to agriculture. Every implement that we require to use is furnished to us at a cheaper rate and of better construction. Our reaping machines, and threshing machines, fanning mills;

ploughs, harrows, hoes, spades and shovels, are now made, in whole or in part, by steam power, and yet it would really seem that the application of this agency, which has revolutionized the world of commerce and manufactures, is but in its infancy in connection with agriculture. Many years after steam had been successfully used in the propulsion of vessels, men of science demonstrated plainly (at least to their own satisfaction) that the navigation of the Atlantic by steam power alone was impracticable. We have lived to see the triumph of steam in that direction, and in other ways as unlooked for, and it needs no other prophet to predict for it further triumphs in relation to agriculture.

The steam power employed in Great Britain in 1851 was estimated as equal to the united forces of six hundred millions of men. It is computed that 40,000 men are constantly employed in mining coal enough to move this vast aggregate of machinery. The population of Great Britain at that time was 21,000,000, each of whom, man, woman and child had thus thirty willing slaves to do their work.—“Slaves hat never tire, never fall sick, need no clothes, and eat only fire and water.

In the agricultural department of the Great Exhibition recently held in London, unmishtakable progress in the exhibition of implements and machines is the distinguishing characteristics, and the most remarkable feature there—the department of steam cultivating mechanism. A writer in the Highland Society's Journal, in treating of this department says:—“So rapidly has the power of steam been accepted as practically available in the field, that to a great extent, in some districts, is the occupation of the ploughboy gone. Literally the smoke of the many steam engines hangs in clouds over the green fields over which the steam plough is dragged with a power greater and more steady than a dozen horses. Already has the day-dream of our enthusiast in steam culture in part been realized; for ‘o'er the lea’ on which the ‘plough man plods his weary way’ is heard the scream of the steam whistle, and is seen the wave of the signal flag. A revolution in culture has been fairly and fully inaugurated. Anticipating future, from its past triumphs, we see, in imagination, the steam engine, pioneer of true progress, placing itself amid, and rapidly bringing tracts of our dreariest deserts into smiling fields.”

Here then is a field on which we might enter and linger with interest and with profit for hours together. My time has only permitted me to mention it, and the mention of it suggests another agency, one in which we cannot fail at this moment to feel a deep interest. I promise you it is the last I shall mention. It is the benefit accruing to agriculture from EXHIBITIONS, great and small.

Much as Agricultural Societies may have done by awarding prizes for excellence in the varied departments of Agriculture, or for reports on the same, it does not admit of a doubt that

periodical exhibitions of the products and manufactures of any country or district are by far the most convincing and reliable indication of the industry and success of its inhabitants, that can possibly be given. Practical farmers, as a class, have a decided antipathy to having “the wool pulled over their eyes” by those whose education may perchance be better than their own. With them, flowing reports and grand speeches are all very well, but “seeing is believing.” And while Agricultural Societies may, with all propriety, make use of reports and speeches as means of improvement, it is manifest that without an exhibition of what has been done, many would be disposed to question the correctness of conclusions drawn, and statements advanced, in reference to agricultural improvement.

We know that the Great Exhibition of 1851 originated in the mind of that good Prince whom we all lament to-day, and it is more than likely that it was suggested to his mind by the success attending the annual exhibitions of the Royal Agricultural Society, of which, as already said, he had long been a member. That this bold and novel experiment was eminently successful is demonstrated in a number of ways. The very building in which it was held was an exhibition of itself, such as the world never saw before—a fairy palace of glass and iron, covering an area of 21 acres of ground. The building in the centre of the British metropolis, was not designed to stand there as an exponent of British greatness, alone—not that Britain might stand out as laying claim to be the most enlightened nation of the age—but, that while shewing to other nations wherein she excelled, she might, in turn, learn from them to see her own deficiencies. To this the people of all nations were invited to bring samples of their products and manufactures. The proposal met with universal approval, and the result far more than realized the highest expectation formed of it. It may seem a small thing to say that it *paid* in a commercial sense, yet so unlooked for a result is worthy of record, that after all the expenses attending it were defrayed, there remained in the hands of the commissioners the sum of £170,000 sterling.

By this great exhibition an impetus was given to the arts and sciences, to manufactures, commerce and agriculture, such as had never been dreamed of. The productions of far distant lands, hitherto supposed to be peopled with semi-barbarous populations, and among them our own Canada, were here placed side by side with the old countries of Europe. The creditable display made by the British Colonies opened the eyes of British statesmen to their importance, and contributed in no small degree to introduce Canada to the notice of those who knew little or nothing of her before.

Perhaps the most noticeable feature in the agricultural exhibition of 1851 was the presence of two reaping machines from the United States.

No attempt had as yet been made to reap by machinery in England. Indeed up to this time England was not prepared for reaping machines. Labor had been abundant and cheap, agricultural machinery of all kinds imperfectly constructed and high priced. Now, however, matters were reversed.—Fields of industry had been opened up, and happy homes provided in the "new world" for many thousand of the redundant population of Great Britain and Ireland. Labour had become less abundant, and in many places the reaping hook had been supplanted by the sythe or the American cradle. Under these circumstances the appearance of reaping machines was opportune, and secured for them every consideration. They were subjected to a thorough test—were highly approved, and to the reaper of Mr. McCormick was awarded the gold medal of the great exhibition.

No doubt this was a good stroke of business for Mr. McCormick. It served, however, another purpose. It brought to light the fact that a reaping machine, similar in its main features, had been exhibited, had received a prize of fifty pounds from the Highland Society of Scotland, and more strange than all, had actually been in successful operation during *twenty six years* previous to 1851. Soon there were champions in the field not only to claim the invention for Scotland, but to claim that the old rickety machine of the Reverend Patrick Bell would do more work and do it better in a given time than the American. Several trials in consequence took place in the presence of immense numbers of interested spectators.—McCormick wisely resting upon his laurels, avoided competition. The particulars need not be stated here, suffice it to say that on each occasion the old Scotch reaper distanced every competitor, including the other American, (Hussey's).—Mr. Bell at last began to see the value of his invention, secured a patent, and entrusted the manufacture of it to an eminent English machinist. This was the exhibition of 1851 instrumental in introducing into England a valuable implement, and in securing to my *bashful* countryman the credit which had been assumed, and was on the point of being conceded to an American. I would not, however, detract one iota from the credit due to McCormick for his wonderful perseverance in bringing into notice this most important labor-saving implement. His efforts have been amply rewarded at home and abroad. It is even probable that he has already accumulated more money from the manufacture and sale of reaping machines than was ever realized from the sale of any piece of mechanism of equal value. I need not tell our American friends present here to-day, that on the expiring of his patent a short time ago, he was refused a renewal of it by the U. S. Patent Office Commissioner, chiefly on the ground that he had already received from the public adequate remuneration for the invention claimed. Mr. McCormick submitted in evidence to the department when applying for a renewal of his patent that he had *only* realized

the sum of \$2,409,251 22-100ths of manufacturing profits.

The distinguishing feature of the exhibition of 1851 was *NOVELTY*. The exhibition of 1862 is remarkable as indicating *PROGRESS*, and nowhere is that progress more remarkable than in the mechanical department of the agricultural division. Here are to be found portable steam engines, thrashing machines, steam ploughs, steam cultivators, steam labor saving machines in endless variety. The inventive genius of man, however, has not stopped short with these, for here, too, though it may seem to be descending from the sublime to the ridiculous, may be found a machine by which the process of milking can, it appears, be performed with "*the greatest possible pleasure and comfort to the cow*," speaking of which, my Lord Derby, at a recent agricultural dinner said, "It is difficult to understand how the inventor had ascertained the experience of the cow, under the operation."

What may be said of these great international exhibitions, may, in a limited sense, be predicted of every county agricultural exhibition, in carrying out which a well directed effort has been made for the advancement of agricultural interests. There may be much sameness year after year in such exhibitions as we have witnessed to-day, yet we are not on that account to ignore their usefulness. If, only, each year exhibits *PROGRESS* in the various departments, we may rest satisfied that the society is exerting an influence for good. Apart from other considerations, I believe it is a good thing for farmers to meet together once in a while without distinction of party, of sect or nationality; for true is it that "As iron sharpeneth iron, so a man sharpeneth the countenance of his friend." Here the man of narrow prejudiced mind may, if he will, have his prejudices removed most satisfactorily; here the most knowing among us, if we really wish to learn, *may* learn *something* that we did not know before; here all of us who enter the list of competitors may, if we will, "see ourselves as others see us." Here, too, (and oh, what a blessing to society) "the wretch concentrated all in self!" the vain-glorious one, puffed up with self-esteem, will, if he competes, most certainly get "taken down," and hence he may go home, "a sadder, but a wiser man."

A few of the agencies which have tended to the improvement of agriculture, have thus been noticed. It has been stated that one hundred years ago agriculture had reached a low ebb indeed. Another sad fact will be acknowledged in conclusion, that from the year 1240 to 1320, not a single Baron was to be found in all Scotland who could sign his own name.—The irresistible inference is, that for all these improvements we are indebted to the ceaseless activity of *EDUCATED MINDS*; and the conclusion to which we are led is that if *we* would be esteemed benefactors of our race, we will do what we can, as communities and associations, and individuals, to elevate the standard of education among us.

It is a grand mistake to suppose that a good

education is thrown away upon a farmer. If our farmers are content to jog along in the old way, as their fathers have done before them, it is pretty certain that they will always be able to make out a living, but we cannot hope that Canada will ever add much to the general stock of agricultural knowledge, unless we impart to our sons a higher education than has usually fallen to the lot of the Canadian farmer. There is an idea abroad that farmers have no need for a classical education. I should like to know the reason why. I think, sir, they have just as good reason to study mathematics and Latin, and Greek, too, as any body else. If the study of these expands the mind of the merchant, it will expand the mind of the young farmer, too. It enables the physician and the lawyer to comprehend the technicalities of their profession, it will familiarize the young farmer with the correct meaning and the correct use of his own language, and that is a very important matter. That much depends upon the ambition of the young men themselves, we see every day exemplified. If one of the farmer's sons expresses a desire to become a doctor or a lawyer, with what alacrity do not the parents make many sacrifices in order that he may obtain the best education the Province affords? Is it not evident that we live in a country pre-eminently agricultural? Is the time not drawing near when we may say of doctors and lawyers, without the slightest disparagement to their professions, that *we have enough of them?* Then what in the name of common sense is to become of our young men of ambition? Carried away with the false idea that the quiet, plodding life of the farmer is too humiliating to *them*; already some of them have found their way to Australia, to California and Carriboo; there for a while they toil like galley slaves; they come back again—they tell us “*There is no place like Canada.*” I would only say, then, to the farmers of Grenville, give your farmer boys as good an education as you can afford. By so doing you will most surely contribute to *their* happiness through life, and to the progress and prosperity of our common country.

I have now only to thank you for your kind attention to my remarks, and to bespeak from the farmers of Grenville now before me, a cordial and unanimous support for their agricultural society. In doing this you place a powerful AGENCY for good in the hands of its directors, one which will do much for the cause of improvement around you. May the efforts of the South Grenville Agricultural Society to improve the agriculture of this part of Canada, be crowned with success.

FLAX CULTIVATION.

EDITOR OF THE AGRICULTURIST.—DEAR SIR,—Now that spring is fast approaching, when farming operations must necessarily soon commence, it is to be hoped our farmers will give

flax that attention it so well deserves, and those who were disappointed last spring, owing to the great drought, must not fail to make the attempt again, knowing well, as they do, all other crops suffered materially also.

While comparatively little is doing in the Home district, other parts of Western Canada are making good use of their time; several new scutching mills have been erected within the last two years, and in no instance, when the farmers can avail themselves of this facility for preparing their flax for market, do they fail in taking advantage of it. At Flora, where a small mill was erected a few months ago, no less than 70 acres were grown in that neighborhood last year, and from the profit derived from it over wheat, the probabilities are we shall hear of 700 acres being cultivated in that locality this incoming summer. Several of Rowan's mills, in addition to those imported last year by the Canadian Government, have also been brought to the Province by private individuals. Several new companies are springing up, not only for the purpose of scutching and preparing the raw material for a foreign market, but for the purpose of spinning and weaving.

The success of the Messrs. Perine Bros., of Waterloo, is a convincing proof of the profit attending this new branch of industry. In addition to four extensive scutching mills in different parts of that county, they have erected at a very heavy cost a large manufactory in the village of Doon, on the river Speed, with machinery for spinning and weaving, as well as scutching flax for the farmers. This is a guarantee for the farmer, he need not be afraid of the want of a market in future. Mr. McCrea, of Guelph, has also become a purchaser of the raw material, and will, no doubt, extend his operations to other market towns as well as Guelph, as soon as there is a sufficient quantity of demands on the market.

During the last few weeks I have had communications I may say from all parts of the Province, inquiring where seed can be procured. In reply I have recommended parties to the house of Messrs. Lyman, Elliott & Co., Toronto, and the various flax millers in the Western part of the Province, for sowing for the years' sowing, but in all cases, when it is possible, the best imported Riga seed should be used; and it is to be hoped there will be sufficient demand in another year to warrant our merchants in making it an article of import. In the eastern townships in Lower Canada the farmers are going into it with a will, the British American Land Company, at Sherbrooke, having already secured one of the mills from the Government. Their active Commissioner, Mr. Heneker, has also sent home for a large quantity of Riga seed to distribute to the farmers on their lands, and to others desirous of obtaining it. This example would be well worthy of imi-

tation by the Upper Canada Board of Agriculture, and every encouragement should also be given by the Canadian Government.

Truly yours,
J. A. DONALDSON.

Weston, March, 1863.

CULTURE OF TOBACCO.

Although personally not an admirer of the weed, or an extensive user of the article, yet as it is considered almost a necessity for many, and as the southern production is limited, in consequence of the war; the taxation heavy—prices high, &c., it is our duty to make some suggestions in regard to growing tobacco.—Much of the soil in Michigan is well adapted. That its successful cultivation there is no doubt, as we know of instances where twenty acres have been seeded to this crop, with the most profitable results. Even within the last few days we have had its fumes puffed under our nose by the lucky possessor of a real meerschaum pipe, who owns a city lot, with the exclamation, "what do you think of Detroit tobacco, we shan't have to go South for it now, and they may put on all the tax they want to, I don't care, as I can raise my own," until we have concluded that he is nearly right. Large quantities are raised in Canada. The seed best adapted to the wants of the soil and climate in this State, is that to be procured from Connecticut, where the plant has been thoroughly acclimated. Every farmer can easily devote a small patch to its cultivation, if he "delighteth in the quid and pipe," for home use. A sixteenth of an acre well selected and attended to should supply his wants. We give the following excellent suggestions in regard to growing tobacco from a practical source.

