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THE

# CANADA FARMER



VOL. II. No. 2.

TORONTO, CANADA, FEBRUARY 15, 1870.

NEW SERIES.

## The Field.

### Making Hedges No. 2.

**DECIDUOUS HEDGE PLANTS.** Those plants that are of a thorny nature are usually best adapted for making a hedge, though good hedges can be made from some varieties of shrubby trees that produce no thorns. One of the most popular hedge plants of America, and one that is every way adapted to the purpose, where it can be successfully grown, is the **OSAGE ORANGE**. It is a rapid grower, makes a strong thorny fence, and is easily propagated from seed. It does not, however, prove sufficiently hardy to withstand the severe cold of our Canadian winters, until the plants have become quite large and strong. In an experiment we tried with it some years ago, the plants were found very variable in their hardiness. Some of them were killed out entirely the first winter, some only partially so, while others were scarcely affected by the frost, and continued in after years to grow vigorously; but the seeming impossibility of filling up the gaps, after several trials, caused the attempts to make a hedge of Osage orange to be abandoned. Three inches apart is the distance they find best to set the plants of Osage orange in the western United States, where many hundred miles of hedges are made of it.

**WHITE WILLOW** suckers so badly it is quite worthless for hedging.

**BUCKTHORN** makes a capital hedge, and proves quite hardy here, but is of slow growth and difficult propagation, and has one serious drawback we have observed in those that have come under our notice, *viz.*, it suffers greatly from summer drought when it has got well established, often to the extent of the destruction of

so many plants as to leave large gaps in the hedge. It may be, however, that this can be prevented by mulching the ground on both sides of the hedge during summer time, with a layer of straw. Plants are set six to eight inches apart. They can be bought at most nurseries for \$6 per 1,000.

**HONEY LOCUST** makes a thick, strong, rapid-growing hedge, perfectly impervious to any kind of stock. The plants can only be raised from seed. It is somewhat liable to winter kill when young, but not nearly so much so as the Osage orange. Plants may be set out nine to twelve inches apart, and it is absolutely necessary to keep it well cut back after the hedge is established, or it will get too strong and unmanageable.

**BEECH.**—Some varieties that are inclined to be shrubby, especially the purple beech, would make an excellent hedge, perfectly hardy, and capable, when once established, of turning any kind of stock. Such a hedge would, however, require to be protected from sheep and cattle, in its early stages, as they are extremely fond of browsing on the young shoots of beech in the winter and spring. Plants set eight inches apart. Can be easily grown from seed, or young plants a few inches high, grown in the woods, may be transplanted to a seed bed, and a year afterwards set out in a hedge.

**WILD PLUM.**—Some of the prickly varieties of our wild plum ought to yield a good material out of which to make hedges, and plants could doubtless be easily obtained from seed. The wild crab would probably also make a good hedging plant under proper management, though as yet we do not think it has been tried.

For merely ornamental hedges to the garden or lawn, or inside the fence in cities and towns, there is nothing equal to

**PRIVET**, which is a quick-growing shrub, easily obtained at a cheap rate in most nurseries, and quite hardy and reliable. Set the plants four to six inches apart. **BARBERRY** also makes an excellent hedge for gardens, and is both useful and ornamental; the berries can be made into tarts and preserves by those that like their flavour.

For a low hedge bordering a garden walk there is nothing more beautiful than the **JAPAN QUINCE** (*Pyrus Japonica*), with its loads of bright scarlet blossoms in spring and early summer. Set the plants eighteen inches apart, and trim the sides in, so as to incline them to throw out branches towards the top and centre till the hedge is about three feet high, at which elevation it is to be kept by regular pruning.

### Working the Soil.

One of the great needs of the farmer is a knowledge and understanding of the benefit to be derived from the thorough good culture of his soil. It is the understanding of the necessity of this, and thoroughly carrying it out, that so greatly helps the tenant farmer of Britain to raise such uniform and heavy crops that he can afford to pay a rent for the land that seems to us out of all proportion to its intrinsic value. But to insure success in cultivating land well, it must first be rendered tolerably dry, and free from any liability to accumulate and retain water, at any and all seasons of the year; which can only be done either by tile draining, or in cases where the soil is already naturally underdrained by having a gravelly subsoil, a good surface drainage should be provided that will carry off all rain that falls in autumn and early spring, so that the land may be worked as early and as expeditiously as possible. It is one of the

great failings of our farmers that they neglect this matter to such an extent, that when seed time comes much of their land is not in a state fit to be worked to any advantage. Land that has been properly prepared in the fall, for spring seeding, is certain to yield much better crops than that which is left to lie over winter unworked. There are now so many implements of tillage and so many improvements constantly made towards economizing the labour of tilling the soil, that a farm can be well worked at a less expense than formerly, and it is a very poor economy indeed to devote land to crops unless the farmer is satisfied that he can get it into such a state of tillage, that a profitable crop can be depended upon.

It is better to have no more acreage in crops than can be so tilled as to insure a full return, than try to obtain the same amount, or but little more, from double the number of acres under indifferent cultivation.

Land that has been properly prepared in autumn, and left in such a state of forwardness as regards drainage, that no stagnant water can remain on it from the late fall or early winter rains to be frozen up in a solid mass with the soil, is likely to be much more benefited by the ameliorating effects of the frosts of winter, and be ready early in spring to be prepared for the reception of seed, than that which has been left neglected. Thorough working of the soil, also means having the land clean, and free from any rank growth of weeds to contend for mastery with the crop the farmer desires to successfully raise.

Good ploughing is an all important matter, that has generally been greatly neglected. Great improvements have been made in the construction of the plough, and that implement has been brought to a high state of perfection, so much so as to now be nearly independent of manual skill in the hands of the ploughman.

But this fact is greatly overlooked by most farmers, and we too generally find that they are content to work with old-fashioned models and forms of the plough, such as they have been accustomed to, and from a mistaken economy, seek rather for cheapness than good quality in selecting this most important implement. Ploughs either entirely of steel, or with the share and mould-board of hardened steel, and with guide wheels in front that keep them ploughing at a uniform depth, and lessen the draught on the team as well as the labour of the ploughman, are now made, and although they may cost double or treble the price of an old-fashioned plough, they

not only last much longer, but do enough more work, and of a better quality, to make them save more than the extra cost twice over in a single year. Inventive talent has been set to work, and the result is the "Volkman Plough Guide," which according to the *Maine Farmer* has on a recent trial worked satisfactorily. It is thus described:

"A plough fitted with the guide looks like a cross between a low-wheeled truck and a half-finished plough. The plough has no handles or stilts, but terminates abruptly with the rear end of the ordinary beam. The forward end of the beam (which is somewhat shorter than usual), is attached by an ingenious combination of links and thumb screws to an upright rod of iron about two feet long. This iron lies close to the mould-board side of the beam, and is so firmly attached to it that it cannot be turned over to the right or left without taking the iron rod with it, although the attachment may be easily loosened to allow the beam to be raised or lowered. The lower end of the rod is securely bolted to a horizontal axle of about three feet long. The furrow end of this axle carries a wheel about twenty inches in diameter, and the other end one of about half its size. A chain passing from about the centre of the beam to the rear of the axle is attached to a hook on the end of the draft-rod, to which the whiff-trees are made fast. This describes the essential construction of the plough. In going to the field, the beam is raised and screwed fast to the upper part of the vertical iron rod. The team is attached, and the plough is drawn along with its point raised about three inches above the ground. Arrived on the ground, the end of the beam is lowered according to the depth of cutting desired. The large wheel is set in the furrow and the team is started. The plough takes care of itself, and any boy able to keep the off-horse in the furrow is competent to do a man's work."

The field where the trial was made was a heavy clay soil, full of stones, some of them pretty large ones, and one that would test severely the best ploughman's skill to get over with any degree of credit; yet the work done in the trial of the above attachment is said to have been better than could have been done by a ploughman in an ordinary way. The implement was thrown out several times by stones, yet as soon as the obstruction was passed over, it again entered the soil, and kept steadily at the same uniform depth, as set by the guide wheels, until it met the next obstruction, when the same process was repeated.

We believe the use of guide wheels in ploughs, as generally adopted in Britain, would ensure better and faster work being done than we are yet accustomed to.

## Practical Drainage.

BY ALAN MAUDOU'GALL, C. E.

Some unfortunate impressions seem to have got into the heads of some readers, that these articles are penned for the purpose of advocating tile drainage altogether, to the exclusion of other kinds of drains or material. They were intended to give some practical idea of the method of laying in drains, cutting the grips the proper depth, distance apart etc. If from the habit of using tiles constantly, that material has been brought too prominently forward, it is to be regretted. Each farmer should select for himself that material which is best adapted to his circumstances and purse, be it stones, wood or tiles. In so large a country as this, where a great deal of work has to be done in improving lands, the circumstances under which he happens to be placed must, to a large extent, influence the farmer. In a newly settled country he can't expect to build his house and barns of stone or brick, when neither is in the locality, although in the better settled parts, or in Toronto, houses are built with both.

Because he can't get stone or brick will a man sit down saying he can't have barns and houses and stables? Will he not at once build them of wood? So, if he happens to be in a country where wood is plentiful, and other material cannot be got, what is to hinder him from making wooden drains, when he knows by so doing he is likely to improve the value of his lands and increase and improve the quality of his crops?

On no account should the want of tiles be allowed to deter a man from draining. Wooden drains will dry the land, and if they do so, all he wants is accomplished; therefore, use wood, or stones, whichever is most convenient. These kinds of drains unfortunately have some drawbacks, but for one drain that will not work hundreds will, and are daily so doing.

The material for the drain, though of great consequence, is not the only and important point to be considered, depth must not be lost sight of, and in this, so far as six months' experience among farmers has enabled me to judge, there is a great deficiency. Drains are put in too shallow, or in other words, too near the surface.

In general classes of clay soil, a drain at two feet or two feet six inches, is of little or no use, to properly repay the cost of laying it in; as has already been explained, at such a shallow depth, the water runs discolored from the pipes, showing

it is carrying off with it, from the soil, various materials that ought to remain in the soil, to aid the growth of the crop, such as manure and chemical ingredients that are found in all soils.

Then, too, a most important object must not be lost sight of, *outfall*. That is, the water borne away from the surface of the land must be allowed to get away freely; as soon as it enters the drain, it must begin to escape, or else the drain is not of any use. This is a matter of such great importance, that it cannot be too strongly dwelt upon. What is it that causes large tracts of lands, such for example as the St. Clair flats, to be unproductive at present and likely to continue so for years to come? Had there been any means of taking the water off the land by open cut ditches, canals or underground drains, would the work not have been accomplished long ago? What is meant by low-lying lands but this, that there is no escape for the water; the water cannot get away, therefore forms into a swale, marsh, or pond!

