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THE CANADA FARMER

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NEW SERIES.

The Field.

Summer Fallowing.

One of the most ancient methods pursued of restoring fertility to the soil was that of fallowing. The ancient Hebrew law commanded a rest to the land every seventh year. Among the Romans fallowing was a universal practice; in most cases a crop and a fallow succeeding each other, so that their system of farming was but a short two-course rotation. With them the land was ploughed soon after harvest, again in spring, and the succeeding summer it was constantly stirred till seed-time came again, the object being, as an old writer of that day observes, "to let the earth feel the cold of winter and the heat of summer, and to render the soil free, light, and clear it of weeds, so that it could more easily afford nourishment to a crop of value."

The Romans introduced their system into England, and there it soon became established, from proving successful in restoring fertility to the soil. The practice did not, however, extend to Scotland till early in the eighteenth century, when Mr Walker, of Beinston, East Lothian, first introduced it on his farm. So great an innovation was it then that Mr. Walker had to endure the ridicule and contempt of his neighbours, who declared him insane for letting his land lie waste for a whole season. Yet so successful did his practice prove, that in less than twenty years after summer-fallowing had become general throughout the country. Previously to this, the land had been cropped year in and year out, till it ceased to produce enough to pay for the labour of working, when it was left alone and allowed to get self-sown with grass, and remain so till the operation of natural causes again brought back some degree of fertility to the soil.

It has been a matter of much debate as to whether a bare fallow is not a loss rather than a benefit, and there can be no doubt

that in many cases fallowing is resorted to without due consideration of the subject, and in other cases, even where it is absolutely necessary to fallow the land, in order to bring it into a proper state of tilth, and get rid of weeds in the soil, the work of fallowing is so bunglingly and inefficiently done, as to prove of very little real value towards attaining the object aimed at.

On light soils, and those that have been thoroughly drained and kept under a proper course of rotation, with hoed crops in their regular course, over a large extent of land, there can be no necessity for a summer fallow, but there is still a great advantage in fall fallowing such of the land as has been in grain crops not seeded to grass, or clover ley intended to be prepared for the root crops of the next season.

The introduction of turnip culture in Britain has in a measure done away with much of the necessity for summer fallowing, except on strong and tenacious clays. With us that system can only be carried out to a very moderate extent, as our climate, besides being less favourable than that of Britain to the growth of turnips, requires that the entire crop should be taken up, carted away, and put under frost-proof cover for the winter season, instead of, as with them, being left in the ground to be fed off by the stock, as occasion may require. This adds too greatly to the cost of our turnip crop to make it a profitable one to grow largely, except by those farmers who keep a high class of stock, and have the necessary capital to enable them to grow the crop, and turn it into beef, mutton, and manure, with advantage.

At the same time, while the climate of Britain is favourable to the growth of turnips, it is less so than ours to the proper preparation and working of a summer fallow. One of the great objects of summer-fallowing is to render available the stores of plant food locked up in the soil, by exposing it to the ameliorating influence of the sun and the atmosphere. The absorbed heat of the sun has great influence in bringing about chemi-

cal changes in the soil, while ammonia is imbibed from the atmosphere. Hence it comes that the deeper and oftener we can stir up the soil with the plough during the heated term, the more ameliorated and richer it will become, especially if of a clayey nature.

There are three objects to be gained by summer-fallowing, each separate and distinct in itself, and requiring a somewhat different method of procedure in order to attain them:

First in order we may place the proper preparation of those strong clays which form, under good management, our best and most profitable wheat lands. On such soils we cannot well dispense with a summer-fallow, as the best and most certain method of ensuring heavy crops of winter wheat. Such soils contain, in a great measure, all the mineral elements that are needed to make up the bulk of the wheat plant. The object to be aimed at on such soils is to render as much as possible of these mineral elements available, by bringing the soil in contact with heat and air, in order to effect the chemical union of the several elements with the carbonic acid and ammonia derived from the atmosphere, and so set in decomposition, for until this is done they remain dormant in the soil in an unassimilable state, in which they cannot be taken up as plant food. To do this well and thoroughly the land must be ploughed and cross-ploughed at least three or four times during the summer, leaving the land rough and cloddy after each ploughing, till the last one before seeding time. It is no uncommon practice, though a very useless one, to harrow the land down smooth, and even to roll it, after each ploughing. This defeats the very object that ought to be kept in view, of exposing as much of the soil as possible to the sun and air, for the more cloddy and rough the surface is, the more heat, and ammonia, and carbonic acid, can it absorb. In some cases it may be advisable to harrow or roll the land, if very rough, but this should only be done just before the next ploughing opera-

tion is to be done, and then only in order to break up hard lumps, and enable the plough to turn up fresh soil, instead of merely pushing aside what has already been turned up and exposed. To obtain the greatest advantage of summer-fallowing it is well to regulate the ploughing so that a fresh layer of soil is exposed at each turning over, which can be done by gauging the plough so as to run at a different depth each time. If the first turning over consists of a sod turned at three inches, in order to rot quickly, the next should be an inch or two deeper, the third still deeper, and the last may be half the depth between the first and last, so as to bring as much as possible of the already ameliorated soil nearest the surface at the time of sowing the wheat. If there is a hard-pan at no great depth, which is often the case in clays that have been cultivated for years, it is well, at the second or third ploughing, to have the subsoil plough, or a second plough with the mould-board and coulter taken off, to follow in the furrow and break up the hard-pan, without bringing the subsoil to the surface.

Another object in summer-fallowing, and one especially desirable of accomplishment in sections of country where the soil is naturally rich and not even clayey, but full of inequalities from cradle knolls and stump holes, is to get the surface levelled and into good tilth, preparatory to being seeded down or brought into the rotation after being stumped. An old grass field, full of rotten stumps, is broken up and summer-fallowed, the stumps being pulled out and burnt as the process of fallowing proceeds. In this case a great deal of harrowing will be required to tear out roots and drag the soil into the hollows till the surface has become somewhat levelled and brought under tillage. A crop of wheat on such soils may often be succeeded by a second fall fallowing to still more level the surface and deepen the soil; and if it be naturally fertile, which will be the case in most instances, another grain crop may be taken before seeding it down to grass. We have known a second crop of wheat, on such land, to exceed the first in productiveness, and if the fertility of the soil is well husbanded by not allowing more than a second grain crop to be taken before seeding down to grass, it will yield good crops for many years.

Still another object, and one that renders it necessary often to fallow land of a light nature, or that is unsuitable to winter wheat, is the getting rid of weeds that infest the soil to an extent that precludes a probability of growing any crop advantageously till the land has been cleaned, and rendered capable of being seeded with clover, to be afterwards turned under as a green crop to manure the land. In this case the main object is to kill out the weeds, which can be most quickly and cheaply accomplished by successive grubbing with a three-horse cultivator, followed by the harrow, the process being re-

peated from time to time as the surface gets green with a fresh coat of weeds. The land must, of course, be first ploughed, and if it gets compacted again, a second ploughing may be necessary to loosen the soil and allow the cultivator to work freely through it. The effect of the cultivator and harrow on such soils is to tear out the weeds by the roots, leaving them exposed on the surface to be killed by the sun, while at the same time any seeds in the soil are brought up to germinate, instead of being left in the soil to remain dormant, as would be the case were they turned under to a depth of several inches by the plough.

The changes produced in a clayey soil by fallowing are often much greater than would be supposed. Among these effects may be placed an increase of the power of absorption, a greater friability, and permeability to the roots of plants, a strengthening of its affinities for vegetable and animal matter, making manure when applied more easily decomposed, instead of remaining inert in the stiff soil, and generally a restoring of the productive capabilities of such soils, which have not been in most cases exhausted, or even greatly diminished, but are simply inert and dormant for want of cultivation.

Mowing Machines.

There is no greater help to the farmer in his labours than a really first-class mower. Such a machine, that will do first-class work with expedition and certainty, without being liable to get out of repair, clog, or require too often renewing of the knives, yet having a light draught for the team, so that they can work from morning to night without being too much pulled down, is yet a great desideratum in Canada. We have mowers, it is true, and enough of them, but they mostly belong to what are called the combined class, and though passably good, are not specially adapted to the cutting of grass, particularly clover, and heavy crops of timothy. The friction and heavy draught of these combined machines, which, in point of fact, are reapers, not mowers, do not tell so severely on the team in standing grain, where the labour of cutting is comparatively light, as in grass, where, especially when lodged, the cutting power required is enormous. All farmers know practically that mowing heavy grass is much more laborious work than cradling grain, and that a man who can cut an acre of grass a day accomplishes more actual hard work than he who cradles two acres of grain. What is required in a mower is strength combined with lightness, and a very keen yet sure-cutting edge to the knives, worked in such a manner as to ensure rapidity of action, without liability to clog from the expressed juices of the succulent foliage they work among. A mower requires to be light, compact, and strong, while a reaper, meeting with comparatively little resistance in a grain crop, and having

its knives working at a much higher elevation, in dry straw, can be made of coarser and heavier construction without materially adding to the draught, yet considerably reducing the cost of the machine.

A good mowing machine is of more importance than a good reaper, if we are to have good hay. It is all important that the grass should be cut and saved in a given space of time, for after once it reaches the proper point, it very quickly goes beyond it, and becomes greatly diminished in value as regards its nutritive qualities, while grain does not.

Another thing, mowing by hand is such laborious work that, in the present fast age, when men desire to live with as little actual hard labour as possible, it is a much more difficult matter to get the work done by human muscle than by brute force, so that even if the actual cost of the two forces were nearly alike in producing a ton of hay, the one is uncertain as to time and inclination, while the other is completely at our disposal, and can be depended on with certainty to accomplish a given amount of work in a given time. That is the all-important question in haymaking, and with tedders to follow the mower and distribute the grass evenly, and horse-rakes to get it together again, the farmer can save his hay at a comparatively small cost now to what was formerly the case, and still have for his stock an article of provender very superior to that of days gone by.

Underdraining.

The following article from a correspondent in the *American Agriculturist* tells so many important truths, in such forcible and plain language, that we entreat our readers to study it well, and when once they have mastered all its points, they will have become thorough advocates of underdraining:—

“Ogden Farm finds encouragement in the following passage in the Hon. George Geddes' Essay on Wheat Culture. ‘Undrained clay lands are never worn out, for the owner that lacks the energy to free them from stagnant water, never has force enough to exhaust their fertility by cropping. Manure on such land is nearly thrown away. Draining is the first thing to be done; next, thorough cultivation, then manure. Whoever reverses this order throws away his money and his labour.’

“This would be a good text for every farmer to keep constantly in mind. The profit of farming comes entirely from the surplus of production beyond the grand total of the cost of interest, labour, seed, manure, and wear and tear. These are nearly fixed quantities. They are at least as great, in the aggregate, with medium crops as with good ones. If thirty bushels of corn to the acre will barely return the outlay, sixty bushels may give a clear profit equal to the value of thirty bushels. There are thousands of farms in the

country, whose soil contains enough of the elements of fertility to produce fair crops with the aid of ordinary manuring, (if only these elements were come-atable) but which, by reason of their soggy and unpleasant condition, would do less injury to their owners if they were hopelessly barren. In the spring and early summer they are moist and cold more like putty than like arable land in July and August they are baked to a crust, and when the fall rains come they revert again to their weeping state. Any effort to make good land of such a farm as this without draining is simply an effort wasted. Neither labour nor manure can do much to drive away the demon of 'bad luck,' by which every path of its owner is beset. I have scores of letters from the occupants of such farms and I have had for years. The gambly advising this and that make-shift, when it was claimed that the expense of draining could not be borne, but I have finally learned to say, point blank, to any man who is trying to make his way on this kind of a farm. 'Either drain it or give it up!' You can make more money by working at day's work, on good land, than by fighting year in and year out, against the established laws of nature. If you can't do better, sell off your stock and if necessary, work for a neighbour enough of the time to earn your bare living. Spend the rest of your time and all the money you can raise in draining the *best* field you have got. Don't imagine that your case is to be an exception, but accept the fact, now that you *can't afford* to farm wet land—either own up that you are only fit for a day labourer, or buckle to and make your land worth cultivating.

"There are two great obstacles to the advancement of underdraining, viz.: One is, the idea that land which suffers from *drought* does not need draining, when the fact is that land often suffers from drought just because it needs draining—take out the water and let in the air, so that the soil can be put in proper tilth, and it will be able to withstand drought. The other is, the not unnatural notion that the first land to be drained is that which is now the wettest. In my judgment the improvement should be first applied to those fields which are just dry enough to be considered arable, but which, two years out of three, disappoint the farmer's hopes and produce barely enough to pay the cost of cultivation. If such land as this is drained it will pay a profit. If a back lot swamp is drained it may be years before it will do more than pay the expenses of its management. Begin with the very best land that needs draining at all, and make it produce a profit, and then take the next best and bring that to a profitable state, and so on until the back swamp comes in its turn. What we want is not so much large crops as profitable crops. A hundred dollars' worth of corn that has cost a hundred dollars, had better not have been grown. It don't pay to work over large areas

for meagre produce. Pile on the steam! Crowd the production to the most remunerative point! and then extend your operations to the next best field, and make that pay a round profit. This is the soundest principle of good farming, and in carrying it out we shall have no more efficient aid than is rendered by thorough draining on the best lands that need draining. When this is accepted as the correct principle, we shall see draining extending in all directions. So long as the chief object of draining is to convert innocent waste lands into fields for unprofitable work, its progress will be but halting, and farmers will continue to cry out against its great cost. Cost? Why suppose it costs as much to drain an acre of land as to buy an adjoining acre. This is no argument against it. The one acre drained would pay a handsome profit—the two acres undrained would pay no profit at all, and had better be left to grow wood. What is wanted, as the foundation of the best improvement, is a conviction in the minds of the farming public that it is better to have good farms than to have large farms. That point being gained, all the rest will come as a matter of course. Let us confine ourselves to such areas as will give us the most money for our farming, and leave the rest of the land to take care of itself."

The Wheat Question.

I am one of those who have observed nature's powers of recuperation, and have a considerable respect for her ability in this respect. Our latter-day agriculturists prescribe artificial manures readily enough; but in this country I notice but few practically following for any length of time this valuable and expensive, as well as learned advice. And this reminds me of the position of a friend of mine, a doctor with a very large country practice, who was taken ill, and called in a learned brother practitioner from the city to prescribe. Tongue, pulse, heart, and lungs, all in their turn underwent examination, but no special disease could be made apparent, as the cause of the illness. So our city physician ended his examination by prescribing rest. *Rest* to a country doctor! Why, the remedy was absurd, and altogether impracticable. What hope had he that he could take rest, who rarely had one whole night's sleep, and often took it by instalments. So the learned doctor was dismissed, and my friend attacked his own case in his own way, following such course as was practicable to him, and consistent with his duties and means.

So it is with our farmers and their farms; we want some help, we want some cure, but the remedy proposed by the learned men of the age is very much like prescribing rest for the doctor, all but impracticable; in fact, it will not pay. I should like to see any of our farmers use artificial manures in quantities with wheat at seventy to eighty cents a bushel. We cannot do so, and some other remedy must be found. We have not gene-

rally the capital, even if it would pay, to adopt this course, and we must, therefore, follow the plan of my friend, and dismiss our learned city doctors, and attempt our own cure with the means we possess.

No doubt, a knowledge of what would be certain to cure our complaint, namely, poverty, and make our farms pay better, is of great value; but we are as far off as ever from recovery, if we have to trust to expensive artificial manures as the only means to effect a cure, for at present prices they will not pay. And besides, I, for one, am not afraid to enter the lists with those learned gentlemen, and to show that although they may be, and probably are, quite correct in what they say in some cases, namely, that the application of certain chemical manures to certain barren lands will produce a good crop, the greater portion of our lands are not absolutely barren, and we are not therefore bound to this course as the only remedy. Is there no other help for us when it is so palpably apparent that this one can not easily be followed, with our capital? I will venture to say that such is not the only course open to us. God pity us if it were, as there would soon be an end to Canadian farming and its comforts.

The opinions of many of these gentlemen of abstract principles, when their ideas are carried into practice, are found to be at variance with known facts. For instance, our new land is just as good as it ever was, but it fails to produce as good crops of wheat. To meet this one great fact we must look farther for the remedy than to the use of artificial manures. Many excellent farmers know this to be true, and are also quite aware that it cannot be attributed to an absolute change of season, such as would continue from year to year for a series of years, as no such great alteration is perceptible.

My opinion, therefore, and that of many others, is that one great cause for short yields under such circumstances is the depreciated quality of the seed wheat; that it is less productive than heretofore under the same circumstances, of course putting aside loss by midge for the present. That some kinds are running out is well known, and, in fine, this tendency to run out attends other kinds of vegetable growth. Why, therefore, may not the same principle affect the various kinds of wheat also? Hallett, the well-known wheat improver in England, has given his whole attention for a number of years towards improving the different sorts of wheat, and has been enabled to grow, without serious difficulty, on good land eighty to eighty-five bushels per acre. Our own countryman, Mr. Arnold, of Paris, has given much attention to hybridizing wheat, endeavouring thereby to produce new and useful varieties; and so important do I conceive the simple plan of increasing our yields of wheat to be, that I would freely vote that a large sum of Government money should be awarded to enable Mr. Arnold to complete his experiments.

Some people may argue that if any depreciation of seed wheat had taken place annually, even in a most remote degree, during the thousands of years wheat has been known, it would have entirely run out. But this view of the case really only strengthens the supposition, as during the time of the Pharaohs the yield of wheat was immense, and the quality then cultivated is not now known. Since that time an immense number of new varieties of wheat have continually appeared, and in their turn been tried, found prolific, and after a certain term of trial sunk into disuse, from the fact that they did not continue to yield or that other new varieties would yield better.

The American publications are full of puffs of various kinds of oats that will yield eighty to ninety bushels per acre; but we must take these statements cautiously, if not sceptically. Yet, of my own knowledge, I am aware of a farmer at Lucan, in the London district, who raised last year eighty to ninety bushels of Russian oats per acre.

The subject of improvement is not necessarily confined to expending large amounts on artificial manures, which few people can afford in Canada, and which manures may only, after all, be requisite to enable our worn-out and depreciated seed to bear, by extra stimulant, a reasonable crop.

When I see, again, as a rule, new land of the same quality as that formerly found to be so productive when sown with our poorest seed wheat, produce with its former certainty as heavy crops as we used to obtain, thirty to forty years since, at which time forty bushels to the acre on good new land could be calculated on with reasonable certainty, I will then say that farming in Canada does not suffer from depreciated seed. These observations only apply where the crop is not injured by midge, and as a comparison with new land now sown with the same wheat and under the same circumstances as formerly found to be successful. Old worn-out land, so called, would be no fair comparison.

We are all aware of the fact that all imported animals depreciate and degenerate here, and require renewal, and some years since the same observations applied even to the vines grown on this continent, and we well know one-half the crop of potatoes can not now be raised as formerly. I have myself many times in England, forty years since, raised 500 bushels of "Monk" potatoes to the acre, and seen my friends with heavier crops than even these; this kind has long since run out. No such quantity can now be obtained, unless we take the recent statements of crops from the "Early Rose," which we see so extensively puffed on the other side of the lakes. I planted potatoes in new land in Canada many years since, nearly every year, and so did my neighbours, and we always had at least 300 bushels per acre if they were well and early put in and on good land; but

of late years 100 bushels an acre from new land is the most that can be ordinarily relied on. There is some reason for all this, and we must look for the remedy elsewhere before we attempt the production of heavy crops by an expenditure of artificial manure to each acre of about one-fourth the value of the land.

When the Siberian wheat was first introduced, great crops were obtained from it; the yield gradually got less and less, until now little is sown. The same observation will apply to Fife wheat; at first it yielded wonderfully, especially on new land, but now no such yields can be obtained, although the wheat has lost none of its attributes, so far as resisting rust is concerned. Golden Drop has shared the same favour and same fate. Club wheat has passed through a similar ordeal, and we might with reason attribute the loss of crops, or yield per acre, to our depreciated land, were it not for our new land, which must be the same as formerly, and on which we obtained such good yields; but on which no such yield is now obtained. As I said before, if we are compelled to continue to grow the same wheat seed, and if this seed will not yield without increased stimulants, in the shape of artificial manure, why, of course, we must use them, and obtain them the best way we can; but I trust we are not yet in so sad a plight. If a merchant is compelled to purchase his goods at a higher rate, he equalizes his profits by charging higher; but the bushel of wheat has a value here in Canada entirely irrespective of its cost of production, and if we only get fifteen bushels of wheat to the acre, we are by no means able safely to calculate on double the price it would be if we obtained thirty bushels. Nor is the price necessarily materially influenced if we do grow thirty bushels instead of fifteen, as we often with good crops obtain as high a price as we do when our crops are about one-half, our markets being governed to a great degree by the crops of other countries.

In another communication I think I can reasonably put the above case, so as to produce conviction in any reasoning mind that there are other ways of regenerating our lands without the enormous expense of artificial manures. C.

Harvesting Barley.

It is a point of importance to cut this crop just at the right time, which is known by the ears beginning to droop and turn over against the stems, which will then be of a yellowish colour. Barley is so extremely liable to shell out whenever it becomes over-ripe that much loss may result to the crop from putting off the cutting of it for even two or three days. Generally it can be cut with a reaper, and if cut when about half-ripe, it may lie in the swath a day or two before being raked up and carried to the barn. The straw being less flinty than that of wheat, the crop becomes very liable to

rot, especially if heavy rains and high winds occur when it is in bloom. Should the crop stand up fairly at harvest time, it is the best plan to have it bound in sheaves and shocked at once. This, however, is rarely done, most farmers preferring to leave it in the swath, and rake it into small cocks before being carried to the barn. This requires less labour and trouble, but results in more loss than if the crop were bound and shocked at once, and should a wet season come the barley in swath or cock will be apt to become much discoloured and damaged, while if in shock it can be capped at once on the approach of rain. One thing ought particularly to be attended to, and that is, not to allow the different qualities to get mixed together in the mow, or at threshing time. A very little of it may get discoloured by rain, and this thrown in along with the rest, spoils the marketable appearance of the whole crop. Better keep that which is clean and bright separate from the other, in order to get a higher price for it. Buyers are much more particular in selecting qualities in this grain than any other, and a little care and judgment at harvesting and threshing times may put a good many extra dollars in the pockets of the grower.

Haymaking in England.

The English, as a general thing, commence cutting their grass in the first week of June, but on good forward meadows commence the latter part of May, and generally finish about the middle of July, and there is almost every season an interval of three or four weeks before harvesting grain commences, as the middle of August is about the time they commence to cut.

The cause of the haying and harvest coming in here both at the same time, can be laid to two causes—First, the Americans let their grass stay altogether too long before they cut it, as it is hay long before they think of cutting it; and, secondly, the seasons in America are so short and forcing that the neglect to cut the grass when it ought to be done, and the hot sun which forces the grain to maturity so much quicker than in England, is, I think, the cause of both coming in at the same time.

With regard to the quality of the hay, the English is decidedly the best, for it is cut so much greener and has a steadier sun on it, taking three or four days to cure, and they take so much pains with it that when it is ready for the barn or stack, it is nearly as bright in colour as when it was cut. The chief, if not the only cause I can see why the Americans do not cut their grass before the sap is dried up, is that labour is so high, and it would take so much longer to make that it would not pay them, and so they would rather have it harvested in the quickest and cheapest way, according to their ideas. —Cor. Country Gentleman.

Grinding Hay and Straw for Feed.

This matter is beginning to be seriously debated in the system of advanced agriculture. Like other new things, it makes but slow progress in the agricultural mind at first, but the advance of the age in using steam power on farms, points out the possibility, and indeed likelihood, of as great an advance in this as in any other direction.

Advocates of the system of grinding hay and straw for feed naturally argue in this way:—

The nourishment in the fibre of hay and straw is only attainable by the breaking down of the fibre of the material, and thus opening to the action of the stomach of the animal the cells of the plant, which contain the starch, the sugar, and the oily particles which have been carried into the stem of the dried plant by its natural growth. These broken cells are then acted on by the juices and liquids of the mouth and stomach, are dissolved, and assimilated into the system of the animal. Hence, the more perfect the crushing and comminution of the stem, the more easily do the animal's digestive organs take hold of the nourishment which the stem of hay and straw contains, and therefore, the more the fibres are so crushed and divided, the more nourishment is obtained from them. Then again, in proof of this theory, they show that grass (which is only undried hay) is much more congenial to the animal than hay, that he lives better on it, and fattens quicker, and that therefore the consumption of grass is more profitable than that of hay. This, they affirm, is because the grass, being softer and more easily chewed, is more thoroughly broken down by the mastication of the animal than can be the case with the dried vegetable, and being altogether in a softer state, nearly, if not quite the whole of the nourishment it contains is at once available, which is not the case with hay.

To prove this, examine the excrement from a grass-feeding animal. Wash it in a fine sieve, until all the colouring matter and the animal additions which it has received in the stomach of the beast are removed, and you will find it to have been ground infinitely finer and more completely than excrement from a hay or straw-eating animal treated in a similar manner. The fibre from the grass-fed animal is nearly as fine as the stuff from which they manufacture brown and coarse paper, while the fibre from the hay-eating animal is quite as coarse as the material which the paper-makers use to make what is called straw-board. These are facts demonstrable any day by every farmer who chooses to try them, and they consequently cannot be denied.

Admitting, therefore, for argument's sake, that the finer the particles to which hay and straw can be reduced before it is placed in the stomach of the animal, the more nourishment

is derived from it, and consequently the more profitable it becomes, we come to the consideration of the question: Can this be more easily attained by the natural grinding and mastication of the animal, or by artificial means?

Many will argue that mastication of cattle food is most natural, and therefore best. In reply to this, the answer is: True in many cases, but not in the fattening of cattle. In this operation we want to avail ourselves of every particle of fattening matter in the food in the shortest possible time. Animals can assimilate more than they do in a natural state, and the farmer's object is to make them do so. He wants to reduce his operations to certainty, not leaving them in any way to chance. Young animals grind their food quicker and more perfectly than old ones. Some animals, from greenness of disposition or other natural causes, swallow their food before it is thoroughly masticated; and although in the case of ruminants it is all brought to the mouth a second time, and even oftener, and re-masticated, after having been softened in the stomach or paunch, yet it is of necessity only masticated in sufficiently fine particles to pass to the second stomach and other digestive organs, and it by no means follows that even the ruminants grind the food as fine as the profits of the farmer require. His object is to make all feed alike. He pays as much for a beast which does not grind his food well, as for one which does—for the lazy chewer as for the more active and industrious one. He wants all the beasts in his byre finished off at one time, and that each and all shall have taken from the hay the last attainable particle of fattening matter. And to make this certain, he applies the help of science in the construction of a machine, to break down and comminute the fibre of the dried plant, having recourse to steam for the power necessary to effect that object.

If this is the case with hay, how much more must it be with straw, whose fibre is harder and more intractable, and whose fattening matters are more sparse and difficult to get at. And if it be true with respect to ruminants, it is of ten times more force with horses, the object in feeding which is to spare the animal all the labour possible, and give him the greatest amount of time in which to rest and recruit his faculties, and where before anything it is necessary that he should be furnished with the least cumbersome and the most easily digested food which is attainable.

It is a well-known fact that hay cut too short in the chaff-cutter gives horses indigestion, and therefore nowadays inch and half inch chaff is preferred; but as the chaff-cutter, though cutting the substances, does not abrade and tear them, it cannot act in the setting free of the hidden nourishment which the hay and straw contain.

Having arrived at the point that grinding

hay and straw may be advisable, the next thing to be seen is how it is to be done, and here we must call in the assistance of the farm machine maker. The operation ought to be effected at one movement—that is, the material should be reduced at once to the necessary fineness. It should be taken from the stack and fed without change to the machine, as a straw-cutter is fed. It ought not to be necessary first to cut it and then to grind it.

The value of boiling hay and straw has been long known; but besides the labour of this course, there is an objection to the constant feeding of animals with hot slops of any kind, for if you begin you must go on to the end of the beast's term of fattening, or he will go back instead of improving.

Steamed straw is now a staple upon old-country farms, and when beasts are purchased for fattening they are at once fed with steamed straw, and are found to do infinitely better than they will do on straw that is given either dry and whole, or chaffed. The steam engines now used on all farms of any consequence in Britain afford by their waste steam the means of steaming straw without extra expense, except the carrying it to the steaming trough and the removal of it from thence to the cattle byre.

VECTIS.

Drying and Harvesting Grain and Hay 'Artificially.'

In the CANADA FARMER for 1869, pages 405 and 442, an account was given of some very interesting and valuable experiments on this matter, and as the present season naturally brings the subject again before our minds, it may not be amiss to call attention once more to the experiments there reported.

Fortunately in Canada our climate is so fine, that it is but seldom any necessity arises for artificial help in the saving of our crops, but it does sometimes arise, and we cannot, therefore, be in too good a position to meet it.

The following are the experiments alluded to as described by Mr. Neilson:—

"I set up a rick of beans in so damp a state that all my servants thought it could not fail of being utterly spoilt. The rick was 20 feet by 15 feet, by 20 feet high, being twice as large as the usual size. Before forming the rick, I placed a wooden trough or pipe nine inches square inside, extending from one end to the centre, and terminating in an aperture on the upper side nine inches square. In stacking the beans, I placed a sack filled with straw vertically over the aperture above-mentioned, and gradually, as the rick was formed, I kept raising the sack, and forming a chimney of the same diameter, till within about six feet of the top. I then connected a centrifugal fan with the end of the air-trough, and had it driven by two men acting on a large pulley from which the motion was connected, by means of a large strap, with a small pulley on the fan shaft. I soon per-

ceived evidences of moisture proceeding from the rick, and in a few days, employing cold air, and with these insufficient means of application, the rick of beans, which it had been predicted would be utterly spoiled, became thoroughly dried, and was threshed out and consumed on the premises. I was thus convinced that the use of artificial currents of air, either cold or by preference heated, would, in the latter case particularly, render the agriculturist nearly independent of weather in harvesting his crops, and I have acted upon this conviction when needful in my operations ever since the wet harvest of 1863.

"This year I formed four ricks of hay, under wooden covers, called Dutch barns, each 24 feet by 16 feet, by 20 feet high, with a wooden air trough running the whole length under them, provided with slides to let on and cut off the passage of air, and each rick having a vertical passage formed as before described. One rick of this hay was mown, tedded, and rolled together by horse labour, put together by hand into large cocks, and on the third day from mowing, without having been previously spread, was carted and stacked. This rick was so out of condition that my bailiff begged me not to let it be stacked, as it must, in his opinion, inevitably take fire. I put up the three other stacks in different stages of condition, but none thoroughly cured. I then applied currents of cold air to the whole by means of a fan driven by a steam-engine of one horse power, and the hay in each stack, including the one above specially noticed, became so thoroughly cured that it has sold at the full market price of the day. By these means the four ricks of hay were harvested with less than one-fourth the expenditure for labour usually required.

"With regard to wheat, it has been customary with me to thresh it by steam power immediately on carting it from the field, without putting it in ricks. On considering the advantages of this mode of drying, I erected an apparatus consisting of a double cylinder eight feet high, closed at top and bottom, formed of perforated zinc plates, the outer cylinder being eight feet in diameter and the inner one two feet, leaving an annular space of three feet, which contained, when filled, upwards of two hundred bushels of wheat. I applied, by means of a fan, a current of air warmed by passing over the steam boiler to the inner cylinder, and the air, after passing through the perforations, filtered through the wheat, causing it to be brought quickly into a fit condition for grinding."

The foregoing experiments having been made on a large and practical scale in the damp climate of England, are conclusive, and it would be well worth the while of any person having a horse-power to attach such a piece of machinery to a fan, and having arranged a stack of hay for the purpose as described, to affix the fanning-mill to an air pipe, and drive the wind of the mill through the pipe and into the interior of the stack.

The stack should be put together in so green or damp a state as to heat, and as soon as you ascertain by having a stick thrust into it that it is sweating and warming, the blast should be applied, and the effect observed—a little experience would show what is required—one horse, and a boy to keep him moving, would be all that is necessary, and less time would then be spent over the hay than in putting up and taking down, turning, and shaking abroad, in the ordinary manner in a catching time. We all know that a certain amount of heating makes hay all the better; but the difficulty is to know when to stop, and to have the power of regulating it. Mr. Neilson's plan would enable us to regulate this, and to have the requisite amount of heat, and no more.

We now grow so much spring wheat, and from the lateness of the season of harvest it is necessarily put up in so damp a state, that the means of drying it in the mow after harvesting it is most important, and if we could with confidence draw the wheat into the barn, as soon as it is cut, or soon after, and then complete the process of saving by the means proposed in the *arn itself*, the time and labour of the machinery and the means to drive it would be well applied. Barley, too, seldom stains while standing, and if we could carry it as soon as cut or within a few hours, and by Mr. Neilson's plan complete the drying of it, the loss of colour would be prevented, and the higher price thus secured would well pay for all the cost and trouble involved.

This is one of those cases where water power could be well applied. Common stove pipes with paper pasted over the joints will carry air any reasonable distance, and the water power would have the advantage of working night and day, and without labour to attend it.

Wind power would also answer well, during the season when the process would be required; there is always sufficient wind during some part of the twenty-four hours to do the work, and it can be supplemented by horse power attached to the threshing machine, to be used when necessary. It must, however, be always borne in mind that air cannot be properly and effectually moved in small pipes, and it must also be borne in mind that every joint, though apparently ever so close, should be covered with pasted paper, and varnished with any cheap varnish or drying oil.