To grow strong tobacco plants the ground must be well prepared and worked very fine. In preparing the seed bed it has been found the best way is to light a large fire on the ground: the soil is then rendered loose and friable, and is easily reduced very fine. If it is not convenient to make a fire, mix the earth with a large dose of wood ashes and small charred dust. By this means the ground becomes so loose that when the plants are ready for transplanting, a good sprinkling from the garden pot will make the ground so soft that each plant will bring with it a small ball of earth, which almost insures the plants growing; and it must be borne in mind that the young tobacco plants require very careful handling. It is better to have a large shallow basket or box to carry the plants in when transplanting, as by this means the plants do not lose the ball of earth, or get bruised so much as if taken in the hand.

The seed bed being made fine with the rake, rake the seed and mix it well with ten times (by bulk) as much fine earth and ashes. This is what you to sow the seed so thin that in draw-

ing the large plants you do not disturb the smaller ones. The ground being prepared, and the seed well mixed as directed, proceed to sow, taking care to sow the seed as equally as possible. Do not rake in the seed, but give the bed a slight beating with the back of the spade, and see that the earth does not rise with the spade. The time for sowing is in April. Let the seed bed be in a sheltered position. When the plants are about the size of cabbage plants usually they may be transplanted. A cloudy or even a rainy day is best for the business. The ground for the crop should be well worked and well dressed with decayed manure: it is better to have two shingles to stick on end in the ground, meeting over the plant to protect it from the noon-day sun or nipped with the morning frost. A light, sandy soil suits tobacco best, if well worked and manured. Plants, to be successfully grown, should not be less than two feet apart each way. Three feet is the Virginia system; this gives ample room for a vigorous strong growth. Before the plant is set, the earth should be drawn up into hills with a hoe, and well-rotted manure mixed in them.

After the plants get well to growing they should be hoed as often as is necessary to keep them entirely free from weeds; a sharp lookout should always be kept for the "tobacco worm," which delights in committing ravages on this plant; and if not promptly attended to, this reptile will soon destroy a crop. Some turn in turkeys after the plant is well grown, who soon clear the intruder. This worm is about 1½ inches in length, and should be looked after every day.

When the plant begins to head it should be immediately cut back, so as to leave from six to ten leaves; suckers then begin to spring out at the junction of the leaf and stalk, these should be nipped off, (some however let them grow until six inches long, and then pick and dry them, thinking them more choice for various purposes than the larger leaves), as if allowed to exist, they will take much from the full development of the main leaves.

Planting is done in May, hoeing and overlooking in June, July, August and September, cutting and housing in October; the other months in moist weather, to the pulling leaves off the tobacco-stalks. In the Southern plantations an industrious man and woman are allowed three acres to manage. When ripe the stalk should be cut off near the ground. When tobacco is ready to cut up, it *must* be attended to or it will spoil, especially if frost is expected, there should be no time lost.

Tobacco of commerce is generally divided into three qualities. The lower leaves or which touch the ground, are liable to get dirty and torn: but on the higher parts of the same stalk two different sorts of leaves are generally found, one yellowish and one brown. These should be carefully separated and put up in bunches somewhat thicker than a man's thumb, and tied

round with a thong made of the leaf itself. The bunches should be slung in pairs across poles and put in the drying house. Great care should be taken of the fires, as too much heat and hurry will spoil the whole crop; if the houses get too hot the finest qualities of the leaf are destroyed, as the real substance is burned out, and only the coarse vegetable matter left.—More depends upon proper drying than any other part to determine its market value.

The culture of tobacco is said to be exhausting to even new land. In Virginia the land will sustain only two, or at most, three crops.

Tobacco of fine quality has been raised on the farm of C. K. Carpenter, in Orion, Oakland county, which has been manufactured into cigars, and is considered equal to Havana by those who are good judges. We have not the least doubt that enough can be cultivated in Michigan to supply the home demand, and that farmers can realise large profits at the present high prices. Let them try a small patch this year, just by the way of experiment.—*W. S. B., Michigan Farmer.*

THE LAWS OF CULTURE OF THE LAND, ACCORDING TO LIEBIG.

[TRANSLATED FROM THE FRENCH OF THE "JOURNAL D'AGRICULTURE PRATIQUE," EXPRESSLY FOR THE "MARK LANE EXPRESS."]

To enable the farmer to cultivate in the most profitable manner, he should know what are the constituent parts of plants, and also by what means these plants obtain nourishment.

The growth of plants, the manner in which they appropriate to themselves the elements which contribute to their nourishment, and the nature of those elements themselves—all this was formerly enveloped in mysterious obscurity. In these modern times the natural sciences have sufficiently progressed to teach us what it is necessary to know to guide us in the culture of plants which the care of man assuredly should develop.

The constituent parts of plants are of two kinds, *gaseous* and *solid*; they are also called *organic* and *inorganic*; the latter are parts that resist the action of fire—the ashes, or mineral parts. If we proceed to consume a plant by fire, the gaseous part will fly into the air, while the other will remain in the form of ashes. The proportion of gases in a plant is found to be much larger than the solids. 100 kilogrammes of fir-wood burnt only leaves $\frac{1}{2}$ kilo. of ashes, wheat-straw nearly 5, pea-straw 9, clover 11.

The volatile or combustible parts are oxygen, azote, hydrogen, and carbon. The solid parts—those that after combustion are found in the form of ashes—are phosphoric acid, potash, silica, sulphuric acid, lime, magnesia, iron, and salt.

Of these elements, *four* volatile and *eight* solid, are formed the bodies of plants; conse-

quently they are the food of plants. The gaseous elements, or otherwise organic principles, are absorbed by the leaves and branches; the roots also take in gaseous aliments when they are in the earth.

In order that the leaves and branches may be able to absorb the gaseous principles, the surface of them is provided with very minute parts. The roots absorb these ailments by their very fine extremities.

To enable the plants to assimilate the nutritive principles, it is necessary that the latter be placed at their disposal in a suitable condition. The volatile principles are, for the most part, absorbed under the form of water, ammonia and carbonic acid; it is only as bodies in solution that the solid parts can pass into the organism of plants.

The various productions from prevailing vegetables are the results of diversified combinations of the four volatile and eight solid principles. Thus, tartaric acid is composed of one-fourth carbonic-acid, one fourth hydrogen, and one-fifth oxygen; essence of turpentine is composed of 10 parts carbon and 10 parts hydrogen; 2 parts azote, 22 of carbon, 30 of hydrogen, and 3 of oxygen form the elements of *atropia*, that violent poison which belladonna contains.

The fibres of wood (cellulose) and fecula contain precisely the same elements—6 parts carbon, 5 parts hydrogen, and 5 parts oxygen—nevertheless cellulose and fecula are two very different substances.

The gaseous, or organic, elements, in accordance with their nature, are found everywhere all over the world. The solid, or inorganic, are fixed to a point from whence they can only be removed by extraneous force. The result is, that the gaseous elements are inexhaustible. The motion of the air, and its tendency to preserve its equilibrium, carries them wherever they are needed, or wherever they seem likely to fail.

With the inorganic elements it is quite the reverse; they are not all found in every country, nor in large quantities. The faculty which plants possess of assimilating the organic principles contained in the air and earth, has some limits, partly imposed upon them by their nature, and partly by the appropriation of inorganic and solid substances. *A certain analogy must exist between the two kinds of elementary substances in plants.*

In order that plants may be able to absorb and assimilate a certain quantity of gaseous elements, there must exist a proportionate quantity of solid elements. The plant can only take in and retain as much of the gaseous elements as it can digest with the help of the solid elements. The composition of plants is the same in all places; the relation between the gaseous and solid elements is always alike in the same plant.

When a plant does not find in the earth the

inorganic substances necessary for its development, it can no longer receive the quantity of organic elements that are necessary for it; its development is checked—in other words, it does not thrive. Supply to the earth the elements that are wanting, and the plant will flourish.

But as all plants do not need an equal quantity of these solid principles existing in the earth, it explains why one plant may thrive in a spot where another will die. If only one of the substances necessary for the plant is wanting in a soil, it will not thrive: the other elements cannot supply what is wanting.

If the soil contains more solids than the plant can absorb, the excess remains in the earth, and if it is in sufficient quantity it may produce a second crop.

The facility which plants possess of appropriating substances to their nutrition is in exact proportion with the extent of surface and the number of organs appointed to fulfil that function, viz., leaves, roots, and branches. For this reason a plant which is abundantly supplied with leaves or roots, may still prosper where another would languish. The cereals having only narrow leaves and weak roots require a highly-manured soil. In the torrid zone the cactus, with its large, fleshy leaves, thrives even upon the parched rocks. How different, too, are the roots of a plant of lucerne from those of the wheat plant!

The existence in a soil of all the substances necessary to the organization of plants, does not, however, suffice to secure the development of those plants. They also require favourable physical conditions, such as air, light, heat, and moisture. No plant prospers deprived of air and light; without heat and moisture the richest soils remain unproductive.

The earth possesses the wonderful property of attracting the substances which serve for the nourishment of plants, taking possession of them and retaining them until it comes in contact with the roots of plants. It is remarkable that with an aqueous dissolution, the earth only extracts those principles which are useful to plants; it does not absorb those which would be useless or injurious to them. Without this beneficent property which cultivable earth possesses, the substances which serve for the nourishment of plants would be carried away by water into the subsoil, and lost to the greater part of our crops.

This power of absorption in cultivable earth has, however, its limits; from the moment that it is satisfied it can imbibe no more. It so varies, according to the nature of the soil; it exists in the greatest degree in clay, and least in sand; between these two extremes are placed chalk and the different mixed soils.

The roots only take their nourishment from

those particles of the cultivable soil with which they come into immediate contact, through the finest extremities of their radicles. The absorption takes place by the co-operation of an organic acid contained in the last cell of the radicle. It is probably in the nature of this acid, that the faculty exists, which the roots possess of choosing the substances that suit them.

It was believed, for some time, that plants could only assimilate the nutritive elements when they were in a state of aqueous dissolution; this opinion is false as regards any but aquatic plants.

As plants only draw their solid nutriment from the soil by the extremities of their radicles, the quantity of nourishment contained in the earth must be much greater than that which is absorbed by one crop.

If we admit that the radicles of plants come into contact with the hundredth part of the earth, it follows that the nutritive principles stored in the soil are to be found there in a proportion a hundred times greater than would be strictly necessary to the development of the plants.

The bed of cultivable earth has yet another remarkable property—that of absorbing from the air and from the subsoil watery vapours, carbonic acid and ammonia. By the absorption of water or moisture the arable land is warmed; this remarkable phenomenon may be proved by direct experiments. Land which has been mellowed and well manured possesses this property in a higher degree than a hard poor one.

The absorption by the earth of carbonic acid and ammonia is favourable to the dissolution of mineral substances. Flints cannot be dissolved in pure water, but they can in water that contains carbonic acid and ammonia.

Stable dung or farm dung is a normal manure; it contains all the principles necessary for the nourishment of plants; for this reason it is the most certain in its action. It contains all the constituent parts of plants, but not all in the same proportion in which they existed in the cereals and fodder; for the entire elements of the crops are not converted into dung, the grains having received another destination, by which a considerable quantity of phosphoric acid has been carried off the land.

Stable dung has also a physical action upon the soil; it communicates heat to it, and during its decomposition into water, carbonic acid, and ammonia, it contributes powerfully to the dissolution of mineral substances. The effect that dung produces by this physical action is often greater than that which it produces as the food of plants. These simple principles which have just been set forth explain all the other phenomena.

T A B L E ;
 INDICATING THE QUANTITY OF ASHES (INORGANIC REMAINS OF ALIMENTARY SUBSTANCES) TAKEN FROM
 THE SOIL BY AN AVERAGE CROP.
 According to Fresenius.

	Potash.	Soda.	lime.	Magnesia.	Phosphoric acid.	Sulphuric acid.	Silica.	Chlorides of Potassium.
	Kil.	Kil.	Kil.	Kil.	Kil.	Kil.	Kil.	Kil.
Wheat.....	32.54	3.32	12.92	4.40	20.30	20.58	129.34	5.76
Rye	21.38	1.88	9.08	4.84	15.22	57.70	0.72	0.72
Barley	68.92	6.38	21.94	15.76	38.46	33.76	140.88	23.88
Oats	21.64	14.66	9.60	10.26	12.20	20.36	91.56	3.08
Peas	24.52	9.22	57.25	13.02	21.74	17.16	22.56	8.66
Vetches	55.50	3.00	51.26	10.82	18.70	4.26	11.86	4.06
Beet-root	145.42	20.14	34.04	17.60	21.32	15.00	25.40	34.86
Potatoes	102.70	1.12	38.98	22.48	34.34	18.52	44.84	13.34
Colza	50.52	11.70	55.40	15.56	50.40	46.06	3.50	55.46
Tobacco	60.76	1.14	92.82	29.04	10.92	10.36	28.70	24.52
Red clover ..	144.00	119.22	138.40	47.80	86.28	18.36	28.80	34.56

(To be concluded in our next)

KOHL RABI.

EDITORS OF THE AGRICULTURIST.—Gentlemen,
 —From your notices of kohlrabi, I was induced last year to try a small patch. I must say the result was not such as to tempt a repetition, but I attribute the failure in a great degree to the extraordinary season (very late in opening and then succeeded by long continued dry weather) and trust to be more successful this year.

It was not until May 3rd that I could get a bed ready to receive the seed in the garden, and, having seen in Lawson's remarks that "insects do not injure it," I never anticipated any danger from the fly; but all the sowings were taken off as soon as they appeared above

ground, until 14th June, when I sowed a few ridges in a field with turnips. The rows were 27 inches apart, and from 20th to 22nd July I thinned and transplanted to about 16 inches which I thought sufficient space at that season of the year. Never having seen the plant before, I do not know how it usually grows, the leaves were very large, and I consequently expected large bulbs, but none of them exceeded $3\frac{1}{2}$ lbs. The leaves appeared to be excellent feed, but of the comparative value of the bulbs for feed I have not had an opportunity of judging, as it is still unconsumed. It keeps well and was unaffected by severe frosts in the early part of November.

I am, &c.,
 BRIAR.

County Carleton, March, 1863.

A MARKET FOR RAW FLAX.

Editor of the Canadian Agriculturist.

DEAR SIR,—Will you be so kind as to inform me through the *Agriculturist*, whether or not there is any market for *Flax stalks*, and what is their value per ton, and who buys them?