Now, when an attempt is made to dry that land by draining it, does not the natural feeling prompt a man to seek a place to let the water escape? Water does not require a great fall, it will discharge freely on a perfectly level surface, that is to say, a level surface understood in the sense of being parallel to the curvature of the earth's surface, not level in the theoretical sense, which means drawing a line to make a tangent to the surface of the earth from any given point. Water will discharge itself on a grade of six inches to a mile, provided the orifice is large enough to allow a sufficient quantity to pass through to overcome the friction in the pipe or drain, or sewer.

But if an outlet, such as a drain in the earth, is to have one end filled up with water, so that the water in technical terms backs on the drain, altering the level of that outlet two or three inches in height, when, perhaps on a field eight or ten chains long, the total amount of fall only amounts to two or three inches, the water will have no chance of escaping, and the field will remain in its old and wet condition—it will derive no benefit from the drains. This matter can easily be understood, if we take a damp cellar as an example. Suppose that, in draining a damp cellar, it was found that on one hundred yards of distance a fall of one inch was obtained, and the drain was carefully laid, so as to present a perfectly uniform surface for the water to flow over; so long as the water in the drain is kept under the level of the high end, which is suppos-

ed to be the cellar floor, that floor will keep dry, but the moment the water rises to the level of the floor, the drain becomes useless, and the cellar continues damp.

In like manner, if, in a low-lying or level field, where there is not a large amount of fall for the escape of the water, the mouth of the drain, (be the drain of stone, tile or wood,) is to be stopped up to half or three-quarters of its height, backing water a long way into the drain, only the higher end of that field would be kept dry, while the lower end was in the same, or perhaps a worse condition, than it was in before the drains were laid. A little care and forethought is always required in such cases, as it would be a waste of money, in general cases, to drain only to benefit half a field. There are cases in which, perhaps, the benefits derived from the drying of the upper half quite compensate for the cost of draining; but these are special cases, and do not occur in ordinary every-day practice. Get rid of all the water it is possible to get rid of, and try to let the water run off freely, is the true axiom of draining.

#### Effects of Salt as a Manure.

It supplies soda and chlorine to growing plants. By its attraction for water it imbibes and retains moisture, keeping the soil moist, and so assisting plants to assimilate the food contained in the earth, especially during a continuance of dry weather. It exercises a great influence in rendering soluble some of the more insoluble earthy salts of the soil. When mixed with farm-yard manure or sown upon soils already dressed with dung, it seems by its penetrative and assimilative power to cause many of the salts in the manure to be sooner developed into a state fit for plant food than would be the case if left to the action only of the slower process of natural decomposition.

When added to the manure heap in the barn-yard and thoroughly mixed into it at the rate of about two tons of salt to thirty tons of manure, it kills the seeds of weeds, eggs and larvae of insects, and greatly promotes the fermentation and decomposition of the whole mass, while at the same time it does not, like lime, set free the ammonia, or volatile salts in the manure.

When added to lime a double decomposition takes place, resulting in the production of soda and carbonic acid, both of which possess greater fertilizing properties than either salt or lime. Combined with gypsum, salt produces soda and sulphuric acid, at a cheaper rate than can be obtained in any other way.

As a general thing, there are few fertilizing materials used on the farm that cannot advantageously have salt added to them.

#### Drainage in Relation to Temperature

BY ALAN MACDONALD, C. E.

Nature has provided that under certain circumstances certain classes of vegetation shall exist: there are many beautiful plants that flourish altogether in the air, others in the water, or in large ponds. If it were tried to make these plants subsist on soil prepared for cereals or green crops, the attempt would be a failure; and in like manner to expect wheat or oats to grow in swampy land will result in a failure. The earth of itself imparts heat and other life-giving elements to all plants according to their situation, and under the laws of nature, plant life is sustained during summer and winter in swamps and ponds as well as in highly tilled land.

The heat of the earth, the great agent in plant life in the earth, is liable to great variations from different causes, such as temperature or climate and depth. In summer the land gets heat from the sun and is warmed, this warmth sinks into the land, to be retained for the use of plant life in winter. In well drained land, the canals, or larger spaces between the particles composing soil, being free to act as water or air ducts, when not perfectly dry, have sufficient moisture in them or are able to draw up enough to sustain plant life, by what is known as capillary attraction. Water being a better conductor of heat than air, draws up by this means, the heat of summer that has been stored in the earth, to the roots of plants during winter; thus feeding them and keeping them in a temperature several degrees higher than the rest of the plant that is above the surface of the ground, which may be covered with snow or frozen over. In undrained land, the canals are either so full of water, that when winter comes, all the heat rises to the surface to be thoroughly drawn out in frost; or the canals are full of air, if the soil be dry, and the heat escapes into the atmosphere.

It has been ascertained, from careful observations and experiments, that the heat of summer sinks into the earth until it reaches a point where the ordinary temperature in summer and winter does not vary; where it is at a mean or average. This depth varies from 50 to 100 feet below the surface, according to circumstances. Variation of temperature also takes place in proportion to the depth under the earth's surface: at 24 feet down it was found to be as little as 3 degrees; at a point from 50 to 100 feet down, as before mentioned it was found

to keep at an average ; at 3 feet the difference between summer and winter was found to be 21 degrees.

A widely known agriculturist, Dr. Madden, has informed us, as the result of his observations, that an excess of water reduced the temperature of the earth six and a half degrees, which amount he calculated to be equal to a difference of elevation of 1959 feet above the sea. Supposing, then, that two fields, one drained the other undrained, were lying side by side, of the same soil and under the same cultivation, the crop of the one that was drained would have all the advantages over the other, as if it were at the sea level and the other 1959 above it.

To prove that draining does affect the temperature of the soil, a premium was given some years ago in Britain, by a nobleman who takes a deep interest in the promotion of agriculture, for the best series of observations and experiments, to be made on soil of the same nature, in the same locality, and bearing the same crop. From this a collection of carefully prepared and reliable data was obtained, showing among other things that in well drained land, during a long continued frost, the temperature of the land was, at a depth of 30 inches below the surface, one degree and a half higher than the undrained : that showers of sleet or rain lowered the temperature of highly drained land 2 degrees and of undrained 4 degrees. In every case the result obtained was in favor of the drained land ; except in summer, when the temperature fell one degree after rain : even this is an advantage to land that is already dry and parched up.

When such results have been obtained in highly cultivated land, from the benefit of heat and air, there is surely a larger field open here, where such large tracts lie untouched, or even farms are undrained ; there is surely plenty here to make an intelligent man think of the great advantages he can obtain from spending his spare cash on his own land instead of lending it or going into speculation, for here is labour saved, land increased in value, and the working made easier, lighter and earlier, and the crops largely increased ; indeed, the importance of the latter is so great, that if draining be properly and carefully executed, it will repay itself in five or six years.

The cranberry lands in Ocean county, New Jersey, last year, were valued at \$2,500,000. It is estimated that the crop amounted to 70,000 bushels. The quantity harvested in 1868 was about 6,000 bushels.

### Make better Manure

The great object with all careful and intelligent cultivators of the soil is to keep the land in a state of continual productiveness, and it is becoming each year a more and more important matter, not only to save all the manure that can be made on the farm, but also to have what is saved of as rich a quality as possible. There is far less labour and expense involved in carting, spreading, and covering in manure when it is in a concentrated form than when it contains a large amount of undecomposed material, such as long straw. One of the greatest losses our farmers suffer is from allowing all the rich salts contained in the urine of animals kept through the long winter season to run to waste. Much of it might be saved and made to add greatly to the value of the manure heap by the use of some substance that will readily absorb it. For this purpose, perhaps, one of the most readily obtainable substances is swamp muck, which can generally be dug out and drawn to the barn-yard during the winter season. It will of course be all the better if it has been dug out and laid by in piles to dry for some time before using ; but even where that is not done, it will still answer well to employ it as an absorbent of the salts by spreading it over the yard in a thick layer, afterwards laying straw over it for the stock to lie on. The same plan may be adopted in the stables and byres, a layer of muck being first spread to absorb the urine, and straw spread over it for the animals to lie on. In this way the straw will last longer as bedding, and much more manure of a better quality will be secured than without the use of an absorbent.

The matter of making manure is, however, seldom thought of by the generality of farmers. They seem to think that the manure makes itself ; at least so one would judge who witnessed the total neglect and indifference shown by them on this most important subject. There is little doubt but that by using proper means of manipulation, the quantity of manure made on each farm would be doubled without the expenditure of one dollar, beyond the ordinary labour to be had on a farm in the winter season.

The great point in making barn-yard manure is to have it so managed as to decompose slowly and yet thoroughly, and to save as much as possible of the salts contained in it. While we are conscious that the quality is generally improved by keeping the manure under cover, we do not think it is a matter of so great impor-

tance as to necessitate the turning of the stock into the cold in order to use the sheds as store-houses for the manure ; but wherever there is room and to spare, it will be well to compost the manure as much as possible under cover, and when it is composted, draw it out and pile it in a large heap in the centre of the field where it is to be used the coming season. If it is to be spread on permanent meadows, the best time to do it is in early spring, after snows have gone, but before the ground gets thawed out.

### Early Reaping Machines

A recent number of the *Edinburgh Scotsman* contains the following interesting notice from "Tate's History of Alnwick," concerning two humble and almost forgotten inventors, whose names deserve to be perpetuated in connection with the early history of the reaping machine, and who may claim from posterity a recognition of their merit without detracting from the honour which attaches to the memory of Patrick Bell.

Henry Ogle, a descendant of the Ogles of Cawsey Park, was born in 1764, in the Old Pele Tower of Whittingham. After knocking about from place to place, he settled down as a schoolmaster, first at Newham and then at Rennington, where he eked out his scanty income by acting as parish-clerk and teaching a singing class and a night school ; by singing his own funeral hymns before the dead on their way to the place of sepulture ; by working in the harvest field and stacking hay or corn, at which he was proficient ; by cobbling old shoes ; and selling a nostrum of his own for cut fingers ; and yet with all these accomplishments and his labour his emoluments seldom exceeded £40 a year. John Common, his associate, lived at Denwick, where he was a maker of machines and agricultural implements. He was born at Buston, on January 25th, 1778, the son of Robert Common, a cartwright. The father and uncle of John were both ingenious mechanics and not-d pugilists. John Common, in 1818, received the silver medal and ten guineas from the Society of Arts, for an improved double-drill turnip sower ; and thirty guineas from the Highland Society for the same invention. He died at Denwick in 1868. Such were the two Alnwick men connected with the invention of a reaping machine, having many points of similarity with those now in use. As early as October, 1802, Ogle, when at Newham, having seen a notice in the papers of the trial of a reaping machine in the south of England, devised a machine which cut with a plain, straight blade ; and of this a model was made by Edward Gates, a country joiner. Some time afterwards he became acquainted with Common ; and from another improved model, made in 1822, Thomas and Joseph Brown, ironfounders in Alnwick, constructed a reaper of iron, which was exhibited in Alnwick market, and afterwards tried at Broomhouse, where the projectors were nearly mobbed by the work-people. After improvements, it was tried again on a field of wheat at Southside, and there 'cut to perfection.' Other trials followed, and in the beginning of 1832, the Browns advertised that they would supply such reapers ; but agriculturists, slumbering then under the spell of Protection, were behind the age, and not one was sold. A drawing and description of this machine are given

in the *Mechanics' Magazine* for 1826 (Vol. V., p. 50), which says—"that of McCormack's is so much the same that the same description ought to do for both." It appears that this production of Northumbrian ingenuity had been sold to the acute Yankees, by whom it has been extensively and profitably utilized. Common, too, constructed machines, one about 1811; and another, by request of the Duke of Northumberland, was sent to the Society of Arts. But though Common may have aided with his practical skill, yet to the humble schoolmaster, Henry Ogilvie, belongs the chief honour of the invention."