VECTIS.

Manure.

To the Editor.

SIR,—When a plant dies, the ingredients of which it was formed, and which in life it had held in abeyance, become released, again spontaneously obey the original laws of chemical affinity, and resume the several combinations out of which the plant first arose.

It becomes our duty to collect these component parts, that we may give them to our

growing plants for their nourishment and support.

Now, the process by which the decaying plant resolves itself into food for its successors is greatly accelerated by heat and moisture, when acting together.

In any wet mass of decaying vegetable matter, the following chemical process is going on:—The carbon and hydrogen, uniting with the oxygen, of which the external air gives an inexhaustible supply, form carbonic acid gas and watery vapour, which when unrestrained fly off into the air. The nitrogen assumes the form of ammonia, and also, unless prevented, escapes, and the minerals are detached from their fixed position in the vegetable matter and become liable to be washed away. This is the exact process which goes on in the dung-heap. The straw and other solid material soak up the animal manure, which latter always contains a great amount of mineral matter.

If we turn the dung-pile we accelerate the operations above alluded to, but we also, by a greater exposure to the air, increase the percentage of the loss of the invaluable ammonia. Our object should be to prevent as much as possible of this waste of the very essence of the manure. We have then to perform two operations which are in themselves antagonistic.

It is absolutely necessary to turn and stir the manure, so that it may rot quickly, and thus hasten the necessary chemical combinations, and on the other hand we have to exercise great care that the products of those very combinations be not allowed to evaporate by exposure, or be washed into the ground.

There is always a great amount of valuable manure made in the open barn-yard, which it is, of course, impossible to cover perfectly; yet there is a way of regulating the formation of such compost, so that it may be of the maximum strength under the circumstances.

Though very common, it is a poor plan to throw down a great amount of litter at one time, covering the barn-yard to a depth of two or three feet. When this is done, it is supposed to save trouble and last a long time—in fact, until it suits the convenience of the attendant to depo it another thick carpet of straw. The effect of this plan of operation is that the animal droppings, instead of being thoroughly mixed with the litter, are deposited in regular layers, separated by a thick wadding of straw, and the mass requires, at the last, a great amount of manipulation to become thoroughly intermixed.

Again, yards are often too large. On this head farmers often say, "Large yards are necessary to prevent the overcrowding of our cattle."

Let your stock be divided carefully, according to their size and species, and there can be little fear of any overcrowding during our cold winter weather.

In this country, where fencing is so quickly and easily erected, our yards may be exactly suited to the amount of stock requiring accommodation.

We shall be able then, by spreading our litter often and in small quantities at a time, to make a deep and solid mass of thoroughly intermixed manure and straw, which, by its very compactness, will defy the rain to wash away its essence, and will rot quickly and thoroughly when thrown into heaps. Where the barn-yard is situated on a gravelly or sandy bottom, and the manure lies over it in thin layers, a valuable portion is washed into the earth, and lost to the farm, by every storm of rain. In such spots the loss of manure, when winter breaks up, is incredible.

I have already trespassed too long on your space, but as you have always shown great liberality in publishing, and expressed a desire to receive communications from the farming community of Canada, I trust that you will allow me to make this letter the forerunner of others upon the subject of manures.

If I be allowed space, I should like to continue the subject by considering farm-yard manure under the following heads:—Manure made under cover and in the open. The intermixture of clay. The processes of forming the heaps, and the relative values of different animal manures.

AN OLD-COUNTRY MAN.

Hay Caps.

Most English farmers cure their hay in the cock, and to enable them to save it from being spoiled by becoming wet with rain or heavy dew, which are tolerably certain to occur in that moist climate, after being put up in cocks, they use hay caps made of linen drill, each cap being made square, and a string attached to each of its corners, and a peg at the end of the string is driven into the ground, holding the cap taut, and preventing it being blown off by wind. Such caps, made of cotton bagging, double width, would in many cases prove extremely useful here, often saving more than their cost in the course of two or three seasons, while if properly taken care of they would last ten or twelve years. They might also be made available in saving the barley crop when cut from becoming discoloured by rain, and in wet harvest seasons the wheat, by being shocked in a circular form, might also be protected.

The experiment is worth trying by some of our enterprising farmers, and if it is found to pay others will soon follow their example. Old bags might be cut up and pieced together in the winter season, and one side covered with a thin coating of diluted tar, or some cheap varnish, to make them more impervious to water. This coat would dry, and what would otherwise be thrown away as useless might thus be utilized to some purpose.

Management of Clover after Haying.

A second or seed crop of clover should not be taken from a field of clover that is cut or pastured the first year after it is seeded down. If it is cut for seed the first year, the clover will not last more than one or two years, while if it is not allowed to ripen seeds till in its second year, having then well established its roots in the soil, it is likely to last longer and yield better crops.

After clover has been cut the first year, the field should be shut up, and allowed to regain a tolerable growth before being pastured, but if it is a second year crop, and to be cut for a second or seed crop the same year, stock may be allowed in it for two or three weeks after haying, before it is shut up. A dressing of plaster and ashes, or superphosphate, at the rate of a bushel per acre, given about the 1st of August, will be a great help towards making a heavy growth of second-crop clover. After a crop of seed has been taken from a field of clover, it is seldom worth cutting for hay again, so that it is rarely done except where it is intended to turn the land to pasturage, or break it up the following season, as the clover usually shows signs of running out after it has been so severely taxed to produce a seed crop. Clover seed at best is a very troublesome and uncertain crop, rarely yielding more than three bushels of seed to the acre, and costing nearly all it is worth to obtain it. On farms where there are a number of grown-up boys, and very little stock is kept, it may pay to cut a second crop of clover for the seed alone. But the best farmers would rather buy what seed they need than deprive their stock of so large an amount of autumn feed.

If it is cut for seed, it must get so ripe that the stalks are of little value as fodder for stock, but when it is cut early and cured properly for hay, a second crop of clover makes excellent fodder for cattle and sheep, and is much less exhausting to the soil and the plants than if allowed to ripen its seed.

Turnips—Early Sowing.

To the Editor.

SIR,—Allow me to give an item of my own experience in raising turnips. Last spring I sowed, on the 10th of May, an acre of turnips, on which the yield was one thousand bushels. On the 1st of June I sowed half an acre, on which the yield was one hundred bushels. For this latitude and climate, at least, I would advocate sowing turnips as early as they can be put in. I believe they are the cheapest roots a farmer can raise for feeding cattle.

A word also on the subject of raising buckwheat. The way we raise buckwheat here is by sowing a half bushel to the acre. I have raised from that sowing seventy-five bushels, and I believe it is the cheapest and best thing that can be used for fattening hogs.

Gloucester Co., N. B.

O. K.

Buckwheat and its Culture.

Considering the good qualities of buckwheat, it is probably less appreciated than any other bread grain. The properties of this grain are very different from wheat; it is, nevertheless, quite as rich in all important compounds.

Buckwheat, or more properly beech wheat, as it is called in Germany, from the resemblance the grain bears to beech nuts, is an herbaceous cereal, stem branched, and growing usually to the height of thirty inches.

Few crops can be turned to better account on a poor, light, sandy soil, than these grams. It is an excellent crop to kill out weeds and grass, and mellow greensward; but it seems to injure land for corn, while it is a good crop to precede potatoes.

Almost any soil will produce buckwheat, but it seems best suited with a light, warm soil, of moderate fertility. It is usually grown without manure, but it feels its application as quick as any other plant, and a corresponding growth is produced. It is not advisable, however, to use very stimulating manures liberally for this grain, as it causes a too rank growth of straw, without a corresponding increase of grain.

The time of sowing is usually between the 20th of June and the 4th of July, though it may be sown earlier, but not till the danger from the late frosts is feared no longer, as the plants are exceedingly tender, and suffer from the least frost. Another thing, cool nights and hot days are essential to a good crop of buckwheat, consequently the seed should be sown so that the hottest weather will have passed by the time the buckwheat is in full bloom.

On light, warm soils, with favourable weather at the outset, it makes a very rapid growth, coming to maturity in nine or ten weeks from sowing. The amount of seed most generally sown is one bushel per acre, but it is better to use less than more than that quantity, especially on soils in good heart. From twenty-five to thirty bushels per acre is about the usual yield with fair cultivation; but this amount is, under favourable circumstances, sometimes doubled.

In harvesting, it is mown with the scythe and worked into small bundles while the dew is on. I have found it a much better way to cut it with a cradle; it can then be worked into small bundles and set upright, with the heads twisted together, leaving each bundle to stand alone, the butts spread out and resting on the ground. It should be left a considerable time in the field to secure its drying. It is the best way to thresh it as soon as drawn from the field. Taken in on a warm sunny day, it can be threshed with one-half the labour that it will require after it has lain in the mow some time, as it soon collects moisture and becomes "tough."

Buckwheat shells very easily, and much waste often occurs before the crop is secured.

Remedy for Potato Rot.

In an essay on potato culture, Dr. H. Compton considers the potato rot at considerable length. Having found that dry rot was remedied by an application of sulphuric acid, it occurred to him that it might also destroy the fruit mildew. An application of plaster, which is composed of lime and sulphuric acid, was made with the happiest results. On the potato mildew the application was found equally efficacious as a preventive, and if timely applied after the mildew appears, as a cure also. The writer adds:

The vines should be watched closely, and on the first appearance of the disease plaster should be applied; not merely sowing it broadcast, but dashing it over and under the vines, bringing it in contact with the stalks, using a handful to three or four hills. Plaster for this purpose should be very dry and powdery, and should be applied when the air is still. One application is seldom sufficient, it should be renewed as often as circumstances require. Examine the vines about three days after a cold night, or about the same length of time after a heavy rain. If the leaves begin to curl and wither, apply plaster at once; and, in short, whenever the vines show any signs of drooping, be the causes bites of insects, excessive humidity of the atmosphere, or sudden change of temperature, drooping from any cause whatever indicates the approach of mildew, which should be promptly met with an application of plaster.

As before stated, plaster the vines as soon as they are up, again after the last ploughing and hoeing, after that, one, two or three times, as circumstances indicate. By this method the vines are kept of a bright, lively green, and the tubers are kept swelling until growth is stopped by frost. Another point gained is, potatoes so grown are so sound and free from disease as to be easily kept for spring market, without loss by rot.—*Utica Herald.*

PASTURING ON THE HIGHWAY.—A correspondent from Vaughan has sent us a communication on the subject of pasturing stock on the highways. He admits the evils of the practice as regards the farmer, exposing him to the loss of his cattle by dishonest or careless drovers, and subjecting his neighbours as well as himself to the incursions of breachy stock into grain fields, but he pleads that for the encouragement of the poor and the immigrant the highways should be free to their stock, but closed against that of the owners of farms. We confess we cannot see the force of such a plea; the poor man's cow will not be better behaved than that of the well-to-do farmer, and with most hearty sympathy for the poor, and every desire to help the stranger and the immigrant, we cannot advocate the perpetuating of a nuisance, such as the ranging of cattle at large, in the neighbourhood of enclosed farms, villages, or towns. In the back country and sparsely settled districts the case may be different; but as soon as circumstances admit, it is best, on all accounts, to keep stock at home.

Stock Department.

Visit to a Farm.

BARN AND STOCK ARRANGEMENTS.

After visiting Mr. Johnson's dairy, an account of which is given in another column, the scene of our next investigation was the barn and outbuildings. In many respects the barn and root-house were similar to those given in the CANADA FARMER of the 15th May, as from them the drawings and arrangements therein shown were partly copied. The horse-power to drive the threshing-machine, chaff and turnip-cutter, were so arranged as to do all the work on the barn-floor above the cattle, which were stabled below.

The horse-power was one of Mr. Johnson's own construction, and answered admirably. It was formed like a large wheel, twenty-four feet in diameter, with notches at the ends of the spokes (which projected through the felloes) to receive an endless chain, passing round a small wheel within the barn, and communicating power where wanted. The chain was about the size of a stout logging chain, and, being kept well greased, wore very little, and a tightening wheel took up all superfluous slack. The notches in the ends of the projecting spokes were defended from wear by irons in the form of the letter Y; this wheel and chain had been in use many years, and were still good. The wood work was, of course, made of oak. By a very simple contrivance, each two pairs of horses were compelled to draw with equal force, and against the opposite team; and Mr. Johnson showed me a plan by which all four teams were separately obliged to do their work, the same as if one team alone had been used. This most useful arrangement is well worth any one's attention, and may be explained by the aid of a cut in some future number.

When the word is given for the horses to start, each team must by this arrangement draw its share, or be pulled back, and no horse likes this. So it follows that directly the slow team finds the collar pulled against their shoulders by the quicker team, they step into their work. We have all seen how difficult it is to keep a slow team up to its place in a threshing machine. If they hang back at all, they escape their work entirely, and leave it to others, who are more willing or quicker, to do it.

In the cattle stalls below the barn, I was amused at the simple plan of preventing cattle from being choked whilst eating turnips. Mr. Johnson best explained the plan by calling my attention to a cow eating a piece of turnip too large conveniently to masticate. The animal, directly it has taken the piece into its mouth, raises its head and extends its neck, in its endeavour more easily to chew the turnip. The roughness of its

tongue naturally carries everything backwards and towards the throat, and the elevated position of its head greatly facilitates this course.

Having first studied out the process, Mr. Johnson proceeded to the cure. Each animal, when in its stable, and whilst eating turnips, morning and evening, was secured in its place by an ordinary brake, formed by one fast and one loose upright post, enclosing its neck. The loose upright was, however, fastened at the bottom, but opened at the top, and when the animal's head was confined in it, a pin above secured it from opening; and when eating turnips, and whilst the animal's head was depressed, a two-inch pin was put through both uprights, over the neck, allowing room for ease in eating.

The animal was allowed plenty of room to eat, but could not raise its head, nor extend its mouth and neck as ordinarily, and thereby completely escaped all danger from choking. I was assured that this remedy had proved most effectual. There had not been any cattle choked since it was used. When they had finished eating the turnips, each pin was removed, and hung down on one side, attached to a piece of rope, and the animal was allowed to raise its head as it pleased.

Many people are prejudiced against these brakes, but for milch cows, nothing is so certain to prevent soiled udders, especially if there is a deep trough, say 8 by 12 inches, behind the animal, and only room enough allowed between the shoulder and the trough for the cows to stand comfortably. All droppings are thus compelled to fall into the trough, and the cows are thus kept perfectly dry and clean. For many years I have myself accustomed my cows to the same treatment, and it was rarely the dirty job to milk it generally is under the too common plan of stabling. My cows were always clean, and the floor where the milkmaid's clothes had to lie, was as clean as any ordinary barn floor. I have often seen milking done, with this arrangement, on Sunday evenings, without any change of dress or soil to the clothing.

The cows were always turned into the yard and sheds after the morning's milking and feeding time was over, and remained there until the time came round again, so that the oft-quoted objection of the animal not being able to lick itself, was thus not felt to be of any consequence. Fattening cattle, which cannot be let out, may not do as well under these restrictions, but certainly cows do not suffer in the least when so managed.

We passed from the cattle byres to the hog pens, and here I saw the old English plan for feeding hogs carried out to perfection. Each hog had a hole to put his head through, no one hog saw what the rest had to eat, as divisions between each were placed across the top of the trough to prevent it, but space was allowed underneath

for a due division of the food. As no one hog could by this means greedily take his neighbour's food, it followed that there was no wrangling, and when one had finished or drawn his head back, he found that each other hog's head was through its hole, and so arranged that he could not get at it to knock it away, and consequently he returned again to his own hole, satisfied that he could do no better. The little pigs were arranged on the same plan, and each head was projecting through the hole made to receive it when feeding. All struggling and getting into the trough was thus avoided.

The food was generally warmed, a large iron cauldron being set in an arch for that purpose. I advocated steam, but Mr. Johnson was afraid of it; he had never been accustomed to it, and had often read of accidents, and hence rather preferred the old plan of the fire direct.

Mrs. Johnson now took me to see her new fowl-house and yard. The yard consisted of nearly half an acre of grass land, well fenced with upright board fence, which had a plank first laid edgewise, all round, attached to the posts, the lower edge about twelve inches below the surface of the earth, the fence boards resting on this, so that not even a rat could get in.

The fowls all walked up an inclined board, and as they came near the top the weight of the fowl caused a carefully balanced little door to rise, and the fowl walked in and down the other side; directly its weight was removed the door shut of itself, until the next fowl walked up the board. This contrivance prevented foxes carrying away the poultry, as they never could feel sure some trap did not exist in the movable door thus raised to admit them. The ducks and geese were allowed egress in the same way, and the contrivance worked to perfection, except in winter, when snow quite disarranged its action. But then, as Mrs. Johnson said, there was no occasion for it, as the fowls were, as a rule, confined to the yard.

A neat little fowl-house in the centre, raised on a centre post for further protection, completed the poultry arrangements. Water was liberally supplied from an overflow of the cattle trough, and everything likely to cause neglect, or increase the labour of attendance, was avoided where possible.

Mrs. Johnson told me that the advantage gained by this fowl-house and yard was so great, in the increased number of eggs obtained, as the hens could not steal their nests, or set at the wrong time, that the outlay would soon be repaid.

We next adjourned to the farm and stock, but I must not trespass longer on your space in this article, but reserve it for another.

C.

Kansas will get 500,000 Texas cattle this year.

Weaning Lambs.

Some difference of opinion exists among farmers as to what is the best age at which lambs should be taken from the ewes, and the weaning process commence. If the lambs have come in February and March, they will be large and strong enough to wean at the end of July. As a general rule, it is inadvisable to let the lambs continue with the ewes beyond the age of four months. By this time their teeth are sufficiently developed to enable them to crop the grass easily, and they will have become accustomed to grazing the pastures. If they are continued on with the ewes beyond that age they will gain but little, while at the same time they prove a heavy drag on the dams, preventing them from getting into good condition by the time it becomes desirable to turn the rams with them. Those flockmasters who have the facilities for housing comfortably and taking care of their flocks during the cold season, usually find it most desirable to have their lambs dropped early, which enables them also to wean them early, and bring the ewes up into condition again in good season for what is commonly termed "blossoming." Old ewes, particularly, are apt to get very low in condition, if allowed to suckle their lambs till late in the season, and never afterwards recover from the strain upon them.

When separated from the ewes, lambs should be placed in a field as distant as possible from them, so as to be out of reach of their bleating, and they will then soon become contented and thriving. The pasture to which the lambs are put ought to be somewhat better than that to which they have been accustomed, yet not too luxuriant, and if the ewes and lambs can be turned into it together for a week, and the ewes then taken away, the lambs will not then fret so much as would be the case were they removed to a field that is strange to them.

The ewes, for a week or two, are best to be on short pasture, or in the stubbles, till their milk secretions cease. Some of the most flush of them it may be desirable to milk by hand a few times, to prevent their udders becoming caked and painful from inflammation, which will greatly retard their thriving and getting into condition. As soon as they are dried up, they should be put on good grass, and brought up into the very highest condition they can attain short of fatness, before the rams are to run with them. The ewes should be taken from the lambs in the evening, rather than during the day, and if they are yarded every night for a week after the separation, it will greatly facilitate their being properly examined, to ascertain which of them seem to require milking, to prevent after trouble. As soon as the lambs are thoroughly weaned, the tup lambs must be separated from the others,

and if they are to be sold the same fall they want a little forcing by being fed on extra good pasture, with an allowance of some grain, such as crushed oats or barley. At the same time, they must be closely watched to see that they do not overgorge themselves, and become liable to an inflammatory fever termed staggers, which carries them off rapidly, unless taken in time, and stopped by a dose of Epsom salts; or if severe, a little bleeding often relieves it.

Some breeders of rams resort to feeding them on rape in the fall, in order to make them appear large and high-conditioned when ready for sale. Such a practice is a very undesirable one, as rape is highly stimulating and heating, and the rams are then what may be termed "artificially made up," and on being taken away by purchasers, are liable to fall off rapidly and become diseased, as well as quickly fail in their procreative powers, from having been too early and unduly stimulated into activity. Their progeny is also liable to be wanting in vigour of constitution.

Such rams should be avoided, for it is to the interest of the purchaser to have only such as are made up of solid flesh and muscle, rather than of bloated tissues filled up with soft oily fat

Stock Sales.

M H Cochrane, of Compton, Quebec, has sold the following Shorthorns.—To Major Greig, of Beachville, Ontario—Cov's Fashion 2nd, by Marion Duke of Airdrie, 4150, out of imported Fashion, Moss Rose, by Marion Duke of Airdrie out of Jessie, g.d. imported Red Rose, Young Rose, by Canadian Punch, 5415, from Young Snowdrop, Flora Temple, by Pioneer, 8791, from Young Rose. Heifers—Cambridge 7th, by 11th Duke of Thorndale, 5611, from Cambridge 4th; Minnie, by 11th Duke of Thorndale out of Sallie Millis; Bessie Bell 3rd, by Clifton Duke 2nd from Bessie Bell; Martha, by 11th Duke of Thorndale from Alabama, Princess Louan 2nd, by 11th Duke of Thorndale from Princess Louan Bull Harold, by Mac, 8561, from Bessie Bell 2nd. Most of the above named cows and heifers are in calf to 11th Duke of Thorndale, General Napier, 8199, or Star of the Realm, 9150. They passed through Toronto on their way to their new home on May 25th, and appeared to be all animals of a high quality of excellence. To Col. Pomeroy, Compton, Que., he has sold the bull Star of Promise, 9149, by Bell Duke of Oxford, 6449, from Woodbine; cow Strawberry, by President, 2049, from Daisy, and the imported cow Fashion, by General Havelock, (16130) out of Snip. To W. T. Benson, of Edwardsburgh, C. W., the cow Charlotte, by General Havelock (297), from imported Beauty by Chilton (10054), and heifer Maude, by Mac out of Isabel, by Bell Duke of Oxford. To A. Smith, Compton,

cow Isabel, by Bell Duke of Oxford from Strawberry. To John Dougall, Three Rivers—Bull Magnet, S566, by Lord Languish, 5894, out of Maggie, by Pluto, 6035. To J. Isles, Springfield, Ill., U.S.—Cow Jubilee 9th, by The Priest, 6246, from Jubilee 6th, and her bull calf. To J. C. Boyes, Metamora, Ill., U.S.—Bull Eclipse, S088, by Baron Booth of Lancaster, 7535, out of Woodbine, by 7th Duke of Airdrie, 5532.

Several animals of note in Mr. Cochrane's herd have also been sold, the particulars of which have not come to hand. He is about renewing the herd by the addition of several very fine animals, of high and fashionable strains of blood, recently purchased in England at high prices.

F. W. Stone, of Guelph, recently sold two two-year-old Hereford heifers to W. W. Crapo, of Flint, Michigan, U.S., and a Hereford bull to Mr. Watkins, of Manchester, Michigan, U.S., also several Berkshire pigs at prices that some would not like to give even for a Shorthorn at the same age.

Good Pigs need Good Care.

"We have kept thoroughbred hogs for some years, and have observed that those farmers who are liberal feeders speak highly of the stock obtained by crossing them on the common sows, but those who believe in starving their sows, and letting the little pigs get their own living, assert that their pigs from a thoroughbred boar are no better than common boars.

"The trouble is not in the thoroughbred boar, but in the sows. We use the thoroughbred boar in order to obtain pigs that will grow rapidly, but a pig cannot grow rapidly unless it has a liberal supply of food. A sow that has been starved all her life cannot produce vigorous, healthy pigs, of good size, and with a tendency to grow rapidly and mature early. To put such a sow to a thoroughbred boar, in hopes of getting good pigs, is as foolish as it is to hope to raise a large crop of choice wheat on wet, poor, neglected land, simply by purchasing choice seed. There is no such easy method of improving our stock. We must commence by adopting a more humane system of feeding, especially while the pigs are young. Then select the largest, thriftiest, and best formed sows, and put them to a good thoroughbred boar. Let the sow be regularly and liberally fed, without making her too fat. After the pigs come, feed the sow on warm slops and food that is favourable to the production of milk. Let the little ones be fed liberally as soon as they commence to eat, and then the beneficial effect of using a thoroughbred boar will be seen."—*Harris on the Pig.*

The effect of using a thoroughbred boar of the best quality, in even common sows, is something wonderful. At six weeks old, the pigs from such a litter will be worth five dollars each, when we would not take those

from the same sow by a common boar as a gift; and as they grow up, provided they are properly taken care of, they will increase in value at more than double the ratio of proportion to the cost of the food consumed to what common pigs will, up to a year old. Every pound of pork made from cross-bred pigs costs one-half less to produce than if made from common pigs.

Ayrshire Stock for Canada.

A recent issue of the *North British Daily Mail* gives the following details of a shipment of valuable stock from Scotland for the Hon. J. J. C. Abbott, of Montreal. The cattle were of the Ayrshire breed, and the selection was made by Mr. Thomas Palliser, of St. Andrews, Quebec:—

The lot comprised the following animals:—

1. Young Primrose, three years old, and bred by T. W. Fleming, Esq., of Kild, at his farm in Ayrshire; dam, Primrose, winner of many prizes; sire, Napoleon, bred by Mr. Craig, Polquhays, out of a cow which gained the first prize at the great international show, Paris.
2. Young Mary; dam, Mary, winner of four first prizes; sire, Napoleon.
3. Young Beauty; dam, Beauty, winner of three first prizes; sire, Napoleon, also bred by Mr. Fleming.
4. Geneva, three-year-old, with calf at foot, bought from Mr. Knox, Polnoon Lodge, Eaglesham.
5. Young Dandy, bred by and purchased from Mr. Hugh Roger, Altigaun.
6. Duke, yearling bull, also bred by Mr. Roger; dam, Kenneth, winner of five first prizes; sire Collyhill, bred by Duchess of Athole.
7. Yellow-haired Laddie, purchased from Professor McCall, of Gallowhill, Glasgow, and bred by Mrs. Lindsey, Hilloch, Galston. Yellow-haired Laddie is a two-year old bull of great promise. As a yearling he proved himself second to none, having carried off the principal prizes at all the open shows.
8. One pig, bred by the Hon. G. R. Vernon, Auchens House, Dandonald, the most successful exhibitor of pigs at the Ayrshire Society's show.
9. One sow pig, bred by the Hon. T. F. Kennedy, Kirkmichael, also a celebrated breeder of swine.
10. A ewe and tup lamb of the Leicester breed, bred by Professor McCall, and from strains of the Bosanquet, Ainslie, and Lord Polworth flock.

To Fatten a Calf.

It has usually been thought impracticable to fatten a calf properly without giving it milk fresh from the cow. Milk is the best type of food for the young animal, because it possesses all the constituents necessary to build

up every part of the system, and in the most soluble and digestible condition. Now, any food containing the requisite constituents, in a soluble condition, easily given in a liquid state, may be substituted for the new milk. Hay tea is sometimes used to bring up a calf. This is the soluble constituents of the hay obtained by cooking. But the best food to fatten a calf, without whole milk, is of meal, molasses, and skim milk for the first two weeks, after which a little oat or barley meal may be added. We have often made calves weigh 120 to 140 lbs. at four weeks old on this food. We have one now that weighs 125 lbs at that age, never having had any new milk after the second day. Molasses may, perhaps, be considered a new food for this purpose, but, when fully understood, must be regarded as an important one. It is very soluble, and easily assimilated by the young animal. Liebig is of opinion that starchy food is first converted into sugar before being assimilated by the animal. We all know how rapidly sugar enters into the circulation of the system. Sugar is found to take the place of animal fats in cold climates in keeping up the heat of the body. It may be considered as a substitute for the oil of the milk used in making butter. Oil meal is rich in muscle-forming food and phosphates with some remaining oil. Its constituents are mostly soluble, and easily assimilated as food. Oil meal should be scalded, and allowed to form a thick mucilage before being mixed with the skimmed milk. The molasses may be added directly to the milk, and the whole should be blood-warm when given. The proper quantity for a young calf is a table spoonful of oil meal and the same of molasses, divided into three parts, for one day's feed, added to the refuse milk. At the end of the first week each may be increased, and at ten days a spoonful of molasses and the same of oil meal may be given at each feed. At the commencement of the third week a spoonful of oat or barley meal may be added to each feed, but this should be cooked. This food, together with the skimmed milk of the mother, will make an excellent calf for the butcher at five weeks old. Now, the whole expense of this extra feed is not more than one-tenth of the value of the butter made from the milk saved. At present prices it will cost less than one dollar for five weeks; and an early calf of the weight mentioned will bring from ten to fourteen dollars. The molasses may be of the cheapest sort, but there is none better than sorghum for this purpose. —*Rural New Yorker.*

Forty-two auction sales of Shorthorns were held in England, Scotland, and Ireland in 1869, at which 1,585 head were sold at prices ranging from 3½ to 650 guineas. The average realized being £35 5s. each, showing but a slight variation from the average price obtained in 1868, when 1,423 were sold at an average of £35 7s. each.

Shorthorn Sales in Britain.

Two more sales of Shorthorn herds of a high type of excellence have come off in England. The first was that of the Biddenham herd of Mr. Charles Howard, comprising fifty-three head, of which thirty-eight were females and fifteen bulls. The bulk of these, numbering twenty-six head, were of the famous Gwynne tribe, descended from Robert Collings' cow Princess, a family to which Mr. Bates resorted for a cross for his unrivalled Duchesses. Other portions of this herd were descended from animals reared by the earliest breeders. The thirty-eight females averaged £77 13s 6d each; the fifteen bulls, £54 19s; the twenty-six Gwynnes averaging £81 18s 10d each. The highest priced animal was Orange Gwynne, which fell to Mr. R. Gibson for 250 guineas. Three other Gwynnes brought respectively 155 gs., 110 gs., and 100 gs. Two bulls, Granville Gwynne and Famous Gwynne, went at 120 gs. and 110 gs. each. Three Fawsleys, Fawsley McIntosh, Fawsley 4th, and Fawsley Belle, went to 185, 160, and 155 gs. respectively.

Closely following this sale came that of the Edenbridge herd, of G. M. Tracey, comprising forty-four animals, principally Sweethearts, descended from the famous cow Charmer. The average of this sale was the highest of any yet reached this season, being £107 for thirty-one females, and £36 7s for thirteen bulls, or £86 2s 6d each over the entire sale. The highest price given was 270 guineas for a yearling heifer, Hebe 2nd, her dam, Hebe, fetching 260 gs. They are of the Surmise family. Twenty-eight Sweetheart females were sold, of which Sweetheart 5th brought 245 gs., Sweetheart 19th 220 gs., Sweetheart 26th 200 gs., Sweetheart 28th 150 gs., Sweetheart 25th 170 gs.; several others going over 100 gs. each. The old cow, Sweetheart 3rd, through which most of the herd has come, was retained, and though now in her seventeenth year, is in fine health and condition, and although she has bred seventeen calves, still gives promise of continuing to breed.

Extraordinary Sale of Short Horns.

A most remarkable sale of Short-horns, which is worthy of note on account of the number of animals sold, their superior excellence, and the high prices realized, took place on the 5th of June, at the farm of Mr. McMillan, Xenia, Ohio. The sum total and the average price of each animal exceeded the results of any previous sales of Short-horns, not only on this Continent, but also in Great Britain, and reflects the highest credit on Mr. McMillan's skill and judgment. Such examples show what amount of even pecuniary success may be achieved in this branch of agriculture, and may serve to encourage and stimulate the intelligent and enterprising breeders in Canada, and point

out to farmers in general the advantage of infusing good blood into their herds.

A correspondent of the *Country Gentleman* furnishes the following details of the sale:—

COWS AND HEIFERS, OVER \$500.

Name.	Age.	Purchaser.	Price.
Mignonette, 6 yrs., C. C. & R. H. Parks, Waukegan, Ill.			\$3,500
14th Louan of Oakland, 1 yr., J. C. Jenkins, Petersburg, Ky.			3,650
Louan 21st, 8 yrs., George Murray, Racine, Wis.			3,600
Winona, 4 yrs., W. J. Neely, La Salle, Ill.			3,000
Louan 35th, 5 yrs., and calf, E. G. Bedford, Paris, Ky.			2,925
Forest Queen, 1 yr., George Murray, Racine, Wis.			2,500
Highland Lady and calf, 5 yrs., J. H. Spears, Tallula, Ill.			2,025
Louan 23rd, 7 yrs., A. J. Dunlap, Galesburg, Ill.			1,750
Louan 39th, 5 yrs., D. J. McGibbons.....			1,650
3th Louan of Oakland, 1 yr., George Murray..			2,050
6th Duchess of Oakland, 2 yrs, George Gregg, Beechville, Ont.			1,510
Linda Bell 2nd, 2 yrs., J. H. Spears, Tallula, Ill.			1,525
7th Duchess of Oakland, 2 yrs., Jas. Fullington, Union Co., O.			1,100
Flora Bell, 3rd, 1 yr., J. Spears, Tallula, Ill.			1,325
Magenta, 4 mos., do do			1,105
Oxford Duchess, 4 yrs., W. Paine, Ind.			1,075
Fanny Hunt, 3 yrs., A. J. Dunlap, Galesburg...			1,025
Myrtle, 12 yrs., and calf, Jas. Fullington.....			1,965
Anna Clark, 2 yrs., Milton Briggs, Ind.			950
Louan of Oakland, 4 yrs., do			800
Clinton Lady, 9 yrs., J. Hagler, Fayette Co., O.			550
Louan 12th, 11 yrs., R. G. Dunn, Madison Co. O.			500
Rosa Bonheur, 2 yrs., Jas. Fullington.....			750
Eudora 2nd, 1 yr., H. B. Campbell, Batavia, Ill.			910
Emma, 5 yrs., do do			720
Honey Bud, 2 yrs., do do			690
3rd Louan of Oakland, 1 yr., J. W. Armstrong, La Salle Co., Ill.			600
Oxford Queen, 5 mos., J. W. Armstrong.....			560
Vain Lady, 2 yrs., B. H. Campbell.....			525
Bride of Greenwood, 6 yrs., G. Gregg.....			525
May Day, 11 yrs., B. H. Campbell.....			525
Minna Watson, 5 mos., H. B. Sherman, Toledo, O.			525
Oneota, 4 yrs., Jesse Hagler			505
Eudora, 4 yrs., Chas. Hook, Xenia, O.			500
Lamma Farmer, 12 yrs., Thos. Kirk, Fayette Co., Ohio.			500

There were ten other cows and heifers that brought \$3,560. The bull "Royal Oakland," brought \$1,300; he went to James Fullington, Union Co., Ohio. "Plumwood Oxford," two years old, sold for \$400, to Mr. Steel, Penn. Nine young bulls brought \$3,650, and we have the following

SUMMARY.