I have perhaps a ton or more, they were pulled as soon as the seed was ripe, were carefully housed, and are still in good condition.

I have heard many complain that it does not pay to grow flax for the seed only, and I feel fully persuaded that until there is a regular market open for the sale of the stalks, flax growing throughout the country will never amount to much.

Yours respectfully,
 JOHN S. SNELGROVE.

Cobourg, Feb. 26, 1893.

[We do not know of any one at present prepared to purchase flax in the raw state. Mr. McCrea, of Guelph, we understand is prepared to purchase any quantity of dressed flax, and probably there may be purchasers in this city. We shall be glad to be informed if there is any establishment where flax is bought in the straw.—Eds.]

GALLOWAY CATTLE.

TO THE EDITOR OF THE AGRICULTURIST.—
Dear Sir:—As a constant reader and admirer of your valuable journal, I take the liberty to propound the following queries, respecting a breed of cattle which I have heard a great deal about, namely the "Galloway" Cattle. From what I saw of them at Kingston and Hamilton Provincial Exhibitions, I am inclined to believe they would be a most suitable breed of Cattle for our severe climate of Lower Canada. But wishing for further information upon the above, I ask the following questions.

1st. Would the Galloway Cattle produce a suitable cross with the native stock of Lower Canada?

2nd. What is the average yield of milk from each cow per day?

3rd. And how much butter per week?

4th. And what could spring calves, from one to two months old be bought for?

By answering the above in your next impression, you will confer a favour upon

Yours &c.,

MATTHEW DAVIDSON.

County of Quebec, C.E. Feb. 21, 1863.

We believe the Galloway Cattle would prove to be well suited to the climate of Lower Canada. We shall be obliged to some of the special advocates and breeders of this kind of stock if they will reply to our correspondent's queries in detail.—Eds.]

BOARDS OF AGRICULTURE.

A late number of the Official Gazette contains the following notice:—

BUREAU OF AGRICULTURE AND STATISTICS.

Quebec, 19th February, 1863.

The following Gentlemen have been elected Members of the Boards of Agriculture in Upper and Lower Canada, for the present year:

UPPER CANADA.

The Hon. D. Christie,
Wm. Ferguson, Esquire,
Asa A. Burnham Esquire,
Dr. Richmond.

LOWER CANADA.

The Hon. L. V. Sicotte,
Major Campbell, C. B.,
The Hon. U. Tessier,
The Hon. J. E. Turcotte.

F. EVANTUREL,
Minister of Agriculture.

BUTTER MAKING.

We beg leave to direct attention to a valuable article on "The Canadian Butter Trade" in the Dairy Department of this number, received from a correspondent in Scotland.

It is a generally admitted fact that a large proportion of the butter brought to market in the cities and towns of Canada is not of so good quality as it should be. An improvement in this respect is highly desirable.

HINTS ON PLANTING CORN.

EDITORS OF AGRICULTURIST.—There is an old adage or saying, that the man who could make two blades of grass grow where only one grew before, would be considered a benefactor to his country. But how much more would the rule apply if two ears of corn could be made to grow where only one grew before.

My attention has been drawn to this fact, from observing that corn is almost invariably planted too thick to allow of the stalks and leaves developing themselves, and maturing at least two ears on each stalk. The most careless observer must know that every plant, from the most minute weed to the oak the monarch of the forest, occupies a certain space, and will cover a certain area if allowed to develop itself. So it is with corn, it must have room to grow.

Corn planted in hills 30 inches apart, with four stalks to a hill generally speaking will have one ear on each of three of the stalks, and the fourth stalk blank. Again, plant corn in hills 3 x 3 feet apart with five stalks in a hill, and it will be found that improvement will have taken place, for although every fifth stalk will be blank, by way of balance every fifth stalk in the hill will have two ears. Yet again, plant corn in hills 4 x 4 feet apart with five stalks to a hill, everything else being equal, it will be found that every stalk will have two large well developed ears, and sometimes even a third ear on the same stalk, while the blank stalks will be few and far between.

The above is no theory, but the result of close observation for a period of over forty years in this Canada.

A. W.

Maitland, County of Grenville, 1863.

QUALITIES OF GRASSES.

The subjoined remarks, from the *Boston Cultivator*, refer to a subject that is daily becoming of more importance in the older sections of this Province, and is intimately connected with every sound system of improved husbandry, particularly of sheep and cattle:—

Late writers on grasses have generally been governed to a considerable extent, in their estimate of the nutritive value of species, by the result laid down in Sinclair's "Hortus Gramineus Woburnensis," a work published many years ago. Various species of grasses were subjected to analysis by Sir Humphrey Davy, and the results obtained were taken as the basis of their nutritive value. As the science of chemistry has advanced, however, it has appeared that the formula adopted by Davy in the analyses alluded to, was imperfect in reference to the end proposed. He relied on the soluble elements obtained from grasses by the action of boiling water, as indi-

cating their proportions of nutritive matter. This is fallacious, inasmuch as it has been proved that the Albuminous matter—of which there is the greatest amount while the grasses are in a comparatively green state—is rendered insoluble by the action of hot water.

A late English writer, in an essay on grasses, speaks of the investigations of Sinclair and Davy, above alluded to, as follows: "The fact is certain that the work has not afforded one single practical fact for adoption, and that no agricultural advantage has been derived, nor will be procured from the laborious production.—Spaces of ground two feet square, placed under one influence of soil and climate, were not capable of establishing any practical result; the experiments were too confined, and not sufficiently often repeated—the variations of soil and climate were not in attendance, that are so very essentially required in the practice of agriculture. The statements are not only at variance, but in direct opposition to the most enlightened practice and the established experience on the subject."

A mistake which American writers on grasses have very commonly fallen into, is recommending species for cultivation in this country according to their supposed value in England. Many kinds which do well in that country are wholly unsuited to this, on account of their not being adapted to this climate. Besides this, writers, both in England and in this country, have in many instances had very little practical knowledge of grasses, and have often recommended species which are not, *anywhere*, adapted for the purposes for which they are recommended. The writer of the essay above referred to, enumerates six species of grass as being of the greatest value to the British farmer. These are Rye-grass, Meadow-fescue, Cocksfoot, Cat-tail, Dog-tail, and Foxtail. We give some of his observations in reference to these species, together with remarks in regard to their adaptation to this country.

Rye-grass is the most generally cultivated species in Britain. It is considered the best for sowing with clover, for hay. The writer referred to says:—"The plant rises early in the spring, and is much relished by all kinds of grazing animals. For the purpose of yielding a crop of hay, and then remaining two or three years in pasture, the rye grass has not found any superior. ... 'The statement in the 'Hortus Gramineus Woburnensis,' that some grasses are superior to rye grass is 9 and 13 to 1, is wholly inadmissible, and must be reversed in the case of agricultural use, whatever the value may be in the hands of the chemist."

The species here spoken of must not be confounded with the Italian rye grass, which is not a perennial. It is chiefly valuable where liquid manuring is practised. It is not hardy, and will only produce well for one or two years.

Perennial rye-grass has been tried in this

country. More than twenty years ago the writer experimented with it to some extent. It is sweet, nutritive grass, starts very early in the spring, but is not sufficiently hardy to withstand our severe frosts. Italian rye-grass is still less adapted to our climate, and is worthless for general cultivation here.

"The meadow-fescue grass comes next to rye grass in sending up a number of level stems, and in likeness to a grain crop; but it fails in readiness of growth on a variety of soils, and in produce of herbage. The seed is abundant, and the foliage is much relished by cattle. The plant is very valuable, and stands next to rye grass for hay of one year, when 6 lbs. of seed are sown on an acre, and to remain in pasture for two or three years. For strictly permanent purposes, 2 lbs. are used. The seeds weigh about 14 lbs. per bushel."

This grass is often found growing spontaneously in this vicinity and in some other sections of this country. It is a valuable species,—more so than rye-grass.—under our climate, it is perfectly hardy. Why it has not received more attention from our farmers, is not known. It is adapted to rather moist, strong soils, where it starts very early in spring, and makes a regular and constant growth till hard frost comes in the fall. It is best adapted to pasture, though it makes good hay, if cut at the proper time.

"Cocksfoot-grass grows in few stalks of a tall height, which are coarse, and ineligible for hay but for pasture the herbage comes early, and affords a good bite from the tufted roots in the spring, and by close stocking the ground, to keep down the coarse stems. The seeds weigh about 12 lbs. per bushel."

This is commonly called orchard-grass, in this country. As observed in the quotation, its stems are rather coarse, which lessens its value for hay. Still from the abundance of long leaves which it throws out, it makes a fodder, which, cured in the proper stage is well relished by stock. The aftermath is often of more value than the first crop. It seldom sends up seed stalks after the first crop, but the numerous leaves continue to grow all the season, presenting in autumn a mass of soft herbage. As above remarked, however, its greatest value is for pasture; no grass starts quicker or grows more rapidly after being cut or fed off. It is best adapted to strong, loamy, or slaty soils, where it retains its vigor for many years. From the strength of its roots it is seldom injured by frost and it is superior to most species in sustaining itself against draught.

"Cat-tail-grass thrives on damp lands and under moist climates, where the produce is considerable. The stems are coarse, and its growth is not large on a variety of soils; its foliage is not much relished by animals. But it is next to the rye-grass and meadow fescue in general use. Six pounds are sown to an acre

or hay, and four for pastures and meadows. The seeds weigh about 44 lbs. per bushel."

This is the herds-grass of New England. It is not held in as high estimation in England as it is in this country. The English farmers dislike its coarse stems, for hay, and as a pasture grass, there are many species superior to it, both in this and other countries. Where hay is produced for market in this country, on moist, rich land, it is unquestionably the most profitable species we have, as it yields a large crop and buyers do not object to its coarseness.

CULTURE AND SUPPLY OF FLAX.

While the public prints are teeming with proposed substitutes for cotton, and about the nature, quality, and applicability of which, the greatest ignorance prevails even among practical men, who ought to be much better informed, it seems not an inopportune moment to direct attention once more to the importance of promoting extended supplies of flax. This subject has just been brought very prominently forward by one who is looked up to, and justly so, by men both in and out of the trade, as one of the best informed on all that relates to flax cultivation and the linen manufacture, in an excellent little work* that cannot fail to be referred to, in future, by all desirous of looking into the matter.

With the history of the rise and progress of the linen trade in Ireland, the manufacturing processes, statistics of mills, and foreign tariffs, all fully treated upon by Mr. Charley, we need not trouble our readers. But we shall certainly be doing some service by placing before them a digest of the valuable statistical details, and practical information furnished as to cultivation in Ireland, referring them to the book itself for more full particulars.

In Ireland the amount of flax sown varies as much as 70,000 or 80,000 acres within a few years. For instance, 1857 it was 91,000 acres, and in 1853 fully 175,000 acres. The difference in value within three years being probably £1,000,000. In 1859, the acres were 136,282, and in 1860 only 128,444. When grain brings a high price, the breadth of crop under flax is diminished; while if it remains at a low rate, the farmer is naturally induced to sow more flax-seed. But there is another influence working against an increase of flax cultivation in Ireland, namely, the gradual introduction of the Scotch and English system ofilage farming on a large scale. As farms increase in size, and labour becomes dearer, it is probable that flax will be even less grown. It is essentially the small farmer's crop, sown by himself, and cleaned, pulped, steeped even scatched by his wife and children, for whom these occupations form a light and agreeable kind of hand labour.

In growing grain crops the farmer has a very

* "Flax and its Products in Ireland,"—by W. Charley, J. P., *Bell and Daldy*.

wide competition, and the profit is consequently at a minimum point; in flax he has fewer competitors, and for many years past there has been a brisk demand for fibre. So that with fair success, he makes fully a double profit compared with a grain crop. In France and Belgium they work the ground for flax as carefully as we prepare it for onions, and use every means to have the soil as nearly as possible of universal texture, both as to tilth and the chemical compounds of the land, using such manures as science points out, to neutralize the excess of one ingredient and to supply the deficiency of another, so as to have all the soil of equal quality. In Ireland, on the contrary, in some of the fields we find four or five different kinds of soil, and consequently four or five different qualities of fibre are produced from the same seed sown on even the best-cultivated farms.

A correspondent quoted by Mr. Charley observes: "Unless we improve our land by a better and more scientific system of cultivation, we can never successfully compete with them in the production of fine fibre for the cambric manufacture. Again, many farmers attempt to grow too much flax in one year, and are therefore obliged to sow too often on the same ground. As the result of my observations abroad, as well as of my own experience at home, I would say that flax should come in the course of a long rotation, and only be sown in the same field at an interval of eight or nine years." The growth and after management of flax require considerable skill and experience; but it is a very interesting crop, and Mr. Charley thinks it worthy of more consideration than it has yet received in Great Britain.

The exports of linen fabric from the United Kingdom are about four and a half millions sterling per annum, and the home trade is probably equal; to this must be added the value of yarns exported, nearly two millions, making a total of eleven millions sterling. About two-thirds of this large sum are represented by the Irish linen trade, and the other third by the productions of Scotland and Yorkshire. It is evident a very great quantity of flax is needed for the production of so large an amount of fabrics, and the demand would certainly much increase if more moderate rates prevailed.

Since the early part of the century cotton and other raw material have undergone a gradual reduction in cost, and the price of manufactured goods has been much lowered, so as to place the articles within reach of a larger number of consumers. The price of late, however, has remained very much the same, and though linen goods are certainly cheaper than formerly, almost the entire saving has been effected by introducing improved means of manufacture—a saving of course not peculiar to the linen trade, but equally enjoyed by all others.

Among the continental nations of Europe, the northern has long been celebrated for the

production of flax and its manufactures: Flanders being especially distinguished for the beauty of its fine goods, and Russia and Germany for the strength and durability of their heavy and other line s.

The entire of the flax produced in Ireland does not average 30,000 tons a year, while the consumption of flax in our linen manufacture exceeds 100,000. At present, therefore, scarcely one-third of the raw material is grown at home, though great attention has been given to the subject. We should like to see our supply of coarse flax drawn from British India and the colonies instead of Russia, and our medium and fine qualities grown in Ireland instead of Belgium; but we do not anticipate that Indian flax will be a rival of our home production. The cheap labour and fertile soil of the Punjab may produce a fibre that will compete with Russian produce; and if it does so, it will be a great blessing to India and a source of increased prosperity to the linen manufacturers of Ireland and Great Britain. In Russia and the rest of Europe we have no power or influence over the supply of flax, except the offer of tempting prices. In Ireland and India there is a large field open, and Belfast, almost unaided, is honourably striving to increase in both countries the cultivation of this highly useful plant.—*Mark Lane Express.*

Agricultural Intelligence.