### White Schonen Oats and Probsteier Barley.

To the Editor.

SIR,—Early last spring I sent you an account of my receiving, from the Agricultural Department at Washington, one pound each of the above named barley and oats, imported from Hamburg. I also stated that I had that day (May 6th) drilled it in on a good piece of ground, and that I would, after harvest, report the result, and send you samples of the grain. Accordingly I have to-day sent you the samples. The seed was drilled in by hand, in drills six inches apart; it came up nicely, and soon covered the ground. On the 17th of August I cut the barley, and on the 5th, the oats. I have now threshed, cleared and weighed the grain; and have of the barley, two bushels and one pound, which is at the rate of ninety-seven bushels to one bushel seedling (it is the two rowed variety); I have of oats four bushels, which is at the rate of one hundred and thirty six bushels to one bushel seedling.

H. M. THOMAS.

Brooklin, Ont.

NOTE BY ED.—The samples of each grain were good, that of the barley particularly fine, bearing considerable resemblance to the Chevalier barley, though not equal in size and weight of berry to some specimens of that variety which we have seen grown in this country during the past year. Mr Thomas requests us to say that he will not have any of the grain for sale till after another season.

### Experiments with Thick and Thin Sown Clover.

To the Editor.

SIR, Your correspondent "C" who advocates such very thin sowing of clover in the December number of the *CANADA FARMER*, has, I think, brought forward a rather unsatisfactory "experimental trial." I, for one should be very glad to be assured that three pounds of clover was sufficient to ensure a heavy yield, as the expense of raising the best of beef-making food would be thus greatly reduced. Let us see what "C's" experiment amounts to. The spring in which "C" made his experiment was one unexceptionably favourable to a good "catch" of grass seeds, and I have no doubt that an agriculturist of "C's" standing would have his fifty acres in

very good order for the reception of the seed; moreover, he sows it with barley, which is generally acknowledged to form the best bed for clover seed. The practical experience of farmers generally is adverse to such thin sowing of clover. I have sown clover, three pounds, and timothy four pounds to the acre, (the clover seed having been raised and threshed on a neighbour's farm where it was certainly not adulterated) on land in such order as to produce a very good crop of barley; but the clover was a failure. Now, this seed was not adulterated, it was sown on land in good order for its reception, and was covered in with the bush-harrow. There is another great objection to sowing clover seed so thin. The plants come up far apart, and if, owing to a very favourable state of soil and season, we have a good crop, the stalk grows very coarsely, and is apt to become dry and brittle after curing and stacking and mowing away. I do not think that any farmer will grudge the extra seed to ensure a sweet, soft, fine-stemmed clover under all changes of season.

"C" wishes a correspondent to enlighten your readers as to a more perfect way of putting in clover seed than that usually practised. As he justly says, "by harrowing grass seed in with the crops we cover it too deeply, and by sowing it on the surface and leaving it exposed, many seeds never sprout and many germinate only to wither away as young plants." I cover clover seed either with a very light set of harrows, or with the bush harrow. If the land be hard and lumpy, which is often the case with the seed bed of fall wheat, then I use the light harrows. I do not approve of the practice of sowing grass seed upon the snow; but in the case of barley or oats, I sow my grass seed as soon as convenient after the seeding of the cereal has been completed, and cover in with a stroke each way of the bush harrow.

I think a distinction in quantity should be made between the amount sown on fall wheat and that sown on barley or oats; because the fall wheat land cannot be in as mellow a condition as that cultivated in spring for the grass seed-bed. I think ten pounds upon fall wheat and six pounds upon barley are about the quantities of good seed per acre that will receive the sanction of the majority of our most successful agriculturists.

C. E. W.

December 23rd, 1869.

NOTE BY ED.—Our own experience is decidedly in favour of a thicker sowing of grass seed than is usual among farmers here, especially when the seed is to be sown on fall wheat. Notwithstanding the humidity of the climate of Britain, and the high state of culture to which its soils are brought, the general practice is to sow grass seeds very much thicker than we do. The object to be gained by thick sowing of grass is not only to secure a good stand without fail, but also to produce grass of a fine and nutritious quality.

### Splitting Rails.

Rails do not split as well in winter when the weather is very cold as at other times. They always split best in thawing weather, and most so in early spring when the trees are full of rising sap. Many a hard day's work have we spent over the job of rail-splitting. No timber splits so easily as cedar, and without question it makes the best and most durable of rails. Next comes oak, which is often close grained and hard to split. Maple makes good easy-splitting rails, but they are liable to break from the shortness of the grain and do not last long, nor does beech, which is often stringy and tough and full of sap. Pine rails last still less time. Elm makes good rail timber, but is tough and stringy.

In cutting timber for rails it is best to split them as soon as possible after the tree is cut, as the longer it lies the more it dries out and the harder it is to split, while the sooner the rails are split and dried out after the tree is cut, the longer they will last. If, after being cut, the rails can be laid away to dry in some out-building, where they will not get sodden with rain or snow, they will dry much more quickly and last longer. If the rails are left to dry in the woods or the open air, they will dry better, as well as much more quickly, if stacked upright against a tree or stump, and if they must lie, they should be piled like lumber, each layer cross-wise on the one below it.

### Overflowed Land.

Mr. Alexander McDonald, of Beauceville, states that his land is overflowed each spring, and on the subsidence of the water a rich alluvial deposit is left. He is unable to grow good crops of grain, and asks for advice as to the best treatment.

Such land would be better adapted to pasturage (if the deposit is not too great), or the growing of forage crops for soiling stock, than for grain. The reason that grain crops on such land run to straw and lodge so badly, and yet yield but light crops of grain, is doubtless that the soil contains a large amount of vegetable matter, and not enough mineral plant food to give stiffness to the straw or weight to the grain. A good dressing of lime would be likely to prove beneficial. We should be inclined to try the virtues of salt, sown on the land after the water has subsided and the soil is ready for the crop. Sow from one to two barrels per acre, and harrow in a few days before seeding. It one barrel (280 lbs.) per acre proves beneficial, but not sufficiently so, try more. If lime can be had cheaply, try the lime and salt together, say ten or fifteen bushels of lime and one barrel of salt per acre. The refuse salt now to be had at a low price from the salt works in Goderich or Clinton is just as good for that purpose as the best. Wood ashes, either leached or unleached, would also be a good material to apply to such land.



## Fighting the Thistle.

To the Editor.

In answer to an enquirer, as to which is the best way to subdue the Canada Thistle, I much regret that, for the present, I have only my own case to report. till the growing season comes round, when I shall have two others that were badly infested, and both close at hand, so that I can thoroughly inspect them in the spring; and I do not doubt the result, for, as in my own case, nothing could be more complete, as never a thistle was attempted to be eradicated by ploughing or otherwise, save only by mowing two crops of clover. I have taken visitors over this clover patch, and asked them to look if they could see one, and two different persons have mown the two crops these last two years, and I have repeatedly asked, have you seen a thistle? The answer has always been, No. It might be well to call to mind that the two seasons, 1867 and 1868, were unusually dry at seeding time, and consequently unfavourable for the germination of the clover seed, and so, many of the crops in those two years were thin; but nothing could be better than the season of 1869 for those who wished to make the inexpensive trial of mowing two crops of clover. Let me here hint that should the land be poor, it is important not to forget a dressing, however slight, of the roughest manure, if it is only cut straw. It will save the clover should the winter be unfavourable, and benefit it also by causing it to grow earlier in the spring; and should the ground be much out of condition, do not spare, after the first cut, half a barrel of plaster mixed with a hundred pounds of fine bone dust or superphosphate, and there will be no difficulty about the second crop, and it will be quite safe as a rule to calculate on not less than three tons of hay, and with no less certainty the destruction of every thistle.

Between the two rivers, the Humber and the Credit, and by travelling either by the Lake Shore road, or by the Great Western Railroad, fields may be seen in the fall perfectly covered with this scourge, second only to the midge. In that distance I have seen a farmer with a gang of men following a reaper; every one had his hands cased with stout leathern gloves, or they could not bind up the vile staff with the precious grain, and when done, some of the sheaves would contain not less than half a dozen stout thistle stalks abounding with thistle heads, full of seeds and fully ripe. This must surely be the pursuit of farming under difficulties. An acquaintance of mine has recently rented a farm on Dundas Street, which I went to see early in the fall, and every field I walked over was thoroughly infested with thistles, and his landlord has a clause in his lease binding him to hoe out all thistles in his young grain crops. Although the landlord did not hoe them out himself, yet he can now say to his tenant, "don't you do as I did, but do as I say." In a recent number of the CANADA

FARMER a writer intimated the necessity of a law being passed subjecting all occupiers of land to a heavy fine for allowing thistles to seed. This, in many cases, would be hard, and even ruinous; for, suppose a farmer of one hundred acres has the half in grain, and all infested with thistles, consequently, all would want hoeing; and suppose a man could hoe an acre in a day, it would involve fifty days' work, and would require five extra hands, and at the same time ten thousand farmers in the Province would require the same number in proportion, and all at the same time; then, where are they to be got? I have this year looked into some young clover crops, (without timothy as an admixture); finer or thicker could not be desired, but full of thistles of the second growth after the grain was cut; but they were all weak and sickly by reason of the young clover overwhelming them. This demonstrates this fact, that clover will grow, and no matter how thick the thistles are in the ground. I am much pleased to see such men as "Vectis" and "C" grapple with this alarming invader, and it might seem presumptuous for one like myself to dare criticize anything these writers might advance, yet the book of nature is open to all; and in this matter of destroying the thistle there certainly exists, and there is apparently ground for, diversity of opinion.