15 cows averaged.....	\$1,152 66	\$51,870
11 bulls do	477 27	5,250
56 do	\$1,020 00	Total \$57,120

There was also a lot of Berkshires that were sold, which brought good prices. Mr. J. R. Page, and J. B. Bridgeman, of London, Madison Co., Ohio, were the auctioneers. There were about 800 of the short-horn breeders there, and among them old Major Duncan.

Mr. J. L. Gibb, of Quebec, has just imported five Ayrshire prize cows, seven Cotswold prize heifers, and 21 Cotswold sheep. The voyage lasted seven weeks but the animals proved good sailors, and landed in first class condition. Mr. Gibb has sent them to his stock farm at Compton.

The value of the thoroughbred horse was often demonstrated during the rebellion. An officer states that one ridden by him during the war was, at one time, on duty 54 hours, almost absolutely without food, and watered not more than three times, yet he came into camp by no means exhausted.

HOW MUCH MANURE TO A COW?—Carefully conducted experiments show that a cow of the average size will void about sixty pounds of manure in a day, measuring about one and one-sixth cubic feet, which is more than three cords, weighing over ten tons, for a year. It is the opinion of many good cultivators that three loads of peat or muck mixed with one load of cow-dung, make a compost quite as effective for top-dressing meadows as the cow-dung itself. If this were done, we should have twelve cords of good compost from the solid excrements of one cow. It is further estimated that the liquid manure is quite as valuable as the solid. If this were carefully saved by peat absorbents, kept under the stable, or in it, it would double the pile, or be equal to twenty-four cords of good compost. If this were spread upon two acres of run-down meadow, producing a ton of hay or less per acre, it would increase the crop probably to three tons to the acre the first year, and the effects of it would be seen in increased crops for five years longer. In those two acres it would make all the difference between profitable and unprofitable farming for five years. This compost, if sold in many good farming districts, would bring \$4 per cord, or \$96. Used on the meadow it would produce much more in successive crops of hay. This estimate shows what may be done under favourable circumstances to increase the home supply of fertilizers. We have found that nothing pays better than labour applied to the compost heap.—*American Agriculturist.*

SHORT-HORN SALES IN ENGLAND.—Another important sale of Short-horns by auction, took place May 24th. This was the Farn-dish herd of Mr. W. S. Adcock. The average price realized for 46 head, comprising 12 bulls and 34 cows, was £49 3s 0d. The old bull of the herd, 12th Duke of Oxford, brought 145 guineas; Baron Geneva, 2556, made 79 guineas; a heifer, Lady Knightly 2nd made 140 guineas, and Claribel 100 guineas. The herd was principally made up of Bates and Knightley blood intermixed.

One of the highest authorities on the subject of animal parasites, Dr. T. Spencer Cobbold, in a work just published, treating of trichinae, says that not a single case of trichiniasis in the living human subject has been discovered in Great Britain or Ireland. The animals have, however, been found in the bodies of some twenty or thirty individuals who died from other causes; and in every instance it is thought, their presence was due to eating German pork sausages, or other preparations of foreign meat. English swine are almost entirely, if not absolutely, free from the so-called disease.

Veterinary Department.

Colic in Horses.

In previous articles we have alluded to Spasmodic and Flatulent Colic in horses. As this disease appears to prevail to a great extent this spring, and some valuable animals have been lost, we again bring it under the notice of our readers.

Both spasmodic and flatulent colic are usually the result of some injudicious feeding, as giving a large quantity of oats, corn, or peas, when the digestive organs are somewhat weakened by hard work or long fasting. Sudden changes of food also produce it, and the same holds good as to the changes in the state of the temperature. Spasmodic colic consists in violent spasmodic contraction of the muscular fibres of the small intestines, giving rise to great pain. The attack is sudden. The horse crouches and throws himself violently to the ground, rolls over, and attempts to balance himself upon his back. This position appears to afford the greatest amount of relief. He will perspire freely, and in a short time will get upon his feet, and stand quietly for a minute or two, when he is again seized with a violent paroxysm. At one time, in the treatment of colic, bleeding was greatly practised; but most cases can be better treated by safer and simpler remedies. The horse should be placed in a roomy box, well littered to prevent injury, and any antispasmodic medicine administered, as the preparations of opium, &c. When no medicines are convenient, a quart of warm ale, or half-a-pint of whisky or gin punch, may be given with advantage. Friction to the abdomen, and rubbing the body well over, has also a tendency to relieve the spasm.

The symptoms of flatulent colic in the first stage of the disease are similar to the above, but in a short time the bowels become tympanitic, causing the flanks to swell out, in some instances to an enormous extent, producing rupture of the bowel, and consequently death. This disease will occasionally terminate fatally in the course of one or two hours from the first attack. Flatulent colic requires instant treatment. The compounds of ammonia, sulphuric ether, and laudanum, and the free use of clysters, are the most effectual remedies in this complaint.

Injuries to Horses' Shoulders.

During the spring months injuries to the shoulders exist to an alarming extent among farm horses, and often prove a great source of annoyance and inconvenience during the busy season. These injuries are very frequently the result of carelessness in using badly-fitting collars, and the shoulders are

not unfrequently more than ordinarily tender from a want of regular exercise during the winter months.

Injuries in the region of the shoulder may vary from a simple excoriation or collar gall to inflammatory tumours or abscesses, and callous enlargements. In all cases these ailments are very painful, and for the time being render a horse almost useless for the ordinary work of the farm. Whenever a collar gall is observed, the collars should be carefully examined, and made to fit the neck properly, and the horse should be allowed a rest for a day or two. The shoulders should be bathed with tepid water three times a day, and afterwards some simple remedy applied, as acetate of lead lotion, in the proportion of half an ounce of the acetate of lead to a quart of water. Irritant dressings, as black oils, &c., should not be used in the treatment of galls, as they increase the irritation in the injured parts.

In young horses injuries to the shoulder are a common cause of making a horse flinch his work, or making him baulky, and there is no wonder that such should be the case in many instances, from the torture to which young animals are subjected through carelessness and inattention on the part of owners or caretakers.

When a puffy tumour appears on the shoulder, it contains serum, and should be opened in due time, at the most dependant part, to allow the effusion to escape. After opening, fomentations should be applied several times a day, until the enlargement is greatly reduced. In cases where the matter forms quickly, and the enlargement increases, it is necessary to pass a seton from top to bottom. This allows the matter to discharge freely, and also stimulates the part to a healthy action. The seton should be kept in for about a week, and must be cleansed and dressed three times a day.

Are Twin Calves Good Breeders?

In reply to an enquiry whether twin calves of the same sex are apt to be barren, or whether barrenness is the result of the opposite sexes of the twins, the veterinary editor of the *North British Agriculturist* says:—"Calves born as twins, when of the same sex, breed as regularly and readily as those which come at a single birth, and often inherit the fecundity of their parents. When, however, a bull and heifer calf come together at one birth, the heifer, in a large proportion of cases, never breeds. Such animals, spoken of by old Roman writers as *Tauræ*, are popularly known as free martins, and often assume masculine characters, are short and rough-like about the head, but seldom have any appearances connected with their generative organs sufficient to account for their not breeding. A few of these martin heifers do, however, breed, but probably

not more than one out of every eight or ten. Bulls born along with heifers do not seem to labour under any disadvantage in procreating their species. It has been stated, but without sufficient evidence of fact, that the martin heifer is more likely to breed if she happens to be born before instead of after her twin brother. Twin lambs, although of different sexes, unlike the martin heifers, breed regularly. Amongst dogs, cats, and other animals where many young of both sexes are produced at a birth, there appears no imperfection in the procreative powers of the female offspring. The barrenness which so generally clings to the martin heifer has no counterpart in the human species."

Goitre in Lambs, &c.

To the Editor.

SIR,—I notice an enquiry for a cure of swellings or goitre in lambs, and thinking some of your correspondents would have more experience in treating this complaint than myself, I have delayed answering the enquiry. I have been keeping this breed of sheep (Southdowns) for the past twenty years, and can add my testimony to their hardiness. I have fed, generally, every winter, as your correspondent, namely, clover and timothy, pea straw and a few turnips. My experience with this complaint is limited to one year only. It occurred the last of March. Two-thirds, or twenty, of the lambs, were attacked rather suddenly. The only remedy tried was turning the ewes on to a heavy growth of fall wheat for a few hours each day, for two days, and afterwards into a grass field for a week, yarded at night and fed as usual. A decided alteration for the better could be observed in forty-eight hours, and in five days a cure was effected without the loss of any. The flock had been confined to their yard and shed all winter, were in good condition, but had received few turnips. I attributed the cure to the relief from close confinement, and the change from dry food to green.

Another correspondent, "Cultivator," wishes for information respecting the best mode of sharpening saws used by farmers. I can confidently recommend *Toole's Manual* to young farmers, as detailing the manipulations of the farm and workshop, with cuts illustrating the different tools of approved form, and directions for keeping them in order, including every information in regard to saws.

JAS. HESLOP.

West Flamboro'.

NOTE.—There is not any evidence that the complaint mentioned above, and that to which we referred, under the same name, were identical. In fact, a disorder that attacked lambs suddenly, some time after birth, was not congenital goitre, whatever it might be.

Congenital Distortion of the Fore Legs of a Foal.—Operation and Cure.

Mr. C. Grice, of New York, reports in the *Veterinarian* an interesting case of malformation in a foal which came under his treatment some time since. The animal was the property of R. Hoe & Co., the well-known printing press manufacturers, and its condition at ten days old, when first seen by the veterinary surgeon, is thus described:

"I found that the foal was not able to stand long enough to get sufficient nourishment from the mare without being supported by the groom, as its two fore feet were turned backwards and upwards so as to bring the front part of both fetlock joints in contact with the ground."

It was removed to Mr. Grice's surgery, and the operation of tenotomy (dividing the tendons) was performed, the patient being first brought under the influence of chloroform.

The tendons were divided alternately in each leg, midway between the knee and fetlock joints, a very small scalpel being used, and care taken not to pass it through the skin on the opposite side of the limb.

After the operation some pasteboard, softened in cold water and well padded with lint, so as to be easily adapted to the form of the limbs, was applied, with a linen bandage, to each leg. Simple cold water dressings were used daily for two weeks, by which time the wounds had healed. Leather boots, made to lace up, were now applied, these being removed every third day, for the purpose of relieving the pressure. The foal was subsequently turned to pasture, and in about six weeks I found the limbs strong enough to allow of the boots being discontinued altogether. After this time the case was left to Nature.

About the middle of January I called on Mr. Hoe, when he informed me that the colt's limbs were as perfect as those of any other animal on the farm.

BLEEDING CATTLE—The *American Stock Journal*, in an article on the bleeding of cattle, enumerates the cases in which the practice is advisable, and which may be briefly classed as follows:—1. Cutaneous irritation, with febrile symptoms, and loss of hair. 2. Inflammatory diseases. 3. Blain. 4. Enlarged glands about the neck. 5. Injuries about the head, and wounds and accidents generally. 6. Catarrh or cold. 7. The Yellows. With regard to the foregoing recommendations, we have just one exception to make, namely—strike out seven of the number. We consider the advice most pernicious, and calculated to encourage the almost exploded practice of bleeding in every case. The fleam will rarely be used by a well-informed and scientific veterinary surgeon of the present day, and in the hands of the ignorant is simply an instrument of mischief.

The Dairy.

Visit to a Farm.—The Dairy and Hogs.

According to my usual custom on the Queen's Birthday, I paid a visit to my old friend Mr. Johnson, and after the departure of the young folks on a trip to the neighbouring town, my host and hostess entertained me with a thorough examination of the farm and homestead.

The new dairy, of course, claimed precedence. Mrs. Johnson declared her outlay in constructing it was fully repaid by one year's use, and as last year was one of unexampled good prices for all dairy produce, it is probable that her statement was strictly true. She had built the dairy herself, out of the proceeds of her former year's sales, and of course was not at all particular in compelling the attendance and assistance of her husband and sons, whenever they were wanted; and the money value of their labour, and the board of the bricklayer and carpenter, were not reckoned as part of the cost. As she argued, the farm boarded them, and the cows paid the store bill, so, as the outlay was for the dairy, there was no reckoning kept but for the absolute cash expended, of which she furnished me with the account.

The basement of a portion of the house, about twenty feet square, was set apart for a milk room, and was first built up to the sills with nine-inch brickwork, the bricks used in the outside course being very hard. As a precaution against damp, the wall was hollow, with the American diagonal bond (this will be understood by any bricklayer), and the outside of the wall, as fast as laid up, was liberally covered with coal tar (tar from the oil works), the barrel of which used cost \$3 laid down. This, of course, rendered the wall absolutely impervious to moisture, and as it was applied outside the wall, next the earth, and rapidly absorbed by the bricks, no offensive smell remained, especially as it was very shortly filled in all round with rubbish.

The dairy floor was smooth clay, sloping every way to one common dish-shaped centre, and provided with boards, with inch cleats nailed on the under side, to enable the females of the household to walk over it clean and dry. This plan answers well, and Mrs. Johnson said she preferred it to any other kind of floor, as each time any impurity accumulated on the surface, about a quarter of an inch of the clay was scraped off and removed; and to the powerful disinfectant effect of the clay itself, no doubt, was due the sweet air that pervaded the whole place.

In the centre was a drain, provided with a stench-trap made of two-inch pine plank, and so simple as to deserve a description. A box 12 inches by 12, and 24 inches deep,

closed at the bottom, and provided with a cover at top, was let into the earth about 12 inches below the bottom of the cellar. About 5 inches from the bottom of this box, the drain, composed of a board trunk 4 by 4 inches inside, was inserted, and the earth rammed firm and hard all around. To carry off any surface water, that might, in some wet seasons, be inconvenient, there were about thirty-two half-inch holes piercing the box about one inch below the surface of the earth; and to prevent any rats or smell coming up the drain, it was laid on a dead level, and provided with an obstruction at the mouth, so as to cause it always to be kept full of water. In fact, the drain did not act until the water was higher than the mouth, and the drain was put lower to produce this effect. Rats, therefore, could not well enter, and never could cut or gnaw holes into it, and as it was always wet, it would never decay. The box was, moreover, provided with a centre division just long enough to leave about one inch underneath it, for the water to descend and escape under. On the side of the drain inlet, a second cover was placed at the water level, covering one-half the box, and thus a most perfect water division was formed, to prevent all air from the drain passing upwards into the dairy, whilst free egress to the water underneath the division, and into the drain, was allowed.

The milk-pans were all placed in wooden trays, just wide enough to take two pans abreast. These trays or troughs passed all round the dairy walls, with a little fall, say two inches, towards one end, and were about two feet six inches high from the floor. They were water-tight, and the sides were about four inches high. They had all been put together of perfectly dry stuff, plenty of paint had been used in the joints, and the whole painted well over afterwards. Mrs. Johnson preferred paint as the cleanest thing she could get. Milk took no effect on it, as it would have done on unpainted pine, and the trays were much easier washed. These trays formerly had been supplied with cold water from the pump, by means of a pipe but Mr. Johnson had just brought a spring from some higher part of his farm into the cattle yard, and a full supply for the dairy was derived from the same source. After the spring had filled the cattle-trough, it passed of its own accord into the above described troughs or trays in the dairy, running in at one end and out at the other. The temperature was regulated at the spring head, by digging a pond and allowing the water to be sufficiently exposed to attain that suited to the season, usually about 55° to 65°. A stream of water was then passing constantly around all the milk-pans, effectually cooling them, and causing everything to be perfectly sweet. When the water was not required, a wooden cock in one corner could shut off the supply, and a similar outlet at the lower end of the trays would soon cause all the contents to run off,

almost dry. Mrs. Johnson told me that the water alone had saved its cost, even when supplied from the pump, in one season, and she would not be without it on any account whatever—and, of course, the trouble of the pump would be saved by the new arrangement.

In one corner, I noticed a lift or dumb waiter. A small wooden winch was so arranged as to be worked above or below, and thus enable all milk when brought in to be at once lowered into the dairy; and when collecting the skim-milk, a tub was placed on the "lift," to bring to the surface both it and the milk-pans to be scalded. Those were all scalded at once by placing about twenty or thirty, one on the other, in a vessel fitted to the cooking stove, and used at other times for hot water. A ring with eyes at each side was suspended over this boiler, and each milk-pan was placed in the former one until the pile was completed, when all were lowered by a rope and pulley into the boiling water, and afterwards raised in the same manner. When sufficiently scalded, the whole were lowered into a tub close by, with cold water in it, and there washed and rinsed. Whilst I stood looking on, ten minutes had not elapsed before thirty milk-pans were scalded and rinsed, without any exertion. Each pan was cleaned with a hand-mop, and, as soon as finished, was placed in a rack to drain. The waste water was allowed to run into the swill-tub, placed outside, and communicating with the sink by a pipe through the wall. The boiler was again replenished with a hand-pump, and the labour of attending to all this was a mere nothing in comparison with the miserable makeshift plan usually adopted.

Mr. Johnson tells me that the skim-milk and buttermilk from each cow make a good fat hog, of 200 to 250 lbs. each year. Some little grain is given, but then more than one hog is kept to each cow. \$10 to \$15 per cow is the gross return from this source alone.

The pig pasture, composed of Alsike, Dutch, and broad clover, reaches to the house on one side, and nothing more is required to feed the hogs than to wheel the swill-barrel (on wheels always under it), to the proper place, and capsize it into the troughs. The hogs were plentifully supplied with pasture, and numbered 52, supported chiefly from the 25 cows then in milk; but Mrs. Johnson tells me she intends to keep 50 cows, and can then well afford to hire more labour.

The cost of the dairy was as follows, promising that the excavation was made in winter by the family, the lumber hauled to the mill and cut on shares from the same source, and the brick also hauled by the boys during winter:—

6,000 brick at \$5.....	\$30 00
4 barrels lime at 50c.....	2 00
6 days bricklayer at \$2.....	12 00
Carpenter's work at troughs and pipes	16 00

Iron work for lift.....	2 00
Rope.....	2 25
Swill-barrel on wheels.....	3 60
Boiler for stove to fit milk-pans.....	2 30
Tar.....	3 00
Paint.....	2 00
	<hr/>
	\$75 15

C.

June Butter the Year Round.

This may be had, and June butter is the best butter. And it is had. There are those who use it the year round; they are not many—the more the pity.

In June you have the tenderest grasses, you have them with a freshness which, somehow, cannot be obtained elsewhere. Though the fresh growth of October and the last of September approaches it, it does not, however, equal it.

The first butter made of grass has a grassy taste. This is not so perceptible at any other time, showing the difference between the first and other growth.

After the first rank taste has vanished, then comes the perfect flavour, the perfect quality all round. There is then no excess of heat; the water is pure and plenty, so are the dews—not charged, as in summer—and the stock is in the full healthy flow of milk.

Then is the time to save your butter save it the year round if you please, or almost as long as you please, for such butter will keep—only keep the air from it, and put it into a cool place.

Your buttermilk is supposed to be out, only the clear transparent moisture standing in silver beads upon it.

This butter, freshly packed, and packed well, in a clean vessel, jar or tub—the tub to be scentless of wood—and salt and water put on top; this will save it.

If it be now put in a barrel of salt—that is, surrounded with salt, tub and all you may transport it to the tropics, and it will still be June butter. This has been done.

A case:—A few years ago we had occasion to call on one of our neighbours, a poor family who had just sold their cow. We remarked about the sale of the cow, when the lady of the house spoke and said: "I shall have butter to last me through the summer. I have a jar yet of last summer."

"But," we remarked, "that is old."

"Ay, but it is good," and she made good her word by exhibiting a specimen. It was what seemed to have been made at the time then (June), fresh, yellow, and of a solid, dissolving consistence. Its taste was perfect—that of fresh June butter. It was difficult to believe it was not made then—just made—and of the good cow the matron had just sold. But her word was law, and I took it as such.

She had made this butter a year ago, kept in the manner we indicated. She said it was her habit to do so—make her butter for win-

ter, and sometimes for the whole of the year, in June. "It was so much better." And that was true. And it is true now if we only feel disposed to test it. "The woman she had lived with had always made her butter so; there she learned it."

This was many years ago, when "the woman she lived with" made her butter. People then knew how to make butter. The science is so simple that there is no reason to doubt that it was made then, and all along back. Cleanliness and June grasses are the points, and those points existed plentifully with the old Dutch settlers.

One thing, however, should be understood, that is, more than it is; it is that some cows will not make butter that will keep. These sometimes spoil a whole dairy. — Cor. in *Country Gentleman*.

Proper Time to Skim Milk.

The following extract from an excellent prize essay by Mrs. M. A. Deane, of Illinois, may be read with advantage by those who, under the idea of obtaining a larger proportion of cream, and facilitating its subsequent conversion into butter, are in the habit of allowing the milk to stand so long that it is sour or even mouldy:—

"The milk should be skimmed as soon as all the cream has risen, and before the milk has thickened. The exact time required for the cream to rise will, of course, depend upon the temperature, but a little experience will enable one to tell. At the time the cream should be removed it will have a bright, healthy appearance a rich, yellow, uniform colour, and such an adherency of particles as will enable one, sometimes, to remove the entire cream at one dip of the skimmer. If allowed to stand too long without skimming, both the quantity and the quality of the cream will be seriously affected. The surface will become discoloured, blotched and knobby, while underneath the cream is rapidly yielding to the corrosive tendency of the acid in the milk. The thickest cream may be a surely destroyed by standing on the milk, as would the finest fabric in a bath of sulphuric acid. When thus destroyed, the cream is replaced by a thin, watery substance, having no resemblance to milk or cream. These facts, which may be easily verified, show how essential it is that the cream should be taken off before the milk has acquired any great amount of acidity. Yet, in order to make the largest quantity of butter, care must be taken not to remove the cream too soon. Many neat, thrifty housewives make a practice of "skimming up" all the milk at stated intervals, so as to be through with the job. This is, of course, very pleasant, but it involves considerable loss, as they do not get the full cream from the newest milk. No milk should all be skimmed at the same time, provided it has had the same conditions as regards temperature, etc. It follows, then, that some milk should be skimmed every night and morning."

Dairy Farming for Emigrants.

The following is the plan of our old friend, George Johnson, and is his scheme for the tenant farmers newly arrived from England renting a dairy farm on shares.

Supposing that the tenant has between \$2,000 and \$3,000 capital to start with, the landlord will obtain, by this plan, some cash rent and some cattle rent, and will at the expiration of about three years have returned to him a fine dairy of young cows, or he can continue the arrangement with his tenant, should he desire not to embark in the business himself. This calculation is based on the farm containing 250 acres of good productive meadow land, or land that can be made so, and also with the idea that the tenant would do well to have the use of his capital, but so expended in stock that at the end of the term he has it all returned in cash to him, to expend on a farm for himself or otherwise, when he will thoroughly understand the country.

The date of the calculation is from May 1, 1870, and the amount in the left-hand column shows how much the tenant pays in cash, and also in raising young stock, for which he is allowed a fair price, as shown in the debit account. The right-hand column shows how much the landlord receives in cash, and also the annual value of the stock raised for his benefit on the farm—such stock to become his at the end of the term. But it must be remembered that the tenant pays a very small cash rent, and the animals absolutely cost him very little, as they grow up on the farm, whilst the landlord in reality derives more actual value for his land than if rented in the ordinary way; and by following the proposed plan of payment in shares, the tenant can pay such rent much more easily than if paid in cash each year. If the quantity of land is too large for some people, or the cash capital too much, divide all the calculations by half, and it will come to the same thing, and suit the case of the farmer with less means at command.

TENANT'S ACCOUNT.		LANDLORD'S ACCOUNT.	
May 1 1871 Rent 1 year, say	\$200 00		\$200 00
Stock kept this year, 50 cows			
30 heifer calves, dropped since May, 1870, which cost the lessee to keep say \$7 each	210 00		
Value to landlord at \$7..		210 00	
30 heifer calves dropped this year no value reckoned.			
	<u>\$710 00</u>		<u>\$770 00</u>
May 1, 1872 Rent second year..	\$200 00		\$200 00
Stock kept this year 50 cows.			
30 head 2-year-old cows to keep at \$10.....	300 00		
Value to landlord at \$12..		360 00	
30 head 1 year old cost to keep at \$7.....	210 00		
Value to landlord at \$7..		210 00	
30 heifer calves dropped—no value.			
	<u>\$710 00</u>		<u>\$770 00</u>
May 1, 1873—Rent third year..	\$200 00		\$200 00

Old stock, 25 head—lessee having this year sold 25 head of his own.		
30 head 3-year-old new milkers—value to landlord at \$25 ..		750 00
30 head 2-year-old—cost to lessee to keep at \$10....	300 00	
Value to landlord at \$12..		360 00
30 head 1-year-old—cost to lessee to keep at \$7.....	210 00	
Value to landlord at \$7..		210 00
30 calves dropped—no value.		
	<u>\$710 00</u>	<u>\$1520 00</u>
May 1, 1874—Rent fourth year..	\$200 00	\$200 00
Old stock all sold off, fat or otherwise, and lessee has back all his capital.		
Stock—30 head 4-year-old milkers—value to landlord at \$30.....		900 00
30 head 3-year-old milkers at \$25 ..		750 00
30 head 2-year-olds, cost lessee to keep at \$10	300 00	
Value to landlord at \$12..		360 00
30 head 1-year-old, cost lessee to keep at \$7.....	210 00	
Value to landlord.....		210 00
20 calves dropped no value.		
In all cases the remaining 20 calves from 50 cows are supposed to go to the butcher.		
	<u>\$710 00</u>	<u>\$2420 00</u>

The following synopsis of the above account will show how much the tenant pays in cash each year, and how much is allowed him for keeping the cattle, also showing how much the landlord obtains as rent in cash, and how much accumulates for his benefit.

Dr. Tenant's account,		
	Cash.	Cattle.
May 1, 1871 - He pays	\$200	\$210
" 1872— " "	\$200	\$300 and \$210..510
" 1873— " "	\$200	\$300 and \$210..510
" 1874— " "	\$200	\$300 and \$210..510
Showing the tenant pays cash.....	\$800	and cattle <u>\$1740</u>
Total.....		<u>\$2540</u>

If he paid \$2 an acre for the land in cash he would have to pay in four years, interest account included, \$2750, which would come very much harder to him than payment of cattle, and the cattle would be better for the landlord.

The landlord received in cash rent for the four years ..	\$800 00
Stock handed over at the end of four years:	
30 head of 4-year-old milkers at \$30..	\$900 00
30 " 3 " " " 25..	750 00
30 " 2 " " " 12..	360 00
30 " 1 " " " 7..	210 00
	<u>\$2220 00</u>
Cash brought down	\$800 00
Showing the landlord to have received.....	<u>\$3020 00</u>

	Cash.	Cattle.
And the tenant to have paid only..	\$800 and \$1740	

The annual value of each cow is well known in Canada to be, on the average, \$35 to \$40. Let us assume it at \$37 50—50 cows would produce annually the snug little sum of \$1875, and the cash capital would all be returned to the tenant in three years.

NOTE.—The above scheme and calculation, it will be seen, though putting the probabilities of profit and increase at a low rate, naturally makes no allowance for contingencies. There are, doubtless, parties whose circum-

stances it would suit better to pay rent in this way on shares, than to disburse cash, and landlord and tenant, to a great extent, share the risks. An advertisement, as the writer suggests in a former article, would no doubt place parties desirous of entering into such arrangements in communication with each other.

The Butter Question.

To the Editor.

SIR.—The butter question appears to be the prominent object of discussion among dairymen at present, and it is only by agitation that anything definite can be accomplished. Therefore, by all means let the matter be thoroughly sifted.

In a recent issue of your journal, Mr. Jepson endeavoured to saddle the farming community with the lion's share of the blame in sending bad butter to market. Now, I am inclined to believe that it is somewhat otherwise.

Butter packed up in firkins at home cannot possibly assume such a variety of colours as he represented some of it to display. I speak in a general sense, of course. Farmers' wives, selling their butter in firkins, generally receive them from the storekeeper gratis, returning them to the same place filled with butter; these firkins sometimes being filled at one churning, and when such is the case, the article must certainly be homogenous throughout. But if only half filled, or as the case may be, it stands till the next churning, when more is added, till it is filled; and it can scarcely be possible that such a difference in colour or quality may have taken place since the last preceding was put in; and these several deposits will be by themselves, in the top, bottom or middle, and not, as represented, thrown in lumps promiscuously together.

But when farmers' wives dispense with the firkin, and bring butter to market in rolls, it is then that the evil is wrought; storekeepers being unable to retail all that comes in to them in rolls, the most saleable is generally kept on the counter, and immediately retailed to their customers; the rest is transferred to the cellar, where frequently it is at once tumbled into firkins, all kinds together, stumped down, the lid clapped on, and it is ready, but not fit, for transportation. Sometimes, instead of being immediately dumped into firkins, it is placed in a large tub, and left till sufficient accumulates, when the process of stirring it commences, which is generally done with a wooden instrument somewhat in the shape of a hoe. And, as matter in a state of fluidity assimilates more readily it is frequently left till the hottest part of the day, and when it is almost semi-liquid, it is mixed, but not blended, while the heat has changed it almost into a state of putrescence. It is then left to solidify, when it is chunked up into lumps, transferred from that horrid receptacle, and deposited in firkins.

Of course, this may not be the general rule, but it is just as I have seen it on more than one occasion.

All kinds of butter left in the hands of clerks to firkin up will have a poor chance of being prepared decently for market. Packing up all kinds of butter together, however skilfully done, instead of making a mixture of a medium quality, produces the effect of rendering the whole quantity worse than the worst kind of it. If storekeepers generally would pay more attention to the packing of rolls into firkins, by judiciously selecting all the different kinds, and neatly packing them into clean firkins, with their sides well rubbed with pure salt, firmly packed and blended throughout, they would command better prices, and such a course would go far to remove the uneaviable notoriety that rests upon our butter.

A DUMFRIES FARMER

NOTE.—The defence set up by our correspondent on behalf of his brother farmers may apply to packed butter, but will not explain the wretched quality of the *roll* butters sent to city stores. If what is here exposed on "the counter" is the "most saleable, the stuff in "the cellar" must be abominable indeed. In our own experience, we can only say that the impossibility of purchasing eatable butter at the stores in this city has well nigh compelled us altogether to discard the use of this article of food.

Advice to Dairymen.

The following paragraph in Mr. Willard's address before the Canadian Dairymen's Convention cannot be too strongly impressed on the minds of all who are engaged in providing milk for cheese factories or private dairies:—

Your manufacturers cannot cleanse filthy milk, and out of it make high-priced butter or cheese. The great demand now is for sweet, nutty, new-milk flavoured goods. It depends on the farmers whether your dairies and factories shall become noted as the best in the land, and then goods be sought after and contended for by shoppers and consumers. There must be cleanliness in milk—no dogging or racing of herds to the stable, overheating the milk, inducing ferment and decompositions—no kicking and banging of cows, no commingling of diseased milk with the good. If you have cows that are sick, or have diseased piglets, throw their milk to the pigs. Do not poison your own and your neighbours' product by turning it into butter or cheese. I have raised my voice against this, that we may be able to bring the character of American dairy products where they shall have no rival in the markets of the world. There is nothing pays better than kindness to milk stock. No man has a right to abuse his stock and keep it in a constant tremor of fear and nervous excitement, and then poison consumers with the milk and

beef of such animals. The best milk comes from upland pastures. In the division of your lands let the low or wetter portions be devoted to meadows. Stock require a variety of herbage, and you should seed with a variety of seeds. Remember that many varieties of grass growing together will produce more food and make a more enduring turf. Provide corn fodder at the rate of an acre for every eight cows, so that when pasture begins to fail, in July and August, you will always have an abundant store of succulent food at your command to keep up the flow of good milk. In this way you will turn your cattle to account, and get from your lands remunerative results.

Canadian Butter.

To the Editor.

SIR,—Though much improvement has been and is being effected in our Canadian agricultural system, yet in one of its branches, the manufacture and disposal of butter, matters are standing still, if, indeed, they are not yearly growing worse. In a community principally agricultural, such as ours is, and I trust will continue, the subject is of importance.