DUART FARMERS' CLUB.

EDITOR OF THE AGRICULTURIST,—SIR:—The accompanying Essay was read at a meeting of the Duart Farmers' Club, at whose request it is sent to you for publication in the *Canadian Agriculturist*.

Very respectfully yours,

ARCH'D BLUE,

Duart, February, 1863.

Secretary.

Essay on Draining, (by C. L. Heycroft.)

To remove water from land two kinds of drains have been adopted, the open, and the hollow, or covered drain. Each has its advantages; but generally speaking, the covered drain is preferable. It is true that it entails greater expense in construction, yet if well constructed is cheaper in the end, as it requires no annual outlay for cleaning out. The construction of open drains is pretty generally understood; it may be well to mention however, that in digging an open drain none of the earth taken out should be left at the side of the ditch, but should be spread as far as possible, so as not to impede the passage of water into the drain. The width at the bottom should never be more than one-third of that at the top.

In constructing a covered drain, the cheapest and readiest mode of excavating it is by the plough, alternately turning in and out furrows, and cleaning out with a shovel. The drain may be carried down to the depth of two or more feet by attaching a pole to the plough and letting the team walk on each side of the ditch. It may be finished by the draining spade. The filling up may also be effected in a great measure by the plough, using one horse. The depth of the drain will, of course, vary with the nature of the soil, but it should never be less than two feet. The principle governing the depth, should be that enunciated by an eminent English Agriculturist, at a late Agricultural dinner in Suffolk: "Get at the water wherever it is."

For filling drains we want a substance that will afford a free passage for the water, allow it to enter along the sides, and at the same time resist the superincumbent pressure.—Many different substances have been employed, such as peat, sod, straw, rope, brush, poles, stones, gravel, sawed boards, tiles and pipes. Of these, the tile and pipe are the best. Peat and sod may be used in certain situations, but they are not sufficiently durable to answer a good purpose.

Columella, a Roman agricultural writer, speaking of straw rope as a draining material, says that the drains will continue good for 50 or 60 years. It does not follow that when the straw decays the drain will cease to be of use. In clay, the straw forms an arch, and after the straw has decayed a passage still remains. In this country the material most abundant is wood in its different forms. Let us see how it answers. Lord Petri, an eminent Scotch agriculturist, gives the preference to brushwood over every other material, in soils that are in the least apt to flow. In such soils it is almost impossible to prevent the earth from collecting around the stones, and ever insinuating itself into the joints of the pipe, where it hardens, and effectually prevents the percolation of water. With brush however, the case is different, for a portion of the wood is gradually decaying, thus affording a passage for the water for a much longer period. Willow brush is very durable in drains. Mr. Young, the agriculturist, says that he has seen it 30 years after being placed in the drain, and that it was then in as sound and perfect a state as when first placed there. The brush, however, must be green when used. Gravel answers a very good purpose for filling, and, perhaps, comes nearest of any to the natural drain. The only objection to it is, that the drains would require to be placed closer together than with other substances. As regards lumber, it appears to us that using chestnut boards, 1½ inches thick and 4 inches wide, steeped in petroleum until saturated, then placed triangularly in the drain on a bottom piece, would be the best means of using this material. The cost would be about

eight cents per rod. Stones are an excellent material, when flat stones placed triangularly, or small stones filled in. In using these last it is only necessary to fill from 6 to 8 inches of the bottom of the drain. A material much used in the south of Devonshire is burnt clay. The clay is puddled, with the addition of some sand, and then formed into irregular lumps with the hand. These are placed in a conical pile around fuel, covered with brushwood and straw, plastered over with clay and burnt like charcoal. This forms a very cheap substance, and very durable, especially if the heat is sufficiently durable to vitrify the clay.

There are other modes of draining, (such as the mole-plough, in use on the western prairies) but they are scarcely applicable here. They all consist in forming a pipe through the soil, at a certain depth, but this pipe is only serviceable for a limited time.

The distance at which drains should be cut will vary with the nature of the soil. In the heavy clays of Devonshire, they are cut from 10 feet to a rod apart, or what is termed thorough drained land. In lighter soils they may be a greater distance. In a gravelly subsoil the effect of a drain will extend very far on each side.

In conclusion we may observe, that in draining care must be taken not to have too much fall in any part of the drain, as it increases the liability to choke; and also, that to secure full effect from draining, especially in heavy soils, it should always be followed by subsoiling.

BOKAHARA CLOVER.

The following communication was submitted at a meeting of the Board of Agriculture at Toronto in February.

BUREAU OF AGR. & STAT'CS.,
Quebec, Dec. 10th, 1862.

DEAR SIR.—The following extract from a recent letter from our late Emigration Agent in Prussia will explain itself. Without being able to form any opinion as to the qualities of the clover seed sent over by him, the Minister has thought it advisable to divide the quantity between the Boards for each Province, to be dealt with as they may think best.

I am, &c.,
E. CAMPBELL,
Act'g Sec.

Hugh C Thomson, Esq.,
Sec. Board of Agr.,
Toronto.

Extract from letter from W. Wagner, late Emigrant Agent to Germany, dated Berlin, Prussia, Nov. 12th, 1862.

"About 8 days ago a young German Agriculturist left Hamburg for Ottawa with the intention of becoming a settler.

"I have entrusted him with a small parcel of seed of 'Bokahara' clover, raised on the field

of experiment of the Royal Society of Acclimatization for Germany. The 'Bokahara' or 'Melilotæ' clover from Bokahara, 'Melilotus alba altissima' is from that part of Asia on the other side of the river Amour.

"The flower is white, and has an agreeable smell. The plant was cut three times during the season, and was in bloom on the 8th of August.

"The plant for green fodder or hay always has to be cut when young, about 2 feet high.

"It produces per acre 17,000 lbs. of green fodder, or 7,400 lbs. of dry hay. This clover will also grow on meagre land.

"These notes were given me by A. Hanniman, Director of the Gardens of the Royal Academy for Agriculture, in Proskarr, Silesia, Prussia.

"Time for sowing, spring."

GUELPH CATTLE FAIR.

The Guelph monthly cattle fair was held on Wednesday last. The day was fine and a large number of buyers were present. There were 367 cattle entered and 17 horses, against 279 cattle and 4 horses at the February fair. Many of the cattle were of excellent quality, and a fair amount of business was done. The average price of beef may be put down at about 3.50 per hundred. Mr. Stagg of Brockville bought somewhat largely, and was intending to have done considerably more but was unwilling to give the prices asked. He bought about three car load of cattle averaging over \$40 each, four from Mr. George Murton at \$55 each, and one very superior heifer only 2 years old, weighing about 1550 lbs. Mr. R. Macintosh of Paisley Block sold a steer and cow for \$61, and six hogs at 3 80 per hundred. Mr. Reeves bought 28 cattle at from \$60 to \$90 a yoke, and about fifty at Elora on the previous day. Mr. Dryden of Dumfries bought a yoke of working oxen for \$79, from Mr. Smith of Puslinch. Mr. Walter West bought a steer for \$20; he also bought 7 cattle at Elora. Mr. John West sold three heifers for \$94, three oxen for \$87, and six cattle for \$137. Mr. Tyson sold a cow for \$25; he also bought one from Mr. Peckover of Pilkington for the same amount. Mr. Angus McDonald, of Erin, bought a steer for \$-9, from Mr. John McMullin of Erin. Mr. Edward Lemon bought 64 cattle at an average of about \$3.50 per hundred, sinking offal. We understand that Mr. Lemon will have 63 hogs coming in tomorrow, which have been purchased from Mr. Gideon and William Hood, and which average about 360 lbs weight, dressed. Mr. Hood sold Mr. Lemon 4 heifers at \$28 each, and two steers at \$70 for the pair, and also 7 head of cattle to Mr. Head of Galt at \$30 each. Mr. Hood also bought 3 cattle from Mr. Gideon Hood for \$115; 4 from Mr. Thomas Hood for \$120; 2 from Miss Brown, Paisley Block, for \$65; 2 from Mr. John Duffield, Framosa, for \$62; 1 from

Mr. Coldwell, Scotch Block, for \$31; 1 steer from Mr. Murray, Nassagaweya, for \$32, and 2 steers from Mr. William Cowan, Paisley Block, for \$110. We believe Mr. Hood intends to kill the latter for Easter. Mr. Head of Galt, bought 20 cattle, averaging about \$30 each; 3 of them for Galt and 17 for Montreal. The show of agricultural implements was about as usual.—*Guelph Advertiser, March 6, 1863.*

HAMBURG INTERNATIONAL AGRICULTURAL EXHIBITION.

We learn that Messrs. C. L. Flint, of Boston, Mass., and the Hon. Daniel Needham, of Quincy, Vt., have been appointed to represent their respective State Societies, at the Great International Exhibition at Hamburg this year.

We understand that the passage to delegates will be reduced by the Hamburg steamers to \$80 in coin, and probably return tickets may be had for \$150 out and back.

The Dairy.

THE CANADIAN BUTTER TRADE.

EDITOR OF THE CANADIAN AGRICULTURIST.—*Sir*: The export of butter from the Colony has for several seasons been steadily on the increase, and it is of great importance that an improvement should likewise take place in the "make" and "cure;" as a glance at a London or Liverpool price current will show that it classes very low as compared with other sorts. It is to be feared that the operations of the dairy in Canada are conducted in a very imperfect manner. The curing also is very slovenly and irregular.—There is no need that this should continue the case for even another season, and I would recommend farmers and storekeepers at once to pay strict attention to the make and cure of this article; having last season had ample proof that such can be accomplished. In the present article I purpose to give an outline of the mode of making and curing butter in the dairy districts in Scotland, as also in County Carlow, Ireland.

In the Counties of Ayrshire and Lanarkshire butter is made in two ways, either by churning the whole milk, or merely the cream. The bulk of the fine fresh butter prepared for the Edinburgh and Glasgow markets is made in the former way, and could not easily be surpassed in point of sweetness of flavour. On the other hand, what is made in the Counties of Aberdeen and Banff is almost entirely made from cream, and is nearly all cured. In Carlow it is the custom to make the butter part from cream and whole milk mixed together. As the preparations for churning in each of these are different

it will be necessary to describe them separately.

Butter made from "whole milk" is managed as follows:—The milk, as it comes from the cow, is placed from six to twelve hours to cool, the same as when set aside to cast up cream, but this is merely to let the milk cool; and whenever it is freed from its natural heat, the whole meal of milk is emptied into a vat sufficient to contain the whole. If the vat is a large one, and a second meal of milk has become cold before the former meal has begun to acidify, the second meal may be turned into the same vat as the first. But if the first is even approaching to acidity, the second meal of milk should be put in a vat by itself, to prevent its being soured otherwise than by its own natural cause. A lid or cover is thrown over the vat, and it should be left undisturbed until the milk is not only acidified but formed into a lopper. Whenever it comes to this state it may be churned. However, if the lopper is unbroken it may be kept for even two days, till more is in a proper state for churning.

When churning has commenced, the milk that has not soured and lapped, should not be churned, otherwise the butter-milk will ferment. After the clotted milk has been put into the churn, and agitated a few minutes, to break the lopper, the temperature of the milk in the churn must be raised to 70° or 75°. This is effected by pouring in hot water. While one is pouring in the water another should keep constantly agitating the contents of the churn, and here the proper heat should be ascertained by a thermometer, which should be found in every dairy, and constantly used in this and other operations of the dairy. When the milk is at the proper heat from 2½ to 2¾ hours is sufficient for churning.

Another mode of making butter is to churn the cream by itself. When this method is followed, the milk, when drawn from the cow, is placed into shallow coolers, either wood or stone-ware, and allowed to stand till the cream rises to the surface. In some dairies it is allowed to stand as long as 48 hours, in others not more than 24 hours; in the former more cream is obtained, by the latter less, but of a superior quality; in certain states of the weather the milk will be greatly injured if allowed to stand too long. The cream is taken off the milk with a skim- spoon, and is put into a vat till as much is collected as may be convenient to churn together. The cream in that state soon acidifies, and the oily matter, with some portion of the milk in the cream, forms into a clotted state over the whey; if it remains long unchurned fermentation commences, mouldiness covers the surface, the mass acquires a rancid taste. To prevent these evils the cream should be well stirred every 12 hours with a stick. In churning cream, the temperature must also be raised to 70° or 75°, the churning should neither be too hurriedly or too slowly performed, and the operation kept up steadily. Two hours is the shortest time it can be done with safety.

In Carlow the milk, as it comes from the cow, is divided, about four imperial pints from each cow are put together and left to stand; of this portion the cream alone is used, the skim milk been kept for domestic purposes. The remainder of the milk, when cold, mixed with the cream of the former portion, is strained into coolers holding from three to five gallons each, and left in there to cool; this mixture, when perfectly cool, is put into vessels of a larger size, and this part of the process occupies twelve hours. The milk is then left before churning to thicken, which, in cool weather will be in about three days; but this will depend on the state of the weather, and the milk must not be left too long, otherwise the butter will have a bad taste, and if taken too soon it will not be productive. In some large dairies they have churning twice a day, in others once, while in smaller dairies only every alternate day.

In the west of Scotland, whenever butter is made in the churn, it is removed from the butter-milk, and well washed in at least three or four changes of cold spring water. If the butter is very soft, and the weather hot, it should be allowed to lie for ten minutes or so in the cold water, to harden, before it is much water; after this it must be carefully kneaded with the skimming-dish, among the changes of water, till every particle of buttermilk is expelled; after which, and while the butter is yet soft, it ought to be salted.

The quantity of salt for butter intended for keeping several months, as used by the Ayrshire dairymen, is half an ounce of salt mixed with ten drachms of refined sugar and ten drachms of nitre, to every sixteen ounces of fresh butter. The sugar improves the taste, and the nitre gives the butter a better color, while both of them act with the salt in preserving the butter from rancidity. Both the sugar and nitre should, however, be used with great caution, and should not exceed the quantity stated above, otherwise the butter acquires a peculiar disagreeable taste. The whole three ingredients are well mixed together and ground or pounded very fine.

In curmg, the salt is minutely mixed, if not, part of the butter is yellow, while the parts that missed the salt will be of a white color, and when thus mixed with white spots it brings an inferior price. But although it is necessary that the salt, &c., be carefully kneaded through the butter, care must be taken not to bake or head it too much, otherwise it gets into a state of putty, and becomes tough and gluey.