In the CANADA FARMER of May, "Vectis" theorizes thus: "Dig up some thistles and replant them five times, and they will surely die." Convert this theory into practice, it stands thus; "Plough the ground five times, which makes sure work of it, and this is absolutely the only method, providing that it is done in hot weather." Now, I understand from the above that if the weather is not hot and dry, then the labour is all lost, so far as regards the destruction of the thistle. Now, the past year was neither hot nor dry, but exceedingly wet and cold, and so the thistle killing of necessity must be postponed till a more convenient season. In the June number, the two elegant experiments of "C" (p. 204), are far more to my liking; but I shall allude only to the second. He says, "the land was deeply and continually hoed, so often that it was quite impossible for any portion of the thistle to fulfil its mission," &c. The result was death, "root and branch." I would beg earnestly to call the attention of farmers to the above, for this hoeing process can be carried on amongst some root crops just as well as on naked ground, and with the greatest benefit to the young plants. The root crops best suited for this purpose are the Belgium Carrot and the Mangold. To kill all the thistles by hoeing on naked ground would require not less than ten hoeings, whereas five hoeings would be ample amongst the roots, because the roots growing on ridges forma shade to the thistle and cause it to elongate in its endeavours to reach the light; but failing to do so, it is deprived of the power to elaborate, and so the roots be-

come exhausted, and if no leaves are allowed to ripen, whether it be a thistle, horse radish, chicory, forest or fruit tree, all must die.

Again, on page 204, the writer goes on to say: "What I adduce from this second experiment is, that to effectually destroy Canada thistles we must allow them to grow until, say the middle of June; their vitality has greatly expended itself," &c. This, in principle, corresponds to the clover system; only, by the latter, the expenditure of vital energy and consequent exhaustion of the struggling plant are more complete.

Beyond this I cannot follow "C," but must face him. He recommends, after mowing his thistles in the middle of June, to plough the ground, then harrow, and then horse-hoe, and so continue till the end of the growing season, say just four months; and this would bring the expense probably equal to five times ploughing, as "Vectis" recommends. I will now put the two systems in juxtaposition, and in as pertinent a manner as I can.

"Vectis" says "nothing but five ploughings will make good work of it." "C" says "four ploughings are efficient and kill all." This, I think, is nothing strange, for we might expect that doctors should disagree somewhat in dealing with such a chronic disease. To plough the ten acres five times, or say fifty acres, would, according to the tables of "C" (page 206) consume just thirty days, and just at a time when a farmer has not thirty hours to spare. "C" claims, and no doubt justly, a great improvement over the plan of "Vectis," inasmuch as he got over his four ploughings in fourteen days, which, he says, was "efficient;" but in justice to "Vectis," the fifth ploughing must be added to the four of "C," which would raise it to seventeen and a half. In either case, look at the enormous expenditure of horse and manual labour. In the case of "Vectis," and allowing the team to be worth no more than two and a half dollars per day, or seventy-five dollars, why, I would undertake to hoe a root crop and exterminate every thistle for the same money. But the objection may be raised, "Our land must be fallowed." To which I say, "not proven." The only necessity I have ever been able to discover, hitherto for summer fallowing is when the ground is too rich to bear good grain crops—a case that does not often occur—otherwise summer fallowing can never fail to be a double loss, as in some future communication I will, with your permission, explain. But to return to the subject in hand, I would earnestly plead for the clover system. Give it a trial. If it fails, no one can lose by it. Contrast the mowing twice your crop of clover with seventy-five dollars (or half that amount) spent in belabouring your skeleton field in the form of a fallow. In the clover you take a paying crop, and leave your field of ten acres seventy five dollars better than the ten acres of fallow. I will repeat once more that which I proposed now nearly two years ago in reference to fields that are too

bad to grow any grain crop, that is, to let them grow exactly as "C" recommends, to the middle of June, and then either mow or plough them in. Then let the ground be well harrowed, or use the cultivator, or both; and then sow the ground with buckwheat. This can all be attended to after all the root crops are sown. The ground being sown with buckwheat, the farmer is free from any further tax on his time during the busy season. After the crop is removed, and without delay, run over the whole with the cultivator till every weed or thistle (should there be any) is cut off. This will excite all the seed that is shelled out to grow, and then it will not be troublesome the next year. Late in the fall the ground may be deeply ploughed, to be sown with barley and seeded down with clover in the spring. Use the cultivator in the spring, but not the plough, and then the same ground will not be brought again to the surface. The serious tax on the farmer's time and pocket in hoving out the thistles from his young grain crops might be overcome in the following manner. Two neighbouring farmers had, one a field of spring wheat, the other, oats. The ground was ploughed in the fall, and both fields thoroughly infested with thistles. It was in 1866, when the Thistle Act came into operation, and there was danger of being fined. The farmer with the wheat, just before it came in ear, took a sword, in the form of an old light scythe, cutting a piece of the blade off at the butt end and straightening the same to a handle, then walking through his wheat, working right and left, he cleared a space of some ten or twelve feet. The thistles at this time were just a head and shoulders above the grain, so that he did not injure his crop at all. A few days afterwards, the wheat having grown, there was not one thistle to be seen in the field. They were fairly checkmated; but being cut off too high, none of them were killed. The farmer with his oats adopted the following plan, which was a compulsory one. When his thistles were half a yard high, his oats were only about half as much; and seeing that if something was not done he would have a crop of thistles at the expense of his oats, he had them mowed as a crop, cutting them off just at the top of his oats and about half way down the stalk of the thistle. Now, speaking in general terms, these thistles all died, they never rallied again. Either, or both, of these plans might be useful in the forthcoming season; for to spud them all out is nearly impossible, as I have seen them so thick that I could not do an acre in a week by spudding.

In conclusion, I would once more refer to the system proposed by "Vectis" and "C" in contrast with the panacea, or clover system, for the entire subjugation of that pest, the Canada Thistle, which, "Vectis" says, is becoming alarming even on the farms of some of the best farmers. After proposing his infallible remedy—five ploughings—at the beginning of the next paragraph (page 167) are these strange words, "It is very sel-

dom that farmers either can or will make a good fallow." Now, Sir, here is a desperate disease, known and felt by thousands, and here is the one and only remedy put forth by "Vectis," and tantalizing to a degree it must be to be told that it can do them no good, as they cannot apply it, "or if you could, we think it would pay you." There is one point the writers both agree in, that if their systems are acted on, it must be both hot and dry. The next thing the country is entitled to know from these writers is, what plan have they to propose to meet the exigency of wet and cold, as their work is but just half done.

For the clover system I ask fair play, a foul season, a foul field, and no favour.

#### PUBLICOLA.

NOTE BY EDITOR.—Without attempting here to discuss this important question or pass an opinion, we cannot forbear remarking that the smothering system of "Publicola" may undoubtedly clean a field of one crop of the thistle, but what becomes of the countless myriads of seeds with which the soil is filled? What is to hinder their germinating and renewing all the trouble as soon as the clover field is ploughed under and another, say a grain crop, sown? The great benefit of a fallow and repeated stirring of the ground is that fresh seeds each time are started into life and the plants killed by the next operation before they have matured, and thus the source of the mischief—the seed of the evil—is combated and exterminated.

#### Grafting Potatoes.

The potato grafting question, says our English cotemporary, the *Agricultural Gazette*, is progressing. "It has passed through the stage of assertion, it has had to bear the brunt of ridicule, (this stage is probably not yet complete), and now it is passing through the examination period. By and by, if after due examination, it shall be accepted, we shall have people crying out that they knew all about it years ago, that it is not new, that their grandfathers practised it, and so on."

When a standard periodical, like the *Agricultural Gazette*, speaks of a fact in this manner, we may be sure that it has reliable grounds to go on, and that the question it treats of is neither a myth, nor a humbug; and the subject may very properly be again considered in these columns.

The intention of the operation is to cause a variation, a hybridization between two kinds of potatoes, by compelling the mixture of the juices and sap of two kinds, and thus to alter the nature of the root, to sink a bad quality and bring forth a good one, and even by such a mixture to produce an absolutely new variety; for the grafting a potato, unlike the grafting of an ordinary tree scion on a tree or woody stock, does not produce a continuance of the branches and body of one kind of tree, on the roots of another, but so mixes and amalgamates the sap that the produce is a joint variety, which is capable of

continuing its kind by the future planting of the so produced tubers.

The mode of conducting the operation we reproduce from the same authority, somewhat shortened, however. Take any two sound potatoes of different varieties, whose good qualities you wish to retain, cut out all the eyes of one of them entirely, with a common pocket knife; then cut out a piece of the potato in the form of a wedge, and substitute for the bit so removed, a piece having a good eye or two, nicely sprouted, about half an inch long; then tie firmly together with a piece of bast matted, or string, having first run a couple of ladies' hair-pins clear through both potatoes. These hair-pins will prevent the tie from slipping off the potatoes, as well as assist in holding both parts together. The fit must be a good one, and the bark or rind of each must meet as in any other mode of grafting. The operation must be performed quickly, and the grafted set must be planted as soon as possible, as the sap would dry up if exposed for any length of time to the air. The trench should be opened and manured ready to receive the grafted tubers, and they should be placed therein and covered up quickly with the soil. Rounds may be grafted with Kidneys, or *vice versa*, or Rounds may be grafted one on the other. Let it be perfectly understood that not every one can graft potatoes successfully, and because you fail don't blame the system. The operation should be performed by a person who thoroughly understands grafting fruit trees, then there is a chance of success; but even he may fail.

Another system is to take two potato plants growing close together, of different kinds; when the plants are well sprouted, remove the earth, and take care that you have only a single stem from each potato; bring the stems close together, graft the stems by inarching, binding the stems together with a soft elastic bandage, and covering the bandage with wet clay, or grafting wax spread on cloth, so as it may be removed when the stems have united. The result (if the operation is successful) is, that the tubers on each plant will show a great variation from each other, and also a great variation from the original kind; and as these variations, in the present state of knowledge on the subject, will be entirely chance work, you have to select from the produce, and try the tubers the second year, before the benefits, or otherwise, can be ascertained.

Another method is to take a large quill, cut it off square, and with the edges of it force it into the body of the potato at the eye, in such a manner as to withdraw the eye and a small portion of the tuber. Then make a similar hole over the eye of another tuber, withdraw the piece, and substitute the abstracted eyes, the one for the other, taking especial care that the rind of each eye fits the rind of the tuber, and makes a nice even joint. Then with a knife, or other instrument, cut away all the eyes from the rest of the tuber, leaving the grafted eyes, of course,



intact. It may be well, in all cases, to cover the joint carefully with a sufficient portion of grafting wax, or other cement which will withstand water, so as to prevent the drying up of the severed edges, and create a greater likelihood of adherence. The potatoes so grafted should in all cases be at once planted in the most favourable position possible for growth.

Now for the results. One person grafted twelve sets; he was completely successful, and from these twelve sets raised more varieties than he knew what to do with. He saved some of the best, and destroyed others; but from those saved sprung one of the most celebrated potatoes in England, now known by the name of the "Yorkshire Hero." Another person, from similar experiments, raised another new variety, now known as the "Yorkshire Hybrid." It is also alleged that our own American "Peachblow" is the result of similar proceedings. These same parties were, on other occasions, not nearly so successful.