The existing state of the case is this:—At those stores where farmers wish to take the best advantage sell their butter, they most frequently purchase the necessary supplies for their households; and our villages are crowded with stores, anxiously competing for custom, and, fearing to drive it to their rivals, accepting with slight examination, and paying the same price for, all butter offered. They reject no quality, as the report of such refusal might divert to less scrupulous butter-buyers the trade of a whole district. As bad butter is more easily made than good, the system offers a premium for it, and tends to increase, and does increase, the amount made. Packing is delayed that the different qualities may mix better, as the store-keeper does not classify, but trusts that, without much trouble, good and bad together can be mixed, packed, and sold for export as a "medium" article. This is the ordinary "store-packed" Canadian butter. Of course, as the chemical composition of the ingredients renders inevitable, the attempted improvement of bad butter by mixture with good does not succeed. Imagine the amount of benefit produced by mixing good eggs with bad ones! The article does not "keep," and much of it deteriorates to such a degree as to be only used abroad for any purpose requiring a cheap grease. As may be supposed, it is not, when some months old, altogether inodorous; in fact, some store-keepers in England have recently been indicted and fined for having it on their premises.

The better class of Canadian butter consists of "dairy" butter, packed on the farm, and generally good; and also of that packed

by a minority of the store-keepers, who resolutely accept none but a good article, and pack at once and carefully. But, of all our butter exported to Europe, a large proportion (three-fourths at least, according to the calculation of persons long engaged in the Toronto butter trade) is "ordinary," and, as may be imagined, our butter neither commands the highest price abroad, nor creates the highest opinion there concerning Canadian farmers.

This is a subject of more than merely local importance—there are national considerations inseparable from such matters, which should not, especially in a young country like ours, be altogether lost sight of. It may not unfairly be supposed that our reputation, as an agricultural people, disposing of our productions in the markets of the world, is likely to suffer, if we allow it to be understood abroad that, occupying a country equally fertile with that possessed by our neighbours, we are unable—or unwilling—to produce an article fit to compete with that which they offer for sale.

As to the remedy—the means of raising the character of Canadian butter in the markets of other countries—but two courses occur to me as likely to be effectual. The first, and most rapid in effect, would be by legislative interference; but this could hardly be productive of much benefit unless it were carried to the extent of actually prohibiting the export of inferior and ill-packed butter—a regulation which would probably be considered too stringent. Another and more practicable, though slower process, would be the establishment of a complete factory system, which would take the matter altogether out of the hands of the storekeepers (most of whom, I fancy, would gladly be rid of it). But, by whatever method the reputation of the article abroad were heightened, the result would be most advantageous. Its value—the demand for it—the profit of making it, and the quantity made—would all greatly increase; as also would, in proportion, the fertility of many of our farms, hitherto too much devoted to grain-raising. It would assist a movement, already well commenced by the encouragement given of late years to the growth of stock, and tending to make Canada more what it should be—a land of rich meadows and pleasant groves, of cool brooks and green pastures—not a dull succession of dry summer-fallows and parching wheat-fields.

R. W. PHIPPS.

Toronto, June 20, 1870.

Floating Curds.

This is a very fruitful source of trouble and annoyance to the dairymen, especially in hot weather. Much of it can be traced to the want of cooling the milk before taking it to the factory, and the hauling of the milk over rough country roads in a lumber waggon,

which causes it to become so much shaken up that by the time it reaches the factory it has the butter globules in it nearly churned into butter. The necessity of cooling their milk before taking it from home does not seem to be so forcibly impressed on the minds of many who supply that needful article to the factory as it should be.

There can be no doubt that the milk will carry with much less jolting and arrive in better condition at the factory if taken in spring waggons rather than the old-fashioned lumbering vehicle so commonly used, and as most farmers in the dairy districts possess a spring waggon, or can easily obtain one, they should make it a point to use no other in conveying their milk to the cheesemakers. It is in most cases for their own interest to do so, as the better the condition in which the milk arrives, the more likely is the cheese made to be of superior quality; and as quality governs price, those who take pains in this matter should not be obliged to submit to loss from the carelessness of those who do not. The factory man, if he understand his business, will closely watch the condition of the milk delivered by each patron, and by putting the really good milk, properly delivered, by itself separate from the others, he can show those who are careless the folly of their proceedings, and save loss to the careful ones.

The American Factory System in England.

The *Chamber of Agriculture Journal* states that the first factory-made cheese in England, got up strictly according to the American method, has just been manufactured at the cheese-factory, Derby. It is only about three months since the question of establishing cheese factories in Derbyshire was first mooted, and yet not only is there a factory in full operation at Derby, with a manager obtained from America, but in about a fortnight a second factory will also be opened at Longford, nine miles from Derby, which will also be under the superintendence of another gentleman brought from America. The factory at Derby is supplied with milk from about 300 cows, and a much larger number will furnish the supply to the Longford factory. To show how rapid was the change in opinion amongst the Derbyshire farmers, who, three months ago, were very dubious as to the new plan, the managers have already had to decline at the two places, Derby and Longford, offers of milk supply from 500 additional cows; and it is confidently believed that it would not now be difficult to start six cheese factories within ten miles of Derby. The milk is received at the Derby factory twice a day, where there is a vat, in which the milk is changed into curd, which will hold 500 gallons. By a simple piece of machinery, the evening's milk is kept very slightly agitated during the night, so as to prevent the cream rising. The farmers who

supply milk are paid for it at the rate of 6½d per gallon, and in addition allowed a share in the profits (if any) of the factory—ten pounds weight of milk representing a gallon. The promoters of the factory system in Derbyshire have been nobly seconded in their endeavours by the landowners, and a guarantee fund has been raised, amounting to nearly £4,000.

Summer Management of Dairy Cows.

In Herkimer county, New York, one of the best dairy districts in the country, a dairy farmer who kept twenty-five cows for the manufacture of cheese, making in one year nearly seven hundred pounds per cow, states his mode of feeding as follows:—

“When the ground is settled, and grass is grown so that cows can get their fill without too much toil, they are allowed to graze an hour, only, the first day; the second day a little longer, and so on, till they get accustomed to the change of feed before they are allowed to have full range of pasture. Shift of pasture is frequently made to keep feed fresh and give a good bite. About one acre per cow affords plenty of feed till the first of August. If enough land was turned to pasture to feed the cows through the season, it would get a start of them about this time, and be hard and dry the remainder of the season. To avoid turning on my meadows in the fall, I take one acre to every ten cows, plough and prepare it, the fore part of June, for sowing. I commence sowing corn broadcast, about half-an-acre at a time (for twenty-five cows) so that it may grow eighty or ninety days before it is cut and fed. I have found, by experiment, that it then contains the most saccharine juice, and will produce the most milk. If the ground is strong, I sow two bushels per acre—more if the ground is not manured.

“The common yield is from fifteen to twenty tons of green food per acre. About the first of August, when heat and flies are too oppressive for cows to feed quietly in the daytime, I commence feeding them with what corn they will eat in the morning, daily, which is cut up with a grass-scythe, and drawn on a sled or waggon to the milk-barn, and fed to them in the stalls, which is one hour's work for a man at each feeding. When thus plentifully fed, my cows have their “knitting-work” on hand for the day, which they can do up by lying quietly under artificial shades, erected in such places as need manuring most, and are most airy, by setting posts and putting poles and bushes on top, the sides being left open. These shades may be made and removed annually, to enrich other portions of soil, if desired, at the small expense of one dollar for each ten cows. At evening, my cows are fed whey only, because they can feed more quietly, with less rambling, and will give more milk by feeding most when the dew is on the

“The capacity of cows for giving milk is varied much by habit. In fall, after the season of feeding is past, I feed four quarts of wheat bran or shorts made into slop with whey, or a peck of roots to each cow, till milking season closes, about the first of December. When confined in stables and fed hay and milked, they are fed each one pailful of thin slop at morning before foddering, and also at evening, to render their food more succulent, and they will not drink so much cold water when let out in the middle of the day. In cold weather cows are kept well attended to in warm stables. No foddering is done on the ground. Thus a supply of milk is kept up, and the cows get in good flesh, while their blood and bags are left in a healthy condition when dried off.

“This flesh they hold till milk season in spring, without other feed than good hay. They will not get fleshy bags, but come into milk at once. About the first of April they are carded daily, till they are turned to grass. Wheat bran in milk or whey, slops, or roots, are daily fed, as they are found best adapted to the nature of different cows, and most likely to establish a regular flow of milk till grass comes.”—*American Stock Journal*.

LIQUID MANURE.—Levi Bartlett, of New Hampshire, makes the following statement in the *Country Gentleman*: In five months each cow discharges urine, which, when absorbed by loam, furnishes manure of the richest and most desirable quality, and most durable effects, for half an acre of ground. The dung pit, which contained all excrementitious matter of the fourteen cattle, as well as the litter employed in bedding them, which was kept separate for the purpose of the experiment, only furnished 240 loads.

LONDON MILK.—The *Mark Lane Express* says:—“Country visitors must be courteously invited to desist from joking about London milk. The milk produced from town cowsheds is better than that brought up by railway from the farms of surrounding counties. So, at least, our scientific authorities, one after another, are telling us. The *Medical Times* contains the result of the analyzation of a large number of samples of milk bought in London. The average of ten dairies supplied with London milk was 10 per cent. of cream, with a specific gravity of 1,031. The highest ten cases where country milk was sold allow an average of 6½ per cent. of cream, and specific gravity of 1,030. The whole of these milks are probably genuine, but in quality and richness of cream the town-produced article is much superior to its country rival. The specific gravities were carefully taken by the 1,000 grain bottle and balance of 60 degrees. The cream was allowed to rise in a tube ten inches deep for twenty-four hours. The results are in conformity with those of previous analyses, and corroborate the opinions expressed by agricultural writers.”

Poultry Yard.

Fowls for Limited Spaces.

To keep birds in good health and condition they must be regularly fed, not crammed one day and neglected the next; for remember, they are entirely dependant on you for their food, as they have no chance of picking up a living like those which have their liberty. Too much food should not be given at one meal, to cause it to be left and trodden under foot. Food may be seen lying about, still it is possible for the fowls to be hungry—perhaps they are tired of that particular kind of food, and require a change. You should try them with some dainty morsel, as a little fresh bread and milk, some crushed bones, cooked meat, a little hempseed, a handful of good wheat, or even a broken oyster shell or egg shell, if neither of the last two are easy for them to get at, and I venture to say the fowls will seldom refuse any of these if they are healthy. People often say, "Oh, my fowls are too fat to lay." I beg to differ with them; at least, when they allude to Spanish, for I have never, in the whole of my eight years' experience, found a hen of this variety become too fat to prevent her laying, and I think it is hardly possible to over-feed, or to give them too nourishing food. If they will not eat one thing you must endeavour to tempt them with another, just as much as they will eat at once. Above all, let their runs and the straw among which their corn is thrown be quite clean; if otherwise, they must eat some of the dirt. Disagreeable smells will be sure to hang about the straw; these will be very quickly followed by all kinds of diseases, and your stock will soon be destroyed.

I always let the first meal consist of either barley alone or mixed with Indian corn, occasionally wheat. I prefer giving them corn first, as I fancy it affords them more warmth than soft food, especially during the winter months. They should have their first food as early as possible, for they are up and about almost as soon as it is day. This is the time when they commence plucking one another's feathers, if there is no food for them. They are hungry and fresh after their night's rest, and naturally anxious to satisfy their hunger, and so begin eating each other. I have had them almost entirely stripped of their feathers in one morning when it has been late before they have had their breakfast, more particularly in the case of chickens, when they get about three months old, and their feathers are young and soft, and full of blood. At the second meal, given about the middle of the day, they have soft food, as barley meal mixed with milk or boiled water—I do not like to mix it with water, as it has a tendency to relax them—or bread soaked in milk or water. When able I always give them milk, for they then seem to thrive much better, and it keeps them in splendid condition.

The barley meal should not be too soft, but so that it will crumble easily in the hand, or when thrown on the ground break into small pieces. If the floor is at all dirty, put the food into a saucer, plate, or on a piece of board, so as to keep it free from all injurious matter. At night (the hour depends upon the season of the year) they have wheat, barley, Indian corn, or if you wish to give them an extra treat, a little hempseed mixed with any of these. Some fancy that in giving corn the last thing before the fowls go to roost, it causes their crops to become bound. I have never found it so, but believe it is very beneficial, as it takes longer to digest, and so keeps up the warmth, and nourishes the body a much longer time.

These foods should be supplemented with a plentiful supply all kinds of green stuff, and vegetables either cooked or raw, any refuse or leavings from the table, occasionally a little cooked meat, or a bone with a little meat on it, as they are very fond of picking a bone, and it will amuse them a long time—a thing you must endeavour to do as much as possible where poultry are kept in confinement. The bones should then be crushed, and they will be very quickly eaten with evident relish. There should always be plenty of clean fresh water easy of access. Use no artificial foods, as they are quite unnecessary. Have nothing to do with bread soaked in old ale; it may stimulate for a time, but ultimately it injures them, and to say the least, it is a most unnatural food for fowls, but do not be afraid of using too much milk—if you have plenty, let them have it to drink.

Information as to the effect of mangold wurzel on fowls was asked in a recent number. I have often given them a mangold to peck at, for they are very fond of it, and I have never found it hurt them in any way. In the winter, when all kinds of green stuff are scarce, I find this an excellent substitute, also a Swede turnip thrown in whole. I have never noticed the combs of fowls turn black after eating it, but I certainly think both the mangold and turnip greatly assist in preventing feather-eating. It requires a considerable amount of exertion before they can peck much off either, it gives them something to do, and we must try and keep them occupied when we have them in confinement with little exercise and good living.—*Journal of Horticulture.*

An auction sale of Fancy Poultry is to be held in Toronto during the week of the Provincial Exhibition. This is not a bad substitute for a poultry show, and will enable breeders to replenish their yards or dispose of their surplus stock.

LEG WEAKNESS is frequently caused by keeping poultry in houses either paved, bricked or boarded. There is no healthy flooring to a poultry house but earth. The treatment recommended by our new Canadian contemporary, the *Poultry Chronicle*, is removal to dry warm quarters, soft nourishing food, and the administration of four grains of citrate of iron daily.

Correspondence.

Editorial Correspondence.

I.

CHICAGO, June 7, 1870.

Here I am this morning, very comfortably seated in the Adams House, after my rapid ride of some five hundred miles since midday yesterday. Never did the fields and woods look brighter and greener than now, and the fine shower of Sunday evening has given all things a freshness that is charming. Now is the time to enjoy the country—now in this leafy month of June. Lay aside your books and papers—your "copy" and "proof," and get out into the green fields and among the whispering trees, and drink the pure air, and look on the pure world that has just come again from the creative hand.

Of the Great Western Railway and its management it is quite superfluous to speak. Every one who has had any experience in travel knows that it is one of the best managed roads on the continent, with roomy, well ventilated, and most comfortable cars, and conductors and employe's generally attentive and obliging.

The fields lying near the road give promise of remunerative crops, and although in some places the winter wheat looks thin, yet when we remember the character of the last sowing season, there is every reason for thankfulness for the promise of the present crop.

Of the fruit crop it is yet too soon to form a decided opinion, but everywhere along the line of the railway there has been an abundant show of apple blossoms, and so far as I could learn, the fruit is setting well. It is not probable that the crop of pears will be as abundant as last year, but the plum trees, especially about London, never set more full of fruit, and if the curculio hunters do their work well, there will be an abundant supply of plums. It is a pity that you could not give the readers of the WEEKLY GLOBE that excellent portrait of Mr. Curculio, for many of your readers are not acquainted with his appearance, and some have written to me for a specimen, that they might see what he is like. The strawberries will ripen early this year, much earlier than for some years past, and if we are favoured with a few more such fine showers as that of Sunday, you will have a plentiful supply. I fear the raspberry canes have been so severely injured by the frost that there will be only a partial crop of this delicious fruit. The cultivation of the raspberry will be the prominent topic of discussion at the next meeting of our Fruit Growers' Association, to be held at London, probably on the 13th of July, and I hope a new impetus will be given to its cultivation, so that our cities may have as good a supply of them as they now have of the strawberry.

I expect to write again from Quincy.

II.

QUINCY, ILL., June 8, 1870.

The ride of yesterday over the Chicago, Burlington and Quincy Railway was through a novel country to a Canadian. At first the prairie was very flat, with hardly a tree to vary the unbroken expanse of level country stretching away on every side as far as the eye could reach; but after a couple of hours' ride the character of the prairie changed from flat to rolling, and along the edges of the water courses were belts of trees, largely of oak, elm and poplar.

It was exceedingly interesting to watch the ever-shifting scene, and many a charming landscape was presented as we rode along, and vistas opening for miles away. The farmers seemed generally to be thriving, with comfortable houses, usually painted white, but their barns and out-houses were often in strange contrast with their own houses, or with such structures among our own thriving farmers. The crop of this part of Illinois is evidently Indian corn. Thousands of acres are planted with it, and the farmers were at work with their cultivators, which are two-wheeled vehicles, drawn by two horses, with a seat for the driver, on which he sits and drives between rows of corn that are sometimes a mile in length. There were occasional fields of spring grain, chiefly oats, and but very little wheat, and that not very promising. The soil was very dry, the drought that we have felt having extended to this part of the world, the teams and drivers being often enveloped in a cloud of dust started by their cultivators. I saw no such orchards as we have in Ontario, yet nearly every farmer has a small apple orchard near his house, and they generally seemed to be quite healthy. There are hundreds of miles of hedge of the Osage Orange, but in all these many miles of hedge I did not see a hundred rods of perfect hedge. In most places it is half killed out, and the patches of dead and living plants are sadly intermingled, giving such a neglected appearance, that one concludes that the Osage Orange in this part is a failure as a hedge plant. There were a few specimens of the famous White Willow hedge, but they were just sufficient to show that there never was any value in this as a hedge plant.

After hearing so much of the boundless fertility of these western prairies, one can not help noticing how very small the trees are, compared with the same varieties at home. Some of the elms seem to stretch up tall enough; but they are mere flag-staffs compared with the elms of our own forests, and the oaks are only pygmies, not giants. Land along the line of the railway is held at \$75 to \$100 per acre; but at a distance of ten miles back can be had of the same quality at about \$30.

III.

QUINCY, June 9, 1870.

The Illinois State Sabbath School Convention is now in session at this place; the skat-

ing rink has been fitted up with seats, chairs and benches for the occasion, and here gather by day three thousand delegates, increased in the evening to an audience of five thousand. Everything has been done for the comfort and convenience of those who attended this gathering, and with a population of perhaps something over 35,000, Quincy entertained this great concourse of strangers, with room enough and to spare.

The delegation from Canada were received with great courtesy and kindness, most hospitably entertained by the friends whose guests they became, and will bear away with them most pleasing remembrances of this great gathering of Sabbath School teachers, and of those citizens of Quincy whose acquaintance it was their privilege to make.

The town is delightfully situated on the east bank of the Mississippi, in a sort of amphitheatre formed by the swells of the rolling ground. The streets are regularly laid out and planted with shade trees, and the dwellings have an air of thrift and neatness. The chief business of the city is its trade with the interior and western country; for while Missouri was paralyzed by the war, Quincy became the trading place for a large portion of that State. There are a great many Germans settled here, and one section of the city is wholly peopled by them.

The two men who first settled here, Mr. Keyes and Governor Wood, are still living. From the dome of Governor Wood's mansion I enjoyed a view of the surrounding country. At our feet lay the city, embosomed in the trees, above which rose the spires of many churches. Away to the east could be seen several towns in the interior; on the west, the Mississippi, like a silver band, gleamed in broken strands through the green foliage, and on its farther side Missouri stretched out into the far distance. Here and there on the banks of the river the several towns shone forth in the clear morning light, or a blue cloud of smoke revealed the spot where they were hidden. The railway bridge that spans the river at this point is about a mile and a third in length, and the train bringing passengers from Omaha or Kansas City, and the Pacific coast, was coming over. And yet five and thirty years ago, a gentleman told me, he had seen three hundred Indians moving down the river in their canoes, on their way to their hunting grounds below.

All the fruits of our own fruitful land seem to thrive here. Strawberries are abundant, the cherry trees are covered with ripening fruit, the apple trees promise an abundant yield, while the peach trees are even now bending under the weight of an enormous crop. There are two extensive nursery establishments here, to one of which my host most kindly took me. The trade in trees here is very heavy, this nursery having sold this season upwards of two hundred thousand trees. Apple trees are usually transplanted here at two and three years old, and are being

very extensively planted, especially in Missouri and Iowa. The pear and plum are grown in much less quantity.

Here the soil is much more clayey than on the prairie, and the trees of all kinds attain a much larger size. Here, also, the Osage Orange hedges look much better than on the prairie, and all arborescent vegetation wears a more healthful appearance. May it not be that the diminutive character of the trees on the prairie is owing to the absence in the soil of some essential ingredients for the building up of woody fibre? Be the cause what it may, the trees grow in this soil as they do not in that, and give a charm to the landscape far surpassing any beauty of the prairie. I leave this city of Quincy with most pleasant recollections of the place and people. You will hear from me again, when I have seen something of Iowa.

IV.

ADEL, Iowa, June 13, 1870.

I found the boat-ride up the Mississippi from Quincy, Illinois, to Keokuk, Iowa, a very pleasant change, after eight hundred miles of dust and jarring inseparable from the cars. The scenery on the river was not such as to call forth exclamations of wonder, or to thrill the traveller with such emotions as one feels on passing through our own Thousand Islands, or through the Highlands of the Hudson. The banks are wooded to the water's edge, chiefly with elm trees, that compare more favourably with those of our own forests than did the more diminutive specimens of middle Illinois. Here and there are small towns, at which the steamer lands to receive and discharge passengers and freight, and islands now and then, that give a pleasing variety to the scene. This "Father of Waters" is a very shallow, muddy stream, bearing in this part no comparison for beauty or grandeur with the St. Lawrence, and whose claim to such dignity of title must lie chiefly in its length.

The boats are very unlike those on Lake Ontario or Lake Erie. With no hold, for they are flat-bottomed, the boilers and the machinery are all on the main deck, and you go up-stairs to find the cabin, state-rooms, ladies' drawing-room and dining-room. Over this is a promenade deck, from which you have a good view of the river and surrounding country, though the range of vision east or west is usually quite limited. Here is another cabin, much smaller than the first, which seems to be appropriated to the officers and men; and on the top of this, commanding the furthest possible range of vision, is the wheel-house.

It is amusing to watch the movements of the deck hands, nearly all negroes of the pure plantation type, when the boat is making a landing. There were thirty-five of these black men attached to the boat. As soon as the whistle gives notice that the

boat is nearing a landing, these men assemble in the bow, and usually seat themselves on the long gang-plank, which is formed of two parallel timbers, about three feet apart, into which the flooring is fastened. The boat is brought up to the bank, headed up stream, and from seventeen to twenty of these negroes seize hold of this bridge and throw one end of it on to the ground. A part of them run out, and by pulling and shoving get it into position. Then all run ashore, and each one takes up a sack of oats, or two of them lay hold of a box, looking much like a hand-barrow, which is packed full of eggs, and seems to be as heavy as they can carry, and they file back into the boat. I should have said that there are two of these bridge-like gang-planks, and while one of them is occupied by the stream of men carrying the freight on board, the other is filled by a line of them trotting out, and thus the empty ones are going on shore and the full are coming on board, until the cargo is all brought in.

It was evening when the boat stopped at Keokuk, and, taking a berth in the sleeping car, I saw nothing of that part of Iowa until morning, and the cars brought me near to Des Moines. Here was a beautiful rolling prairie, bounded by the wooded bottom of the Des Moines River, and here too I saw the Osage Orange hedges badly killed out, and one I noticed that had been allowed to grow up to a height of some twenty feet, that was killed completely dead, root and branch. I left the railway at Wauken, a small collection of houses on the open prairie, without tree or bush to cast a grateful shadow or break the sweep of the winds. The ride across the prairie was a pleasant one, from its very novelty. In many places it was gay with flowers. Prominent among them were the phloxes of many hues, larkspurs, indigo-plants, rosinweed, oxalis, and blue-tinted Icelias.

I reached Adel, a pleasantly-located village, of about twelve hundred inhabitants, on the Coon river, a branch of the Des Moines, about noon, and in the afternoon walked out about a mile on the prairie to examine the orchard of Dr. Vanfossen, the best orchard in all Dallas county, if not in all Iowa. The Doctor was at home, and took much pleasure in showing me his orchard, and answering my thousand and one questions. This orchard is the result of years of patient and persevering planting, in which many varieties of apples have been tried and found to be valueless, but the worthy Doctor had nailed his flag to the mast, and, nothing daunted by repeated failures, kept on planting until he found those varieties which will thrive and bear fruit in the climate and soil of this section. Those varieties which are so much esteemed by our orchardists he found to be useless, and the R. I. Greening, Baldwin, Roxbury Russet and Golden Russet had to be given up as worthless. But the Carolina Red June,

Early Harvest, and Red Astracan among summer apples, the Duchess of Oldenburg, Lowell and St. Lawrence for early fall, and the Snow Apple, Coles' Quince, Winesap, Willow Twig, Ben Davis or New York Pippin, and Talman Sweet, answer well for late fall and winter sorts. The Jonathan is about half hardy and a great bearer, if it lives to bearing age, while the Gravenstein seems to endure as a tree, but produces no fruit. The Doctor does not prune his trees up as we do, but has the branches come out low down, so that there shall be but little of the trunk exposed; nor does he thin out the branches much, the strong winds from the prairie causing sufficient circulation of air through the tree tops, without much thinning out. In the spring this orchard gave promise of a most abundant crop, but a severe frost one morning, following a rainy night, cut off two-thirds of the fruit just as it was setting. The plum of our gardens will not grow here, though the country is full of wild plums, like those that abound in Canada, but many of them of much larger size. The Doctor has two pear-trees yet growing in his orchard, but so far the cultivation of the pear has not been successful. The peach and quince cannot be grown here, and only the hardest Morello cherry. The strawberry grows nicely, as the fine plants and berries on Doctor Vanfossen's grounds abundantly testified, but other small fruits had not yet been thoroughly tested, save that the Lawton blackberry and the Iona grape would not stand the climate. Some Concord vines on the Doctor's grounds gave promise of endurance and fruitfulness.

It is evident that the fruit-grower in this part of Iowa has more to contend with than the Canadian orchardist, and can truly say that he finds the price of good fruit to be eternal vigilance.

D. W. BEADLE.

Pigs and Experiments.

To the Editor.

SIR,—One morning in November last, whilst taking a look into my sty, I discovered that during the night there had been an addition of four to my hog tribe. When the little pigs were four weeks old, they were so plump and handsome that I determined to keep two for the purpose of rearing them. I took them from the sow when five weeks old, placed them in a tolerably warm pen, with a cozy nest to sleep in. They were fed for four weeks or so on buttermilk, potatoes, and buckwheat flour—after that, ground unbolted barley was substituted for the buckwheat flour. For ten weeks they grew amazingly fast, but at the end of that period one of them became lame in the hinder parts. For a while I could not tell whether it was affected in the back or the legs, but after a short time all doubt was removed by discovering that the upper joints of the hind legs were badly swollen and inflamed. Its

appetite almost entirely failed, and in a week or two it was reduced to a skeleton. At last it could only rise on its fore legs, and whenever it was forced to move seemed to be suffering intense pain. Not understanding the disease, I could apply no effectual remedy, but following the advice of some sympathizing neighbours, I tried "condition powders," sulphur, &c., but with no visible effect. At last all hopes of recovery fled, but the pig wouldn't die, although it could not eat. My hired man being somewhat of an ingenious turn of mind, said that it was the "contrary nature of the pig tribe" that kept it alive. All the folk about the farm being of a humane disposition, no one could be induced to knock it on the head, though under the circumstances it did appear to be an act of mercy to do so. But a suggestion from my man changed the mode of the pig's death. Says he, "Let us give it some pickle; I saw father kill a whole litter with it once." I consented, for I had heard that pickle would kill hogs and poultry, and here, thought I, was a chance to test its effects. A quantity of herring pickle was placed in a shallow trough before the invalid, of which it partook, and died in two hours time. On this history I have a few questions to ask:

1st. Can any of your numerous readers inform me, for the general good, what the disease was with which this pig was affected—the cause, and the remedy?

2nd. What is the *modus operandi* by which the pickle caused death so suddenly? And if you like:—

3rd. Why was not the writer of this communication poisoned, whilst on a ten weeks' tour over the extreme east of this Province, he fed on little else than salt herring. In other words, if fish pickle will kill hogs, why does not salt herring kill men?

COLCHESTER.

Nova Scotia, April 22, 1870.

NOTE BY EDITOR.—We will offer a comment or two in reference to your queries, leaving it to our readers to give any more definite opinions or information, if they can. The disease of the joints was either of a scrofulous or rheumatic character, affecting at last the synovial membrane, and probably the bone. In the early stage of such an affection, first warm, then stimulating applications to the joints, such as hartshorn and oil, would be appropriate, and from five to ten grains of powdered colchicum might be given twice a day. In regard to the second enquiry, there is much not yet fully understood in the injurious effect of brine on some animals. Pigs and poultry, like other animals, require salt, but are easily hurt and even killed by brine in certain conditions, that is, brine in which animal matter exists in a state of decomposition. Such brine would be injurious to human beings, as well as to most brutes. In fish pickle there is

generated, under like putrescent conditions, a peculiar substance known by chemists as *proplylamine*, which also forms an active principle in ergot, the poisonous effects of which are well known. On the third query it may be observed, that besides the idiosyncracies that render some animals, and even some persons, specially susceptible to injury, from causes which do not affect others, there was, in the cases adduced, a very essential distinction. Half putrid fish pickle or brine, and well cured salt meat or fish, are very different things; and when the latter are used for human food, all impurities are usually removed by washing previous to cooking.

Hybridizing Wheat.

To the Editor.

SIR,—As you request me to reply to a correspondent who "wishes to be informed of the best method of procedure in hybridizing wheat," and as the season is now near at hand when the operation must be performed, I invite the individual who wishes to try this delicate operation to call and see me, and I will show him the whole process; and at some future time, when I have a little more leisure, I shall take pleasure in giving your readers all necessary information, and the benefit of my experiments in this interesting, and, to the progressive farmer, important but neglected field. It is sufficient at this time to say that, in my opinion, the removal of the male organs, before the pollen is ripe, from every kernel that is intended to be used for the female parent, is absolutely necessary to success. When wheat is said to be in flower, fructification has already taken place, and what appears to the naked eye to be the flower, on close examination under a microscope is shown to be little tubes, that have emptied themselves of their fructifying matter upon their own pistil, before the glume is open, or the pistil exposed to pollen of other varieties, that might be floating in the air or carried by insects.

And as you truly suggest, "what is the value of the plan proposed for facilitating fertilization in wheat by violently shaking the ears by means of a cord stretched along the rows, when the wheat is in bloom?" Such a method of crossing wheat must only result in disappointment to all parties concerned.

CHARLES ARNOLD.

Paris, June 3rd, 1870.

FREE GRANT LANDS.—Our correspondent from West Zorra should apply to the Minister of Agriculture for the information he desires.

SELF-RAKING REAPERS.—We cannot admit criticisms of advertisements, amounting in reality to counter advertisements, except on the usual terms for such communications.

SILVER BEET.—"Inquirer," writing from Georgina, wishes for information in regard to the method of raising this crop. The mode of cultivation is exactly similar to that of ordinary beet or mangel-wurtzel.

AGRICULTURAL BOOKS.—Amongst other enquiries of a similar nature, we are asked what are the "best books published in Canada on agriculture, the diseases and treatment of horses, cattle, sheep and hogs." Without assuming to pronounce which are the best, and admitting that there are excellent publications besides those to be mentioned, we can confidently recommend the following:—Allen's Farm Book, Flint's Dairy Farming, Waring's Drainage for Profit and Health, Johnson's Elements of Agricultural Chemistry, and if not too expensive, the American edition of Stevens' Book of the Farm. These and similar works, though not published in Canada, can be procured through our booksellers. In regard to stock, Youatt on Cattle, The Canadian Horse and his Diseases, by A. Smith, V. S., Morrell's American Shepherd, and Harris on the Pig, are excellent, cheap and reliable works.

Advertisements for the "Canada Farmer" must be sent in to the office of publication early, and in order to secure their insertion in the forthcoming number, must in no case be later than the 7th of the month.

The Canada Farmer.

TORONTO, CANADA, JULY 15, 1870.

The Season and Crops.

The season of 1870 has thus far presented a marked contrast with that of 1869. Last year the country suffered from an excess of rain and cool weather; during the present summer we have, in common with a large portion of Europe as well as North America, been visited with a severe and extended drought. So general has been this condition of the weather that serious alarm for the coming crop has been felt; prices of grain have risen, and much speculation has been excited. But, as in most panics of the kind, the danger has been exaggerated, and the promise of the harvest all over the world is to-day more favourable than many besides habitual croakers at one time feared.

The latest accounts from Great Britain give a favourable report of the condition of the wheat, and speak of refreshing rains having at length succeeded to the long-protracted drought. The dry weather would, it was thought, most seriously affect the barley and oats, and hay would undoubtedly be a short crop. Roots promised fairly.

The severity of the drought has been more felt in France than perhaps in any other portion of Europe, yet even in that country late reports are somewhat re-assuring, and though a light harvest and dear bread seem inevitable, matters are not so bad as it was feared, and the deficiency will, it is expected, be made up by foreign supplies without a ruinous advance in prices.

Over the Northern and Western States of America the season has much resembled our own, and the same fears and complaints regarding the most important crops have prevailed amongst our neighbours as we have heard in Canada. The official statements, however, as well as the general press, give, on the whole, an encouraging view of farm prospects. Wheat will, nevertheless, be probably below the average, while corn promises much better than last year. In another column we give more specific details from an official American authority.