In the north of Scotland, viz., in the Counties of Banff and Aberdeen, where a good deal of butter is cured, it is customary to put in about four per cent of salt, being rather more than that is used by the Ayrshire dairymen; but few of the curers use either sugar or nitre. In Carlow I am not aware of the exact quantity used, but from its taste would suppose about the same as in Ayrshire. Some of the dairymen in Carlow use brine for cleansing the butter when it comes

from the churn, which is thought preferable to bleaching it among fresh water. It would be well for farmers and dairymen both in Scotland and Canada to give the brine a trial, as I am of opinion it may tend to retain the sweet flavour of the butter.

In the North of Scotland the make and cure of butter was conducted in a very slovenly way; however, during the past twenty years there has, happily, been a great improvement, although from the fact of its being all store-packed it it does not come up to the quality of the dairy cured Ayrshire butter. The great recommendation of the Aberdeenshire cure is its uniformity; all of one brand being equal in quality, degree of satteness and finish; thus in selling, seldom more than two or three casks are opened for inspection in a lot of twenty or thirty casks, while all the butter cured over that district of country is gone about much in the same way. There is very little difference in the value of any two cured lots, if made at the same season of the year, seldom more than two or three per cent between the best and worst quality: still the system has its faults, and it may be well to point them out.

Formerly the farmers and small crofters in the north used to allow the butter to be about in a fresh state for days before they took it to the shop-keeper, in exchange for other goods, and he in turn only cured when convenient for himself. Of late years, however, a great improvement has taken place, most of the larger curers have now spring vans which they send round their districts, and in this way the butter is collected and cured more rapidly than formerly; still it never has, nor can have the light sweet flavor of butter cured in the dairies of Carlow.

It will be necessary now to make a few remarks on the packing and the finish of the butter; the kegs should be of oak, and of a uniform size and shape, quite water-tight. The butter when cured should be carefully packed, leaving no spaces around the sides as is too often the case with Canada butter; the kegs should be well filled up, as close as merely to admit the head into the grooves; after being filled the butter should be made quite smooth on the top with a bone knife, made for the purpose; after this a very little fine salt should be sprinkled upon it; then a piece of clean new cotton or linen cloth, cut to the shape of the head of the head of the keg, (and previously well washed through water or brine, to free it from the bleaching powder,) lay the cloth quite wet on the butter, after which a little wet salt should be sprinkled on the cloth, when the keg may be headed up; in this way if the make, cure, and finish has been attended to the casks when opened up for inspection months after, will have a fine fresh appearance.

The great drawback in Canada is the excessive summer heat. I have been informed that it is necessary for the farmers to salt the lumps

as churned, as the butter would not keep till conveyed to the storekeeper; who in turn must have much difficulty in knowing how much more salt to put in, when mixing the different lumps of butter together. Some understanding should be come to between the farmers and storekeepers as to the quantity of salt each shall into the butter, otherwise it will be impossible put ever to turn out a uniformly good article.

That the quality and cure of Canadian butter can be improved there can be no doubt. I have ample proof of this from the fact of an Aberdeenshire* correspondent, now settled in Canada West, sending here store-packed butter, which brought last season as high a price as the best Canadian dairy cured, sent at the same time. The difficulty he has to contend with is the twice salting, which, it is to be hoped in another year, may in part be removed; otherwise his butter is as uniform and as carefully cured as when in Aberdeenshire, and it only requires equal care on the part of the other storekeepers and curers to make this a valuable article of export.

The great point is cleanliness. Extreme attention should be given to the scalding and scouring of the coolers, vats, churns, &c., as without this, however good the management in curing and packing, the butter will have a strong taste, and consequently be of inferior quality.

It is also necessary to keep the cured butter in a cool airy place; the outside of the kegs should be kept dry and clean, as a great deal depends on appearance in getting a price; if the temperature of the store can be kept low by keeping ice in it, all the better.

It is the custom in the North of Scotland to have their name or trade-mark branded on the kegs or stamped on with ink; and when a cure gets into repute with the buyers, it is called a fancy brand, and gets a somewhat higher price, and much of this sort is sold to arrive in a brisk market; the buyer being satisfied it will turn out good.

In conclusion, I would urge all interested in the article to do their utmost to raise the quality of the butter produced in the Province.

Leith, Scotland, 4th Feb., 1863. M.N.L.

The Apiary.

ITALIAN HONEY-BEES.

EDITORS OF THE CULTIVATOR:—In answer to the numerous inquiries pertaining to this species of bee, allow me through the columns of your paper, to give a description of them.

When they were first introduced into this country, I regarded them as more of a *humbler* than an improved species of honey-bee, and no doubt others have come to the same

conclusion. But after due consideration and experience for the past three years, I have become convinced of their superiority over the common bee. They seem to be very hardy, will stand the cold of our northern winters better, collect honey much faster, work earlier in the morning and later at night than the common kind. The queens are more prolific and will breed much faster than the common species. They will collect honey from some species of flowers which other bees pass by. Their proboscis seems to be longer, and being stronger and more active, they will frequently tear the flowers open to obtain the sweets, which the common bee will never do, and as has been frequently alleged, will collect honey from the smaller kinds of red clover. Their size is governed by the size of the cells where they are reared. If comb of other bees' make is used, they will be about the same size as our common bees. But if they are allowed to build their own brood comb, they will be considerably larger.

It has been frequently asserted, that the Italians have no weapon of defence. This is an error, as I learned in the early part of my experiments. I then thought they had instruments of warfare of unusual length. By careful management, I find they are much less liable to sting than the old kind. Bee-keepers who are not thoroughly acquainted with the nature of bees, would do well to use a *fumigation pipe*, which will render any swarm perfectly manageable in less than ten seconds. They can even be shaken out of the hive, and not a bee will resent it.

They differ very materially in color as well as in the shape of their body, from the common kind.—Their bodies seem to be somewhat longer, and taper to near a point. The workers are all marked by a series of gold bands, encircling their bodies just under the wings. The drones are not so strongly marked. The workers resemble the common yellow wasp quite as much as they do the common kind of bees. The queens vary in color; some of them are a dark brown, others are quite light, approaching to near a gold color; but the progeny of a dark queen bear the marks quite as plainly as a light-colored one.

In regard to their moral habits, I cannot speak very favorably, unless it is for the robbery of our common stocks. In that capacity, they will excel anything I have ever seen. Being very smart and active, they will make their way into any common hive and get load of honey and make their escape unharmed. They will have a full hive whether it is a good honey season or not, and I have frequently had them fill two hives, by placing one on to of the other.

I would advise all persons who engage in their culture, to make the entrance of the hive containing the common species very small

* The storekeeper above alluded to is George Clark, of Dundas.

to prevent being robbed by them. The entrance of the Italian swarms should also be continued, to prevent their robbing neighboring varieties. The Italians are not so liable to rob their own species. K. P. KIDDER
Burlington, Vt.

Horticulture.

TORONTO GARDENERS' IMPROVEMENT SOCIETY.

The monthly meeting of this Society was held in the Agricultural Hall, on the evening of Feb. 16th. Present—Messrs. J. Fleming, (Chairman); C. Young, E. Townsend, S. Ashby, G. Vair, C. W. Lawton, J. Gray, J. Maughan, R. McNish, Higgins and J. Forsyth, Secretary.

Mr. Vair exhibited some Floral specimens from the Conservatory of D. McPherson, Esq. Among them were *Azaleas obtusa*, *marginata*, and *Louis Napoleon*, which called out some remarks upon their respective merits. Also a flower of the *Meyeria recta*, a beautiful and much admired Mexican shrub.

The subjects discussed were the cultivation of the *Camellia*, and the best system of growing Mushrooms.

Mr. Vair read a paper upon the culture and management of the *Camellia*. He said it is a plant unsurpassed for conservatory or greenhouse decoration, and justly holds a place in every collection of greenhouse plants. It has been cultivated in Europe for the last hundred and seventy years, and its varieties now amount to hundreds. Its beautiful form of flower, its endless shades of colour, and ever verdant foliage, render it an object of attraction at all seasons—lacking but the perfume of the Rose to constitute it the queen of flowers. The *Camellia* may be raised from seed or propagated by cutting. Some of the single or semi-double varieties seed freely, and with a little attention during the blooming season to the distribution of pollen, some interesting experiments may be made, and many new and it may be valuable varieties obtained. Many of the dwarfed sorts may also be improved by grafting upon stocks of a stronger and more robust habit. As to the best soil for *Camellia* culture, he would recommend a good, clean, yellow loam, with one-third peat. The soil must be free from all deleterious substances, such as chips, thick roots, &c., as they only tend to produce fungi or something else equally injurious. He believed a mixture of peat to be very beneficial, but would prefer growing them in loam altogether rather than use the swamp muck found in the neighbourhood of Toronto, which is often tried as a substitute for peat.

Good drainage he considered a very important point in the cultivation of the *Camellia*—giving

an idea which he thought, if carried out, would be found of some advantage, that is, to have a flower pot constructed with a double bottom, the inside part to resemble the bottom of a propagating pan and perforated in the same way, through which every drop of water might percolate into a small chamber between the bottoms and pass off in the usual way. Although they like plenty of water, it is necessary that it should pass quickly off. He believed stagnant water about the roots, or improper drainage, to be the principal cause of the yellow sickly looking foliage sometimes to be seen. In such a state they are particularly liable to be scorched with the sun. He would recommend a careful examination of the roots and drainage when the blooming season is over, let them be well and regularly supplied with water, in a temperature of 60 to 65° and they will make a good growth. He would use the syringe freely upon growing *Camellias* both night and morning in clear weather, but it ought not to be applied with too much force, as it may injure the young and tender leaves. Plenty of air is also very essential to the growing *Camellia*; they will do well outside during the summer, in a situation where they may be shaded from the mid-day sun. A pretty free exposure in September will have a tendency to ripen the wood well, and may prevent the falling of many buds as well as the discolouring and unnatural enlargement of others. When brought inside in the fall they require all the air that the weather will permit; much fire heat he considered injurious, although he did not think it advisable to let the temperature be under 40°. The *Camellia* may be trained to almost any form to suit the taste of the cultivator, and if managed successfully cannot fail to command the admiration of all.

Mr. Turner recommended putting the *Camellia* out in summer; a house made of lattice work, constructed in a convenient and well chosen place, would suit the purpose well. As regards soil, he had used successfully a surfy loam, and watered occasionally with manure water. He thought the best time for re-potting would be in spring, when the buds are swelling.

Mr. J. Gray, who has had much practical experience in Horticulture and one of the earliest *Camellia* growers in Toronto, could endorse much that had been said, but thought that the *Camellia* might be re-potted in the early part of September with as much success as in the spring; with regard to the temperature, in the winter months he had seen it as low as 32° without any perceptible injury to the plants. When removed to the outside he thought it important that the pots should be plunged, as the action of the sun upon the pots or a drying atmosphere will have an injurious effect upon the roots. No plant will stand pruning better than the *Camellia*; by a

judicious use of the knife, badly formed plants may be much improved.

Mr. C. Young was in favour of growing the Camellia in partly burned (or what is commonly called charred) soil, with $\frac{1}{2}$ rough sand, stating that some of the best specimen plants he had seen in England were grown in this composition. In putting the Camellia outside in summer it is necessary to avoid a situation where they would be exposed to the drops of trees. The growing temperature ought not to be under 60°. He would use the syringe freely and water regularly. The principal cause of buds falling he believed to be neglect of water at some previous period. Manure water may be used to some extent at any season.

CULTIVATION OF THE MUSHROOM.

Mr. Ashby in introducing the subject said, to raise Mushrooms, it is first necessary to procure the proper material. He would collect a quantity of horse droppings from the stable, as free of straw as possible; he thought a small mixture of cow manure very beneficial, and if sheep manure can be obtained all the better. The whole should be kept dry and sunned frequently until thoroughly incorporated and well tempered, when the bed may be commenced in some suitable place. In the summer season an old shade or barn would suit the purpose very well. To form the bed two parallel boards may be stood on edge, 3 feet apart and of any length required; the prepared material to fill the space between the boards to the depth of 15 inches, patted nicely and equally together and covered with 3 or 4 inches of light rich earth. When the heat of the bed has become regular the Mushroom spawn may be inserted in small lumps equally over the soil and covered with hay or straw. The bed may be kept moderately moist by sprinkling with water when necessary.

Mr. Gray said that good Mushrooms may be raised without using spawn, by collecting a sufficient quantity of as pure horse droppings as possible and preparing it in the usual way. The bed may be formed 3 feet wide and of any length, according to the quantity of material or the demand for Mushrooms. A layer of droppings about 9 inches deep is first deposited and covered with loamy earth to the depth of 3 inches; then another layer of droppings of the same thickness covered like the former, each layer narrower as it advances in height. When finished it will be in the form of a ridge and should be covered with a coating of hay or straw. The advantage of such a bed is that it will continue to bear for a long time. If a suitable cellar can be devoted to the purpose Mushrooms may be had all the year through; he (Mr. Gray) had raised good Mushrooms in this way, and had recommended the system to others, who had been equally successful.

Mr. Maughan remarked that to grow Mush-

rooms well, and have a continued succession it would be necessary to have a properly arranged erection for the purpose. The house should be made with a dark roof, and the light admitted by small windows with wooden shutters, that could be opened or closed as occasions required, the sides to be fitted up with deep shelves one above another of sufficient size to contain the bed. As a uniform temperature very essential, a brick flue may be constructed to run along the centre of the house; he would recommend a temperature of about 55°. In this way successional beds may be made as Mushrooms had at any season.

It was agreed that the subject to be discussed at next meeting should be the cultivation of Grapes under glass, and the management of hybrid perpetual Roses.

After which the meeting adjourned.

Meeting on March 16th, 1863.

Present, Messrs. J. Fleming, J. Gray, C. Young, S. Ashby, E. Townsend, S. Turner, J. Maughan, C. W. Lawton, G. Vair, E. Louis, J. Leslie, Wm. Greenwood, Pouty, Higgins, & Venn.

Mr. Young exhibited some seedling Cineraria worthy of notice, also some cut flowers of a new variety of Azaleas, and a specimen of the beautiful Orchid-Phalanopsis Grandiflora, which attracted some attention.

The subject discussed was the cultivation of Grapes under Glass.

Mr. Ashby in introducing the subject said: Previous to planting it would be necessary to form a border of proper composition for the purpose. To do so, he would excavate to a depth of three and a half feet, and put in the bottom a quantity of stones, brick-bats, or other material proper for drainage, to a depth of six inches, then procure from the pasture field a rich turfy loam, laying the grass side of the top spit down upon the drainage, adding to the lower part of the border a quantity of unbroken bones, in the upper part, or near the surface, an equal quantity of small or crushed bones.