The fact once established, numerous experimenters have been called into the field. The successful ones naturally vaunt their success, and consider potato grafting a great fact; the unsuccessful ones at once set the thing down as an arrant humbug; while doubtless there are hundreds of quiet and somewhat shy operators, who are working away in silence, and purely with an eye to the main chance, and the many new sorts daily coming into notice, are doubtless the result of grafting; for but very few would take the chance and expense of raising seedlings, which notoriously require at least three seasons' growth before any judgment can be formed of the future root; and even after that, some five or six years of care and attention are demanded before the seedling shows its true quality for future use; whereas the grafted tubers show the second year what they are, and are at once fit for propagation and spreading before the public as a new variety.

The *Gardener's Chronicle* gives a long list of experiments, which, if the subject attains importance in Canada, may be referred to in future. Meantime, it may be assumed that, from the pains-taking and highly reliable character of the agricultural journal from which the above particulars are gathered, there can be no doubt that the editor of that paper fully satisfied himself of the respectability of the parties whom he quotes, and of their standing in the gardening world, and that the evidence which that paper produces is so much to the point that there can be no question as to the facts advanced. It is safe, then, to conclude that we are on the eve of a great advancement and improvement in potato culture.

VECTIS.

The average cost of producing a bushel of wheat in Iowa is estimated at not less than eighty cents - so says the Iowa *Honest*.

Winter Wheat

Mr. H. P. Zimmerman, of the Zimmerman Mills, Nelson, sent us a short time since a number of specimens of ears of winter wheat grown on his farm. They were fully ripe, and sent with the straw attached, and the collection comprised the following varieties: Diehl, Soules, Wild-geese, Bald Treadwell, Bearded Treadwell, Red Chaff White, Mediterranean, Common Midgo-proof, Bald Midgo-proof, and Lowe. The last is a new variety, much resembling the Diehl in appearance, but having grain and chaff as white, or nearly so, as the Soules. Heads 2½ inches long, bald, and of the same shape as those of the Diehl. We should be glad to have some further particulars about this new kind, especially in regard to its yield and freedom from the attacks of the midgo.

Three varieties of spring wheat were also sent, viz., Fife, Ohio Club, and a Midgo-proof bearded variety.

In a note which came to hand some two weeks after the samples arrived, Mr. Zimmerman gives the yield of some of the varieties on his farm last year, as follows: Diehl, 32 bushels per acre; Soules, 30 bus.; Treadwell, 25 bus.; Red Chaff White, 20 bus.; Wild-geese, 16 bus.; Midgo-proof, 16 bus.; Mediterranean, only 10 bushels per acre.

He says the Diehl requires a rich, well-prepared soil, and a favorable season to succeed; with these, a good crop can be depended upon. It does not, however, make as high a grade of flour as he expected from its appearance. He seems to give the preference to the Treadwell as likely to be most certain in the hands of ordinary farmers. It is not liable to winter kill, will give a better yield than Diehl on inferior land or land that has not been well prepared, and if sown late will come out in spring better than any other kind. He gives the preference to the Bald Treadwell, over the Bearded.

No mention is made in the note of the Lowe wheat, or any of the varieties of spring wheat sent. Some parties imported very nice-looking samples of spring wheat from Scotland last year, and as several enquiries come to us about Scotch wheat, we should be glad to have any information concerning it from those who grew it the past season.

One great means of destroying most kinds of weeds is to keep the leaves and stems from appearing, by frequent mowings or cuttings. Cutting them before the seeds have ripened is, of course, absolutely essential, but not always sufficient.

The Seasons of 1868 and 1869.

Few years have shown a more marked contrast than the two last. The year 1868 was warm and dry, and the harvest very early; while in 1869 the season was cool and wet, the harvest being very late. The difference in the two seasons will be seen by the annexed record, in a tabular form, of the times of sowing and reaping the principal grain crops in each of the two years. The earliest date both of sowing and reaping is given throughout. Had the last date in each case been set down, the contrast would have been still more marked.

On the farm from which this record is taken, (and indeed the case was general in the country,) the crops were cut much greener in 1869 than they were in 1868. It would have delayed the harvest still farther by several days to have waited till the crops were as ripe as they were when cut in 1868.

The crops referred to in the table below were on the same farm and a similar soil in both years.

1868.

Crop.	Time of Sowing	Time of Re'ping	No. of days in ground.
Wheat.	April 15	July 24	101
Barley	April 22	July 18	87
Oats.	April 24	Aug. 3	101
Early Peas	April 17	July 11	86
Com. Peas.	May 2	Aug 6	98

1869.

Crop.	Time of Sowing	Time of Re'ping	No. of days in ground.
Wheat.	April 20	Aug 14	116
Barley.	April 27	Aug. 2	67
Oats.	April 23	Aug. 19	113
Early Peas	April 29	July 29	91
Com. Peas.	May 4	Sept. 1	120

Coburg

W. R.

Cost of Producing an Acre of Wheat.

Even at the present exceptionally low price of wheat, it can hardly be said to be raised at a loss, as the following estimate of the cost of an acre of spring wheat will show:

Rent of one acre, .....	\$ 3 00
Ploughing twice, fall and spring....	3 00
Harrowing twice .....	1 00
Seed, 1½ bushels at prices of last spring.....	1 87½
Sowing and covering .....	62½
Reaping by machine.....	1 00
Binding.....	1 50
Carrying to barn.....	1 00
Thrashing 25 bushels at 8c.....	2 00
Cleaning up and bagging .....	50
Teaming to market and tolls.....	1 50
	\$17 00
Gr. by 25 bushels at 80c.....	20 00

As will be seen, with wheat at 80 cents per bushel, and a yield of 20 bushels per acre, the farmer makes more than enough to pay his rent and the labour, which, if done by himself, is so much money, in his pocket, and has the straw, which, if saved in good condition, will be worth about \$7, making \$10 clear profit. If the price goes above 80 cents, or the yield is greater, every cent increase in price, or every

bushel over 25, is nearly so much clear profit. The estimate of expense must not, however, be considered as applicable to a single acre only, but as an average of expenses on an ordinary farm where ten acres or more of wheat are raised; and very many farmers, it must be admitted, fail to get anything like a yield of twenty-five bushels per acre, and of course will find a loss resulting from their inferior system of culture.

The beet sugar manufactory at Fond du Lac, Wis., is, according to the *Western Rural*, an entire success, and they are now in shape to turn out 1,000 pounds of superior sugar per day. The product of this factory is already in the market, and is highly spoken of.

It is said that in many parts of Wisconsin scarcely any varieties of grape vines will survive the winter, even when buried in the soil, except the Concord and the Delaware. A liberal mulching saves the vines of these varieties.

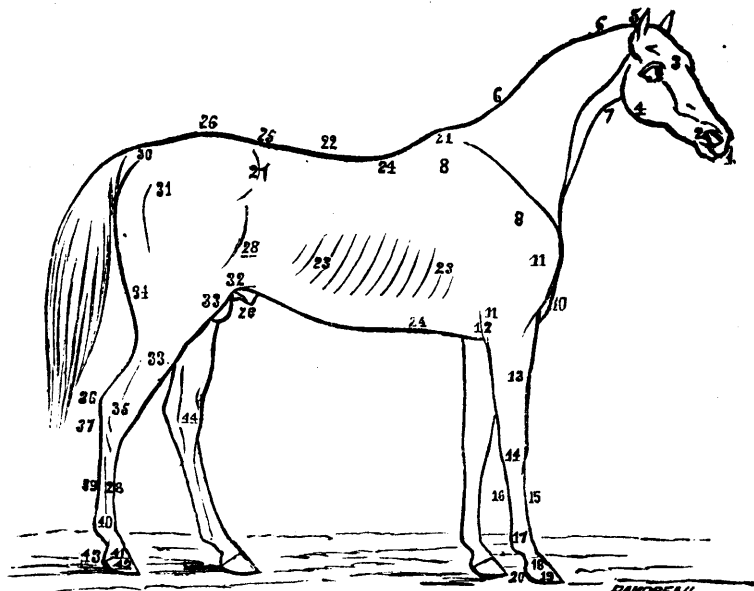
In several parts of Germany and France, last year, the grapes were gathered while the ground was covered with snow. On the first of November, the white grapes in the vine yards on the Lower Moselle had not been gathered, and some inches of snow lay on the ground.

A man in Key West, Florida, sold his crop of pineapples last year for \$7,000. This crop was gathered from less than an acre and a half of ground. He has 250,000 plants which will be in bearing this year, and these cover less than seven acres of ground, and if sold at the same rate as last year's crop, the fruit will net him \$60,000.

**AXLETREES.**—We have frequently been asked our opinion upon the different axletrees in use. For buggies and carriages: a good wrought iron axletree, so constructed that the greatest possible amount of strength can be obtained with the least possible amount of weight, is best. For light and heavy waggons, the thimble skein, if well set, we prefer, and next to this the wooden axletree, with croch skeins in iron boxes. Iron axletrees on lumber waggons are liable to become bent by bearing heavy loads, and but a sixteenth of an inch out of set is required to make a wagon run hard.

**ADULTERATION OF MANURES AND FEEDING Cakes.**—The attention of the Royal Agricultural Society of England has recently been specially directed to the very prevalent adulteration of artificial manures and feeding cakes furnished by the trade in those commodities; and under the Society's auspices Dr. Veeleker has instituted an extensive analysis of samples from various establishments. From his examination it would appear that a large proportion of the so-called Peruvian Guano in the British market is comparatively worthless, containing as little as two and a half per cent. of phosphate of lime, and three of ammonia, in place of twenty-five of the former and sixteen per cent. of the latter, which genuine guano should average.

## Stock Department.



### HEAD.

1. Muzzle.
2. Nostril.
3. Forehead.
4. Jaw.
5. Poll.

### NECK.

6. Crest.
7. Thropper, or Windpipe.

### FORE-QUARTER.

8. Shoulder-blade.
9. Point of Shoulder.
10. Bosom, or Breast.
11. True arm.
12. Elbow.

13. Forearm (arm).
14. Knee.
15. Cannon bone.
16. Back sinew.
17. Fetlock.
18. Coronet.
19. Hoof or Foot.
20. Heel.

### BODY, OR MIDDLE-PIECE.

21. Withers.
22. Back.
23. Ribs, (forming together the barrel or chest.)
24. Girth.
25. The Loins.
26. The Croup.
27. The Hip.

28. The Flank.
29. The Sheath.
30. The root of the dock or tail.

### THE HIND QUARTER.

31. The Hip joint.
32. The Stifle joint.
33. Lower thigh or Gaiter.
34. The Quarter.
35. The Hook.
36. The point of the Heel.
37. The Curb place.
38. The Cannon bone.
39. The back sinew.
40. Pastern or Fetlock joint.
41. Coronet.
42. Foot or Hoof.
43. Heel.
44. Spavin-place.