In our own country, the harvest will be early, and there is no reason to anticipate any serious deficiency. The frequent and abundant showers which have fallen all over the Province, have wonderfully revived vegetation, and joined to the power of the sun, have pushed on the crops with great rapidity. Hay, though short, will be much more plentiful than the condition of the fields in the early part of June seemed to warrant, and we hear, on the whole, good accounts of the cereals and roots. The prospect in regard to the prices of farm produce is altogether favourable.

The weather of the past month has certainly been remarkable, and from the meteorological records of the Toronto Observatory we learn that the mean temperature has been $67^{\circ}.3$, being $5^{\circ}.9$ warmer than the average, and $8^{\circ}.9$ warmer than June, 1869. The highest temperature at the observatory was $83^{\circ}.4$ on the 18th, and the lowest $50^{\circ}.0$ on the 2nd. Many thermometers, not so carefully located or accurately graduated, have registered a much higher temperature than 83° in the shade, and, no doubt, many localities have experienced a greater degree of heat than the neighbourhood of Toronto.

The warmest day, taking the mean temperature of the twenty-four hours, was the 28th, when the mean temperature was $77^{\circ}.7$; and that of the coldest day, the 10th, was $57^{\circ}.4$.

Rain fell on 16 days, amounting to 8.090 inches, very nearly three times the average quantity, which is 2.79 inches, and 3.617 greater than June, 1869. Of this quantity, 2.360 inches fell during the storm of the 11th, and two inches during that of the 30th.

There have been 8 days entirely clouded, 16 partially so, and 6 clear. Thunderstorms have occurred on 16 days, accompanied by hail on two occasions, the 11th and 26th.

The prevailing winds have been E., S. W. and W., the easterly winds during the early part of the month predominating to a great extent.

On the Permanence of Improvement in Land by Manure.

The scientific agriculturists of England have lately been much exercised on this subject. Science has long ago proved that plant life is nourished by particular elements which the roots find in the soil, these are rendered into a fit state for the food of the plant by moisture; they are either naturally soluble or must be rendered soluble by artificial means. These elements are either processed by the soil in its normal state, or they are added to it artificially, or both may be the case. If the soil hold them naturally, the farm is spoken of as a "good farm," and yields a high rent. If the soil does not afford them naturally, the reverse is the case; but it is now incontestably proved that, provided the land is sufficiently light in substance, and has been dried either by natural or artificial means, its fertility can be increased by manures of the proper nature, and be rendered quite equal, and in many cases superior, to the naturally rich and good land of a heavier description.

These lands do not, however, bear as good a rent as those more naturally fertile, because while, in the first case, the fertility is the property of the landlord, in the second case it is the property of the tenant, having been added to the land by the use of the capital and by the knowledge and skill of the farmer. Rents of farms of this nature are, however, advancing, and probably they are chiefly advanced by persons who are ignorant of the means and cost by which the fertility that is so apparent is produced. The farm for the time being is really fertile, but it is the fertility of manure, and not the fertility of nature.

This being the case, it has become an important question how the tenant, at the end of his lease, ought to be remunerated for the improvement which he has made in the land. The landlord, for his own interest, keeps a record of the crops of his tenant with a greater or less degree of accuracy; he is aware that when the tenant entered on the farm the crops were bad, and the character of the farm was inferior, and that, by the peculiar management of the tenant, the crops became good, and that the character of the farm is fast rising in public estimation; naturally the consequence is that at the expiration of the term of the lease, the landlord expects an increased rent, which the tenant, knowing that the fertility attained by the land is his own doing, and has been effected by his capital and skill, is unwilling to give. Other parties are, however, easily found, who are aware of the present improved character of the place, without being aware, possibly, of its original quality, or of the means which have produced the improvement; but seeing the occupant do well, naturally think he has the farm at too low a rent, and are willing, when opportunity occurs, to offer more.

Some new applicant, therefore, is pretty certain of getting it, as soon as the first tenant's term is out.

These facts being beyond dispute, it naturally happens that the outgoing tenant either takes out of the land the last dollar in value which he can, being, however, prevented from going too far by the terms of his lease, or he claims from the incoming tenant or landlord the value of such artificial and other manures as he may leave in the soil, and which benefit the land and the incoming tenant; and it is this fertile cause of dispute that has brought the question at the head of this article so prominently before the public. Like all other discussion and enquiry, it has led to the promulgation of much useful information, and while the question of unexhausted manures, between the outgoing and the incoming tenant, and the landlord, remains pretty much *in statu quo*, the results of the discussion afford the observant agriculturist most valuable as well as curious information.

Some of the best and most scientific farmers in England, and prominently among them that great public benefactor, Mr. J. B. Lawes, have been making for the last twenty or thirty years experiments to show not only what the effects of good farming are, but the effects of bad farming also. Mr. Lawes has compiled, and has repeatedly published, tables the results of actual experiment, showing the effect of wheat after wheat, without the application of manure of any kind, not even its own straw, for twenty-six years; of barley after barley, for nearly an equal period, also unmanured; of other portions of wheat for a similar period, manured with farm-yard dung every year; of other wheat manured with phosphatic manure, and of other wheat manured with ammoniacal artificials; and further of the four-course system, namely, wheat, turnips, barley, beans, then wheat again. All these experiments and many others have been made, the results recorded, and the tables of those results published. The conclusion at which Mr. Lawes arrives is set forth in his own language as follows:—

"To sum up the chief points of these illustrations of the extent or limit of the fertility of a somewhat heavy loam of by no means extraordinary quality, it has yielded an annual average produce per acre, without any manure at all, of 15 5-8 bushels of wheat for 26 years; of 20½ bushels of barley for 18 years; of 23½ cwt (112 lbs each) of hay for 14 years; and under rotation for 20 years of an average over the last four courses or 16 years, of 40½ bushels of barley, 12½ bushels of beans, and 34½ bushels of wheat. I confess," says he, "that my view of the productive capabilities of heavy, or even moderately heavy soils, has undergone considerable change since I commenced the various experiments to which I have referred. Formerly, I supposed that a very few years of

consecutive corn growing without manure, would suffice to reduce the corn growing capabilities of any ordinary soil to practically nothing. Such, however, is not the case, and a very little reflection will show how essential it is for the well-being if not indeed for the existence of man, that the elements of fertility should be so locked up and distributed throughout the soil, as to be capable of being taken up by crops very gradually, and so to last for an immense period of time. If needy landlords or indigent tenants could have drawn upon the locked up elements upon which the maintenance of the natural or standard fertility of the soil depends, how little fertile soil would still remain in England. It has sometimes been argued that the soil is to be looked upon as little else than a support for plants, to which the cultivator must add all the constituents necessary for the growth of the crops here, moves, just as the manufacturer who hires the mill has to supply the cotton, or other material for the manufacture. I think, however, it would be difficult to account for the difference of rent paid for land, except upon the assumption that it yields from its own resources a greater or less surplus in the form of grain and meat, beyond the amount required to pay the cost of cultivation and to return interest on the capital employed, and to afford a profit to the tenant."

Mr. Lawes then enters deeply into the question of the relative values of light and heavy soils; but all his arguments and experience go to show that, except in the case of bonedust which has been applied in a coarsely-ground state, and of guano, the benefit of both which manures extend over several years, the first and second crop grown on manured land will take the so added goodness out of the soil, and leave it in pretty much the same position and state as it was before the addition of the manure. In our own case, in Canada, the effects of lime are often observed to extend over a more lengthened period, but Mr. Lawes seems to think that the addition of lime to soil does not permanently benefit it, and that the improvement visible after the application of lime is a mere mode of enabling the plant to get some constituents out of the soil faster than it could otherwise get them, and that, therefore, liming only assists in exhausting the soil of its natural fertility, and not of imparting new fertility to it.

Mr. Lawes' paper is too long for our columns, but it is well worth the perusal of all farmers, whether practical or theoretical, and we trust that both it, and the numerous valuable tables which it contains, will, with his other experiences, be ultimately published in book form, when they will become a most valuable addition to the library of the agriculturist.

A correspondent of the *Boston Cultivator* says that since he commenced keeping farm accounts he has cleared double the money he did before.

Immigration Societies.

We have frequently advocated the importance of a scheme of combined effort in assisting newly arrived immigrants in this country, and it is gratifying to find that the subject is attracting attention, and being practically tested in various localities. A recent circular from the Hon. Commissioner of Agriculture has again brought the matter before the notice of municipal authorities, and the great advantage of concerted action on their part, to provide for this increased population in such a way that we may retain the larger portion of it within our own borders, is set forth by the instance of a society that has been organized for this object in the County of Peterborough. Every county should have some such organization, and as a guide in their formation, we give extracts from the Constitution of that Society, as furnished in Mr. Carling's circular:—

"This Society shall be hereafter known as the 'Peterborough Immigration Society,' and shall have the following officers, to be elected annually on the first Wednesday in May, in each and every year of the existence of the Society, by those present at such annual meetings, namely, a Chairman, Secretary, Treasurer, Registrar, Medical Attendant, and a Managing Committee, consisting of five members, and of which Committee the Chairman, Secretary, Treasurer and Registrar of the Society shall be *ex-officio* members—in addition to the said five members—three of the said Committee to be a quorum.

"The Managing Committee shall have the charge and direction of all business coming within the objects of the Society, and may from time to time direct the payment of such sum or sums of money as may be deemed necessary—such payments to be made by the order of the Chairman (countersigned by the Secretary) on the Treasurer, or in the absence of the Chairman, then by the order of three members of the Committee, countersigned by the Secretary, and the said Committee shall report to the Society their proceedings, and shall carry out such directions as may from time to time be given them by the Society.

"The Society shall meet whenever convened by the Chairman, and at such meetings shall receive reports from the Managing Committee, and transact such business as may, to them, seem calculated to advance the objects of the Society.

"It shall be the duty of the Secretary to notify members of meetings, keep a record of the proceedings of the Society, and take charge of all papers connected therewith.

"It shall be the duty of the Treasurer to receive all moneys contributed for the benefit of the Society, and give receipts therefor, to hold the same, subject to the order of the Chairman, countersigned by the Secretary, and render an account thereof to the Managing Committee or Society whenever requested to do so.

"The Registrar shall keep a book for the purpose of registering such information as the Managing Committee may from time to time direct—said book to be furnished by the Managing Committee at the expense of the Society.

"The Managing Committee shall, as soon as practicable in each year, ascertain the ap-

proximate number of persons requiring immigrant labour, of all classes, in the town and surrounding townships.

"The Managing Committee shall procure, at a moderate rental, during the summer season, a suitable place for immigrants on their arrival, more especially for those who are peculiarly unable to provide for themselves, and shall endeavour to provide employment for them with as little delay as possible.

"The Managing Committee shall solicit the Town Council and other municipalities in the County (or in any other way they may deem expedient) to contribute funds for the purposes connected with the maintenance and welfare of the Society, and the relief of the destitute immigrant—such sums to be paid over to the Treasurer.

"Your Committee would respectfully suggest the early discussion by the Society of the most advisable course to be pursued towards advancing the settlement of the lands in the back townships.

We trust this example will be largely followed throughout the Province of Ontario.

Labour Statistics.

We have very frequently urged the necessity of having in Ontario something like a labour Exchange, especially for the benefit of new comers; and we were accordingly glad when something of the kind was attempted by the Department of Agriculture in this Province. Circulars were some months ago sent to all the Reeves in Ontario requesting returns of the number of labourers and mechanics to whom employment could be given within each municipality, so that the Immigration Agents might be guided and assisted in their distribution of those coming to the country in search of employment. We regret to learn that a good number of these gentlemen have not sent in any answer to so reasonable a request. They owe it to the people who have chosen them to their present official positions to lose no time and to spare no trouble in procuring and forwarding the desired information. Great loss was sustained by farmers last year from not having sufficient help during harvest; and it is likely, if considerable efforts are not made, that this will be still more the case during the present season. It is neither prudent nor patriotic, for our rural population especially, not to co-operate as far as possible with the Government in its efforts to locate all immigrants as speedily as possible after their arrival. Some may not be able to do so much as others, but all can at least do something, and the Council of each township can, at any rate, ascertain pretty nearly how many hands could be employed within their boundaries, and send the necessary information on the subject to Mr. Carling at Toronto. We may add, that if some benevolent and public-spirited individuals in each district, were to take a little interest in looking after the new comers on their arrival in the townships, the good work would be greatly helped, and not a few deserving persons benefitted and encouraged.

Trying Experiments.

Canadian farmers are eminently conservative. They have great faith in the maxims and practice of their forefathers, and in the adage that "What is, is right." They can rarely be induced to overstep the bounds of the course they have followed with steady and unwearied perseverance from the time they were able to hold the plough or handle a scythe. If once in a while one happens to go beyond his fellows, and attempts to bring the light of science to bear upon his labours, and enter the charmed circle of experimentalism, he is very apt to be looked upon by his neighbours as something of a fool. He goes into it with many misgivings, is careful of his pocket, and should he succeed, which is one chance in ten, considering that he acts without any faith in either his proceeding or its results, he keeps his newly acquired knowledge to himself, and gets no credit for it, while if he fails, he spreads the knowledge of his failure among his neighbours, gets well laughed at for his pains, and ends by discouraging others from making any further attempts at improvement. He will often spend a few dollars extra in purchasing some highly vaunted variety of grain, which may be a new sort, but may only be some old one that has by extra cultivation been rendered more productive for the nonce, and then brought out under a new name. If he were to spend ten dollars extra per acre in improving his land and his system of culture, he would in most cases attain the same result of an increased yield with the same varieties of grain he has been in the habit of growing, with much more advantage to his farm than by buying new kinds of seeds in order to try what they will do. He does not consider that a dollar's worth of labour, well applied, will go much further than a dollar kept in his pocket, or cast away on trashy varieties of seeds. He will perhaps not grumble at paying an extra price for Early Rose or Climax potatoes, in order to try and get an extra crop of that valuable esculent, when the expenditure of the same amount in manure and extra culture would bring in double the crop of Chilies or Peachblows, at a much less actual outlay of hard cash. He will buy a thoroughbred bull or boar, and forgetting that liberal feeding makes liberal manure, and manure makes liberal crops, he will sell his hay and straw, and wonder where the good of keeping improved stock lies. A single failure discourages him, and he falls back again into the old ruts with the greatest complacency, content to be the slave of his own prejudices for the rest of his life, when, had he persevered in trying experiments till he had made success or failure a certainty, as the result of continued observation, he would be gradually emerging from obscurity, and attaining the high road to wealth and comfort in after life.

No man is more sure of success than the intelligent, observant, and persevering agriculturist, provided he is determined to make the trial to achieve it.

Clearances in the Free Settlements.

We directed attention lately to the plan of clearing ten acres and building a house on each of twenty lots in the Free Grant region, and letting those who can pay for such improvements have them in the order of their application; the money received being devoted to clearing others in the same way, and so on indefinitely. Every renewed consideration of the proposal makes it the more to appear at once practical and benevolent. It would bring a class of settlers in the region with a little capital, which would go a great way there, though it would not buy a cleared farm in the older districts. It would secure homes for the females of such settlers at once, instead of subjecting them to the misery and expense of staying in towns and villages separate from fathers or brothers, while these were struggling with the first difficulties of the wilderness. It would give a full year of a start, and would greatly mitigate the first difficulties of bush life, while it would preserve to Canada a large number of industrious and worthy people who, rather than face the first difficulties of a houseless wooded lot, will go west and secure a prairie farm, with apparent advantages for making a start. The difficulty and heart-break attendant upon getting up a house, and clearing the first acre, are greater than what is involved in all the rest. We have seen letters from Muskoka and Larry Sound strongly in favour of such a plan, and eagerly expressing a wish that the writers of them could have the privilege of purchasing such a start. Numbers of deserving settlers have spent their little capital in lodging their families and in travelling about seeking a location, who could have purchased such improvements, gone on the free grant at once, and had their families with them from the beginning to cheer and help them in their new home. Bush life has many hardships; even at best it is sound policy to make these as few and as little formidable as possible.

The Wool Clip of 1870.

There is every reason to anticipate that the wool clip this year will be at least equal to that of any previous year. Some portions of the country may have less to offer, but others, it is ascertained, will have more. It is a matter of regret that the American markets evince so little buoyancy this year, owing to the extreme depression in the woollen manufacture, and the quantity of last season's clip still in stock in many of their mills, and even in some places in Canada. The American demand for our fine

combing samples has every appearance of being regulated by the duty, which operates in the following manner, namely, if the price in Canada, with commissions and shipping charges added, amounts to within a fraction, however small, of 32c., the duty is only 13½c. gold, per pound, but if the price exceeds 32c. the duty becomes 15c., gold, per pound.

Buyers for the American market have not yet bought any wool upon which they will be required to pay the higher rate of duty, if their own statements be taken, but it is yet undecided whether the Customs' officers will accept the statements of shippers themselves, or take the highest quoted figures paid last week, which in a few instances were over 32c. One buyer advertised in the *GLOBE* to pay that high rate, but almost immediately after withdrew from the market. We are assured that the average of the largest buyer here will not exceed 29½c., and he has never taken any jobbing lots at over 30c. In one case, a lot of some 7,000 made 31c., but the buyer had the privilege of selection. Last year the price for a few days ran up to 35c., but from all appearances, this year, farmers will have to be content with somewhat less money.

Editorial Notes.

No time of the year is so enjoyable in the country as the month of June. The rushing work of getting in the crops is then pretty well over, and the farmer has a time of comparative leisure, while the hired men are hauling manure on the turnip field or hoeing the corn.

A visit during the week June 13th to 15th among the farmers in several counties, afforded an opportunity to note the progress of the crops. In Halton and Wentworth the spring crops were still very backward from the effect of the late drought, but the broken weather and abundant rain-fall of the past few days will soon bring them forward.

In Waterloo and Wellington the spring grain looked much better and more forward than near the lake. The soil is richer and better cultivated in the last two counties.

The Wellington, Grey and Bruce Railway, which will be of immense advantage to the country through which it passes, is now completed as far as Fergus. The track is as yet only ballasted for about two-thirds of the distance, but it is expected that the road will be opened for traffic by the 1st of July next. The road goes through a part of the country famous for the excellence of its stock and its good farming. It was noticeable how very well the crops looked, and what great breadths of land were being prepared to be sown with turnips. The hay here is more than twice as thick and heavy as it is near the lake. The railway track is very crooked, and full of twists and turns, made, we presume, in order to save heavy work, and to economize in every possible way. Some of

the embankments were scarcely wider than the sleepers laid on them.

The farmers in this section are quite satisfied of the value of introducing thoroughbred blood among their cattle, and the Shorthorn bulls in use are very numerous.

So far as can be judged, the fall wheat makes but a poor show this year. It is heading out short, and very thin on the ground. The hay also, especially clover, will be short, having bloomed too early, from the effect of the dry weather. The late rains will help the timothy, which has not yet begun to flower, but the clover will be fit to cut in a week in many places, and it is to be hoped that farmers will not delay cutting too long, under the mistaken notion of getting more growth by waiting.

Canada thistles are unusually abundant, and now coming into bloom. It is astonishing how much indifference is shown towards destroying this most troublesome weed. Thousands of acres of thistles might now be cut while little else needs attending closely to. Let the farmers beware of carelessness in this matter. It may cost much mowing and hard work to get rid of a nuisance now in its infancy.

A farmer writes to the *Birmingham Post*, stating that in North Warwickshire, within ten miles of Birmingham, a landowner has informed his tenants that "they must not use mowing or reaping machines this year, because they disturb the game." The farmers in that district only hold yearly leases.

THE CANADIAN POULTRY CHRONICLE.—We have received the first number of this new periodical, which in the present condition of the poultry "fancy" in Canada, is a timely and acceptable addition to the literature of the farm, while it will also be welcome to many residents in cities, who find both amusement and profit in raising poultry. The publication is in the form of a small octavo pamphlet of 16 pages—a very convenient size for binding—is well printed and full of valuable information. The first number contains, besides other useful articles, an admirable editorial on the "Improvement of Stock," showing the advantages of a good breed over ordinary stock, in a very clear light. It abounds also in useful practical hints, and is enlivened by excellent letters from correspondents. We heartily wish the projectors of the enterprise the success they deserve, and trust that this additional means of diffusing information on a matter of growing importance will increase the number of those who take an intelligent interest in poultry-raising, and promote generally the objects of the association under whose auspices the publication is brought out. The *Canadian Poultry Chronicle* will be issued on the first of each month. The subscription price is \$1 50 per annum. Communications should be addressed to the Editor, Box 20, P. O., Toronto.

The prospects for the wheat crop in California are very far from favourable, and in some districts it is expected to fall below the average of the last ten years.

The Agricultural Society of France has arranged for an international trial of reaping machines during the ensuing harvest. The first is to take place during the second fortnight in July, and the second during the first fortnight of August. The first prize to be 1,000 francs, and the second, 500 francs.

The *Army and Navy Gazette* says:—"It is understood that the officers selected to examine Thompson's traction engine, referred to by Mr. Cardwell on a recent occasion in the House of Commons, have reported most favourably of its applicability to army transport, and that the Government have recommended that one should be ordered for experimental purposes at Aldershot."

As evidence of the extent of the British trade in foreign wools, it is stated in a recent English exchange that, within a few days during the month of May, the arrivals of wool in London have been almost unprecedented in extent, having, on the 12th, 13th and 14th of May, amounted to no less than 76,581 bales, representing a value of probably upwards of £2,000,000. With the exception of a few Capes and Monte Videos, they were all Australian and New Zealand wools.

AGRICULTURAL EXHIBITIONS.—We shall feel obliged if the secretaries of agricultural societies, or other persons who can give correct information, would apprise us in good time of the dates fixed for the fall exhibitions to be held in their neighbourhood. We shall then be able to publish a list, which we hope to make as complete as possible, of the agricultural shows to be held in the Province, besides the principal fairs in the United States, during the coming season.

The *Hearth and Home* for the week ending June 25th, contained the first of a series of sketches entitled "Jethro Throop's Night Thoughts," by John Thomas, who is no other than Petroleum V. Nasby. The great humorist will take an honest country boy to the city, conduct him through the usual experience, and restore him to his home a sadder and a wiser boy, satisfied that the peaceful, honest, and temperate life of the farmer is the best and safest life that can be lived. This is a lesson greatly needed at this time, and Nasby is the man to teach it.

NEW PERIODICAL.—"LIVESTOCK."—This is the title of a new American periodical, devoted, as its name implies, chiefly to the live stock department of agriculture, including horses, cattle, the dairy and poultry-yard. The first number has been received, and is a handsome quarto of 24 pages, containing useful practical articles, original and selected, and two illustrations. It is edited by Mr. G. A. Martin, and published monthly by H. C. Springer & Co., Buffalo, the subscription price being \$1.50 (Am. Cur.) per annum.

Horticulture.

EDITOR—D. W. BEADLE,

CORRESPONDING MEMBER OF THE ROYAL HORTICULTURAL SOCIETY, ENGLAND.

Our Gardens.

The warm weather of May has brought vegetation forward so rapidly that June finds our gardens more advanced than has been usual for some years past. And never did they look more beautiful than now. The leaves are covering trees and shrubs in all their freshness, distinctly marked with their several hues of green, now and then relieved and heightened in beauty by contrast with the purple beeches, hazels and hollyhock. The early flowers of spring—the Snowdrop and Crocus, Hyacinths and Tulips—are gone, but in their place have come the gorgeous Peonias, with every hue of crimson, rose, pink, saffron and white, and with them many a flower of graceful form and lovely hue, and sense-delighting fragrance. The double-flowering Almond has been covered with its beautiful peach-coloured flowers, and the branches of the Plum-leaved Spirea wreathed with pure white daisy-like blossoms; and now that these are fading, the Rose-coloured Weigelia and dazzling white Spirea Reevesii are making good their place. Many of the hardy herbaceous plants are now unfolding their floral treasures. Double Columbines of every hue, from the darkest purple to the lightest rose, the fragrant Fraxinella, loading the air with aromatic perfume, the Fleur de Lis of every shade of blue, barred with gold, the Lychnis Fulgens, glowing with scarlet, and the graceful Astilbe Japonica—these and many others are making the gardens gay.

But beyond and above all these in stately majesty and peerless beauty, comes the Queen of Flowers. Here and there one may see the prints of her footsteps in the early morning, catch the shimmer of her gorgeous golden train, the gleam of her pendants streaming in scarlet and crimson, and the smiles and blushes that play on her lovely face.

The garden in June—this June—is lovely beyond description—is Paradise regained. Pity the man who has no garden—no place where his children can play among the flowers—where he can walk in the cool of the day, and bring his mind and heart in contact with the beautiful in nature, and drink in some of the sweet lessons she has to teach of the beautiful Mind that gave them birth. Said a little girl to her mother, as she was feasting her eyes on the flowers in the garden, "I want to kiss God and thank him for making these pretty flowers."

SALT FOR HORSE RADISH.—A writer in an exchange says he has found salt or brine an excellent dressing for horse radish plants.

Propagation of Pinks.

These often suffer in winter, from not being rooted early enough in the season. Although many persons defer propagation until a later period, yet I would not recommend it to be delayed longer than the last week in July. The reason for commencing early is obvious. Not only will the young plants form more vigorous roots before the approach of cold weather, but their blooms next season will be finer than could be produced by cuttings, which not being properly rooted would have a hard struggle to live through the winter. The most certain and expeditious method of propagation is by pipings or cutting of the grass of the present year. Before commencing this operation a slight hotbed should be formed of leaves or any other material which is not likely to heat violently. Upon this a layer of the rough siftings of decayed vegetable mould should be spread, to serve for drainage, and upon the whole a mixture of fine leaf mould and silver sand, to the depth of three or four inches. This bed, after being made perfectly level and firmly beaten down with the back of a shovel, should be well watered, through a fine nosed watering pot, and in a few days it will be fit for use. In selecting the grass for pipings, strong and short-jointed shoots should be chosen. The piping should be cut off with a sharp knife, immediately below the second or third joint, from the top of the shoot, and it may then be readily disengaged from the two leaves which surround its base and which are commonly termed a sheath. The tips of the leaves should be shortened for convenience, otherwise when planted it will be difficult to prevent the hand glass from resting upon them or disturbing them whenever it is removed. As the pipings are prepared they should be put into a basin or pan, filled with water, to prevent them from flagging before they are planted. For this and similar delicate operations the cool hours of the evening are most suitable. In planting the pipings they should be pressed firmly into the soil, to the depth of about half an inch, leaving them an inch and a half apart every way, and after being properly secured they should be gently watered through a fine nosed pot to settle the mould closely around their stems, and as soon as the leaves become thoroughly dry a bell glass should be placed over them. The glass should be pressed lightly into the mould to prevent as much as possible the ingress of air. In sunny days the bed should be shaded from seven or eight o'clock in the morning until five or six in the evening, and if there is any appearance of damp among the pipings the glasses should be occasionally taken off to allow them to dry, and all plants so attacked should be immediately removed. It is very probable that the pipings will not require to be watered until the greater part of them have taken root. Should water, however, be necessary, the leaves must be allowed to become dry before the glasses are replaced. As soon as roots are

formed the hand glasses should be slightly raised on one side, and by degrees may be entirely dispensed with. The young plants, after by degrees becoming inured to the sun, may be transplanted six inches apart, in an open bed previously prepared for the purpose, in which situation they may remain until required for planting finally in the beds where they are to bloom.—*Cor. National Agriculturist.*

Beautiful Variegated Grasses.

One of these is known in the florist's catalogues as the *Panicum variegatum*. A correspondent in the *Cottage Gardener*, speaking of the plant, says that when it is well grown it is one of the most beautiful plants lately introduced, making a specimen very quickly.

As a basket plant, he says it has a charming effect when suspended from the rafters of the stove, drooping fully a yard, and looking like a ray of sunlight. The ground colour of the leaf is a bright green, striped over fully one-half of the surface with pure white edged with pink.

It is also grown by him as a pyramid in a five-inch pot, into which about a dozen plants have been set around the rim. A pyramid is then formed with rods to any desired height, and the space filled with moss. Upon this moss the grass is to be trained by pegging down; it will soon cover the whole perfectly, and present a most charming appearance. The moss requires to be kept constantly moist, which can be very easily done with a fine-rose watering pot.

Another variegated grass is found in the catalogues under the tiresome name of *Dactylis glomerata elegantissima*. It is most beautifully silver striped, dwarf in habit, and makes a most effective edging. Bedded out with dark-leaved plants it affords a peculiarly charming contrast. To those who attempt display on the ribbon system it is most invaluable.

Flavour of California Fruits.

Josiah Hoopes, in his late annual address before the Penn. Fruit Growers' Society, said of his observations in California:—"I may say in regard to the larger fruits, such as the apple, pear, peach, &c., that their remarkable size and beauty appeared very little short of a miracle; indeed, I was totally unable to detect old standard varieties, time and again. Their enormous size and perfect shape, together with that peculiar waxy appearance proverbial to all California fruits, was a continual picture, and will not soon be forgotten. But, beautiful and large as are all these vegetable productions, there is lacking that delicious flavour, the agreeable aroma, and the richness of our less perfect, but better fruits. We search in vain for these requisites beyond the Rocky Mountains, and I very much doubt if they have the more desirable acquisitions, or that we would exchange our quality for their appearance.

New Fuchsias.

The *Florist and Pomologist* for April figures several of the new fuchsias, two of which are exceedingly fine, and well worthy of attention by the growers of this charming flower. One of them is named **SPLENDOR**, and is described in that magazine as having the largest intense dark purple corolla of any variety yet sent out. In some blossoms the diameter of the expanded corolla measured fully three inches. It has a bright scarlet tube, with sepals of the same colour, reflexing so as to form a perfect crown. The plant is said to be a strong bushy grower and a free bloomer. It was raised by Mr. E. Banks.

The other, named **AVALANCHE**, is described as one of the finest double whites which have yet been produced, the plant of excellent free-blooming habits, blossoms very large and very full. The tube and sepals are of a brilliant carmine scarlet, the corolla very double, pure white, with streaks of carmine at the base.

We hope some of our enterprising horticulturists will soon stage these truly magnificent fuchsias at some of our horticultural exhibitions. And would not our Horticultural Societies be fulfilling their mission were they to offer special prizes for the best and newest varieties of our leading popular flowers?

The Cultivation of the Rose.

To have this Queen of Flowers in perfection, requires high culture. It is fond of rich fare; strong, rich garden loam is the best; sandy or gravelly soils are the worst; heavy, wet clay soils are scarcely any better; on light or shallow soils the flowers are few and of inferior form.

But the rose can be grown on any soil, if the necessary pains are taken; light soils should be trenched to the depth of twelve to eighteen inches, and incorporated with well-decomposed cow manure and the surface soil from rich woods or old pastures; or, better still, remove the earth to the above depth and fill in with the compost above recommended. After the bed is thoroughly prepared in the above manner and ready for planting, select good, strong plants; if dormant plants are chosen, cut back with a sharp knife, all long roots, but preserve all the fibres possible; also cut the previous year's growth one-third to one-half; if pot plants, they require only to be turned out of their pots, and planted where they are permanently to remain. The various classes termed monthlies should be lifted after the first frost in autumn, and potted, and placed in a greenhouse, pit or cellar. Those who have not the command of these facilities can select a dry spot, and bury them root and top to the depth of four inches (to prevent their being destroyed by mice), and covered with forest leaves, straw, or any other litter which may be conveniently

at hand, to the depth of six inches—making the whole either crowning or oblique, to carry off the water. The hardy or Remontant and June roses should have the earth around them to a considerable height to prevent the water from lodging about the roots and collar in winter, and the tops covered with leaves or other material; we find it absolutely necessary to bank them up to carry off the water, for where they are only laid down and covered with earth the water is apt to lodge about them and freeze in winter, causing a rupture of the sap vessels, which generally proves fatal.

PRUNING—Is almost as essential as the soil to insure a fine bloom. The shoots should be shortened back from one-third to one-half; all dead and small branches should be entirely removed. To obtain a good fall bloom of the Remontant or Hybrid perpetuals, a part of the spring bloom must be sacrificed, by cutting one-half the shoots down to two buds, so as to induce a strong growth from which the autumn flowers are to be expected. When done blooming the others should be treated in the same manner, and all decaying flowers and seed-pods removed. The plants will be greatly benefitted during the drought of summer by being well mulched, and receiving a copious watering of liquid manure about once a week.

POT CULTURE.—Avoiding the sudden or violent application of artificial heat, and the gradual and gentle application of the same, are the chief requisites to success.

The process of growing the rose in pots to have it in bloom during the months of April and May for commercial purposes, is very simple, and thoroughly understood by the commercial florist. We will briefly detail the *modus operandi*, and devote the principal part of this essay to the culture of the Rose, with a view of obtaining flowers during the winter months for spring bloom.

Pot your roses early in the month of October; strong one-year-old plants grown in the open ground are best. In all cases avoid roses that have already been forced, for they will bloom but indifferently well. For potting, use a suitable soil; we have found the surface soil from rich forests, with an addition of sand and well-decomposed cow manure, the most suitable; place in pots in a cool greenhouse on the approach of cold weather; cover the glass with leaves and boards to prevent the wind from blowing them off. No more artificial heat should be used than will suffice to keep out frost, until about the first of February, when the temperature should be gradually increased to 45° or 50° by fire heat, allowing it to rise to 60° or 70° during the day with sun heat, when air should be given through the top ventilator, but avoid any sudden changes of temperature, which will surely engender mildew, that pest to successful rose-growing.