After planting, keep the house warm and moist by frequent syringing. Under favorable circumstances they may be expected to mature in 12 or 14 feet of wood the first season. The cultivator will have to decide the mode of pruning to be adopted, he believed the cane system to be a good one, as clean, healthy wood, can generally be had by that method. He would syringe at night only, and admit air early in the day before the house gets too warm. It is necessary to cease syringing at the blooming season, the fruit will set better in a rather dry atmosphere, after which it may be resumed free until the berries begin to colour.

Thinning the berries and bunches is an important operation; they may generally be reduced about two-thirds, and should be done in a regular equalizing manner.

Mr. Young in making some remarks upon the question, said, that three and a half feet

ph of border is unnecessary, he believed two and a half feet quite sufficient; the most live and healthy roots are invariably found near the surface. He did not think an outside border necessary; by having the roots entirely under control inside, stimulants may be applied with greater success. Good drainage he considered very essential under any circumstances.

Mr. Lawton thought a shallow border preferable, and recommended a mixture of charcoal in its composition. The first year after planting he would cut them well back, leaving only one or five eyes, and not allow them to fruit the second season. The third year six or seven bunches may be obtained, and the fourth year ten or twelve bunches, according to the strength of the vine. He did not think that any of the best varieties are suitable for a cold Grapery. Mr. Gray spoke at some length upon the subject, recommending the system of propagating in eyes, and planting out immediately. In this he had fruited the vine well in thirty months from the time of striking the eye, and believed to be the most successful method that can be adopted. He agreed with former speakers that no borders are unnecessary, and that shallow prepared borders, produce the finest and best flavoured fruit. At the time of starting the vine, by removing all superfluous buds, the remaining ones will break stronger and more regular.

Mr. Pouty asked the meeting if the vine is improved by root grafting, whether it will produce better wood or fruit? He believed that it was preferable to eyes, especially for pot culture.

Mr. Young said, that he thought it a benefit to weak growing varieties only.

The meeting then adjourned.

The subject to be resumed at next monthly meeting.

JAMES FORSYTH, *Sec.*

CULTIVATION OF THE PEAR.

The following communication was referred to the report of the meeting of the Board of Agriculture, in our last number.

TO THE BOARD OF AGRICULTURE OF UPPER CANADA.—*Gentlemen*,—Believing that the capabilities of our Province as a fruit growing country have been as yet but very partially developed, and being desirous of doing something towards the ascertaining of those capabilities and the encouragement of fruit raising, I hereby propose to you to give the following premium:—

Any person, not a professional nursery-residing within the county of Ontario, or in the counties of Victoria, Northumberland, Peterborough, Prince Edward, Hastings, Lennox, Frontenac, Leeds, Lanark, Grenville, or Stormont, who shall exhibit the largest collection of really valuable pears, more than six specimens of each variety,

not less than three varieties in each collection, each variety named, and shall with the entry make the written statement required below; a premium of *thirty-five pear trees* of suitable size for planting, grown either upon the pear or quince stock, at the option of the exhibitor, and of such kinds as the exhibitor may select from the list of pear trees cultivated at these nurseries.

To the exhibitor of the second best collection, upon the same conditions, a premium of *fifteen pear trees*, with like privilege of choice to exhibitor.

To the exhibitor of the third best collection, upon the same conditions and with the same privileges, a premium of *five pear trees*.

Each exhibitor to send with his entry a written statement, shewing the township, lot and concession where the fruit exhibited by him was grown; the nature of the soil; the stock, whether pear or quince; the hardiness of each variety and probable ability to endure the climate of his locality, and which of the varieties the exhibitor values most highly; such statement to be signed by the exhibitor, giving also his post office address.

The collections to be exhibited at the Provincial Fair, to be held in 1863, subject to the rules and regulations of the Agricultural Association, such entries to be distinct from all other entries. The Board of Agriculture to appoint two of the judges to decide upon the merits of the several entries, the third judge to be subject to my appointment.

The same premiums for like collections to be exhibited in 1864, by residents in the counties of Lambton, Huron, Bruce, Grey, Simcoe, Perth and Wellington, subject to same regulations.

Permit me to submit the above for your consideration.

C. BEADLE.

St. Catharines Nurseries, Nov. 12th, 1862.

LIST OF FRUITS RECOMMENDED BY THE FRUIT GROWERS' ASSOCIATION.

St. Catharines, March 2, 1863.

Editor Canadian Agriculturist.

DEAR SIR,—At the last meeting of the Fruit Growers' Association of Upper Canada, I was directed to transmit to you a complete list of the several fruits passed upon by the Society, and shewing for what they had been recommended.

Below you will find the entire list arranged under appropriate headings.

Yours truly,

D. W. BEADLE,

Secretary.

Apples recommended for general cultivation.

1. Duchess of Oldenburgh. 2. Early Joe, as a dwarf for Gardens. 3. Early Harvest. 4.

Esopus Spitzenburg. 5. Famense or Snow apple. 6. Fall Pippin. 7. Golden Sweet. 8. Gravenstein. 9. Golden Russet. 10. Hawthornden. 11. Keswic Codlin. 12 Northern Spy. 13. Pomme Grise. 14. Rambo. 15. Red Astracau. 16. Ribston Pippin. 17. Roxbury Russet. 18. St. Lawrence. 19. Talman Sweet.

Apples recommended for cultivation in particular localities.

1. Baldwin. South of Lake Ontario and the G. W. Railway. 2. Rhode Island Greening, in the vicinity of the lakes.

Recommended for further trial.

1. Benoni. 2. Belmont. 3. Beauty of Kent. 4. Colvert. 5. Dominic. 6. Fall Janetting. 7. Jersey Sweet. 8. Porter. 9. Pimate. 10. Sweet Bourh. 11. Summer Rise. 12. Swaar. 13. Twenty ounce apple. 14. Wagner. 15. Westfield Seek-no-further.

Pears, recommended for general cultivation.

1. Belle Lucrative. 2. Flemish Beauty. 3. Louise Bonne de Jersey. 4. Madeline. 5. Seckel. 6. Tyson. 7. White Doyenne.

Recommended for cultivation South of Lake Ontario and G. W. Railway.

1. Bartlett.

Recommended for further trial.

1. Beurre Godefroid. 2. Beurre d'Anjou. 3. Duchesse d'Angouleme. 4. Osbands' Summer.

Cherries, recommended for general cultivation.

1. Mayduke.

Recommended for cultivation South of Lake Ontario and G. W. Railway.

1. Black Tartarian. 2. Black Eagle. 3. Bigarreau or Yellow Spanish. 4. Eaton, also for trial further north. 5. Early Purple. 6. Etchhorn or Tradescants' Black Heart. 7. Governor Wood. 8. Napoleon Bigarreau.

Recommended for further trial.

1. American Heart. 2. Knights' Early Black. 3. Late Duke. 4. Monstreuse de Mezel. 5. Queen Hortense.

Plums recommended for general cultivation

1. Coe's Golden Drop. 2. Green Gage. 3. Imperial Gages. 4. Lombard. 5. Lawrence's Favorite. 6. Prince's Yellow Gage. 7. Reine Claude de Bevey. 8. Smith's Orans. 9. Washington. 10. Yellow Egg.

Recommended for further trial.

1. Jefferson. 2. Sharpe's Emperor.

Currants, recommended for general cultivation.

1. Black English. 2. Black Naples. 3. Cherry. 4. Red Dutch. 5. Victoria. 6. White Grape. 7. Whit Dutch.

Recommended for further trial.

1. Ogden's Black Grape. 2. Prince of Wales. 3. Red Russian.

Gooseberries recommended for general cultivation, English varieties.

1. Crownbob. 2. Sulphur Yellow. 3. Warrington Red. 4. Whitesmith.

American Varieties.

1. Houghton Seedling, not being as subject to mildew as the English varieties.

Strawberries, recommended for general cultivation.

1. Burr's New Pine. 2. Jenny Lind Wilson,—for market.

Recommended for further trial.

1. Hooker. 2. Monroe Scarlet. 3. Pope's Victoria. 4. Triumph de Gand.

Raspberries, recommended for general cultivation.

1. Franconia. 2. White Antwerp.

Recommended for further trial.

1. Brinckle's Orange. 2. Belle de Fontaine. 3. Fastolf. 4. Kievet's Giant.

Cranes—No variety has yet been recommended for general cultivation in all parts of the Province.

Recommended for cultivation north of Ontario and the G. W. Railway

1. Clinton.

At the meeting held in Toronto on the 11th of November, 1862, the members present presented each a list of the varieties that he had the best. On examining them it was found that the Delaware was on every list, Concord on all but one—Diana, on all but two—Hartford on all but three—Rebecca, on all but one—Ontario, on all but four—Isabella, on all but five.

THE DWARF APPLE TREE QUESTION

EDITOR OF THE AGRICULTURIST.—It is my intention at this time, to attempt to reply to Mr. Werden's last article on the above subject, for the following reasons.

1st. Because I am of opinion that all discussions, when written for a periodical *Agriculturist*, should be ended in the same issue in which they are begun.

2nd. Because I am unable to perceive in Mr. Werden's last, one idea on the subject that was not replied to in my last.

3rd. Because it is best for all parties concerned, that the discussion should stop, when the discussion cannot be carried on, without the participants calling in question each others' verities. Now Sir, I assured Mr. Werden in the September number of last year, that my Dwarf Apple got ordinary cultivation, or such as other dwarf and bushes generally get, in the gardens

ty farmers or mechanics," and yet Mr. Werden reiterates, that he "hinted in his last article Dwarf trees might be made," viz., "cramp roots in a pot," and then says, "which doubt is the cause of Mr. Arnold's trees bearing." Now Sir, I shall positively refuse to refer to anything that Mr. Werden may write; Mr. Editor, if you will please to refer to articles on the Dwarf Apple Tree question last year's *Agriculturist* and shall express myself of the opinion, that there are points in Mr. Werden's *first article* that have not been answered, then, I will take pleasure in referring to that portion to the best of my ability. There are several points in Mr. Werden's last, to your new subscribers, would seem to demand a reply, but for the reasons assigned for not doing so, and also not wishing to let a punishment upon last year's subscribers, I will not and refrain from giving, and conclude with one word about my refusing to supply Mr. Werden with 25 Dwarf Apple trees; he says, "send along your trees, and if I don't see fine large trees of them, then I will pay you \$100." When, Mr. Werden? Ten or twelve is too long for me to wait. But why not put my proposal, to put the trees in the hands of disinterested parties in order that they may be tested fairly. If Mr. Werden sends his order accompanied with the cash, the trees will be sent; and allow me to say to Mr. Werden that everything sent out from this establishment, is warranted to be what it is called. If Mr. Werden should accuse me, as he has done others, of "writing this for the purpose of selling my trees," I will, as soon as spring comes, send him half a dozen Dwarf Apple trees (2 year old) warranted genuine and true and defy Mr. Werden to make them like common Apple Trees under the Dwarf cultivation unless he plants the Dwarf Apple trees as to cause them to throw out roots from the graft, as well as upon the stock.

Your's,

CHARLES ARNOLD.

Woodstock, March 23rd, 1863.

Veterinary Department.

AGRICULTURAL AND VETERINARY CLASS.

It must be already known to most of our members that for some time past the Board of Agriculture has been making exertions to bring a systematic course of Veterinary instruction within the reach of young men engaged in agricultural pursuits. Accordingly a small class was formed for this object in the winter of 1862, the result of which was sufficiently successful to justify a further trial. Another class

was therefore commenced in January last, comprising upwards of thirty young men from different parts of the Province, who attended three or four lectures daily on subjects relating to Agriculture, the anatomy, physiology, and diseases of the horse and ox, and the sciences which bear on these pursuits. Mr. Andrew Smith conducted the Veterinary department, assisted by Mr. Eachman, a licentiate of the London and Edinburgh Veterinary Colleges, who has recently come to this country and intends to commence the practice of his profession at Woodstock. Professor Puckland gave daily lectures on the science and practice of Agriculture, and was assisted in Chemistry, Geology, Natural History, and Meteorology, by Professors Croft, Chapman, Hincks, and Kingston, of University College. The main object of the course was to awaken rather than to satisfy curiosity; to prepare the minds of the pupils for some extensive and systematic study, and to instruct them how to read, investigate, and observe for themselves. Many of the students made considerable progress in dissecting the horse, and evinced a more enlarged and accurate knowledge of the anatomy and physiology of that useful animal than could have been expected in so short a time.

Although no examination either on entering or leaving the class was imposed as a necessary condition, the Board of Agriculture with a view of encouraging emulation, offered four prizes to the four students who should pass the best examinations in all the subjects, agreeably to that order; the value of the prizes to be given in suitable books. Accordingly at the end of the course, the beginning of March, eight students presented themselves, and after two days examination conducted by written questions and answers, the following results were obtained:—1st Prize, value \$20, David McCrac, Guelph; 2nd Prize, value \$15, John Wen, Wentworth; 3rd Prize, value \$10, John Brown, Binbrook; 4th Prize, value \$5, James Dunlop, Woodstock. The questions were so framed as to test not only comparative but absolute merit; and the answering, on the whole, was highly satisfactory. Both Professor Puckland and Mr. Smith complimented the class for the industry and application they had evinced, and encouraged them to follow their studies in a similar spirit at home. At the conclusion of the proceedings, the members of the class presented Professor Puckland with a very handsome walking-cane, and Mr. Smith with an elegant riding-whip, as an expression of their goodwill and appreciation of those gentlemen's services.

HOW TO PUT HORSES IN CONDITION.

From the North British Agriculturist.

By proper feeding, exercise, and grooming, is this important end to be attained. There is and can be no patent or rapid process. Time and good management are equally requisite. The plan pursued must be identical with that followed in the training of those athletes who are to perform feats of strength or agility. He who would enter the ring with a Tom Sayers, or try a few miles with Deerfoot, must live for months on light and digestible but concentrated and nutritive fare; by constant and appropriate exertion must keep his body and limbs firm, light, and active; by friction and baths preserve in all their integrity the important purifying functions of the skin, and by reasonable sleep and rest recruit the powers of life. Under such training, with avoidance alike of stimulants and depressing agencies, great activity and vigour are obtained; and it is also noteworthy that such a system of self-denial is favourable to the development of the mental as well as the physical powers. Dr. John Brown, the author of the inimitable "Rab and his Friends," aptly says in his excellent papers upon "Health" that "there is a religion of the body as well as, and greatly helpful of, the religion of the soul." And in the busy pushing population, especially of large towns, this is too often lost sight of. The denizen of the city cannot spare the time or exercise the self-denial necessary to attain such condition as would enable him to thrash a professional boxer, ride for the Liverpool Steeplechase, or bend the stroke oar at a crack Oxford boating match; but by walking, drill, cricket, or any other rational exercise he may invigorate his limbs, expand his chest, enjoy a sound digestion, avoid "attacks of the stomach, liver or nerves," and render his life not only longer, but happier and more useful.