### Points of the Horse.

A correspondent asks for information on the points of a good horse. We cannot better reply than by giving some extracts, bearing on the question, from a standard work, "The Horse in the Stable and the Field," by Stonehenge, (Walsh, Editor, *Field*.) The better to elucidate the matter, we have given above an outline drawing from the same work, illustrative of the form and external anatomy of this noble animal. The principal points of excellence are indicated in the following admirable summary:

"THE HEAD.—Without a wide forehead (which part marks the seat of the brain) you cannot expect a full development of those faculties known as courage, tractability, good temper, &c. The size of the muzzle is partly regarded as an element of beauty, and partly as a sign of high breeding. Hence, in the cart-horse, a coarse jaw and thick muzzle are not regarded. A large and patent nostril cannot be dispensed with in horses intended for fast work, and should be desired even in the cart-horse, for in drawing heavy loads on a hot day, his breathing may be rendered almost as laborious as that of the highly-taxed race horse or hunter. So also with the jaw, if

there is not ample width between the two sides for the development and play of the larynx and windpipe, the wind is sure to be affected, and in addition, the head cannot be nicely bent on the neck. \* \* \* The eye is to be examined with a two-fold purpose, firstly, as an index of the temper, the nature of which is marked by the expression of this organ; and secondly of its continuing healthy. A full and clear eye, with soft, gazelle-like expression, is scarcely ever associated with a bad temper, and will most frequently continue sound, if the management of the horse to which it belongs is proper in itself. The ear should be of medium size, not too small, nor too large, nor should it be lopped, though many good lop-eared horses have been known, and some very superior breeds, like that of the celebrated Melbourne, are notorious for this defect.

"THE NECK should be of moderate length, all beyond a certain dimension being waste, and even a moderate-sized head at the end of an extremely long lever being too much for the muscle to support. It should come out full and muscular, with a sweep between the withers and the bosom, and should gradually diminish till it runs into the head, with an elegant bend just behind the ear. A very narrow throat suddenly bent at the upper

part, known as the thropple, is apt to be connected with roaring, and on that account is objected to by horsemen.

"IN THE FORE-QUARTERS there are several points to be attentively examined, and among these, the shoulder is regarded as of most consequence, when the horse under consideration is intended for the saddle. It is evident that, unless there is length of the blade, and also of the true arm, there cannot be a full surface for the attachment and play of the muscles, nor can there be the same amount of spring to take off the jar which follows each footfall. The straighter the angle formed by the long axis of each of these bones, the less spring there will be. So, also, if the angle is not sufficient, the muscles of the shoulder-blade will not thrust forward the true arm, nor will the latter be sufficiently clothed with muscles (without being loaded) to act on the fore-arm, commonly known by the horseman as the arm. Hence it is found, that with an upright shoulder, not only is the stride in all the paces short and the action stumpy, but there is not that elastic movement which enables the horse to carry his body along rapidly and evenly, without rising alternately behind and before, and thereby jarring himself or his rider. On the other hand, the upright shoulder, loaded with a thick mass of muscles, is useful in the cart-horse, and to a certain extent also in the carriage-horse, in both of which the pressure of the collar requires a steady and comparatively motionless surface to bear it. \* \* \* The point of the shoulder should be well developed, but not showing any rough protuberances, which are equally objectionable with a flat or ill-developed point. The length of the true arm is mainly dependent upon that of the blade; but sometimes when this is oblique enough, the true arm is short and upright, and the elbow stands under, or only a little behind the shoulder point. This is a very faulty conformation, and is seldom attended with good action. The chief defect in the elbow is seen when it turns inwards, and rubs so closely against the ribs that the finger can hardly be insinuated between them and it. Here the elbow is said to be tied or confined, and the horse is very apt to turn his toes out; while the opposite formation is indicated by turned-in, or 'pigeon' toes, and turn-out elbows, frequently accompanying long-standing rheumatism of the shoulders. A long and muscular fore-arm is a sure accompaniment of strong and sweeping action, and should be carefully prized; in other respects there is little to be noted here. Next comes the knee, which should be broad, and when looked at from the front should be much wider than the limb above and below. It should taper off backwards to a comparatively thin edge, and should have a good development of the pisiform bone, which projects backwards at its upper part. The leg, immediately below the knee, should be as large as any other part, and not 'tied in' there, which indicates a weakness of this part. A bend-

ing of the knee backwards is called a 'calf-knee,' and is not objected to in cart-horses, in which it is by no means uncommon; but it is very apt to lead to strains of this joint in the race-horse or hunter. A knee naturally bending somewhat forward is much preferred by good judges, though, when it is the result of overwork, it is almost equally to be avoided with the calf-knee. Flat, and at the same time large, cannon bones, without gumminess, are of great importance, and if attended with a full sized suspensory ligament, and with strong, clean, and free back sinews, the leg is to be considered faultless. The fetlock-joint should be of good size and clean, whilst the pasterns should form an angle with the ground, of between forty-five and sixty degrees. Lastly, the foot should be well formed; but the construction of this part being elsewhere more fully described, its consideration here is omitted.

"IN THE MIDDLEPIECE the withers come first under notice. It is usual to desire them high and thin, but they are very commonly too much developed, and if the bony processes stand up like the edge of a razor, without muscles in them, they are to be regarded as objectionable rather than otherwise. \* \* \* The volume of the chest is the measure not only of the capacity of the lungs, but of that of the large organs of digestion. Hence, unless there is a middle-piece of proper size, the wind is seldom good, and the stamina of the individual will scarcely ever be sufficient to bear hard work. \* \* \* The capacity of the lungs is marked by the size of the chest at the girth; but the stamina will depend upon the depth of the back ribs, which should be especially attended to.

"A SHORT BACK, with plenty of ground covered nevertheless, is the desideratum of every practical horseman. Unless the measurement from the shoulder point to the back of the quarters is somewhat greater than the height at the withers, the action is confined, especially in the gallop, for the hind legs cannot be brought sufficiently forward on account of the interference of the fore-quarter; and, indeed, from the want of play in the back, they are generally too much crippled in that respect. \* \* \* Next to these points in the middle-piece it is important to pay attention to the upper line of the back, which should bend down a little behind the withers, and then swell out very gently to the junction with the loins, which can hardly be too wide and muscular.

"IN EXAMINING THE HIND-QUARTERS, so much depends upon the breed, and the purposes to which the animal is to be put, that only a few general remarks can be given. \* \* \* Muscular quarters and gaskins are desirable in all breeds; for without strong propellers, no kind of work to which the horse is put can be duly performed. The judge of a horse generally likes to look at the quarters behind, so as to get a good view of their volume, and unless they come close together, and

leave no hollow below the arms, he suspects that there is a want of constitution, and rejects the animal on that account. But not only are muscles of full size required, but there must be strong joints to bear the strain which these exert, and one of the most important of all the points of the horse is the hock. This should be of good size, but clean and flat, without any gumminess or thoroughpins, and with a good clean point standing clear of the rest of the joint; the 'curby place' and the situation of spavin should be free from enlargement; but to detect these diseases a considerable amount of practice is required. Lastly, the hocks should be well let down, which depends upon the length of the thigh, and insures a short cannon-bone. The pasterns and feet should be formed in correspondence with those of the fore extremity, to which I have already alluded."

### Wintering Swine.

There is such a demand for pork at good paying prices, especially for large, heavy, solid bacon or mess pork, that the business of raising hogs, if properly carried out, is likely to prove a most profitable one, for at least a year or two yet. The pig is, when young, a rather thin-skinned, lightly haired animal, very susceptible to cold, wet, or changes of temperature, and therefore ought to have a well sheltered, dry place, well littered with straw, to lie in, and yet be separate from other stock; for if allowed the free run of the yard and stables, byres, &c., it will be continually running about, poking its nose into every trough and feeding box it can get at, and destroying much of the fodder when thrown down from the lofts or stack, preparatory to being carried into the feeding quarters of other stock. In fact, there is no greater nuisance on a farm than a lot of pigs, wandering about, running from house to barn and back again, getting into the way of everybody and everything. Let the brood sows be kept in their proper sties, and the shoats and stock hogs in a roomy shed, with a small yard attached, if there is no proper, well ventilated, yet warm sty, in which to keep them confined.

It is of the greatest importance that they should be kept warm and comfortable, by having plenty of litter in the place where they sleep.

It is a poor policy to feed much grain to stock hogs till they are put up to fatten, so long as other food that will keep them growing thriftily can be had. We have kept them in splendid growing condition all winter by feeding boiled Swede turnips, pulped, with fine cut clover hay, and pea chaff; to this a little ground pea meal was added. If the

hay, turnips and meal can be steamed together, so much the better. Whatever food is given them, it will be found most profitable to cook it, and if possible feed out in a slightly warm state. Abundance of water must be supplied, and some salt, and charcoal given occasionally. They should get their food at regular, stated intervals, not less often than three times a day, and always at the same hours, so that they will keep always quiet, and out of the cold as much as possible. Their feeding troughs should not, however, be in their sleeping apartment, if it can be avoided.

#### Sale of Stock.

A sale of Short-horns and high bred grade cattle, the property of Joseph S. Thomson, Mayfield, Whitby, took place on the 8th of December last, by Mr. James Patterson, when fourteen pure Short horns and fifteen well bred grades were sold. The Short-horns, comprising six bull calves, three cows, two two-year old heifers, and three heifer calves, all in fine condition, making up a good lot of much merit, brought an average price of \$142.00. The bidding, notwithstanding the large attendance, was rather slow on a few of the first bull calves brought out. However, as the hazy delusion of bidding-in at these sales vanished away, the bidding became more lively, and assumed rather a spirited character. The highest prices were on the two two-year-old heifers, which brought respectively, \$274 and \$276.

The grade cows and heifers, fifteen in number, mostly all young and in fine condition, were a very superb lot, and sold on an average at \$72 each, one six year old cow bringing \$172.

#### Shrinkage on Hogs

We wish to be able to show, by the actual experience of breeders and farmers, how much loss or shrinkage there is between the live and dead weight of fat hogs, and also the gain or loss on the different breeds, as compared with each other, and with common hogs. To that end we have communicated with parties in the United States, and shall be glad to have any of our readers furnish us with data on this question: Give the age, breed, and condition of each hog, and the live weight, just before killing, when it is presumed the animal has been fasting long enough to have an empty stomach, and the weight of each hog when dressed and hung up till cold. The drovers and pickers, agents, we find, generally insist on having a deduction made of one-third to one-fourth of the live weight, as usual, when buying hogs, without any regard to breed or condition, which we think is a serious loss to the farmers, especially those that have well-bred animals. To set the matter at rest on this point, we desire to have reliable statistics from various sources.

#### Breeding Horses.

Canadian farmers, as a general rule, are justly proud of their horses, and it is generally conceded that the farm horses of Canada, taken as a class, are on the whole the best to be found in the New World.

Much enterprise has been shown, and a good deal of money spent, in importing some of the best stallions of the purely agricultural breeds of horses, of Britain. In some townships, where the matter of breeding and care of horses has been taken hold of in an enlightened manner by a few of the most enterprising and intelligent among the farmers, the general class of horses in that locality has become in a short time so much improved and so greatly in request, as to bring buyers from distant points ready to pay handsome prices for all the animals they can get. Yet, for all this, there are thousands of colts raised every year that do not, nor cannot by any possibility, sell for as much as it has cost to raise them up to the age when they ought to be fit to work. Why is this? We will answer. The want of an observance of one general rule, viz., that "like begets like."