For winter forcing, obtain in the spring strong, young plants that have not been

forced; shift into pots a size larger, as they generally are grown in small pots when obtained from the florists; place out of doors in a cool, airy situation; keep all flower-buds removed during summer; shift whenever necessary, until they require a six or eight inch pot, which will be about the first of September, and then give them their final shift, pruning as previously recommended; cut back the side shoots to four eyes; if they are then in a healthy condition, they will push vigorously and set buds abundantly; at the approach of cold weather remove to cold frames or to greenhouse, whence they can be brought into the forcing house whenever wanted during winter. They can also be lifted from the open ground early in September, carefully potted, pruned, and kept in a cool place until wanted, with tolerable good results. The best, most simple, and successful method is to grow them on the back wall and rafters of a lean-to greenhouse, or prepared borders where they are permanently to remain, keeping them quite dry—not so dry as to shrivel them, but so as to prevent their making much growth during the summer, which enables them to recuperate their strength to undergo the next campaign.

At about the first of September give them a thorough watering and cut back, as recommended for pot culture—excepting the varieties of the Noisette class, which should have only their surplus branches removed, for they bloom best on two-year-old wood. Treated in the above manner, in a house heated with the time-honoured smoke flue, they will give a succession of bloom from the middle of December to the first of March. The following varieties have proved the most suitable for the purpose with us:

La Marque, greenish white; Gloire de Dijon, salmon yellow; Celine Forestier, bright yellow, very fragrant; Hermosa, rosy pink. Madame Bosanquet, pale flesh; Saffrano, saffron yellow, magnificent in bud; Cels, blush white, pink centre; Joseph Gourdon, lilac, crimson—purple crown, probably the same as Louis Philippe, crimson purple, blush centre; Bougere, salmon rose.

PROPAGATION.—There are five modes of propagating the rose; by cuttings, budding, layers, grafting, and suckers.

Budding the rose is a very simple method of propagation, and one by which a large stock can be grown in a short space of time; but it has also its disadvantage when budded on manetti stock, by its suckering propensity to destroy the variety worked on it. Except in the hands of the experienced they are worthless, even at best, in our severe climate. Budded roses are precarious; if they get winter-killed below the point of inoculation, they are lost, and in place of your Gen. Jacqueminot and Gen. Washington, you have a lot of single roses; while if grown on their own root they will start out again from the roots and produce their kind.

Propagating by layers can be performed at

any time during the months of June, July and August, by selecting strong shoots of the present season's growth, tongued in the same manner as recommended in the books for layering; in the fall the layers should be taken up, heeled in a frame, and well protected, or potted and kept in a greenhouse.

Grafting has about the same disadvantages as budding; the only thing in its favour is that the work can be performed during winter, when work is slack; but generally the results are not satisfactory.

By suckers, is nature's own method of propagating.

Propagating the rose by cuttings is our hobby, and one which we ride quite successfully; we prefer a hotbed frame for striking cuttings to any other method. Prepare your frame in an open airy situation, in the best manner, using fresh, fermented horse manure, which place evenly from twelve to eighteen inches deep, and tread it slightly to prevent its settling unevenly, on which place your frame; fill in a layer of good compost about two inches deep, upon which put sand of a suitable depth. The best cuttings are those selected from the plants called blind shoots, (i. e., such shoots as produce no flower-buds); prepare your cuttings in lengths of two or three eyes each; cut off square at the lower joint and trim off all the foliage except the upper pair of leaflets; insert in the frame, and when the frame is filled give a gentle watering; place your sash, and shade the glass from the direct rays of the sun for the first ten or twelve days—to be successful it is absolutely necessary to retain the foliage—by which time they will be well calloused and commence pushing out roots; they should be gradually inured to the full light of the sun by the time they are well rooted, which will be in from fifteen to twenty days from the time they were put in, and will be ready to transfer to pots. Roses can be propagated by cuttings in spring from plants grown in the greenhouse in the months of April and May, or in the fall from plants grown in the open air. September and October is the best time in the fall; the nights then being cool, the sash can be taken off in order that the cuttings may receive the benefit of the night dew.

Potatoes and their Culture.

Touching the chief features in the culture of potatoes, I have proved over and over again that there is no greater mistake than that of selecting very small sets or of cutting up large potatoes into many. Any one can put this matter to the test by planting a quarter of potatoes, beginning at one side, and putting in a row of very small sets, gradually increasing their size in every row till the very largest are planted. It will be found at harvest-time that the small sets give the greatest proportion of small fry, and *vice versa*, so that when potatoes are planted whole, medium-sized sets should be chosen. Of the early Kidney varieties I always save sufficient of the very

largest tubers I can select, and have ever found them produce the finest crop with the least proportion of small potatoes unfit for table. The seed should always be saved from the earliest crops, and in garden practice it is a good plan to green them, and store them thinly on shelves in a dry, airy place; as soon as they begin to sprout they should be planted the first opportunity.

I consider that the cutting of sets is attended with many evils. The potato loses much of the sap that should be husbanded. In dry seasons, and particularly in field culture where the ridge system is practised, and the manure ploughed into the centre of the ridge in a dry state, the cut potato is surrounded with a medium which sucks the sap from it like a sponge, and unless rain set in, blanky fields are the result, and the farmer says his potatoes have taken the "dry rot."

It is not a matter of unfrequent occurrence to see potatoes first allowed to grow in pits, and then be cut into small pieces, and planted as above; and surely it is a practice which cannot be regarded as anything but most irrational. In garden practice I either plant in soil that has been well manured for the previous crop, or else trench in the manure in autumn, and in doing so mix it well with the whole staple.

One-half the manuring which takes place in field culture I regard as positively mischievous, just because it is generally done in dry weather in April, and when the manure, if not well rotted, becomes dried before it is ridged in with the plough.

The ridge system itself I look upon as very objectionable on light dry soils. The manure and sets are enclosed in a dry state in an elevated ridge, where the manure when once dry is not easily wetted, and can be of little avail to the crop; indeed, I have seen it turned out in autumn in very much the same state as when it was ridged-in in April. If the sets were planted on the flat instead of in ridges in dry soils, it would be the means of producing fine crops, and more especially if the manure were well incorporated with the soil in the previous autumn. The system of grubbing with horse-hoes close to the stems of the crop, loosening the plants about the neck, and tearing up the stringy roots on which the young tubers are formed, is pernicious in the extreme.

In gardens where the soil is generally rich and deeply worked I think wide planting should be practised. By this means light and air are allowed to play freely about the tops, and the rays of the sun can benefit the soil. For such sorts as Myatt's Ash-leaf, I allow two feet ten inches, and from twelve to fourteen inches between the sets; and for larger-topped sorts such as Ross's, three feet by fifteen inches. I am persuaded that more fine useable tubers are thus produced than when thick planting is practised.

The early varieties, such as the Ash-leaved, may, when planted at such distances, be al-

towed to grow with two shaws; and the later sorts at the widest distance named, sometimes I leave with three without any bad effects. Indeed, if allowed to grow with only one top, such as Ross's Early are apt to be too large for any purpose, excepting baking whole in their jackets; for this purpose I am required to grow a few of Ross's every year. One season, about three years ago, I took the trouble to weigh twenty-four tubers out of about three barrel loads, and their united weight was forty-four pounds, whilst one set reached the enormous weight of three and three quarter pounds. These were sound to the centre, and when baked, came out of their skins sparkling like powdered sugar. They were produced from large potatoes planted whole and wide, and when turned out the soil looked as if it had been literally paved with potatoes of enormous size, and there was scarcely a single tuber that could be called small. — D. Thomson in *Gardener's Chronicle*.

Hamilton Horticultural Society's Exhibition.

A spacious room, tastefully decorated, and filled with beautiful plants and flowers, is ever a charming scene, and the display made on the 24th of May by the Hamilton Horticultural Society was one that must have been highly gratifying to both members and citizens. The tables were well filled with finely grown plants of great variety and beauty, and the air was laden with the delicious perfume arising from thousands of sweetly scented flowers. Not much could be expected in fruit at this early season, yet there were thirty-one entries of very fine-looking apples, in an excellent state of preservation. Golden Russets, Roxbury Russets, Baldwins, and Spys were the prevailing varieties. In the vegetable department there were about a hundred entries. There were some most finely grown asparagus buds, rhubarb stalks by the yard in length, and good early potatoes grown in frames. The lettuce seemed to have found the bright sun of the past few weeks too hot for it. Indeed, the late opening of the season, followed by such warm weather, causing everything to advance with unusual rapidity, has thrown such a burden of labour at once upon the gardener, that it was quite impossible to have everything attended to in its proper time.

In the floral department there was a fine display of foliage plants and most charming ferns, mostly familiar faces. Among the Roses we noted Marechal Niel and Souvenir de Malmaison, Maurice Bernardin and Madame Victor Verdier, names of high and well deserved celebrity.

The fancy Pelargoniums were beautiful, as well they might be with well-flowered plants of The Pride, Napoleon, John Hoyle, Beadsman, and their compeers to adorn the tables. The Scarlets were well grown and in full flower, making the tables gleam with their dazzling brightness.

In Verbenas it was gratifying to note that, although the best of Henderson's new varieties for 1870 were on exhibition, the first prize was awarded, and justly, to a collection composed mainly of seedlings raised by a member of the Hamilton Horticultural Society. Two of these, named respectively "Wentworth," and "Total Eclipse," were very fine indeed, and we congratulate Mr. John Freed, of Hamilton, on his success, for they are blooms of which he may most justly be proud. We understand that these are the result of careful cross-fertilization, and that we may hope to see yet greater achievements in this direction, the results of further experiments in which he is engaged.

Through the politeness of the President of the Society we enjoyed the privilege of dining with the officers and judges, and took the liberty on that occasion of making the suggestion that the Hamilton Horticultural Society, being one of the leading societies of the Province, might set the example of encouraging the production and importation of some of the new plants and flowers of merit, by offering a sufficiently large premium for such novelties. In response it was stated that the Society had not the means, being now debarred from drawing any of the funds appropriated by Government for the encouragement of agriculture, horticulture, and the arts, because the City of Hamilton constituted in itself an Electoral Division, and there was a city agricultural society of some one hundred and fifty members, and this society drew all the Government grant, to the total exclusion of the Horticultural Society. Why our law-makers have cut off the Horticultural Societies in cities from participation in this fund we can not understand. Had the fund been given wholly to the city horticultural societies it would have seemed more wise, as an agricultural society in a city must be a very tame affair.

Surely there must be some method devised whereby horticulture in our cities shall not be on a worse footing than in our small towns and villages.

Bark Splitting.

To the Editor.

SIR,—I notice in your May number a communication relative to the splitting of the bark of the apple tree, and a note, I think, of your own, asking for information relative to it.

I have made a practice for many years of running a knife perpendicularly down the trunk, cutting through the bark to the wood, with the best results, immediately freeing the tree from any tendency to being hide-bound, which I believe to be the cause of the disease. I give you this as the result of my own experience—it is for you to judge of its utility.

JAMES TAYLOR.

St. Catherines, May 25.

Hardihood of the Franconia Raspberry.

An examination of the canes of different varieties of raspberries this spring, shows that but few sorts ripened their wood last summer sufficiently well to endure even the moderate cold of last winter. The Franconia, which has been esteemed to be almost hardy, was killed to only to the ground at St Catharines, and at Ellettsport, N.Y., a large plantation of several acres had suffered in like manner. It is now certain that, although the Franconia is sufficiently hardy to answer well during the majority of our seasons, yet there are occasional exceptions where the canes are so entirely killed back that the crop will be very seriously injured, if not entirely lost.

The only varieties on the grounds of the writer, which have come out unharmed, are the Yellow Canada, Arnold's Red, and the Philadelphia. These seem to be perfectly hardy, and lacking only in size and firmness of berry. Nearest to these in hardihood seems to be the Clarke, yet our acquaintance with it is too limited to speak positively of its merits.

The Double-flowered Geraniums.

In the proceedings of the Royal Horticultural Society is a report by the floral Director, giving his notes upon a collection of forty varieties of these truly beautiful and useful plants. These notes present a truthful and unbiassed record of results and opinions formed upon their respective merits during one season, in which the plants were grown and flowered in pots under glass.

We do not give the entire report, but select a few of the most desirable sorts, as appears from the notes:

ANDREW HENDERSON.—This variety is of moderately-vigorous growth, with faintly-zoned leaves, and compact trusses of orange-scarlet flowers very freely produced. It is an ornamental variety well worth growing.

LE VESVE.—A vigorous-growing variety, of rich habit, with faintly-zoned leaves and fine trusses of large, well-formed, full, double flowers, of a light orange-scarlet colour. A very promising sort.

MEMNON.—This is a meritorious variety, of moderately-vigorous growth and with faintly zoned leaves. The trusses are of fair size, and compact, consisting of close, well formed, light scarlet flowers, distinct and promising.

TRIOMPHE DE LOURRAINE.—A variety of some merit, being of moderate growth, with faintly zoned leaves, and close trusses of carmine-scarlet flowers.

WILHELM PFEIZER.—One of the useful second-class sorts, of moderately vigorous growth, with indistinctly zonate leaves, and fair-sized trusses of good full flowers of a light scarlet colour.

GLOIRE DE NANCY.—A handsome and moderately vigorous-growing variety, still retaining a high position in the double class. It has green leaves, and good bold trusses of well-formed, full, double, rosy-carmine flowers. This proves to be also a good bedding plant.

MADAME LEMOINE.—One of the very best of the varieties in the whole collection. It is dwarfish in habit, with faintly-zoned leaves and large, full, double, bright, rose-pink flowers, freely produced in good showy trusses.

MARIE LEMOINE.—A variety of first-class excellence. It is of dwarf stocky habit, with flat, faintly-zoned leaves and large-sized flowers, forming abundant, bold, and effective trusses. This variety is much like Madame Lemoine in the colour and general aspect of its flowers, but it is of dwarfish habit, distinct in its foliage, and producing better flowers.

VICTOR LEMOINE.—One of the finest of the varieties in the whole collection. The plant is of a rather vigorous habit of growth; the leaves are marked with an indistinct zone, and the flower trusses are large. The flowers themselves are somewhat rough, having serrated petals, but they form a fine head, and are of a rich orange-scarlet, brighter than Le Vesuve.

The Fruit Market.

The supply of strawberries during the week ending June 25th has been only moderate, showing that the crop has not been equal to last year's. This falling-off applies to the quality of the fruit as well as the quantity, the berries being generally smaller, less juicy, and more acid than those of last season. Such, at least, appears to be the character of the Wilson strawberries in market. Some private gardens, and grounds of limited extent, have produced excellent crops of Triomphe de Gand of large size and fine flavour.

In view of the inadequate supply, and the disadvantages of transport to any distance, would it not be a desirable and profitable application of capital and enterprise to establish strawberry vineyards near the city of Toronto, and indeed in the vicinity of all large towns? There is ample evidence from past experience of the suitability of soil and climate in this neighbourhood for the successful cultivation of this wholesome fruit, which will be largely consumed in proportion as it is abundant and can be sold cheaply.

The price has been kept up during the week to 12½c. and 15c. per quart—those offered at the lower rate being frequently the finer fruit. At Oakville, we are informed, the wholesale price was 5c. Some idea of the extent of the business, which has sprung up among us only within the last few years, may be gathered from the statement of a local journal, that there are at Oakville about 200 acres under culture, and the present year's crop is estimated to be nearly 500 000 quarts. The berries are shipped principally to Montreal and Toronto, where the demand is greatly in excess of the quantity raised.

Of cherries, at 15c. and 20c., there has only been a limited supply.

Apiary.

Bees—Their Nature and Habits.

WORKERS GATHER PROPOLIS, OR BEE-GLUE.

A few years ago it was supposed by many that propolis, or bee-glue, was an elaborated substance, that it was produced by the workers much in the same manner that wax is produced. Others, again, thought that its production was, and ever would be, locked in mystery. Now, however, it is well understood that bee-glue is a gum, or resin, and is gathered by the workers from trees and shrubs, from which it exudes. The workers gather it much in the same manner as they do pollen, or bee-bread, by working it into little pellets and carrying it in the little baskets or cavities on their legs. The bees that gather it do not apply it, at least I have never observed them doing so; but running through the crowd it is removed from their legs by the workers employed in glueing up every crevice or crack about the hive.

Evidently this glueing is for their better protection against their enemies, such as the ant and miller, or bee-moth. Oft-times cocoons containing larvæ of the bee-moth will be completely waxed over on the bottom-board of the hives with this glue, or more properly gum. Persons wishing to observe the operation of glueing should watch closely the bees when they first enter the honey box during the swarming season, and generally they will see several bees engaged in applying the glue to the corners of the box, or at the edges of the glass where it comes in contact with the wood. It may have been observed that newly varnished articles, if exposed out of doors in the vicinity where bees are kept, attract the bees; it is the odour of the gum used in the varnish that attracts the workers, who are seeking for bee-glue. Pollen, or bee-bread, as already stated, is also gathered by the workers, and like the bee-glue is carried in the cavities on their legs in small pellets. This is deposited in the cells for food for the larvæ, and when the cell is nearly filled it is covered with honey, thought, by some, to keep it moist. I am inclined to doubt this, however, but think rather, that such cells are filled with honey in order to utilize all available space in the hive for storing honey.

Parties wishing to observe the bees in the act of gathering pollen, can do so in early spring by placing in the neighbourhood of the hives dishes of flour or meal of any kind; attracting the bees to the dishes by placing a little honey in the dish on a piece of comb. The pollen gatherers will be seen to light on the flour or meal, first proboscite it, and then gathering it upon their legs, collect it into pellets on the wing, hovering an inch or two above the dish. The same operation may be seen by watching the bees that are working in the pumpkin blossoms, which yield an abundance of pollen.

J. M. THOMAS.
Brooklin, Ont.

Bees Killing Drones.

To the Editor.

SIR,—As you give place in your excellent paper to the subject of bee-keeping, I take leave to call your attention to a curious freak of these insects, which seems to be quite general in this section.

About the first or second week in May I observed the drones making their appearance, and they soon became very numerous. I supposed that they would soon swarm, but about the 25th, my wife called my attention to the fact that the bees were killing the drones, which I think they have fully accomplished. Although I have strong stocks, they do not give indications of swarming. A number of my neighbours have told me that their bees have swarmed, gone back into the hives, and then commenced killing the drones. Some of them wished me to take off artificial swarms, but I hesitate to do it, as there are no drones.

Allow me to ask whether this is a common occurrence, and whether it would be safe to swarm them?—also, will they be likely to cast natural swarms after killing the drones?

G. S. JOHNSON.

Brighton, June 6, 1870.

REPLY.—A scarcity of honey is the cause of bees killing their drones in spring. It is not a common occurrence, and it is by no means universal, though, if I mistake not, in 1864 or 1865 bees killed their drones generally throughout the Province. This year it occurs only in certain localities and neighbourhoods. It generally occurs between the passing away of fruit blossoms and the coming in of white clover blossoms. It is a strong indication of dry weather. I would not advise artificial swarming unless there is drone brood nearly ready to come out. If the honey pasture revives and becomes abundant, such stocks will swarm, but later in the season. If the dry weather continues, bees will not do well.

J. H. T.

Mortality amongst Bees.

I am in receipt of letters from several individuals, who, having lost all their bees during last winter, express themselves as somewhat discouraged, believing themselves to be the only unfortunate ones. For the benefit of such, I would say that last season was an extraordinary one, such as we have not had for many years.

The entire season being cold and wet, bees did not lay in sufficient stores for winter use. It will be recollected that winter set in uncommonly early. It was also late in spring before bees could be brought out from their winter quarters and placed on their summer stands. Hence they were closely confined to the hive much longer than they generally are, requiring larger winter stores than usual, while the cold and wet season prevented their laying in even an ordinary amount

The result is, there has been a fearful loss of bees throughout the country, by far exceeding anything of the kind for years, and those few who think themselves the only unfortunate ones may console themselves with the thought—if consolation it is—that nearly all beekeepers have suffered a similar loss, many having lost their entire stock, others one-third or one-half, and nearly all losing some. I am informed of one man who went into winter quarters with one hundred stocks, and came out with only fourteen, and those in a weak condition. Others, again, with forty stocks, came out with seventeen.

Many supposed their stocks had sufficient stores, and yet they were found dead in the spring. We can only account for stocks being heavy, and yet proving short of honey, by their having gathered largely of pollen, bee-bread, and by the honey being watery, making hives weighty. It will require some time to make up the loss, and every beekeeper should renew his determination to keep only strong stocks.

The present season bids fair to be a good one. Bees are now doing well, and swarming commenced as early as usual, though the scarcity of honey consequent, to a great extent, on the dry weather about the last of May, caused the bees to kill off their drones in many localities, which will retard swarming and the breeding of queens somewhat.

J. H. THOMAS,

Early Swarms.

One of the questions discussed at the recent German Bee convention was:—"What are the chief requisites for producing early swarms?" Amongst other speakers, Dr. Ziwanisky, of Brunn, remarked that the first condition is having strong stocks, and for this a young, healthy, and fruitful queen is requisite. The second condition is a sufficiency of wholesome food. Hives which fulfil these two conditions will have young brood early, and therefore as a rule be soonest ready to swarm. Mr. Dzierzon observed that the greatest incentive to swarming was warm moist weather, and that the cause of bees swarming more freely in one year than another lay chiefly in the difference of the weather. Bearing this in mind, the beekeeper would do his best to follow this principle. He would feed his bees in spring with diluted honey, and keep a constant supply of water near the hives, so that the bees may be encouraged to breed, and not suffer any interruption through want of water. Dr. Preuss was not present, but a paper was read containing some remarks contributed by him on this subject. 1. Early swarming is hereditary, and for this simple reason, that an early swarm is much more forward in its first season, and therefore, under the like conditions in other respects, sooner ready to swarm next year. 2. Fully built combs also lead to early swarming. 3 and 4. Are the well-known requisites of strong stocks, and a plentiful supply of honey. 5. Protection against the ruling winds, especially if from the north or east. 6. A position open to the southerly sun. 7. Hives of a material easily warmed through by the sun. 8. Plenty of water. Lastly, whoever has no swarms by midsummer day should at once make them artificially.

Entomology.

Who'd be a Butterfly?

A NEW VERSION.

Who'd be a butterfly? Not I for one,
Chased by each idle young son of a gun,
Damaged by many a slap and a rap
From tatterdemalion's unmannerly cap.
Who'd be a butterfly? Who, I say, who?
Not I, for one! For another, not you!

Caught by rude hands, whose brute owner presumes
Fingers don't damage your delicate plumes;
Rubbed with rough touches till powerless to fly,
Then loosed, to flutter away—and to die.
Who'd be a butterfly? Who, I say, who?
Not I, for one! For another, not you!

Who'd be a butterfly? Even at the best,
Prey of some keen entomologist's quest,
Pierced with a pin, and with pinions displayed,
Safely away in a cabinet laid.

Who'd be a butterfly? Who, I say, who?
Not I, for one! For another, not you.

Ah! brother-butterflies—two-legged, I mean,
From these poor insects what morals we glean:
Do not the faults which the angels deplore
Soil our bright wings till they sink—and not soar.

Who'd be a butterfly? Who, I say, who?
I am, for one! For another, are you?

Even at the best, we have butterfly-fame,
Pinned in a case with a label and name,
Gazed at with pride for a week—or a day—
Then in dark cabinet huddled away!

Who'd be a butterfly? Who, I say, who?
Well, I'm afraid, my good friend,—I and you.

Fun.

Curculio Extermination Made Easy.

The following short and easy method of dealing with the Plum Curculio has been published by the editor of the St. Joseph, Mich., *Herald*. It appears reasonable and worthy of a trial; if as satisfactory as reported we may look forward to an early period when plums and other stone fruit shall be as plentiful and cheap as apples, and raised with as little difficulty. We have been trying this new mode during the last three days in our own garden, but with by no means the extraordinary success that we anticipated. Each morning we examined all the traps, and once obtained one solitary curculio. To-day we resumed the old jar-ring process, and gathered thirteen specimens of the "little Turk" from three of the same trees. We mention this, not as a convincing proof that the new method is fallacious, but to show that complete success cannot be expected in every instance. We intend, however, to continue the experiment, and trust our readers will all try it also, and let us know the results. It may be that the warmth of the nights on which we tried it caused the insect to remain upon the trees and not to descend to the ground, and thus rendered the operation of no avail.

"The importance of this subject; the demand for prompt and persistent action, the absolute necessity of arousing every peach,

plum, and stone-fruit grower to destroy the Curculio, has led the editor of the *Herald*, as Secretary of the St. Joseph Fruit Growers Association, to issue this extra. Not a single day should be lost, for with united action 500,000 Curculios may be killed in a single day.

"There is no doubt on this point; this morning Hon. John Whittlesey called at the *Herald* office, and stated that, on the 14th inst., he killed 2,715 Curculios about the roots of 200 trees, and on the 15th, in four hours, on the same trees, he killed 1,566 by actual count.

"Mr. Whittlesey also stated that Mr. Ransom, Mr. Bonelle and himself had in five hours killed upwards of 5,000 Curculios in a portion of three small orchards; that he had hansen alone in two days of eight hours each killed one-half more Curculios than were ever taken by three men with the old-fashioned sheet in a week. Mr. Whittlesey is one of the most successful and scientific fruit growers of St. Joseph, whose word is a bond, but he said, 'Do not believe me; go to Mr. Ransom's orchard and see for yourself.'

"Entering Mr. Ransom's orchard, the editor met Dr. Lyman Collins coming out. Dr. Collins is widely known for his successful peach culture.

"Well, Doctor, is it a success?"

"Most assuredly. I tried the experiment on eight of my trees in the evening, and the next morning took 104 Curculios. I am going home to trap my whole orchard in this manner.

"Wm. B. Ransom, the discoverer of the new method of exterminating the Curculio, was found on his knees in the back of his orchard examining his Curculio traps. This was at 10 a.m., and he had already killed 1,357 on three hundred trees. The editor stooped down and lifted a corn-cob not six inches long, and found and killed seven Curculios. There is no doubt whatever that the long-desired means of exterminating the Curculio is discovered.

HERE IT IS.

"Put the orchard in the best order. Level down the soil about the root of every peach tree, and smooth a circle for a diameter of two and a half feet from the tree as a centre. Have the ground very clean around the base of the tree. Do not leave a single hole next the tree. Leave no place where the Curculio can hide except under the shelter you provide. Now lay close to the tree, and close to the ground, about four pieces to a tree, either chip, or bark, or board, or lath, or rag, or corn-cob, or old leather, or anything for a covert.

"The Curculio will conceal itself under this shelter, and may be destroyed by the thousand. Go around every day, turn over each chip, and kill every Curculio. They will generally adhere to the chip, but may often be found on the ground under the chip.

"Probably no person in the United States has studied the Curculio and its habits more carefully than William B. Ransom. For fifteen years he has been trying newspaper experiments unsuccessfully. Last year, when bugging, he discovered that all the Curculios dropped within two or three feet of the roots of the peach tree, and on examination found the little Turk sheltered on the trunk and in the holes near the base and on the under side of the principal limbs.

"For the last fortnight Mr. Ransom has spent most all the hours of the day lying on the ground in his orchard, patiently watching and waiting for the first Curculio to show himself. On the fourth of May a few single Curculios were discovered, but not a single pair; on the 5th a few pair were found coupling. Constant, careful observation has led Mr. Ransom to these conclusions:

"In the fall the Curculios seek a warm and safe shelter to hibernate; this is either the ground, or leaves, stumps, logs, old fences, woods, or other congenial places of concealment. The first warm day in spring that starts vegetable life, calls the Curculio forth, and it proceeds to its feeding and breeding ground.

"They walk very fast, and they fly and feed generally at night, eating the young and tender leaves. The first warm days this year they fed, then the weather fell cold, and for a week Mr. Ransom found no indication of their feeding. Since Friday night, the 13th, the weather being warm, the Curculios have been feeding. They scatter all over the tree to feed, and come down towards morning, and as late as 7 a.m., to hide.

"They crawl on cold days and nights, and hide under the shelter of the trunk of the tree, waiting to feed when the nights become sufficiently warm. The Curculio uses the green peach only to hold its egg. It sometimes eats the ripe peach, also blackberries, quinces, and other fruits.

"Some idea of the quantity to be taken from a single tree may be found from the following: Mr. Ransom states that on the 14th he took 25; on the 15th, in the morning, 50; in the evening about sundown, 15, and on the 16th, 60 were killed on the same tree, and of these 11 were taken in a cluster, under a chip two by three inches.

J. E. CHAMBERLAIN,
Secretary St. Joseph Fruit Growers' Association and editor St. Joseph Herald."

ENTOMOLOGICAL SPECIMENS may be sent for identification or for information respecting history and habits, to the office of the CANADA FARMER, or direct to the Entomological Editor, Rev. C. J. S. Bethune, Credit, Ontario. The postage should be prepaid. The specimens should be sent in a pasteboard or other box, not loose, but packed with cotton wool, or some similar material. The name and address of the sender should also accompany the package, not necessarily for publication, but as an evidence of good faith, and that we may know where to apply for further information, if required.

Entomological Queries and Replies.

POTATO BEETLES.—James Taylor, Kilmartin, Ont.—The insects, of which you sent us specimens, and which you say are destroying the potato plants in your township, are the well-known "Three-lined Potato Beetles." (*Lema trilineata*, Oliv.) They may be at once recognized by the three black lines on the pale yellow wing-covers. Their larvæ are very disgusting in appearance, being covered with their own excrement, and bearing a considerable resemblance to slimy slugs. They may be destroyed by (1) picking off and killing the beetles, (2) dusting the larvæ with lime, ashes, or soot; (3) brushing off the larvæ from the plants to the ground when its surface is dry and hot.

SPECIMEN WANTED.—B. Pearson, Aurora, Ont.—You either omitted to enclose the specimen referred to in your letter, or else it escaped from insufficient packing—at any rate it has failed to reach us. Please send another, and we shall probably be able to identify it for you; and be careful to pack it in a pasteboard or other box that will bear knocking about in the mail-bags.

ENTOMOLOGICAL APPARATUS.—W. Munro, Embro, Ont. The Secretary of the Entomological Society (Rev. C. J. S. Bethune, Credit, Ont.) can supply you with the best German insect pins imported by the Society, at the rate of 50 cents per packet of 500. There are six sizes, of different degrees of fineness. A set of 500 each of Nos. 1 to 4, and 250 each of Nos. 5 and 6, will be sent free by post for \$2 65. Sheet cork, imported from England by the Society, is sold for 16 cents per square foot; six square feet free by post for \$1 10. Cabinets can be made of all sizes, materials and descriptions, and of course vary very much in price. An estimate could be obtained from any good cabinet-maker.

NAMES OF BUTTERFLIES.—*Ibid*—If you send to the Editor of this department (address as above) a specimen of each of your butterflies, carefully packed in a box, and free of charges, we will return them to you with the names attached; or if you send us specimens of your duplicates with a number attached to each, and corresponding numbers affixed to the specimens you retain, we will give you a list of the names, and thus save you the charges on the return of the box.

There are only four species of Canadian butterflies that are identical with British species, namely, *Pieris rapae*, *Vanessa antiopa*, *P. atalanta*, and *Pyraucis cardui*.

The best books you can get on the subject are Harris' Injurious Insects (\$6 with coloured plates, \$4 plain plates), and Packard's Guide to the Study of Insects (\$5 in parts unbound, \$6 bound in cloth). We can send you these works free of carriage at these prices, or you can obtain them through the leading Toronto booksellers.

LUNA MOTH.—*Ibid*—The large green moth with tails to the hind wings, of which you gave a very good description in your note, is the beautiful Luna Emperor Moth (*S. luna*, Drury), the most lovely of all our night-flying insects.

REARING BUTTERFLIES AND MOTHS.—C. Fletcher, Salford, Ont.—It is difficult to tell you in a few lines how to rear butterflies and moths, and we have not space at this time of year for a long article on the subject. We shall endeavour, however, to answer your question. By beating the branches of trees and shrubs over an inverted umbrella, you can obtain plenty of caterpillars to experiment upon. Place them, with some of the leaves upon which they were feeding, in any convenient box—the larger-sized chip boxes answer very well for most species—and supply them with fresh food every day, removing the old, and being especially careful not to handle them if it can be avoided; when they have done feeding, and formed a chrysalis or cocoon, they can be removed into a gauze covered box, prior to the emergence of the perfect winged insect. All sorts of devices are used by different entomologists for breeding insects, some using elaborate cages and others any kind of box that comes to hand; the description of box is not of so much importance as attention to feeding and cleanliness. If the specimens are enclosed in boxes large enough, their food may be kept fresh for a considerable time by sticking the end of a twig of the food plant in a phial of water or a juicy potato. Try a few common caterpillars first, and you will soon learn how to manage them better than by following any number of printed directions. The best work that we know of upon this subject is Dr. Knagg's "Lepidopterist's Guide," published in London, England, by Van Voorst, at 1s. 6d. You can, of course, capture many fine specimens for your collection by means of an ordinary butterfly net, and the exercise of a little patience and perseverance.