But our province is with the health of animals, and not of their masters, and our horse waits our attention. The groom is anxious to know what physic he is to have and stares with a half-contemptuous smile if you attempt to insinuate the possibility of dispensing with it. But one dose by no means satisfies the ideas of such functionaries. There is the approved and orthodox number, the first to stir up the humors, the second to set them afloat, and the third to clear them off, which it sometime does, and the horse as well, as Professor Dick in his lectures was wont facetiously to remark. But seriously speaking, we cannot discover any advantage in giving physic to any healthy horse. It only evacuates the bowels, and purges the system of a quantity of useless fluid matters, which might be more naturally and safely got rid of through the skin. It may nauseate and weaken, but it cannot strengthen and invigorate. No sensible trainer, whose man is healthy and living under a sound regi-

men, drugs with salts and senna, rhubarb, colocynth; and with the horse which is every respect so much more under control and is, moreover, a total abstainer, the dosing is still less necessary.

But whilst physic is useless, and even harmful for a healthy horse, there are certain circumstances in which it becomes serviceable. Young animals fresh from a dealer's stable from grass, sometimes thrive too well, fed permitted too greedily, and thus disorder the stomach and bowels. The skin sympathizes as it ever does, with the irritable state of intestinal mucous membrane, is dry, raw and itchy, and in such cases a simple laxative followed up by an occasional dose of saltpetre will prove useful. Sometimes the effect from soft laxative fare to dry heating fare made too suddenly or rapidly, and an unhealthy state of the skin and consumption of the body are the result. In such cases, besides a laxative diet, a small dose of aloes will be useful. Again, if a horse in fair condition becomes lame, accident, or any such thing, unable to take his usual exercise, and is confined for several days to his box or stall, it is usually advisable to give him, with mashes, a small dose of medicine which will prevent his legs swelling, and counteract any febrile or inflammatory tendency.

In spring and autumn, whilst the cold being shed, horses are notoriously weak and difficult to keep in condition; and at such times the old-fashioned remedy is the favourite, often repeated at intervals, for several days. This obviously can only make matters worse. The horse wants something put into him instead, taken out of him; and the sensible man, instead, at such times pay special attention to the stable comforts, will lighten the work especially for young growing horses—will, by the goodness and soundness of the oats and hay, introduce besides a little variety into the dietary. In these and many other cases, where horses are weak and wanting in life and vigour, instead of flying absurdly to their alterative balls, give daily a quart of white peas. They are palatable, digestible, and nutritive. Linseed cake is another of much value, especially for young horses. No other food produces so smooth, silky, glossy a coat. A pound every second day will suffice, appearing to act both on the lungs and skin, and helping to counteract any constipative effect of the dry oats and hay. A little well-boiled flax seed or boiled linseed acts much in the same way. In various cases, some of the patent and medicated foodstuffs largely advertised are employed, and although not devoid of utility, their useful results usually be more economically obtained by a sensible selection and judicious varying of ordinary articles of food already mentioned. Many horses between the ages of four and five fail to do their work satisfactorily owing

led and painful state of the gums, especially of the upper jaw. Eating in consequence becomes difficult and painful. This state of affairs is known as lampas, and is nothing more than the fulness and tenderness of the gums accompanying in all animals the eruption of the teeth. The simple malady is, however, generally considered as an abnormal growth, and the enlarged palate is cruelly torn away, and is widely burnt with a hot iron. The appropriate treatment is to bruise the animal's oats, and to give it for a time soft and easily masticated food, and to relieve the swelling and tenderness attending the gums.

Parasitic Dyspnœa or Wheeze in Cattle.

Through the columns of your influential journal, I beg to offer the following few remarks on a subject that might probably be treated with interest—dyspnœa or wheeze in cattle—by those who may be more immediately concerned, and to this end I would advance that all young animals are the subjects of various degrees of disease produced by them varying according to their location, habits, and number; for example, the *Cœnurus cerecralis* in sheep, by reason of its situation, while causing staggers, causes infinitely more disturbance than the *Estrus evui*, or bot, irritating the cuticular portion of the horse's neck; the *Distoma hepaticum*, or liver fluke, in consequence both of its situation and numbers, does more harm than the *Hydatidæ* inhabiting the cellular tissues of the lungs, which create in pigs the disease called caliculus. The entozoon *Filaria branchiæ* called from its thread-like appearance a threadworm, the bronchial tubes, especially of young cattle, generates in them the disease called wheeze, or husk.

The bronchial filaria are chiefly *oviparous*, that is, egg-producing, in contradistinction to the *viviparous*, which bring forth their young alive; they are of distinctive genders; the females seek the remotest portions of the passages to deposit their eggs, which they deposit in vast numbers. The males, even when young, are less numerous than the females, and the latter present the ova-ducts at the centre of their bodies; the mouth in all cases is alike. A description of the changes wrought in the egg during its development into the young though perfect filaria, need, no doubt, be uninteresting to the theoretical, and; therefore, shall be passed over unnoticed. The ova deposited develop into young entozoa, which in their turn, generat- likewise, and so on, *ad infinitum*, there- counting for the multitude found on a *post-mortem* examination of the diseased ani-

mal, and the general emaciation and difficulty of breathing observable during life.

This disease in the ox tribe is almost entirely confined to animals under the ages of eighteen months, at which time the system seems favorable to the vitality and development of the ova. No doubt, the germs of these parasites reach the system of the aged, because both young and old are placed under the same circumstances, the former becoming the subjects of the disease, whilst the latter entirely escape by reason of their non-susceptibility to nourish and favor the growth of the ova. Occasional cases, do occur, however, in the old animal, when debilitated from any cause, such as privation, exposure to inclement weather, or protracted disease.

This affection is mostly prevalent on soils badly drained, naturally retentive of moisture, or after a hot, dry summer, the latter being antagonistic to the generation of most parasitic diseases.

Out of many theories accounting for the spread of the malady, the following is probably the most correct. The *Filaria* gives rise to a countless number of eggs lodged in the mucus (which they themselves by their irritation produce) of the bronchial tubes, the animal coughs frequently, and discharges a large quantity of this mucus (which by the microscope may be demonstrated to contain thousands of eggs) upon the surrounding herbage. Another beast whilst feeding deglutates a portion of food upon which the mucus so impregnated fell; and as the application of a little heat (such as is afforded them by the mouth) is sufficient to liberate the young worm from its protecting envelope, there is no reason why some left on the back of the mouth and fauces may not at once seek their proper habitat. This explanation seems true when we remember that two of these entozoa, male and female, in consequence of their immense propagating powers, will be sufficient, having entered the bronchial tubes, to lay the foundation for a future attack of this disease.

It is impossible to err in diagnosing the affection, the symptoms are so characteristic.

A wheezing cough, discharge of mucus from the mouth, rattling noise whilst breathing, heard plainly on auscultation, respiration hurried, with emaciation proportionate to the previous duration of the malady, all point to its pathology.

In treatment, the object should be two-fold: firstly, support the strength of the patients; secondly, if possible dislodge the entozoa.

They should be provided with nitrogenous food, and protected from the debilitating influence of inclement weather; tonics, vegetable or mineral, may be administered; gentian and sulphate of iron are perhaps the best. —*Veterinarian.*

Domestic.

Pea Soup (inexpensive.)

INGREDIENTS. — $\frac{1}{4}$ lb. of onions, $\frac{1}{4}$ lb. of carrots, 2 oz. of celery, $\frac{1}{2}$ lb. of split peas, a little mint shred fine, 1 tablespoonful of coarse brown sugar, salt and pepper to taste, 4 quarts of water, or liquor in which a joint of meat has been boiled.

Mode.—Fry the vegetables for 10 minutes in a little butter or dripping, previously cutting them up in small pieces; pour the water on them, and when boiling, add the peas, which should have been soaked overnight, as in the preceding recipe. Let them simmer for nearly 3 hours, or until the peas are thoroughly done. Add the sugar, seasoning, and mint; boil for $\frac{1}{4}$ of an hour, and serve.

Time $3\frac{1}{2}$ hours. Average cost, $1\frac{1}{2}$ d. per quart. Seasonable in winter. Sufficient for 10 persons.

Potato Soup.

INGREDIENTS. — 4 lbs. of mealy potatoes boiled or steamed very dry, pepper and salt to taste, $\frac{1}{2}$ quarts of medium stock.

Mode. When the potatoes are boiled, mash them smoothly with a fork, that no lumps remain, and gradually put them to the boiling stock; pass it through a sieve, season, and simmer for 5 minutes. Skim well, and serve with fried bread.

Time, $\frac{1}{2}$ hour. Average cost, $1\frac{1}{2}$ d per quart. Seasonable from September to March. Sufficient for 8 persons.

Potage Printanier, or Spring Soup.

INGREDIENTS. — $\frac{1}{2}$ a pint of green peas if in season, a little chervil, 2 shredded lettuces, 2 onions, a very small bunch of parsley, 2 oz. of butter, the yolks of 3 eggs, 1 pint of water, seasoning to taste, 2 quarts of medium stock.

Mode.—Put in a very clean stewpan the chervil, lettuces, onions, parsley, and butter, to 1 pint of water, and let them simmer till tender. Season with salt and pepper; when done, strain off the vegetable, and put two-thirds of the liquor they were boiled in to the stock. Beat up the yolks of the eggs with the other third, give it a toss over the fire, and at the moment of serving, add this, with the vegetables which have been strained off, to the soup.

Time, $\frac{3}{4}$ of an hour. Average cost, 1s. per quart. Seasonable from May to October. Sufficient for 8 persons.

Useful Soup for Benevolent purposes.

INGREDIENTS. — An ox-cheek, any pieces of trimmings of beef, which may be bought very cheaply (say 4 lbs.), a few bones, any pot-liquor the larder may furnish, $\frac{1}{2}$ peck of onions, 6 leeks, a large bunch of herbs, $\frac{1}{4}$ lb. of celery (the outside pieces, or green tops, do very well), $\frac{1}{2}$ lb. of carrots, $\frac{1}{2}$ lb. of turnips, $\frac{1}{2}$ lb. of coarse brown sugar, $\frac{1}{2}$ a pint of beer, 4 lbs. of common rice or pearl barley, $\frac{1}{2}$ lb of salt, 1 oz. of black pepper, a few bread-rasplings, 10 gallons of water.

Mode.—Cut up the meat in small pieces, break the bones, put them in a copper, with the 10 gallons of water, and stew for $\frac{1}{2}$ an hour. Cut

up the vegetables, put them in with the stock and beer, and boil for 4 hours. Two hours before the soup is wanted, add the rice and rasplings, and keep stirring till it is well mixed the soup, which simmer gently. If the liquor reduces too much, fill up with water.

Time, $6\frac{1}{2}$ hours. Average cost, $1\frac{1}{2}$ d. per quart.

Note.—The above recipe was used in the winter of 1858 by the Editress, who made a week, in her copper, 8 or 9 gallons of this soup for distribution amongst about a dozen families of the village near which she lives. The effect as will be seen, was not great; but she is not disposed to believe that it was very much liked, and gave to the members of those families a dish of warm, comforting food, in place of cold meat and piece of bread which form, for too many cottagers, their usual meal, with a little more knowledge of the "cook's art, they may have, for less expense, a warm dish every day.

Miscellaneous.

THE LATE MR. JONAS WEBB, OF BABRAHAM. — Mr. Jonas Webb may be said to have risen in the very height of his success. It is true that he had gradually got clear of his famous south-down flock, as last summer witnessed their final dispersion. The glories, however, of the sheep had already been replaced, and the great metropolitan show of this last summer Mr. Webb exhibited a young short-horn bull of his own breeding, which, in addition to the prize of its class, took the gold medal the best male animal of the section. In fact, the repute of Babraham had in this way come as generally well established, and the American Speculator, the Spanish noble, or French commissioner went down quite as prepared to look at and bid for a pure pedigree cow as even for a score of short wool ewes. This visit to Babraham was in itself an event in a man's life, though we little thought, we left the scene in July last, that the handsome, portly presence of Jonas Webb himself would never again give a genial grace to the occasion, however well the gatherings prosper in other hands.