It is a very common practice among farmers to breed from old mares that are past any service or usefulness. We have often seen an old, worn-out mare bring at a sale of farm stock from twice to three times as much as she is worth, under the mistaken impression that she would do to breed from. This is where the fault lies with many breeders of horses, and from this cause, and no other, can be traced the continued increase of poor horses. The old mare, worn out by hard work and crippled by disease, for in nine cases out of ten this is likely to be the fact, is to become the progenitor of a race of working animals that need to have every bone, sinew and muscle of the best quality. She has a spavin, a ring bone, a touch of the heaves, or some other ailment that unfits her for work, but as a breeder she will pay for her keep! So thinks the farmer, forgetting that spavin, ringbone, &c., are mostly hereditary diseases, that descend by blood, and that however good a horse may be used for a sire, yet the imperfections of the dam must and will appear in her offspring. Her blemishes are impressed upon the issue of her body, and though they may not show during the first year or two of colt life, they are sure to appear as soon as the colt has been broken in and put to work. Another thing: an old mare, however sound and free from blemishes she may be, has her

vitality weakened by age, and although there may be cases where an old mare has produced offspring of high quality, such cases are very rare, and not to be met with except where the animal has been so well used and taken care of, performing but light labour, that she was perfect in her constitution and organization.

A moderate old age—of from twelve to sixteen years—need not exclude a mare from being used for breeding purposes, provided she is perfectly sound, free from disease or blemishes, and has not been overworked.

So common is the practice becoming of using very old mares, past their usefulness for any purpose, for breeding, that it is always unsafe to buy a colt under four years of age, unless both dam and sire are well known to the purchaser to be sound in every respect, for however good the sire may be, the deficiencies or blemishes of the dam will ultimately prevail.

In order to succeed in raising good horses, it is absolutely necessary that the dam as well as the sire should be an animal that combines all the good qualities that are desired to be perpetuated in the offspring. Some deficiencies, not very material in the dam, may be apparently corrected in her offspring, by using a sire that has exceedingly good points where those deficiencies exist, but they will again appear in the next generation after, unless great care is taken to breed so as to continue correcting them.

#### Raising Calves.

For the last year or two nothing the farmer can raise has paid him so well, under proper management, as stock, and especially horned stock. The great demand for good cows to supply milk to the cheese factories, and the constantly increasing demand for beef cattle in the United States, have caused prices to rise to a point that makes it worth while for the farmer to take more pains in selecting and feeding the calves to be raised. It is demonstrated by statistics that while there has been a steady increase of population in America there has been a falling off in the number of cattle. This has partly been caused by the comparatively high prices of grain; but now that grain has got almost below cost of production, it will be a good time to stimulate farmers into going a little more strongly into mixed farming, of which stock raising forms the leading point.

The usual practice of raising calves, as generally followed by the majority of farmers, results in making them cost, by the time they are two years old, something



considerably over their actual selling value.

They are generally the most utterly neglected stock on a farm. During summer they are often confined in a small lot near the house and fed on cold skim milk, without a mouthful of grass beyond what they can pick up from the dried-up surface of an old pasture. During winter they get the run of the yard, knocked about among the older cattle, with nothing to eat beyond the very innutritious food to be obtained from the straw stack, and the shelter of the fence corner as the only protection from the chilly blasts. They grow up stunted, scraggy, pot-bellied little brutes, worth about \$5 each when a year old. Another year finds them a little more advanced on what they can pick up on the roadsides, the woods, and, after the harvest, the stubble-fields. By the time they are two years old they are worth, perhaps, \$12 each. Another year of the same routine and they may weigh 500 or 600 lbs. each, live weight, and be worth \$18 to \$20, and at best, under such treatment, do not attain their full growth till five or six years of age, when \$25 would probably buy the best one of the lot, to be put up to fatten or turned into a dairy cow. This way of raising stock cannot and does not pay, except perhaps in the backwoods, where land is of little value.

The better plan is to raise only so many as can be well fed and attended to, say four calves to every six cows kept on the farm. Those that are the produce of the best and largest cows should be selected to raise. Let each calf suck the dam at least one week, before weaning. Then teach it to drink, and for four weeks more feed new milk only. During this time each calf will require four quarts night and morning, or eight quarts per day. When five weeks old, give an additional four quarts, at noon, of warmed skim milk, and gradually substitute warm skimmed milk for the new milk, adding to it some fine oatmeal or pea meal, stirred in, giving all that the calf will take of the milk and meal. As soon as grass gets high enough, put the calves into a nice paddock, well seeded with clover or grass. They will begin to eat grass when from six to eight weeks old. Continue feeding the milk and meal till the calf is quite able to subsist on dry provender, which will be at the age of six months. After the calf is three months old, sour milk will do if meal is added. A calf brought up in this way, ought, if a good grade, to weigh 500 lbs. when eight months old.

In winter give the calves a warm shed to shelter them, plenty of good clean straw to lie on and nibble at, all the clover hay or good clean pea straw they will eat, and in addition a few roots each day, if enough roots have been raised on the farm. The roots must be sliced.

Keep them out of the way of the older stock. If any stock is to run with them, allow only the last season's lambs that privilege. The second year give them good pasturage with abundance of water, and a regular supply of salt.

The secret of success in raising horned stock is to crowd them on, gently at first, but more fully as they get older. Under this system, and with proper management, a two year old grade shorthorn steer will turn the scales at 1000 lbs., at three years old ought to be ready to fatten, and be worth \$45 to \$50 as a store beast to feed into beef. The heifers will at two years old have become well developed. If then sent to the bull they will be likely to come in as cows before their third year is completed, and be worth at least \$40 each. The extra cost of this plan of raising horned stock will be more than compensated by the extra quantity and quality of the manure made, leaving their increased value as so much clear profit to the farmer who treats them well, and takes pains to make them valuable.

#### Disturbing Sheep.

Prof. Miles, in his observations on sheep, has called attention to the effect that sudden disturbance or any kind of agitation has on sheep. He found that any disturbance, such as the passing and repassing of other stock, retarded the fattening, and frequently threw his sheep off their feed for a time. Mr. Julian Winnie, of Albany, confirms the correctness of this observation, and says on the subject of winter care of sheep:

"Littering is something which must not be neglected. I have stood in the yard and noticed, when the littering or bedding was getting dirty, how carefully the sheep avoided it, and how reluctantly they lay down upon it; and as soon as the clean bedding was given them I have seen them drop down upon it, and rest as contentedly and happily, to all appearances, as an exhausted person upon a bed of straw. I believe that it is during this period of rest that they acquire flesh, and hence I would recommend that sheep be kept as free from disturbance as they please. Never allow strangers in the yard, unless with the feeders. I have forty sheep in one pen, (the scaffold pen), that are kept absolutely undisturbed save by the daily visits of their feeder; and their condition is better than that of those in any other pen, which I attribute wholly to the silence in which they are kept.—*U.*

#### Floors for Cattle Stables.

*To the Editor.*

SIR.—I would be much indebted if you would give us an article on the best method of constructing the floors of byres, in which fattening cattle are tied to stakes, and the best material to use—the principal objects being, to keep the cattle dry and comfortable, and to save as much of the liquid manure as possible. And perhaps you or some of your readers who have been in the habit of fattening cattle, would give us their opinion whether or not it would be a better arrangement to have the cattle loose, two and two together, by having the feeding house divided into suitable divisions, than having them tied to stakes with chains round the neck.

BYREMAN.

ANS. BY ED.—Make the floor on which the animal stands of two inch plank of pine or hemlock, laying it so that the upper end towards the head of the beast will be elevated an inch or two above the lower end, to allow enough slope for the urine to run off. These planks should just be long enough to allow the beast to stand or lie on it to the length of its chain. Beyond this, to the rear, the floor should be a little lower, say three inches with a slight slope upwards towards the rear from its junction with the standing floor. This will leave a slight depression or channel just behind the beast, in which the urine can collect. This may be filled with muck, sawdust, chaff, or any other substance that will readily absorb the urine and save the salts, and much of the dung will be dropped into it. This is to be cleaned out twice a day and a fresh supply of absorbents given. The part where the beast lies can be well littered with straw, which will last for some days by being frequently shaken up once or twice a day, and the wet portion at the bottom thrown out. Cattle require bedding to be under them at all times, as they lie down whenever they are not feeding.

There are several methods of tying cattle in byres, but one of the best is to have a short chain with a ring at one end that slides freely up and down a round post or bail, to which the animal is fastened, the other end being round its neck. The plan of large feeding boxes is not advisable here, as the beasts by being somewhat crowded together in stalls along side each other help to keep up the animal heat. For bulls or valuable cows heavy iron calf boxes are best.

#### Steaming Food for Stock

*To the Editor.*

SIR.—In a recent issue of your journal I noticed an article about boiling or steaming food for stock, the writer recommending the use of a steam boiler, which would be much too expensive for the majority of farmers.

A better plan would be to invent and fit a strong tub, the staves sixteen inches or two

feet long and two inches thick, into the top of an agricultural boiler. Slope the staves off from the outside, so that they will fit the top of the kettle tight, and plaster it round with a mixture of clay, sand, lime and ashes, till it is perfectly steam-tight. Have a hole in the bottom of the tub to pour in the water, and a hole in the side for a pipe to take away the steam: the hole in the bottom may be closed by a plug. Take your steam pipe into a box containing from 150 to 200 bushels, and you will steam it in a short time as effectually as can be desired. Last winter I worked on this plan with a common large sugar kettle set in a small stone arch, with a tub turned into it as described, and a pipe from the side of it leading into a common grain bin holding 75 bushels. In filling the bin I first put a layer of chaff or cut straw about a foot deep, and then a sprinkling of meal, and so on to the top of the box. I then filled the kettle with water to within a foot of the top, started the fire, and in a short time the steaming was complete. Instead of a common grain bin made of inch stuff, it would be better to have it made of two inch plank, with a false bottom. Some may be inclined to think that this plan may not be effectual; but I have known two taneries, in the early times of the settlement, to work for years with a similar contrivance. I trust that this hint may be of service to some of your readers.

A. LURGAN

Byfield.

**LIVE AND DEAD WEIGHT OF ANIMALS.**—The amount of meat obtained from a domestic animal sold by its live weight is very variable, and experiments have recently been made in Liverpool to ascertain the proper allowances to be made. From the statistics to be derived from the public slaughter houses, or abattoirs, of Paris and Brussels, it appears that the race and the condition of the animal, besides many other circumstances, affect the result, and that certain animals yield as much as 70 per cent. of meat, while others only give 50 per cent. The mean weight of meat produced, however, is calculated at 58 per cent. of the live weight in beef cattle. In the case of sheep, the proportion is from 40 to 50 per cent. From experiments made, it appears that the different products obtained from oxen and sheep are as follows: An ox at the live weight of 1,322 pounds yields, meat, 774.4 pounds; skin, 110.2; grease, 88; blood, 55.1; feet and hoofs, 22; head, 11; tongue, 6.60; lungs and heart, 15.33; liver and spleen, 20.65; intestines, 66.15; loss and evaporation, 151.322—making the total of 1,322 pounds. The products from a sheep weighing 110.2 pounds are as follows: Meat, 55.1 pounds; skin, 7.714; grease, 5.51; blood, 4.98; feet and hoofs, 2.204; head, 1.408; tongue, lungs, heart, liver and spleen, 1.408; intestines, 6.612; loss and evaporation, 19.835—making the total of 110.2 pounds.