PLUM CURCULIO.—J. P. K., Widder, Ont.—The specimens sent by you, taken from your plum trees, did not include the notorious Curculio. The pale brown beetle is a specimen of *Dendroides Canadensis*, which is chiefly remarkable for its curiously branched antennæ. It is a harmless insect, living in the larva state in the form of a flat grub under the bark of trees. The steel-blue insect is a sand wasp, (*Pelopaeus ceruleus*, Lin.) and may be considered rather beneficial than otherwise, as it stores up insects as food for its young. The small black insect, with transparent wings, is another species of wasp. You will find figures of the plum curculio in the June number of the CANADA FARMER, which can be procured at this office for ten cents. You can breed specimens by keeping the stung plums that have fallen to the ground in a jar, or other vessel, with a few inches of earth in the bottom.

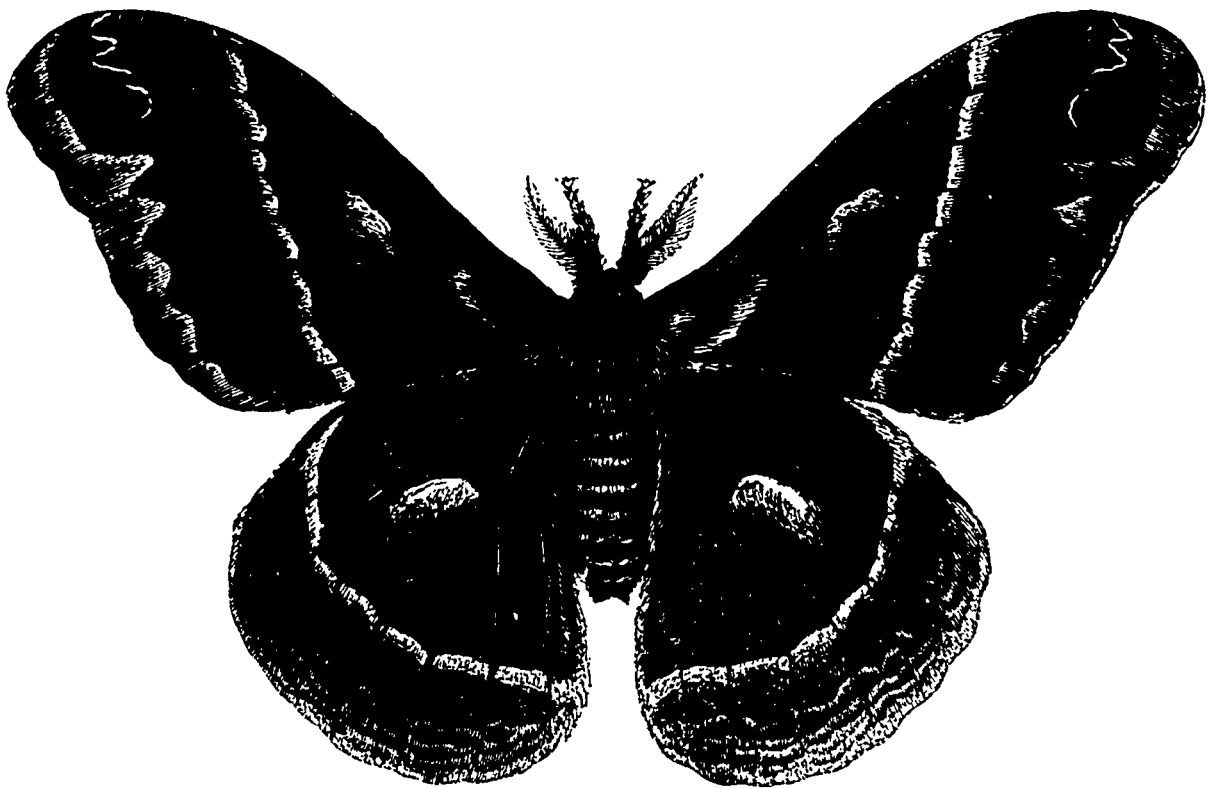
Cecropia Emperor Moth.

"A Constant Reader," at Hibbert, Ont., has sent us two cocoons, and a specimen of the male Cecropia Emperor Moth, respecting which he writes that he obtained the cocoons from an apple tree about the middle of May, and placing one in his desk with the intention of sending it to us, thought no more about it. Some ten days afterwards, however, his wife was considerably astonished to find a large moth fluttering about in the desk, and could not imagine how it possibly gained access to such an unwonted situation. At length the cocoon was remembered, and on examination found to be empty—and thus the mystery was solved.

to its numerous enemies, that it must be ranked amongst neutral or innocuous insects. Throughout correspondence professes to be a constant reader of our journal, we fear that he is a forgetful one, else he would never have sent us by mail a live moth loose in a large box, where it could flutter and smash its wings to its heart's content, and with two loose corners to roll about and aid in the work of distraction. The moth, though alive when it reached us, was in a pitiable condition, and perfectly useless as a specimen. A few drops of ether or chloroform would have killed it almost instantaneously, and then it might have been packed in a much smaller space, and with no room in which to knock or be knocked about.

and the hinder angle of the posterior wings prolonged into peculiar crescent-shaped tails, an inch or more in length; the body is covered with snow-white down, and the legs are purplish brown; the wings expand in front to a breadth of about five inches. The caterpillar of this moth feeds upon hickory, walnut, beech, and according to Dr. Packard maple also; it forms a cocoon like that of the Polyphemus Emperor Moth towards the end of summer, in which it remains till the following June, when the perfect insect appears. It is not at all a common insect, and as it flies only by night, is very rarely seen by any but entomologists.

A portrait of this beautiful moth is given in the second illustration.



The Cecropia Emperor Moth is the largest insect we have in Canada, its wings often expanding as much as seven inches, and it is also one of the handsomest. Its colours are dusky brown, relieved with red and white. The cocoon is a curiously constructed pod-shaped envelope of tough light brown silk, fastened on its flat side to the stem of a tree. As the larva is a very general feeder, this cocoon is frequently found on a large number of different kinds of trees and shrubs. Were it to increase to any great extent, it would no doubt have to be classed amongst our noxious insects, as the capacity for food of so large a caterpillar is by no means trifling; but it is so comparatively rare, owing

The first of the annexed illustrations represents this magnificent moth, with the cocoon above it.

Luna Emperor Moth.

A correspondent has sent a specimen of the Luna Emperor Moth, or "Queen of the Night," as it is sometimes termed, which he caught "one dark night flying towards a small bright fire which had been kindled for amusement on a hill-top." The wings of this beautiful creature are of a delicate light-green colour, with a purple-brown margin to the front of the fore-wings, a transparent eye-like spot near the middle of each wing,

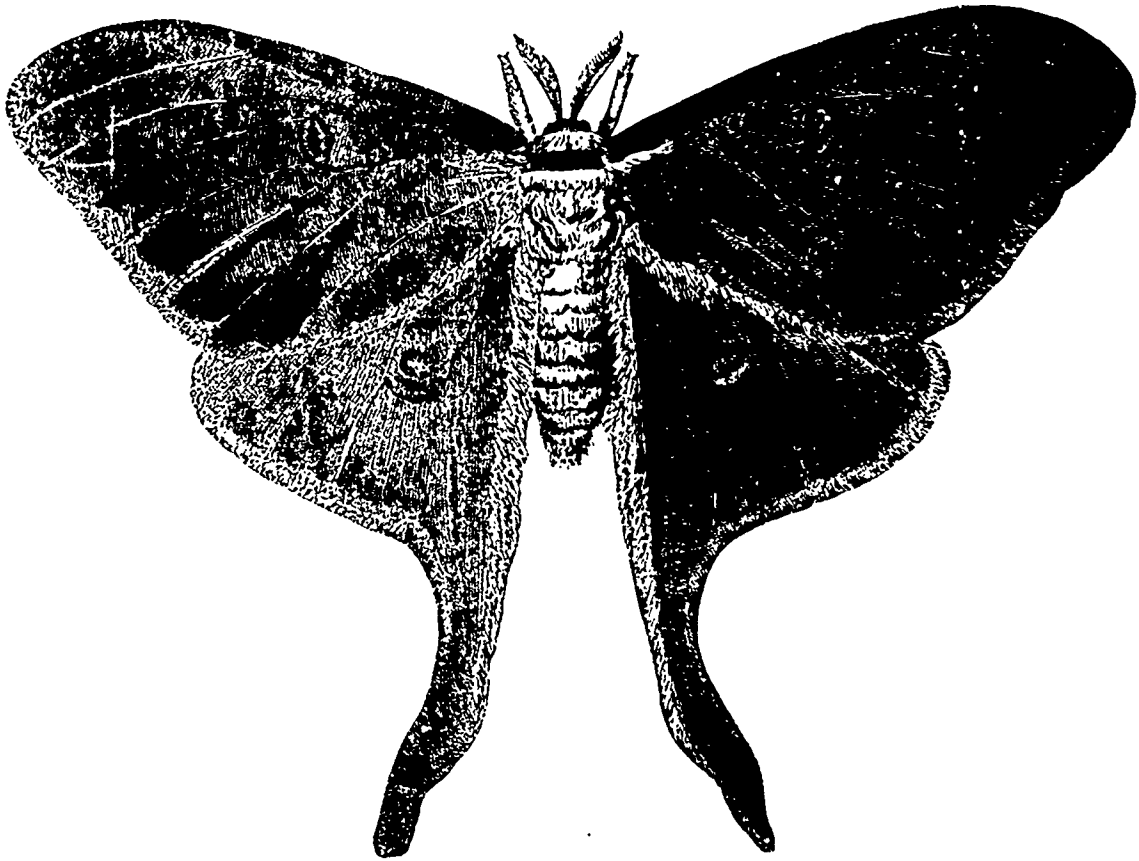
Polyphemus Emperor Moth

As this is the height of the season in the insect world of rank and fashion, we have been favoured with two more imperial visitors. They have been forwarded on their journey to us by our esteemed correspondent, "F.," of Fergus, Ont., and reached us in safety, through the medium of Her Majesty's mail-bags. They belong to the highest rank of entomological aristocracy, and are known by the Homeric name of Polyphemus, bestowed upon them by Linnæus, the founder of our present system of scientific nomenclature. As both sexes are represented, they may be known as the Polyphemus Em-

peror and Empress, and may be at once recognized by the conspicuous and beautiful eye-like spot on the posterior wings, resembling that which gives so much beauty to the plumage of the peacock. The last illustration is a portrait of this imperial insect.

were a dozen or so of small white threads about an inch in length, which I took to be the young ones. Not having a microscope, I was unable to notice them critically. Immediately after being taken from the water they became active enough, uncoiling them-

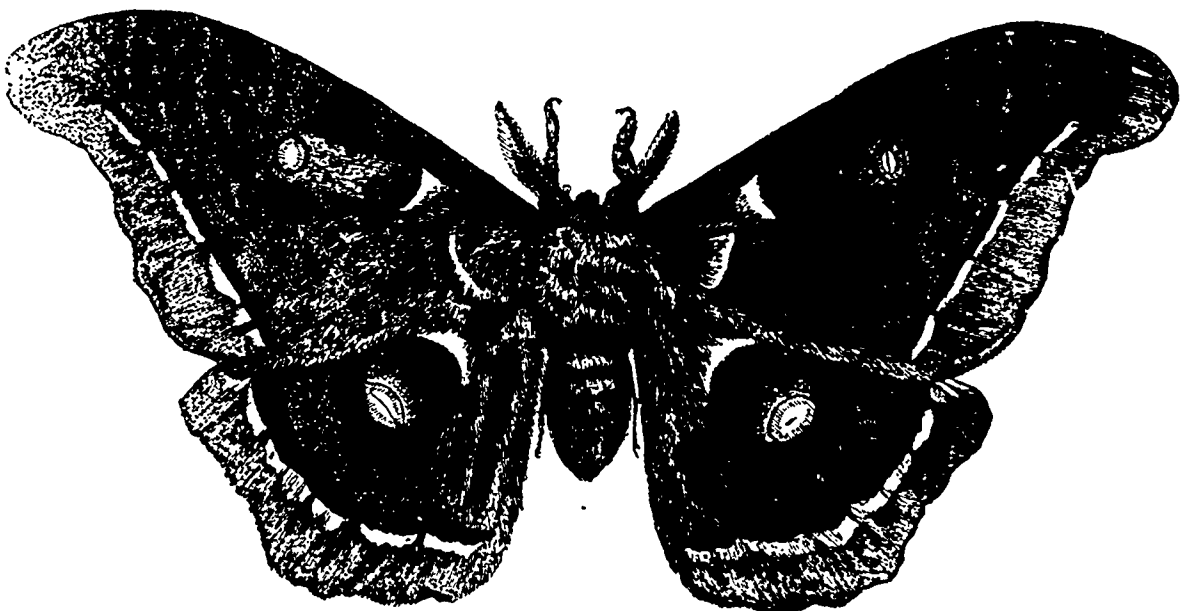
no stomach, intestinal canal, or vent. The interior of the body is occupied by a pith-like matter, in which have been observed genital and other organs. They have nothing like blood-vessels or air-tubes, and their nervous system consists mainly of a



HAIR SNAKES.—S. D. H., Newark, Ont., has sent us specimens of the so-called "Hair Snakes," which he found "in a small puddle by the roadside after a shower," and which he states are considered by the coun-

selves, writhing and thrashing about as before. I have observed them enough, however, to know that they never originated from horse-hair; as soon might I expect them to eventually turn into young colts!"

single cord. It is difficult to distinguish any actual mouth; nutriment apparently passing through the soft tissue of the head. No eyes or other special organs appear to exist. They are wonderfully prolific, extruding



try people to originate from horse-hairs, but that he cannot imagine such to be the case. He adds, "I noticed that as they lay in the water the whole of them (four in number) were coiled closely together, and among them

Our correspondent is quite right in his conclusion that these creatures have nothing whatever to do with horse-hair, beyond a mere general likeness. They are animals of low position in the series of nature, having

their eggs in a long narrow white cord from between the lobes of the tail. A single female has been observed to lay a series of eggs estimated at upwards of six millions, in the course of two weeks. They are parasitic

in the bodies of beetles, grasshoppers, crickets, and other insects; when they have emerged from their prey they live in small pools or puddles of water. We have often observed them in hollows of the rock filled with water by the waves on the shores of Lake Ontario. Occasionally they are found in pans of milk into which a cricket has fallen. Their scientific name is *Gordius*, derived from the fabled Gordian knot of mythology, and applied to them on account of the intricate knotted mass into which they often coil themselves. The reader will find an interesting and elaborate article on these curious creatures in the May number of the *American Entomologist and Botanist*, by Prof. Leidy of Philadelphia.

PARASITES ON A CATERPILLAR.—E. R. M., Holloway, Ont., writes:—"Enclosed find what seems to be a caterpillar, apparently found depositing eggs. Please explain the matter, as caterpillars do not lay eggs. These and several others were found upon cotton cloths that had been left upon the grass for a day or two. As any conclusions I may draw are likely to be erroneous, I apply to you."

The supposed eggs are the little white cocoons of a small Ichneumon fly, belonging probably to the genus *Microgaster*, which includes a very large number of species. The eggs of this useful parasite are laid by the parent fly on the body of the young caterpillar. When hatched, the maggots burrow into and feed upon the fat of the worm, and at length occasion its death. When they have become full-grown, and almost demolished the worm, they work themselves out of its body, which has hitherto afforded them board and lodging, and form their egg-like cocoons. In about a week, a little lid is opened at the top of each cocoon, and out comes a small four-winged fly, which goes off to repeat the operation on another unfortunate caterpillar. These cocoons should not, of course, be destroyed, the parasites being most useful as a check upon the undue increase of destructive caterpillars.

THE PLUM CURCULIO.—G. C., Craigvale, Ont.—The specimens you sent are harmless flies, though numerous enough about plum and other fruit trees to be mistaken for enemies. The holes in your plums must have been made by the pestilent curculio, and not by this fly. Jar your trees, as we have often recommended, and you will no doubt catch some of the real offenders. We have sent you a live specimen of the Plum Curculio by mail, that you may have no difficulty in recognizing your foe for the future.

CUT-WORM EATER.—J. McCully, of Howard, Ridgetown, has sent us a specimen of an insect that he found destroying Cut-worms among corn. Another was observed that had seized a large worm by the neck, and was in mortal combat with it. It is the larva of a large ground beetle, which, like the rest of the members of its family, is car-

nivorous in its habits, and destroys numbers of other insects. Being generally nocturnal in their habits, these larvae are seldom seen, and not much is known about them: the beetles into which they turn, however, are very commonly observed under stones and rubbish, and even running over the surface of the ground. They should, of course, be regarded as good friends of the farmer and gardener.

Poetry.

Flowers.

Your voiceless lips, oh flowers, are living preachers;
Each cup a pulpit, every leaf a book,
Supplying to my fancy numerous teachers,
From loneliest nook.

'Neath cloistered boughs each floral bell that
swingeth,
And tolls its perfume on the passing air,
Makes sabbath in the fields, and ever ringeth
A call to prayer.

Not to the dome where crumbling arch and column
Attest the feebleness of mortal hand,
But to that fane most catholic and solemn
Which God hath planned.

To that cathedral boundless as our wonder,
Whose quenchless lamps the sun and moon supply;
Its choir the winds and waves, its organ thunder,
Its dome the sky.

There, amid solitude and shade, I wander
Through the green aisles, or stretched upon the sod,
Awed by the silence, reverently ponder
The ways of God.

A Dream of Summer.

BY JOHN G. WHITTIER.

Bland as the morning breath of June
The southwest breezes play;
And, through its haze, the winter noon
Seems warm as summer's day.
The snow-plumed Angel of the North
Has dropped his icy spear;
Again the mossy earth looks forth,
Again the streams gush clear.

The fox his hill-side cell forsakes,
The muskrat leaves his nook;
The bluebird in the meadow brakes
Is singing in the brook.
"Bear up, O Mother Nature," cry
Bird, breeze, and streamlet free.
"Our winter voices prophesy
Of summer days to thee."

So, in those winters of the soul,
By bitter blasts and drear,
O'er swept from memory's frozen pole,
Will sunny days appear.
Reviving Hope and Faith, they show
The soul its living powers,
And how beneath the winter's snow
Lie germs of summer flowers.

The Night is Mother to the Day,
The Winter of the Spring:
And ever upon old Decay
The greenest mosses cling.
Behind the cloud the sunlight lurks,
Through showers the sunbeams fall,
For God, who loveth all His works,
Has left His hope with all.

Household.

Birds' Nests—Household Ornaments.

To the Editor.

SIR,—The advantage of rendering our homes attractive to the eye as well as to the heart has repeatedly been the subject of editorial comment in the CANADA FARMER, and I fully concur in regarding the subject as one of great importance. Farmers, and all who live in the country, have many ways of adorning their homes without indulging in costly ornaments, which are usually quite beyond their means. Objects of natural history afford the most pleasing means of contributing to this end in almost endless variety; and among the most interesting and beautiful specimens of nature's handiwork, few things are more curious and attractive, or better fitted to serve the purpose of giving an air of refinement and taste to the interior of a room, than birds' nests on the table or other fit place. The wonderful structures of these tiny, feathered architects, are full of instruction. To the reflecting naturalist they open up a wide field of enquiry. Speaking of the mechanical skill and industry, manifested by birds in constructing their nests, Professor Rennie says:—

"This work is the business of their lives, the duty which calls forth that wonderful ingenuity, which no experience can teach, and which no human skill can rival. The infinite variety of modes in which the nests of birds are constructed, and the exquisite adaptation of the nest to the peculiar habits of the individual, offer a subject of almost exhaustless interest. The number and variety of the eggs of birds are curious subjects of contemplation, and should be carefully noted whenever opportunity offers."

Professor Rennie has arranged birds into systematic order according to the construction of their nests, under the following heads, namely: Mining birds, Platform-builders, Basket-making birds, Ground-builders, Mason birds, Carpenter bires, Weaver birds, Tailor birds, Felt-making birds, Cementers, Dome-builders, and Parasite birds. It only requires an examination of the nests themselves, which he has thus arranged, to convince us how appropriate the terms are which he has applied to their several structures. In preserving eggs it is only necessary to make a small hole at each end of the egg with a glover's needle or a triangular awl, then blow through the egg, and the contents will escape. The eggs should now be returned to the nest and fastened down with a little cement, dried in the open air, but in the shade. Then take the nests and their contents to the parlour, where they will attract more attention than any silver tea tray or other costly articles. Besides, any boy or girl can accomplish the task without money or loss of time.

Bayfield, Ont. A. B. BROWNSON.

Oiled Floors for Kitchens.

I have for several years followed the plan of oiling uncarpeted floors, in order to avoid the labour of scrubbing them, and I find it works well. You can either oil or paint them, of course, but I consider the oil preferable on the following grounds:

It is cheaper.

You can apply it yourself.

You have not to wait for it to dry.

It produces a pleasanter colour.

It does not show tracks of dust, mud, and such like, and then more, a floor thus prepared does not require frequent mopping.

The oiled floor is better than a plain one in the following particulars:

It looks better.

It does not require scrubbing, which saves your back.

It is never to be mopped in hot water or strong suds, which saves your hands.

Grease spots never hurt it, which saves your temper.

To prepare a floor, I take a quantity of the cheapest and least offensive oil I can secure, and apply it with a common paint brush. I put it on smoothly, so that it will strike in equally all over and not stand in spots on the surface. I do this at night, after the evening work is finished, and find the place ready for use the next morning. Of course, it would not injure the oil surface itself to tread upon it at once, but grease is liable to be tracked from it at first to adjacent parts of the house. A new coat of oil applied once in six months, or even once a year sometimes, is sufficient to keep a floor in perfect order.

One may thus prepare to great advantage the floors of kitchens, pantries, summer dining rooms, back halls, stairways and porticoes, closets, bath rooms and labourers' bed rooms. It is also a good plan in children's apartments, particularly when training them to do their own room work, to leave bare that end outside of the floor on which the bed stands, and oil it. That portion of floor under the bed can then easily be kept free from dust, the sweepings can be more readily removed, and the children will be afforded free scope for their duck-like style of ablutions, without danger to the carpet.—*Ec.*

TO SOFTEN HARD WATER. Long experience proves the following to be successful. "Put cold water to about four quarts of good hardwood ashes, and bring to a boil, then add more cold water and let it settle, pour this off and add still more cold water to the ashes—the result should be about a pailful of good lye, which strain and pour into a barrel of water; let it stand overnight, when there will be found a deposit in the bottom of the barrel, which should not be disturbed in dipping off the water. This water will be found to make a suds as readily as rain water (if it does not there is not sufficient lye), and does not injure the clothes in the least. If the lye is too strong it may make the hands a little tender, but that is the only inconvenience, and the strength can easily be regulated.—*Ec.*

Agricultural Intelligence.

Wheat Crops of the United States—1870.

OFFICIAL REPORT OF THE U. S. AGRICULTURAL BUREAU.

DEPARTMENT OF AGRICULTURE, }
Washington, June 17. }

The natural tendency of low prices to reduce the acreage of wheat has been apparent this year, though not to the extent threatened. I last year estimated the increase over 1868 at more than a million acres, making an aggregate of 19,098,000 acres. I figure a reduction this spring of more than 900,000 acres, or nearly 5 per cent. of last year's acreage. The reduction is greater in Illinois—15 per cent. in winter wheat, and 18 in spring wheat; Indiana, 6 per cent. in winter and 20 in spring; Ohio, 4 per cent. in winter and 7 in spring; Wisconsin and Iowa (spring mostly), each 8 per cent.; Missouri (winter), 7 per cent.; Minnesota, with an increasing population, while threatening to stop wheat growing, claims an increase of 2 per cent.; Kansas also claims an increase of 16 per cent.; and California a gain of 5 per cent.; West Virginia and Kentucky show a larger breadth; North Carolina alone in all the South claims increase, some of the Cotton States failing 20 per cent.; New York appears to have lost 4 per cent., and New England 2 per cent.

EXTENT OF WINTER-KILLING.

"Freezing out" has not been general or very serious in its results. The winter was mild, and comparatively uniform, during its earlier months especially. February and March, the most critical period for injury by freezing, were stormy and cool, with far more of snow than the preceding months, affording protection against the season's changes. In view of the general mildness and openness of the winter, from which severe winter-killing might naturally be expected, the exemption is striking. In many instances this exemption is evidently due to the use of the drill, which plants the grain more deeply and uniformly than the brush or harrow used in broadcast sowing. Abundant testimony has this spring been furnished to prove that the wheat drill is annually worth millions to the agriculture of this country. Draining has also been a means of preventing loss by freezing.

Whenever winter-killing has occurred it has been in isolated patches, not throughout the whole counties or broad belts of country; it has been due more to condition of soil than to extreme or frequent changes of temperature; it has been seen in stiff soils, in hollows where water stands on the surface, in half pulverized soils, and in fields where the seed was scattered upon the surface. Very few good farmers have occasion this spring to complain of the effects of frost; yet there has been some loss, considerable in the aggregate, as there is each year, but scarcely as much as the years will average.

In New England and Northern New York the loss from freezing was small—the most complaint coming from Windsor County, Vt., and from New Haven County, Conn. In New York, Chautauqua suffered most, and among other counties, Niagara, Warren, Steuben, Oneida, Alleghany, Madison, and Westchester report injuries. In New Jersey, Ocean, Morris and Union are most prominent. In Pennsylvania, wheat in many counties was injured slightly—none severely. In Clearfield, the surface was covered with snow

144 successive days. In Maryland the plant was killed in level clay soils, which were under-drained. In Virginia one-fifth was killed in Patrick, and less in Montgomery, Lancaster, Albemarle, Cumberland, Greene, Henry and Loudon. The Southern States, from California to Texas, have a small area, but it escaped winter-killing almost entirely. In North Carolina the plant started vigorously in nine-tenths of all the counties. In Tennessee, Dyer, Fayette and Green suffered most; and in Kentucky, Butler, Calloway, Carroll, McCracken, Gallatin. In Missouri, only one-fourth of stand is found in Lewis and Vernon. Taney and Howard have suffered. The belt between thirty-five and thirty-eight degrees, which rarely has much snow, and often presents a very bad stand of winter grain, shows fewer bare spots this year than usual. Kansas, in this zone, is this year almost entirely exempt from injury.

Among the great grain fields of the West the severest injury from winter-killing was in Illinois. Here, as elsewhere, early drilled wheat on carefully prepared, dry or drained soils, escaped injury. Among the counties in which winter-killing was more or less severe, involving a loss of 10 to 50 per cent. of the plants, are Wayne, St. Clair, Menard, Franklin (killed in prairie, but good in timber), Marion, Jackson, Henderson, Edwards, Peoria, Adams, Crawford, Tazewell, Kendall, Clay, Ellingham, Fulton, Macoupin, Perry, Tuscola, Knox, and Monroe. In a third of the counties of Indiana sufficient loss was sustained to reduce the general condition of wheat below the average. Fully half the counties in Ohio presented in early spring a less than average prospect, with some injury from freezing, in no case particularly severe. North and west of Illinois less than a tenth of the crop is of a winter variety, and that moiety was little injured by freezing. Michigan, an exception in its latitude on account of its insular position, cultivates a large proportion of winter wheat, and has not escaped injury from frost, especially in Montcalm, Barry, Hillsdale, Van Buren, Calhoun, Livingston and Oakland counties. In some counties snow furnished complete protection; in Emmet it was three feet deep on the 1st of April.

LATE SOWING.

The feebleness and unthrifty appearance of the plant, whenever apparent, has almost been universally attributed more to a late seeding than to any other cause. More than half the crop was sown or drilled later than usual. The severe drought in the Middle and Southern States, and the pressure of summer work delayed by the unpropitious spring in the West, together with the habit of delay from which farmers suffer as well as other men, postponed the breaking up of wheat lands; while the unusually early closing in of winter left the plant scarcely above the frozen surface, and in many instances not even visible.

PRESENT PROSPECTS.

The season has been moderately propitious as a whole, though not precisely as farmers would have it in many localities. There have been few showers and much sunshine, pushing the crop into early maturity, but promising a yield not equal to the thirteen or fourteen bushels per acre of last year, and scarcely equal to that of 1868, but with an average of thirteen bushels. In many places the prospect was never better. In some localities there is complaint of too little rain, and in others of too much. The rain-fall of May was quite small in New England, New York, generally throughout the West, and in the Cotton States. In the Atlantic States,

south of New York, on the contrary, rains have been excessive. In New York much of the winter grain is not in an average condition; in Washington county it has seldom looked worse at this season of the year; it is small and unpromising in Genesee; the late snow is unthriftily in Livingston. Spring grain looks better. In New Jersey, wheat has made an extraordinary growth in Cumberland, has "much improved" in Hunterdon, and the season has been unusually favourable in Burlington, and is looking well throughout the State. The crop presents an improved appearance in Pennsylvania, promises well in Maryland, and a good average crop is cutting in Virginia and North Carolina, with little loss from rust or falling in consequence of heavy rains. The crop in the South is generally good, though light in some places, as the result of drought. The Tappahannock (from the Department of Agriculture) is a great success in this region, and is very generally preferred. In the Red River region, Texas, the weather has been cool, and the crop late, but unusually fine. It has been injured there only by hail and other storms. The crop will be fair in Tennessee, with some drawbacks, as lodging, rust, &c., during the recent heavy rains.

In Illinois a reduction of perhaps fifteen per cent. may be expected in the yield; in some counties the crop appears well; in some, fears are entertained that little more than half a crop will be gathered. When the plant had a feeble vitality at the start the dry weather has nearly destroyed. Accounts from Indiana are variable, ranging from failure to fullness. Ohio, Michigan, Wisconsin, Iowa, Missouri, Kansas, in fact, all the Western States, report more discouragements from feeble growth, drought, hail, rain and rust, than for two years past, and render probable a much smaller aggregate production than that of last year, and very likely a smaller yield than that of 1868.

WHEAT IN THE SOUTH.

This crop is more than ever neglected in the Cotton States this year. Probably not more than two-thirds of a million of acres are growing in the six States from South Carolina to Texas. Tennessee, alone has a larger breadth than all combined. Good wheat can be raised over nearly all their surface, and the higher lands of South Carolina, Georgia and Alabama, and an immense area in Northern Texas are admirably adapted to wheat-growing. The present crop is already gathered in this portion of the South, and is of good quality and fair yield for the culture received.

THE LEADING WHEAT-GROWING STATES.

Twenty years have wrought changes in the list of wheat-producing States that are suggestive and even startling. Pennsylvania stood at the head of the list in 1849; she was the sixth in 1859; and in 1869, of nine leading States she stood ninth and last. In 1859, nine States produced less than seventy per cent. of an aggregate of 173,000,000 bushels; in 1869, nine States produced 191,000,000 bushels, or seventy per cent. of our 260,000,000 bushels; and California, which is fourth, in 1869, was not found among the leading nine of ten years ago, while Minnesota, the seventh, was at that time scarcely in existence as a State. The first list is as follows:—

States—1849.	Bush.	Bush per capita.
Pennsylvania.....	15,367,691	6.64
Ohio.....	14,487,351	7.31
New York.....	13,121,498	4.28
Virginia.....	11,212,616	7.88
Illinois.....	9,414,576	11.06
Indiana.....	6,214,458	6.28
Michigan.....	4,925,889	12.36
Maryland.....	4,494,680	7.70
Wisconsin.....	4,286,131	14.06

Illinois, fifth in 1849, becomes first in 1859.

States—1859.	Bush.	Bush per capita.
Illinois.....	23,837,023	13.92
Indiana.....	16,848,267	12.47
Wisconsin.....	15,637,458	20.13
Ohio.....	15,119,047	6.46
Virginia.....	13,130,977	8.54
Pennsylvania.....	13,042,165	4.48
New York.....	8,681,105	2.23
Iowa.....	8,449,403	12.51
Michigan.....	8,336,368	11.12

The figures for the leading States of 1869 are estimates, in round numbers. Representing, in the proportion of production to population, California occupies the first place and Minnesota the second.

States—1869.	Bush.	Bush per capita.
Illinois.....	27,230,000	11.00
Iowa.....	25,000,000	20.00
Wisconsin.....	24,000,000	19.00
California.....	21,590,000	39.00
Indiana.....	20,600,000	12.00
Ohio.....	20,400,000	9.00
Minnesota.....	19,000,000	35.00
Michigan.....	16,800,000	13.5
Pennsylvania.....	16,500,000	5.5

With these facts before us, it is not difficult to anticipate the time when the larger portion of our wheat crop will be produced west of the Mississippi. Facts showing the decrease of yield in each State would be equally striking and more sadly suggestive.

J. R. DODGE.

The Provincial Exhibition Buildings.

The Chairman of the Standing Committee of the City Council on Walks and Gardens, Mr. Alderman Baxter, has advertised for tenders for the erection of several new buildings on the Provincial Exhibition grounds, and for altering and repairing those that now exist. Mr. Jas. Grand, architect, has prepared all the plans, and on the recommendation of Mr. Cooley, the Agricultural and Arts Association's Superintendent, they have been accepted, and the work will probably commence in less than a month. The Crystal Palace is to be restored to its former state, and that portion of the northern side of the building which was occupied by the Staff-sergeants of 13th Hussars, will be fitted up for the exhibition of plants and flowers, while what was formerly the riding school, will be employed for the exhibition of dairy products. The fountain will be reconstructed in the centre hall, and will be used for exhibiting Mr. Wilmot's system of pisciculture. For pigs, three new buildings will be erected; one will be 180 feet, another 90 feet, and the third 192 feet long, and altogether they will contain 184 pens. An old building that is to be repaired will contain 94 pens. A new building, 240 feet long, and two others 162 feet long each, will be put up for the accommodation of cattle. These with the old buildings will contain 162 ordinary stalls, besides 30 stalls constructed especially for bulls. A new building 162 feet long, and capable of stabling 54 horses, will be put up, and the old stables will be altered so as to accommodate 126 more. For the accommodation of exhibiting sheep four new buildings will be put up. One will be 240 feet, one 200 feet,

one 150 feet, and one 130 feet long. Altogether there will be 290 pens. A poultry house 176 feet long and designed to contain 380 coops will be erected. For the exhibition of implements a building 200 x 25 feet is to be put up on the south side of the road running through the grounds. The horse ring situated just east of the Crystal Palace is to be enlarged so as to measure 400 feet in length by 250 feet in width, and it will be surrounded by a picket fence 4 feet high. Then there are to be six cattle rings, each 60 feet in diameter in the vicinity of the cattle sheds. The building at the gates leading into the grounds and the fences are to be repaired, and in order to prevent a recurrence of the ticket frauds detected last year at London, turn-styles will be placed in the gates, and there the number of persons entering the grounds will be exactly indicated.