Mr. Jonas Webb never went far from his birth-place for a home of his own. He was born at Great Thurlow, in the county of Norfolk, on the 10th of November, 1796, being the second son of Mr. Samuel Webb, of West Wilham, Cambridgeshire, in which county his ancestors had long resided. Commencing business as a farmer at Babraham, in Cambridgeshire, in 1822, he speedily turned his attention to the breeding and improvement of south-down sheep; while his object and success may be perhaps best told by himself, in a letter addressed to the *Farmers' Magazine*, nearly twenty years since, on the occasion of his portrait being given in that work: "I commet-

ing south-down sheep as soon as I began
 for myself, about twenty-two years
 from a conviction, through many experi-
 made when at home with my father
 many different breeds of sheep, that more
 and wool of the best quality could be
 per acre from south-down sheep than
 any other breed, upon nine-tenths of the
 land in this country, where sheep are
 fully folded, especially where the land is
 and the animals have far to walk to fold.
 can by purchasing the best bred sheep
 could be obtained from the principal
 in the county of Sussex, regardless of
 age, and have never made a cross from
 other breed on any occasion since. At the
 ing of the Royal Agricultural Society of
 and, held at Cambridge in July, 1840, I
 the first prize for the stock ewes and
 of the south-down or any other short-
 bred breed of sheep, and also the first prize
 shearing stock ewes, at the same meet-
 ize which time I have never shown for
 prize but for rams, being convinced of the
 inevitably brought upon all breeding
 by over feeding. I believe I only raised
 three lambs from the nine shearing
 which I had fed to exhibit at Cambridge;
 lost, I think, four of them also. My
 or Samuel, who also resides in the same
 of Babraham, has shown for the shear-
 ings prize for the years 1841, 1842, and
 and has obtained the first prize: every
 from my blood of sheep, he having pur-
 the ewes of me, and always hires my
 to put to them; he has been equally un-
 useful with those which he has over fed. I
 three out of four of the prizes offered by
 Royal Agricultural Society of England, at
 meeting at Liverpool, in 1841, for south-
 or any other short-woolled breed of sheep;
 Bristol, by the same society, in July,
 I won two, out of four, of the rams'
 and also at Derby, in 1843, at the
 ing of the same society, I won three out
 of the prizes for any kind of short-wool-
 led sheep; but in feeding sheep for that occa-
 sion I over fed two of my best, and killed them
 at the show took place; they were both
 year-old sheep, and were each highly com-
 mended by the judges, as yearlings, at the
 meeting. I had refused 180 guineas
 the hire of the two sheep for the season. I
 quite destroyed the usefulness of two
 aged sheep, by over-feeding them last
 year. They never either of them propagated
 about the season, and I have had each of
 killed in consequence, which has so com-
 mitted me of over-feeding that I never
 exhibiting another aged ram, unless I
 alter my mind, or can find out some
 way of feeding them which will not destroy
 the animals, and which I have hitherto failed
 to accomplish. What I intend exhibiting in
 will be shearlings only, as I believe they

are not so easily injured by extra feeding as
 aged sheep, partly by being more active, and
 partly through having more time to put on
 their extra condition, by which their constitu-
 tions are not likely to be so much impaired.
 I wish particularly to let the public know that
 in future I do not intend exhibiting aged rams,
 through the reasons which I have stated. You
 can, if you please, also notice my repeated suc-
 cess at the Smithfield club, and that I also ob-
 tained the first prize at the Highland Society's
 show at Dundee in 1843—the only time I ever
 exhibited stock in Scotland—for the best
 shearing south-down ram, the only prize I
 showed for; and, contrary to the rules of the
 society, the committee decided to have my
 sheep's likeness taken for the society's museum
 at Edinburgh. One of the rules of the society
 is, that no animal shall be taken as a specimen
 for that purpose, unless it is full-grown. My
 sheep was considered in every respect more
 finished and complete than any old sheep
 which had been exhibited. I also won the two
 first prizes last year at the Royal Irish So-
 ciety's meeting at Belfast, and the society's
 medal for the best ram of any breed exhib-
 ited at the meeting, never having previously shown
 my stock in Ireland. At the Saffron Walden
 Agricultural Society, which is open to any
 person in the United Kingdom who chooses to
 subscribe to it, I obtained all the first prizes
 in all the classes of south-down sheep, with
 the exception of two, during the whole period
 I continued to show in it; and I also won the
 first prize every year for the best pen of shear-
 ling wethers of any breed, which I believe
 brought the south-down sheep more into re-
 pute, in this and the adjoining counties, than
 all the other prizes which I obtained, as there
 was at one time a strong prejudice against
 them." Even before the portrait could be
 published, as a pendant on which this letter
 was written, more material was ready; and
 the editor had to add a postscript: "Since re-
 ceiving this communication from Mr. Webb,
 and which was previous to the meeting of the
 Royal Agricultural Society in July last, he has
 again been an exhibitor, in the class for shear-
 ling rams only, at the meeting at Southamp-
 ton, and again obtained the first prize of 30
 sovereigns." And we must again add "since"
 when the prize lists of the Royal Agricultural,
 and the annual lettings at Babraham, will tell
 how Mr. Jonas Webb's success as a breeder of
 sheep has still continued to increase, until,
 satiated with his own triumphs, he resolved to
 retire from the pursuit, and give others a
 chance.

His active mind, however, could not remain
 idle, and with his wonted sagacity he took up
 the short horn as he had done the south-down.
 For years, indeed, the herd and the flock
 were going together; but it was not till the
 former was about to be resigned that the

Babraham cattle came to take any especial prominence at the great meetings.—*Mark Lane Express.*

THE USE OF THE BAROMETER, &c.—Robert Bradley, Professor of Botany in the University of Cambridge, at the beginning of the last century, published a Treatise on agriculture, in which the following information is given as to the use of the barometer and thermometer. Professor Bradley was the discoverer of the circulation of the sap in plants, and defended the discovery with very considerable ability. The directions are in the form of a letter:—

Barometers will be of particular use to farmers, by assisting them to elect proper times for sowing and reaping.

The rules and observations made for knowing the weather, by the various rising and falling of the weather glass or barometer are these;—

1. That the least alterations in the rise and fall of the mercury in the tube should be regarded, in order for the right finding the weather by it.

2. The rising of the mercury presages fair weather, as the falling indicates the contrary viz, rain, snow, high winds, and storms.

3. In summer, if the quick silver be up a bout fair, and the weather very hot for four or five days, then we may expect black clouds to rise, and a brisk gale with thunder, and a shower or two, which will soon go off.

4. In winter, the rising presages frost; and in frosty weather if the mercury falls three or four divisions, there will certainly follow a thaw; but in a continued frost, if the mercury rises, it will certainly snow.

5. When foul weather happens soon after the falling of the mercury or quicksilver, we are to expect but little of it; and judge the same with respect to fair weather, shortly after the mercury has risen in the like manner.

6. In foul weather, when the mercury rises much, and continues so two or three days before the foul weather is over, then we may expect a continuance of fair weather to follow.

7. In fair weather when the mercury falls much, and continues for two or three days before the rain comes, then we may expect a great deal of wet, and high winds.

8. An unsettled state of the mercury denotes uncertainty and changeable weather, as sunshine, some black and some white clouds with frequent showers.

9. If the mercury be up at fair and does not fall, and it happen to rain, then we may expect but little of it.

10. If the mercury be down at rain, and does not rise, and the weather proves fair, then we may expect it not to continue.

11. We are not strictly to mind the words that are engraven on the plates, though for

the most part the weather will agree with them; for if the mercury stands at much and does rise up to changeable, it presages fair weather, although it is not to continue long as it would have done if the mercury was higher; and so on the contrary.

But to know how to judge still with greater certainty of the alteration of the weather we may accompany the foregoing instrument with a hygrometer, which will forewarn of wet and dry weather, by pointing to the degrees of moisture or dryness in the air, how one or the other increases. The best instrument I know of this kind is made of a gut, about a yard in length suspended, by a plummet or piece of lead, with an index pointer hanging at the lower end, by which means the catgut will twist or untwist, if the air dries or moistens, and shorten or lengthen so as to raise or sink the plummet with the index, which will mark the degrees we after—the weight of my lead is about six ounces: but some who use fine whipcord instead of catgut, put a greater weight of

The twisting or untwisting of either the gut or cord occasions the lead with the index to turn round, as well as rise and fall; so I choose to mark my degrees upon an screw of brass, within which the plummet index has its motion. There may be several devices for the figure of the weight or plummet, as a Cupid with an arrow in his hand, point at the degrees; or a bird with its wings extended for flight, with some branch in its mouth to serve for an index. These figures may be gilded for ornament, or others may be contrived as fancy directs.

When we are provided with these instruments, we should compare the motion of one with the other, in order to judge of the proportion the rise or fall of the quicksilver in the barometer bears to the twisting or untwisting of the cord or catgut, whose degrees of moisture we may observe by the index or pointer of the hygrometer; and at the same time observe both these with the risings and fallings of the spirit in the thermometer, to know what degree of heat or cold attends every change of weather.

The thermometer shows, by inspection, the present condition of the air, whether hot or cold—which day in summer, is the warmest, and in winter coldest, or any part of the year, and from thence many useful experiments have and may be made, viz, discover the hottest or coldest bath, or the degrees of heat or cold. So likewise of any spring, how much it exceeds the other in coldness.

When I can persuade my brother, to use these instruments, I hope to be able to visit their respective stations in and about the country, make remarks upon the several springs of them, and fixing London as the standard, communicate what remarks they make.

eral countries they reside in ; for by comparing one with another, we may come near certainty what plants will grow and prosper every part of the kingdom ; and from my observations of that nature draw such conclusions as may be of universal benefit.

R. BRADLEY

As I have taken occasion to publish this paper, I think it not amiss to prescribe a method for some of my readers to follow, in the points or observations they make on the alterations of the instruments named in it, viz, barometer, hygrometer, and thermome-

The method I shall propose, is that which is practised by the order and direction of the honourable Samuel Molyneux, Esq., to whom the learned part of the world is obliged for many great discoveries.

To give an example of this method according to the directions prescribed by the aforementioned gentlemen, we are to provide a book for twelve months' remarks, which should be made six times every day. At each time is to be observed.

1st, The rising or falling of the quicksilver in the barometer. 2nd, The alteration of the thermometer. 3rd, The rise or fall of the mercury in the thermometer. 4th, The point of the compass from whence the wind blows, as near as can be guessed with what strength. And 5th, Whether rain, snow, hail, and what quantity fallen.

Each leaf of the book designed for this use should be divided into several columns ; the first for the day of the month and of the week ; the second, for the number of inches and parts of an inch in the tube of the barometer, where the quicksilver stands at the time of observation ; the third, to mark the degrees pointed out by the index of the hygrometer at the same time ; the fourth, to show the number of inches and parts of an inch in the thermometer, where the spirit stands at the time of observation ; the fifth, to mark the winds, and their strength ; and the sixth, for the quantity of rain falling, and disposition of the clouds and air.

ANTIQUITY OF THE PIG.—The pig is the living representative of a very ancient race of animals which lived and died upon this long before there were Christians to detest or Jews to abhor their flesh. The same species of wild boar that was hunted by our fathers was contemporary with the mammoth, cave-bear, and the longhaired rhinoceros. Some persons imagine that geology deals only with fossil shells or fishes ; but there is a vast field of interest attached to the geological history of the predecessors and representatives of our domestic animals. We know that the ancestor of our domestic pig was in existence before the separation of England from the

Continent of Europe ; and that the hunter, had hunters then lived, might have chased the boar through forests the site of which is now occupied by the waves of the English Channel. Mammoths, tigers, and rhinoceroses perished, but the wild boar lived, and lives still on the Continent of Europe, though extinct here.—*Old Bones ; by the Rev. W. S. Simonds.*

Editorial Notices, &c.

AMERICAN POMOLOGICAL SOCIETY.—We are indebted to the officers of this Society for a Copy of their very interesting Report of the ninth session of the Society, held at Boston, Sept. 17, 18 and 19, 1862. It is a thick pamphlet of 230 pages, printed on exceedingly fine, white paper, somewhat of a rarity in these days, when good paper has become so expensive. Amongst the contents is a valuable catalogue of fruits, occupying 54 pages, showing the districts in the United States and Canadas, in which the cultivation of each kind is recommended by the Society. The remainder of the Report is taken up with the addresses, proceedings and discussions at the Convention.

NEW BRUNSWICK CENSUS.—By the kindness of J. G. Stevens, Esq., M.P.P., New Brunswick, we are in possession of a copy of the Census Report of that Province, taken in 1861, and lately submitted to the Provincial Parliament. The Report exhibits a very satisfactory state of Agricultural progress since 1851, when the last preceding census was taken. The present population of the Province is 252,047 ; the value of farms and stock \$32,780,310 ; the value of the agricultural products of 1861. \$7,709,382.

NEW BRUNSWICK BOARD OF AGRICULTURE.—We are also indebted to Mr. Stevens, who is Secretary of the Board of Agriculture of New-Brunswick, for a copy of the Report of that Board for the year 1862, being a well printed pamphlet of 80 pages, containing much interesting matter in reference to doings of the Board of Agriculture, and the Agricultural Societies of that Province for the past year.

THE JOURNAL OF THE BOARD OF ARTS AND MANUFACTURES FOR MARCH, 1863.

The current number of this well-conducted Journal contains as usual a number of useful and interesting articles, original and selected. An elaborate article appears under the head of

THE TEST WELL AT ENNISKILLEN, in which the most important facts relating to the nature and distribution of Petroleum on the Continent are very clearly set forth. Dr. Hurlburt's article on the Chief Forest Trees of Upper Canada originally prepared as descriptive of the specimens sent to the International Exhibition in London, cannot fail to interest many readers in Canada. Gold in Indiana, Wool and Woollen Manufacture, and a number of shorter papers will be found well worth a perusal.

It may not be known to some of our readers that this useful Monthly is published under the direction of THE BOARD OF ARTS AND MANUFACTURES FOR UPPER CANADA, at the very low charge of *fifty cents a year*, or eleven copies for \$5. To mechanics and manufacturers of every description it is peculiarly adapted, while farmers and general readers will find much to interest and instruct. Mr Edwards, the attentive Secretary of the Board, will forward the Journal to all pre-paid applicants, and give any information that may be required of the functions and proceedings of that body. The Library of Reference and Model Rooms are open free to public daily, in the New Hall of the Toronto Mechanic's Institute, Church street, and are well worth an inspection by country visitors.

The British Reviews:

We have received through Mr. Rowsell of this city, from the Publishers in New York, the American reprints of the last number of the WESTMINSTER, NORTH BRITISH and EDINBURGH REVIEWS. Considering the late calamitous fire with which the enterprising publishers, Messrs. Leonard Scott & Co., now of 38 Walker street, Broadway, New York, were visited, the reprints of the Reviews and Blackwood's Magazine have been brought out far more promptly than the public had any right to anticipate, and we trust that the publishers will find their labors appreciated by an increasing number of subscribers, particularly in the British Provinces, to the people of which these invaluable periodicals have both a special claim and adaptation, as the accredited exponents of British literature, science and politics. For particulars of terms, &c., we refer the reader to our advertising columns. Among the more interesting articles in the current numbers of the Reviews are the following:

THE WESTMINSTER:—Essays and Reviews,

with Dr. Lushington's Judgment; British Sea Fisheries; Railways: their cost and profits; Gibraltar; The Encyclopedia Britannica; The Religious Difficulties in India; The Star Power.

THE NORTH BRITISH:—Christian Individuality; The Austrian Empire; Assimilation of Law in France and Scotland; Popular prophetic Literature; Syria and the Eastern Question; The American Conflict.

THE EDINBURGH:—India under Lord Dalhousie; Gold-fields and Gold-miners; the Campaign of 1815; Modern Judaism; Convicts; Slavery in England and Ireland; Public Affairs.

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Oats, ".....	42 " 48
Rye, ".....	56 " 60
Pork, per 100 lbs.,.....	3 75 " 4 50
Beef, ".....	4 00 " 5 00
Mutton, ".....	4 00 " 4 50
Potatoes, per bushel,.....	55 " 60
Apples, per barrel,.....	1 00 " 1 25
Turnips, per bushel,.....	18 " 20
Onions, ".....	1 25 " 1 50
Fresh Butter, per lb.,.....	15 " 16
Tub Butter, ".....	12½ " 13
Eggs, per doz.....	14 " 15
Turkeys, each.....	60 " 1 00
Geese, each,.....	50 " 60
Ducks, per pair.....	50 " 60
Chickens, ".....	40 " 50
Hay, per ton,.....	10 00 " 20 00
Straw, ".....	8 00 " 12 00
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