Agricultural Exposition at Paris.

We learn from the *Mark Lane Express* that a proposal was recently made for holding a universal agricultural exhibition in Paris in 1871, and the idea seems to have been favourably received. Already the sum subscribed from private sources towards the expenses of the exhibition amounts to £2,800, while the Society of Agriculturists of France has voted for its part the solid subscription of £2,000, making an aggregate of £4,800 already obtained. With such a beginning it appears to be considered well nigh certain that for the first time in her history France will next year have a universal agricultural exhibition organized by private initiative. It may be remarked that the subscriptions made do not represent so much cash parted with for ever, but are rather loans made to the enterprise, and even these loans are not to be paid up until there are 300 subscribers. The liability of each subscriber is limited to the amount of his subscription, and the surplus receipts of the exhibition, after payment of the working expenses, are to be devoted to the repayment of the subscriptions either wholly or in part. At present the subscriptions are solicited in sums of £40 each; but if the amount required (£12,000) cannot be raised by £40 subscriptions, each share of subscription will be reduced to £20, and 600 subscriptions will be solicited. This plan failing, the subscriptions will be reduced to £10 each, and 1,200 subscribers will be sought for. The Royal Agricultural Society has been invited to take part in the Exhibition, and to furnish a report on British agriculture. The Council have determined to accept this invitation, and have suggested the following as subjects worthy of discussion, and affording opportunities of illustrating the present position of English agriculture: Drainage, Implements and Machinery, Manures, Rotation of Crops, Fattening of Cattle and sheep, and the Labourer. From Belgium a like hearty response to the invitation has been received.

Steam Ploughing.

Among the Victorian farmers the steam-plough is coming into high favour, and no wonder, with the aid of this machine, they are getting land ploughed nine inches deep for fourteen shillings per acre. To those who have been taking off crops year after year without returning anything in the form of manure, every acre broken up by the steam-plough is equal to an acre of new land. The merits of a system which introduces such a noble mode of culture are not easily over-estimated. It at once does away with the great cause of failure in Australian cultivation—shallow culture, with its attendant evil consequence to the farmer whether the season brings him too little or too much moisture. The system upon which the work is done in Victoria appears equally applicable to large districts in Queensland. The Darling Downs, the Logan and Albert, the Mary, the Pine Rivers, and the district surrounding Brisbane, all offer inducements for the introduction of steam-ploughing machinery. The ploughs are owned by enterprising men, who move about the country, ploughing and harrowing for about the rate per acre mentioned.—*Cor-Queenlander*.

The Drainage Act.

Mr. Molesworth's report takes in a large area of country. It comprises 370,000 acres fully surveyed, where drainage can be effected by gravitation. Of these, 48,000 are in Kent and Essex, 40,000 in Lambton, 14,800 in Perth, 13,200 in Bruce, 2,600 in Simcoe, 113,000 in Carleton and Russell, 100,000 in Wellington and Grey, and 38,000 in Middlesex. Then there is an additional area of which quantities have been given, that will increase the total to some 500,000 acres of unproductive swamps, which, as Mr. Molesworth observes, cause malaria and fever, and obstruct communication, divide townships, and retard the prosperity of the country.

It is proposed to drain this land by main and branch drains, leaving the side drainage from the lots to be done by the occupants, at a cost varying from 87 cents to \$1 50 per acre, by which it is assumed that an increase in value of the lands drained, to the amount of from \$4 to \$6 per acre, may be gained. Mr. Molesworth sets the whole cost of the works at \$500,000, of which he considers that \$250,000 could be expended in the ensuing year. There is, therefore, some authority for the supposition that the sum granted to the Government will be disposed of, and that no part of it will return next December to make its appearance in the new estimates as a re-vote, and thereby raise the wrath of the member for South Bruce. Even this, however, must depend somewhat upon the municipalities.

The counties in which it is proposed to proceed with drainage this ensuing year are Kent, Essex, Lambton, Huron, Perth, Middlesex, Bruce, Wellington, Grey, Simcoe, Victoria, Carleton and Russell, Stormont, Dundas and Glengary. The Elma swamp, in the county of Perth, contains an area of 14,800 acres, which may be drained by eighteen miles of drain at a cost of \$22,168; and the estimated increase in the value of the land is put down at \$53,800, or more than 140 per cent. over the cost. The Brook swamp, in the county of Lambton, covers an

area of nearly 30,000 acres, of which the main drainage may not exceed 13½ miles, at an estimated cost of \$20,399. But there would also be needed 22 miles of branch drains, which Mr. Molesworth thinks could be constructed at a cost of \$500 per mile, thus raising the total amount to \$35,399, or at the rate of \$1 10½ an acre. The value of the land in this swamp is \$3 per acre, and if drained it is considered that \$8 could be easily obtained. If that price were realized, there would be a return of \$142,000 upon an expenditure of \$41,399—a prospect that must be admitted to promise sufficient returns.

Without enumerating all the various swamps which go to make the total amount given above, we may note that the average cost of the works, as estimated by Mr. Molesworth, seems to be about \$1 30c to \$1 35c per acre; and if the estimated increase in the value of land ranges from \$4 to \$6, the average for the whole amount is probably something less than \$5. This leaves a very wide margin for profit; and unless it involves an error, which we have no right to contemplate, it indicates not only a better mode of investing the money of the Province, but also a more profitable one than that of merely hoarding it at a low rate of interest.

The large sum of money thus to be expended during the next twelve months, points to the necessity for a large increase of our population. It holds out an inducement to the labouring classes of Europe to come among us, and thus in a secondary manner increase our wealth and our power, while it prepares the way for the ultimate settlement of the same persons upon what may probably prove some of the finest agricultural lands in the Province. It is not too soon to make this known on the other side of the Atlantic, in anticipation of the spring-tide flow of emigration, and if duly taken advantage of there need be no doubt that the result will tend to a further liberal expenditure in future years upon works which are calculated to promote inter-communication in the country and develop its inherent resources.—*Builder*.

Buffalo Live Stock Market.

The following account of the large and growing business in live stock transacted in the city of Buffalo is abridged from an article in the *Buffalo Commercial Advertiser*. What has been done and is doing in Buffalo could with great advantage and profit be done here in Toronto. Extensive and comfortable cattle sheds, with convenient arrangements for feeding and watering the animals and securing good drainage, would draw to our city a vast traffic in live stock. The *Advertiser* says:—

We will venture to say that among our citizens but a fair proportion are fully aware of the importance which the live stock business has assumed in our midst, of the excellent accommodations afforded at our Live Stock Yards, or of the magnitude of daily transactions at that point.

Of late steps have been taken by certain prominent dealers, which go to indicate the appreciation entertained of the advantages presented at this centre

The markets at Communipaw, N. J., and Pittsburgh, Pa., have been largely made by the heavy shipments to that point of live stock by Mr. John T. Alexander, of Jackson-

ville, Ill., via the Pennsylvania Central and Jersey Central Roads, who has regularly sent over the roads named between one hundred and one hundred and twenty cars per week. Associated with Mr. Alexander are Messrs. George D. Alexander, of Chicago, and William Fitch, of New York. It will be a source of pleasure to those who look for the advancement of business interests in this city to learn that the firm will hereafter ship via Buffalo to New York, and that Mr. Joseph Alexander will locate at this point and have the charge and superintendence of transactions in the purchase of stock for the firm named, who, we are informed, will undoubtedly buy largely, making in consequence the Buffalo market a most desirable one for western stock dealers to ship to. The senior member of the firm named is called "The Cattle King of Illinois," and is thus spoken of by the *Chicago Railway Review*:—"A plain, homespun, practical farmer is John T. Alexander, of Morgan county, Ill., who commenced with little capital, but now owns 30,000 acres of land, most of it improved, and all of good quality. He puts about 5,000 acres usually to corn, and cuts about 2,000 acres of grass yearly. He is now feeding about 10,000 head of cattle, and buys and ships east, from Chicago, from 1,000 to 2,000 head of cattle every week."

This growing trade has brought here during the past four years the following dealers, who are among the largest and most responsible in the business, and who now provide at this point for eastern markets: Messrs. Coon and Thompson, comprising B. C. Coon of this city, and W. Thompson, of New York; M. Lauterbach and M. J. English, representing S. Schuster, of New York; Yeoman and Warner, of Chicago, represented here by P. D. Yeoman; Otis & Moore, of Chicago, here represented by H. Rankin; H. D. Hough, of the firm of Strayhorn & Co., Chicago; Woods & Gillespie, the latter being the heaviest shipper on the Erie road; Hudson & Post, of Hudson city, represented here by D. Post, of this city; J. & D. Howell, of Chicago, and Livingston & Rosenthal, represented by H. S. Rosenthal; and many others. Mr. A. Morris, of Chicago, who is represented at this point by William B. McCarthy, of that city, ships on an average east via the Buffalo Yards, from seventy-five to one hundred cars per week.

We learn that the proprietor will immediately commence the enlargement of the Central Yards to the original extent—giving yardage for one hundred and fifty cars of cattle in addition to the present capacity, making a total accommodation for over six hundred cars. There will also be built two large sheep buildings, each 200 by 50 feet in dimensions, with all the modern improvements, including also a commodious office with additional scales and so forth. In all this the city may well take a proper pride.

GOOD SUFFOLK PIG.—A correspondent informs us that Mr. Joseph Sadler, of Kinsale, 6th concession of Pickering, has a boar pig, which weighed, when two months old, 85 lbs. The pig was sired by Mr. Jeffreys' Suffolk boar, which gained a first prize at the exhibition of 1869. The mother was an imported Suffolk sow.

The danger of eating diseased meat is alarmingly illustrated in a case reported from Leicester, where seven families, including twenty children, have been poisoned by eating "brawn" made of putrefied meat. Several of the sufferers were dangerously ill.

Prospect of the Harvest in France.

(From the Paris Galvani, June 14.)

The Paris *Siecle*, which is ordinarily pessimist in its views as to agricultural matters, has received a communication from one of its contributors, who, it says, is peculiarly well qualified to form an opinion on the subject. We subjoin the principal part:—The autumn wheats, generally cultivated on strong or heavy lands, have certainly suffered from the drought; but I believe that the evil has been exaggerated, and that the deficiency will not be so great as was feared. In many places I have seen some satisfactory crops—fine ears, stalk short; the loss will fall rather on the straw than on the grain. The spring wheats have been injured everywhere. The ryes are thin; barley greatly compromised, except the winter kinds. The oats which have not been protected from the severity of the heat by rolling, cut a very sorry figure; the others would still afford some hopes if rain should fall speedily. However, I am rather uneasy as to this cereal. The turnip fly has made frightful ravages among the colzas, turnips and swedes. The growth of the beet root has been difficult and incomplete and their progress was hindered when no possibility existed of filling up the voids by thinning out. Complaints are made as to the flax, but the hemp is good. The clover is feeble and the young lucernes could not stand the want of water. Some anxiety is felt as to the plots of artificial forage. As for the natural meadows, with a few exceptions the crop is wretched, and on the pasture grounds the spectacle is grievous—not a blade of grass shows above the ground. The only remaining resources are the after-math, the second crops, &c., but to count upon what does not exist is to run the risk of being seriously disappointed. On the other hand, the vines which have not been frozen, and the fruit trees promise well. In fine, the situation is not good for the cereals and is positively bad for the forage. The proof of the fact is furnished by the rise in wheat and oats on the market, and the fabulous price of hay. The consequences are easily to be foreseen. Cheap bread will not be seen, but no disquietude as to the deficiency of the harvest need be felt; commerce will readily provide what is wanting. As to green food, that is another affair. In spite of themselves the graziers will be obliged to reduce their herds towards the end of autumn and sell the cattle at a low price. But the fewer the beasts in the stall the less manure, and the more so that people will be chary of their litter, on account of the scarcity of straw, which will be mixed as much as possible with the ordinary food. Thus, on the one hand, but little manure for want of animals to produce it, and straw to receive it; and, on the other, of inferior quality, since it will arise from scanty nourishment. Therefore, next year the land will suffer.

The City of Ottawa Agricultural Society have issued their prize list for the Fall Exhibition, to be held in the Society's grounds, at Ottawa, on September the 21st to 23rd inclusive. The premiums are on a liberal scale, amounting in the aggregate to \$2,500. Excellent arrangements have been made for the convenience of exhibitors, for whose accommodation the building and grounds will be open three days before the admission of the public, to allow time for the proper disposal and display of their goods

The third annual Exposition, under the auspices of the Woollen Manufacturers' Association of the West and South, is to be held at Indianapolis, Indiana, beginning the first Tuesday in August, and will continue four days.

THE OHIO STATE FAIR. The fair of this society will be held at Springfield, September 12 to 16. Competition is open, and the premiums have been so increased that the aggregate will amount to more than \$25,000—the largest sum ever offered by any State Society in the Union.

Cincinnati is preparing for an Industrial Exhibition of Arts and Manufactures, under the joint auspices of the City Chamber of Commerce and Board of Trade and the Ohio Mechanics' Institute. The Exhibition is to be opened on September 21st, and to continue until October 15th.

The Scaforth cattle fair on the 21st June, was well attended, and sales were good. The transactions were estimated at about \$1,700. About thirty milch cows brought from \$30 to \$46 50. In fat cattle, one cow sold at \$56; a heifer, \$52; two steers, \$67 50; and four other fat cattle at \$117 50.

BARON LIEBIG.—A testimonial in money has been subscribed for presentation to Baron Liebig. At the Baron's request, however, it is to be devoted to the foundation of a prize, to be called the Liebig medal, and to be from time to time awarded to the scientific investigator in agricultural chemistry.

THE FIRST WHEAT!—Mr. Isaac Poole, of the Township of Oxford, County of Kent, writes us that on Monday, 27th ult., he commenced cutting his Fall wheat, and that it appears, so far, to be a fair average crop. It is difficult to keep extraordinary occurrences in recollection—but we fail to recall to mind any season in which wheat was cut in Canada on so early a day in the season.

WHEAT AND GRASS PROSPECTS IN ENGLAND.—The last *Mark Lane Express* brings us advices from all parts of the island, respecting the condition and prospects of various crops up to the beginning of June. Vegetation is said to be nearly a month later than in ordinary seasons. An early harvest is considered impossible, but the warm and moist weather of the last week or two of May has forced every thing to a rapid growth, and the spring crops are doing well. Grass suffered much by the drought and frosts of early spring, and although late rains started pastures afresh, meadows were too far advanced to receive very decided benefit, and the hay crop will in most sections be quite short. The wheat crop, too, it is thought will fall below that of average years. In fenny lands it is not at all promising, and in many localities the fields have been ploughed up and re-sown with spring grain. That which remains stands thin, even in the most favourable sections, and can not be expected to recover.

The East Middlesex and City of London Agricultural and Horticultural Societies have fixed upon the 27th, 28th, and 29th of September for a united Exhibition. The prize list has been issued, the total amount of premiums offered reaching the handsome sum of \$6,000. The novel feature of a market on the Exhibition grounds, for the sale of all kinds of stock, manufactures, &c. is to be introduced on the third day of the "Fair."

The movement for the abolition of toll-gates is making great progress in England. At the end of July, says an English paper, 51 turnpike trusts, maintaining about 500 toll-gates, extending over twenty-one counties, will be abolished, and the repeal of thirty-two Acts on the 1st November, and of two others on the 31st of December, will effect a further abolition of 350 gates. A total of \$50 will thus be cleared away during the year.

THE LONDON HORSE SHOW.—The seventh annual show of horses, in the Agricultural Hall, Islington, commenced on the 6th of June, continuing open till the 10th. It was, judging by the reports of such journals as the *Mark Lane Express* and *Bell's Weekly Messenger*, equal in merit to its predecessors. The show of hunters was especially good. The number of entries and also of exhibitors exceeded those of 1869, though the names of some of the most famous studmasters were absent from the list of competitors. The first prize in weight-carrying hunters was won by Sir Watkin Wynn for Expectation; the second by Captain T. Anstruther Thompson for Iris; Mr. H. Saunders' horse, Iron-master, taking the lead in the same class. There was also a fine show in other classes, including thoroughbreds, road and carriage horses, &c.

BATH AND WEST OF ENGLAND AGRICULTURAL EXHIBITION.—The annual show of one of the oldest agricultural associations in Great Britain—that of the Bath and West of England Society opened on the 6th of June, at Taunton, in Somersetshire. The society is now in the 75th year of its existence, and has been a zealous organization in promoting the improvement of British agriculture, which during the present century has made such rapid strides. The recent exhibitions appear, from all accounts, to have been worthy of the society's reputation. The show of Devon cattle, especially, was remarkably fine, while that of Herefords closely rivalled it in numbers, and exhibited a marked improvement on former years. The number of Durhams in competition was below either of the above classes. The chief feature of the show was the splendid display of Somerset and Dorset horned sheep, which were of such excellence as almost to warrant, says the *Mark Lane Express*, the distinct recognition of these breeds, for which flockmasters are moving. Other live stock, including poultry, were all represented, and there was an extensive and interesting display of implements.

Miscellaneous.

The "Victoria Stone."

A new artificial stone, invented by Rev. H. Highton, is described by *Engineering* for May 13th: "The process of manufacture consists in mixing broken granite with hydraulic cement, and steeping the whole, when set, in a solution of silica. Two kinds of granite are used, Mount Sorrel and Guernsey. This is broken up into small fragments on the works. It is then mixed with Portland cement in the proportions of four of granite to one of cement, sufficient water being added to render it of a pasty consistency. In this state it is filled into the moulding frames, and allowed to stand for four days to dry. It is then taken from the mould and placed in a solution of silicate of soda, where it remains for two days, when it is ready for the market. * * The material produced is known as the Victoria stone, or petrified concrete, and the objects moulded from it are flagging, sinks, mantel-pieces, coping, and cap stones, sills, stairs, and such like articles. It is not so applicable for finely cut mouldings. * * A slab of the concrete two feet wide and two inches thick, resting loosely on supports two feet apart, will bear in ten days' time an average weight of 700 pounds in the centre. After having been steeped in the silicate bath, it will sustain more than 1,000 pounds, whilst in five months it will carry 1,700 pounds, and in nine months 2,400 pounds. The crushing strength was found by Mr. Kirkaldy to be 6,441 pounds per square inch. A block, presenting a surface of six inches by nine inches, sustained a weight of nearly 160 tons. At a London brewery it has been laid to replace ordinary paving, which was constantly being broken by the rough handling of barrels. Since the Victoria stone has been laid not one slab has been broken."

Shrinking of Seasoned Timber.

The various kinds of oak, and some other kinds of valuable timber, will shrink more or less every time the surface is dressed off even a small fraction of an inch. Wheelwrights accustomed to work in oak are well aware of this fact, and a correct appreciation of it often enables them to turn out work of a superior character, even of ordinary materials, by first blocking out the pieces roughly, then allowing the timber to season, and afterward working the various parts by degrees, as the seasoning process becomes more and more complete. White oak spoke timber, for example, may be allowed to remain in the rough state for half a score of years, under shelter, without becoming seasoned so thoroughly that the timber will not shrink after the spokes have been dressed out.

Carriage wheels have often been made of the choicest quality of oak timber after every spoke had been seasoned for several years; and to the great surprise of the wheelwright, every spoke would move in the joints before the vehicle had run three months. The defect in such instances could not be attributed

to inferior timber, nor to perfunctory workmanship; but simply to this one circumstance that the parts of the timber were put together before the timber had ceased to shrink.

To prove that the best quality of oak will shrink, after a spoke has been dressed out, let a tenon be made on one end, and driven immediately into a mortise; after a few days' exposure in a warm workshop, the spoke may be withdrawn with little difficulty. The same fact will hold good in the manufacture of wood-work of any kind where oak is employed for tenons. In order to make joints that will never start, the pieces on which the tenons are to be made should be dressed over several times, until the shrinking has ceased. Then let the tenons be made. After these have shrunk, while exposed to the drying influences of a warm workshop, the spokes, or other parts, may be driven into their respective mortises, with the assurance (especially if they are dipped in oil paint previous to driving) that the timber will shrink no more.

Many kinds of farming implements, in the manufacture of which oak and ash are employed, render very unsatisfactory service, simply because the seasoned timber was not allowed to shrink before the tenons were driven into the mortises. In like manner, oak chairs and other oak furniture will frequently shrink to such an extent that the pomels, rungs, dowel-pins and banisters will all work loose, if the precaution we have described is not observed. —*Manufacturer and Builder.*

Advertisements.

CANADA AIR LINE RAILWAY.

NOTICE TO CONTRACTORS.

THE SURVEYS, PLANS, AND SPECIFICATIONS, authorized to be made by the Provisional Directors, in pursuance of the Act of Incorporation,

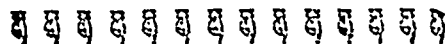
WILL BE ON EXHIBITION at my Office, in Hamilton,

From 22nd August to 2nd September next, For the construction of that part of the above-named Railway lying between Glencoe and Aylmer.

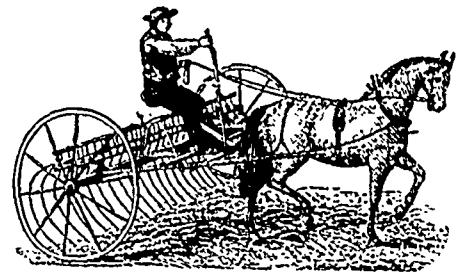
HAMILTON, Ont., 5th July 1870. } GEO. LOWE REID, Chief Engineer.

SITUATION WANTED.

A MANAGER ON A FARM, BY A YOUNG MAN lately from Scotland (son of a farmer); seven years experience, and understands stock and arable farming thoroughly, both practically and scientifically. Upper Canada preferred. v2-7-1* D. C., Post Office, St. Eastache, Montreal.



TO THE WORKING CLASS.—We are now prepared to furnish all classes with constant employment at home, the whole of the time or for the spare moments. Businessness, light and profitable. ... v2-7-1* D. C., Post Office, St. Eastache, Montreal.



Steel Tooth Sulky Horse Rake

Will do more work, easier, cleaner, and better than any other. Does not gather dust in the hay. Will rake over rougher ground. Is light and strong, well-made and nicely finished. The teeth are fine spring steel, independent of each other, and will yield to pass obstructions. Took first prize at the Provincial Fair, London, 1869. For testimonials, &c., send for circular. As our manufacture for 1870 is limited, orders should be sent at once.

Responsible Agents Wanted in every County. J. W. JAMES SOUTAR & CO., Foundry and Agricultural Warehouse, v2-4-11. Chatham, Ont.

ST. CATHARINES NURSERIES. NOTICE.

NO travelling agents are sent out from these Nurseries. The following dealers have engaged to purchase all their stock of trees and plants for the fall of 1870 and spring of 1871 at these nurseries, the same to be of first quality only. Parties ordering trees, &c. of any of the under-mentioned dealers will correspond with the parties from whom they order. Their names and address are as follows, namely:

C. P. WALDOCK, Westminster, London P. O. ROBERT GORDON, Goderich P. O. JAMES STEWART, Goderich P. O.

v2-6-21 D. W. BEADLE.

Why Does Everyone go to White's to buy Sewing Machines?

BECAUSE they can get the best Machine in the Dominion, warranted for five years, and W. A. WHITE & CO. take American Silver at Par. Call and see them at

v2-6-21 90 KING ST. EAST, TORONTO, ONT.

ANT. ROOZEN, Overveen, Haarlem, Holland, WILL BE GLAD TO SEND HIS

Catalogue of Dutch Bulbs and Roots, For 1870, to all Gardeners, Amateurs, &c., on application to box 45 D, London, Ontario. v2-7-21

WE WILL PAY AGENTS A SALARY OF \$35 PER WEEK,

Or allow a large commission, to sell our new Inventions. Address, v2-7-11* J. W. FRINK & CO., Marshall, Mich.

NEW ARRANGEMENTS AND GREAT INDUCEMENTS.

Wishing to give more attention to the raising of bees and queens, I offer the following inducements till the close of the coming Provincial Fair:—

To any person sending \$3, I will send my single-boarded hive with improved entrance, price \$3, or an individual right, price \$3, and my dollar book on bee culture, soon to be published; tickets will be sent for the book. For \$5, both hive and right, or an Italian queen, and the book. For \$10, or the highest bid above that during the next six weeks, a township right and the book. For \$12, or highest bid above that, a township right, one hive, and the book. For \$400, or highest bid above that, a right for the entire Province of Quebec, with the exception of two or three counties that are sold, this right is worth \$2,500. For \$200, or highest bid above that, I will sell a patent for a Self-acting Buggy Hub, lately introduced; specimen carriage to be seen at Brooklin, Ont.; this patent is worth \$2,000. Sale of townships not to interfere with sale of hives upon the above conditions.

v2-5-11 J. H. THOMAS, Brooklin, Ont.

DOMINION OF CANADA



EMIGRATION TO THE PROVINCE OF ONTARIO.

To Capitalists, Tenant Farmers, Agricultural Labourers, Mechanics, DAY LABOURERS, And all Parties desirous of Improving their Circumstances by Emigrating to a New Country.

THE attention of intending Emigrants is invited to the great advantages presented by the Province of Ontario. Persons living on the interest of their money can easily get eight per cent. on first-class security.

Tenant Farmers with Limited Capital Can buy and stock a Freehold Estate with the money needed to carry on a small farm in Britain. A cleared land, with a dwelling and good barn and out-houses upon it, can be purchased in desirable localities at from £4 to £10 Stg. per acre. Farm lands can readily obtain work at good wages. Among the immunities offered to intending Emigrants, by the Government, is

A FREE GRANT OF LAND (WITHOUT ANY CHARGE WHATSOEVER)

Every Head of a family can obtain, on condition of settlement, a FREE GRANT of two hundred acres of land for himself, and one hundred acres additional for each member of his family, male or female, over eighteen years of age.

All Persons over 18 years of age can obtain a FREE GRANT OF 100 ACRES.

The Free Grants are protected by a Homestead Exemption Act, and are not liable to seizure for any debt incurred before the issue of the patent, or for twenty years after its issue. They are within easy access of the front settlements, and are supplied with regular postal communication.

Registers of the Labour Market

And of Improved Farms for sale, are kept at the Immigration Agencies in the Province, and arrangements are made for directing emigrants to those points where employment can be most readily obtained. Several lines of railway and other public works are in course of construction, or about being commenced, which will afford employment to an almost unlimited number of labourers.

Persons desiring further information concerning the Province of Ontario, are invited to apply personally, or by letter, to the Canadian Government Emigration Agents in Europe, viz.: Wm. Dixon, 11 Adam Street, Adelphi, London, W. C.; J. G. Moylan, Dublin, Charles Foy, Belfast; David Shaw, Glasgow; and E. Simays, Continental Agent at Antwerp.

Also to the Emigration Agents in Canada viz.: John A. Donaldson, Toronto, R. H. Kay, Hamilton, Wm. J. Wells, Ottawa, Jas. Macpherson, Kingston, L. Stafford, Quebec; J. J. Daley, Montreal; E. Gray, Halifax, Nova Scotia; Robert Shives, St. John, and J. G. Leaton, Miramichi, New Brunswick, from whom pamphlets issued under the authority of the Government of Ontario, containing full particulars in relation to the character and resources of, and the cost of living, wages, &c., in the Province, can be obtained.

JOHN CARLING,

Commissioner of Agriculture and Public Works for the Province of Ontario.

Department of Immigration, Toronto, October, 1869. v2-2-121.

Markets.

Toronto Markets.

"CANADA FARMER" Office, July 11th, 1870.

FLOUR AND MEAL.

The market is unsettled and comparatively little business is transacted. The quotations are therefore in part nominal.

Flour—Superfine, \$5. Extra, \$5.20 to \$5.40 Oatmeal \$1.40 to \$1.50 Cornmeal—\$3.75 to \$4. Bran—\$9 to \$10.

GRAIN AND SEEDS.

Wheat—Treadwell, \$1.18; Sonnes', \$1.20 to \$1.20; Judge Proof, \$1.12, Spring, \$1.12. Barley—Inferior, 100 to 600, Br. Bl. 60c. to 70c. Oats—40c. to 42c. Peas—70c. to 80c. Rye—70c.

HAY AND STRAW.

Hay continues in full supply, with fair demand, sold here at from \$6 to \$11. Straw, in limited supply, at \$5 to \$7.

PROVISIONS.

Butter—Wholesale choice dairy, 16c. to 16 1/2c.; retail, 18c. to 20c. Cheese—12 1/2c. to 13c. Eggs—12c. to 14c. per dozen, Potatoes—4 1/2c. to 5 1/2c. per bag, Live Hogs—\$7 to \$7.25.

CATTLE MARKET.

The following are Toronto prices, dressed weight.

Beefers—From \$4.50 to \$7 Sheep—From \$3 to \$5.50 Calves—From \$3 to \$7. Lambs—From \$2 to \$3. Hides—From 6c to 7 1/2c. Steepskins—Green, \$1.25 to \$1.60; dry, 45c to 75c. Calfskins—Green, 10c. Cured, 12c. Wool—From 26c. to 31c.

Montreal.—Flour—Superior Extra, \$5.90 to \$6; Extra, \$5.90 to \$6; Fancy, \$5.40 to \$5.50, Welland Canal Superfine, \$5.20 to \$5.25, Superfine No. 1 Canada wheat, \$5.15 to \$5.40; No. 1 Western wheat, \$5.20 to \$5.25; No. 2 Western, \$4.90 to \$5; Bag flour, 100 lbs., \$2.50 to \$2.60. Wheat, Canada fall, \$1.17 to \$1.17 1/2, spring, \$1.13 to \$1.15; Western, \$1.14 to \$1.16, Oats, per 32 lbs., 39c to 40c. Barley, per 48 lbs. 60c to 65c. Peas, per 66 lbs., 92 1/2c to 95c. Butter, dairy, 17c to 19c; store-packed, 16c to 17c. Ashes, pots, \$5.45 to \$5.50, pearls, \$7.40 to \$7.50. Pork, Mess, \$25, Prime Mess, \$23. Rye Flour, \$3.60 to \$3.75.

London, July 6.—White Wheat, \$1 to \$1.14; Red do, 95c to \$1.03; Spring do, 90c to \$1.05. Peas, 60c to 74c. Corn, 60c to 70c. Oats, 36c to 36 1/2c. Barley, 45c to 60c. Fleece Wool, 25c to 32c. Butter, in rolls, 15c to 17c, do tub, 13c to 16c. Eggs, 14c to 16c. Cheese, factory, 12c to 15c; do, new, 10c to 11c.

Hamilton, July 6. Best Wheat, \$1.30 to \$1.32, Treadwell do, \$1.16 to \$1.17, winter do, red, \$1.14 to \$1.15, spring do, \$1.09 to \$1.12. Barley, 58c to 62c. Peas, 75c to 80c. Oats, 35c to 40. American Fleece, 27c to 38c; Canada fleece, 70c to 31c; superfine pulled, 27c to 28c; Common do, 25c to 29c, No. 1 do, 22c to 24c.

Port Hope, July 6.—Fall Wheat, \$1.20, spring do, \$1.05. Oats, 30c. Peas, 60c. Very little grain offering. Flour, extra, \$5.50, fancy, \$5.75, No. 1, \$5. Butter, 14c. Wool, 30c.

Collingwood, July 6.—Spring Wheat, \$1.03 to \$1.12, Fall do, \$1 to \$1.20. Oats, 30c. Barley, 50c. Butter, 15c to 16c. Eggs, 12c. Hay, \$10 to \$10.50.

New York.—Flour—10c lower; receipts, 15,000 bbls; sales, 6,000 bbls at \$4.50 to \$5.10 for superfine State and Western, \$5.40 to 6.10 for common to choice extra State, \$5.20 to \$6.10 for common to choice extra State and Western. Rye Flour, Firm. Wheat, 1c to 2c lower and heavy, receipts, 149,000 bush, sales, 55,000 bush. No. 2 Milwaukee at \$1.20 to \$1.25, amber State at \$1.44; winter red western at \$1.43 to \$1.45. Rye, Dull; receipts, 8,000 bush. Corn, firm, receipts, 29,000 bush; sales, 35,000 bush at 55c to \$1.05 for new mixed Western. Barley, nominal, receipts, 2,000 bush. Oats, Firmer; receipts, 29,000 bush; sales, 26,000 bush at 63c to 64c for Western; 69c to 70 1/2c for Ohio and State. Pork Steady at \$29.50 to \$29.75 for new mess.

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Communications on Agricultural subjects are invited, addressed to "The Editor of the Canada Farmer," and all orders for the paper are to be sent to

GEORGE BROWN, Managing Director.