## Veterinary Department.

### Internal Structure of the Horse's Foot.

The tendons or sinews connected with the foot are the terminations of the extensor pedis and of the flexor pedis muscles. The former is attached to the prominences on the upper part of the wall of the coffin bone, whilst the latter is attached to a roughened portion behind the solar division of that bone. The ligaments are those in connection with the coffin joint.

In a former number we alluded to a very important structure situated at the superior part of the wall, and known as the coronary ligament or substance. The coronary substance occupies a large groove on the inner and upper part of the wall, and appears to be continuous with the skin, its upper part being usually designated the coronet. This substance, although apparently continuous with the skin, is of quite a different structure, and presents a well-marked line of demarcation when subjected to certain anatomical tests. Internally the substance is in connection with the coffin bone, and also the extensor tendon, and externally it is attached to the wall by villi, which enter the pores of the wall.

The coronary substance is largely supplied with blood-vessels, and is a very important structure, as it is from it that the wall is produced. As it passes down on the coffin bone its inferior part becomes thinner, and gathered into numerous folds, from which the sensitive laminae appear to be derived. The sensitive laminae are those vascular plates which invest the wall of the coffin bone, and are also attached to the horny laminae on the inner side of the wall. Their connection with the wall is by an elastic structure of a fibrous-like texture, which also affords protection to the numerous blood-vessels coming from the interior of the bone. The laminae are beautifully arranged in parallel rows, being longest over the toe, and gradually decreasing in length as they pass towards the heels. Their superior extremity is in connection with the coronary substance, and the other ends imperceptibly in the sensitive sole, which fills the cavity on the solar surface of the coffin bone. The sensitive sole is more highly organized than the laminae, presenting a beautiful network of various blood-vessels. It is connected by its circumference with the edge of the coffin bone, and in the centre it is united with the frog. The sensitive sole secretes the horny sole.

Occupying the posterior and central part of the foot is the sensitive frog, which is also composed of a network of blood-vessels, of fibro-cartilaginous tissue, and of elastic substance. The frog (sensitive) is continuous with the sole and coronary substance, and has upon its upper part the *tendo perforans*. From the sensitive frog is produced the horny frog.

### Development of the Hoof

In the early months of foetal life the foot is covered with a structure somewhat analagous to the cuticle, but having the appearance of a cartilaginous substance, supplying the place of the hoof; and, like the hairs and nails, this substance originates from the cutis or skin. The material which covers the sole is the production of the sensitive sole and frog, and is very largely developed, giving the extremity an approximation to the deformity known as club foot. The portion which forms the wall is thin in comparison with the sole. The bony matter makes its appearance in the wall some time before the sole and is first observed in the form of plates passing downwards from the coronet, these plates distinctly showing the lamellated structure. The bony substance is of different textures in different animals, and also varies in the same animal, and the hoof of the horse presents a well marked and striking example of this variation, both in quality and texture. The three parts, wall, sole and frog, which form the hoof, are all fibrous in their nature, but differs in their texture. The fibres of the wall are somewhat likened to strong and coarse hairs, and run downwards in an oblique direction from the coronet to the inferior or solar border of the wall. These fibres are closely united, giving the wall the appearance of a solid substance. The wall is developed from a sensitive part that is called the coronary ligament or substance, its villi manufacturing from the blood a gelatinous matter, which becomes harder and harder, and finally develops into horn.

The fibres forming the sole are of a finer quality than those of the wall, and run in an oblique direction from behind forward, corresponding in the degree of obliquity to the fibres of the wall. The horny sole is a production of the sensitive sole, being developed from its villi. It is owing to the fineness of the horny fibres of the sole that it presents such a degree of elasticity and softness. The frog is formed of still finer fibres, which also run in an oblique direction, and are formed from the villi of the fatty, or sensitive frog.



### Internal or Sensitive Structures of the Foot.

**OSSEOUS STRUCTURES.**—The bones which enter into the formation of the foot are the coffin bone (*os pedis*), the navicular or sesamoid, and the lower pastern bone, (*os coronæ*.) The coffin bone is extremely hard and porous in its texture, with very irregular outlines, presenting an appearance somewhat analogous in shape to the hoof. It may be divided, for convenience of description, into several portions, as the wall, the sole, the tendinous surface, and the wings or alæ. The wall presents a semilunar convexity with a number of perforations; the larger of these openings are for the transmission of blood-vessels, whilst the smaller ones are for the attachment of the sensitive laminae which line the wall. At the upper part of the wall there is a prominent process, to which is attached the tendon of the principal extensor muscles of the leg. This process also tends to prevent dislocation of the joint formed by the coffin bone and small pastern bone. The lower edge of the wall shows an irregular serrated appearance, with numerous small openings for the passage of blood-vessels.

The sole is concave, and towards the front is quite smooth, gradually becoming of a more porous nature as it passes toward the wings. The tendinous surface is of a half circular shape, and is situated behind the sole, and to it is attached the tendon of one of the flexor muscles of the leg. At each end of the roughened part for the attachment of the tendon, is a groove which leads into a passage in the interior of the bone. The wings are formed of the protuberances projecting from the back part of the wall. To the upper protuberance is attached the lateral cartilage.

The Navicular bone is a very small bone situated at the back of the coffin bone, and assists in forming the coffin joint. It has been called the shuttle bone, from the resemblance in its form to a weaver's shuttle.

The small pastern bone is only partly within the hoof, and is a very strong bone, its transverse diameter exceeding its longitudinal diameter. The inferior surface has two prominences which fit into the hollow on the upper surface of the coffin bone. The three bones mentioned form a very important joint, commonly known as the coffin joint, so called because it is enclosed in the horny substance of the hoof. In this joint the motion is but slight.

## Poultry Yard.

### Farm-yard Poultry.

The relative value of the different breeds of poultry to the practical agriculturist (says the London *Field*) forms the subject of a paper in the last volume of the "Journal of the Bath and West of England Society." The writer, Mr. Tegetmeier, regards several of our exhibition varieties as of no use to the farmer. He states:

"As at present exhibited, Spanish fowls are not of any great importance in a practical point of view. Every useful property has been more or less sacrificed in the endeavour to produce a breed possessing an enormous development of white skin on the face and ear lobe. Some years since the Spanish were large, hardy fowls, remarkable as prolific layers of very fine eggs. At the present time they are diminished in size, and are certainly much less hardy than was formerly the case. High-class Spanish are certainly not fowls for the farm-yard.

"The Coloured Dorkings are large-framed heavy birds, well adapted to produce first-rate chickens for the table. The drawback to these birds is that they are rather delicate, and require, especially when young, a considerable degree of attention to ensure the production of large well-grown birds.

"The White Dorkings are small in size as compared with the coloured breed: good birds of this variety are very scarce.

"Amongst the breeds that sit and hatch their own eggs, Cochins take a good position. They are easily confined by a three foot fence, quiet and domesticated in their habits, lay well, are exceedingly hardy, and furnish large, rapidly-growing chickens for the table, although from their yellow skins and want of plumpness on the breast they do not command the first price in the market.

"For really useful purposes Brahmas closely resemble Cochins, but are somewhat superior to them in some respects. From the farmer's point of view they are most useful, affording the means of a cross with the more delicate Dorkings: the cross-bred birds thus produced being of extraordinary hardiness, growing most rapidly, and being really admirable table fowls. Rearing these cross-bred birds need not prevent the raising of pure-bred birds for stock, as if two or three Brahma hens are put into a yard stocked with pure Dorkings, or Dorking hens with Brahmas, the eggs are easily distinguished by the colours, and consequently either pure or cross-bred chickens can be hatched as desired. At the winter shows where prizes have been given for the best couple of fattened head chickens, they have been, in the great majority of instances carried off by cross-bred Brahma and Dorking.

"Game fowls are so generally known, and their merits so fully appreciated, that they

require but little comment. Self-reliant, vigorous, active, the hens admirable sitters and most courageous mothers, they are precisely suited for outlying localities, where the fowls have, in a great degree, to look after themselves. They are fair layers, and good, plump, though rather small, table fowls.

"The Pencilled Hamburgs are non sitters, but very constant layers of small eggs.

"Polish, with their singular tufted heads are rather to be regarded as ornamental than as farm-yard stock, although in suitable localities they are advantageous, being really prolific layers. The Spangled are larger and hardier than the Black variety.

"The French breeds are well worthy of the notice of the British agriculturist. Both the Crevecoeurs and the La Fleche are black, the former being distinguished by a full crest of feathers, and the latter by a two-horned comb. Both varieties are large, white skinned and plump. As table fowls, they cannot be surpassed. The young birds, fattened by being crammed with pellets of buckwheat meal and milk, supply the Paris markets with poultry of unequalled excellence.

"The Houdans are in some points even more useful, being much hardier and more easily reared than the La Fleche, which in England have proved to be delicate. For a generally useful breed the Houdans have no superior: they are most prolific as layers, very good table fowls, and perfectly hardy.

"In suitable localities ducks are very profitable. Mr. Fowler, one of the best known exhibitors, says that £20,000 per annum is received in Aylesbury and its neighbourhood for young ducks reared for the London market. Of the two, the Aylesbury are the earliest layers; if well fed, they will lay in January, the eggs are then hatched under hens, and a large number of ducklings are placed in a sheltered warm place, with one of the hens fed with meal and milk, and sent to market when seven or eight weeks old, at which time they produce from 10s. to 18s. per couple during the early spring months."

### Birmingham Poultry Show.

This great poultry show, which is almost unrivalled by any similar exhibition in the world, was held at the same time as the fat cattle show, during the first week in December. The number of entries, 2,453, was slightly below that of last year, owing perhaps to an increase in the amount of entrance fees; but the quality of the exhibition was quite up to the usual standard. There were 300 entries of Dorkings, and among them many magnificent birds. It would not have been difficult to have selected ten hens that would have weighed together one hundred pounds. The best cocks weighed twelve pounds each. Mrs. Arkwright was again winner of the first prize. The Cochins, numbering 180 pens, were also a superb class; but the Dark Brahmas seem to have been the

most remarkable feature of the show, never before having been exhibited in such numbers, or of such extraordinary excellence.

The French fowls also seem to be gaining in favour, and were very numerous and admirably represented.

The show of ducks was one of the best ever seen, even at Birmingham. The following are some of the weights of prize birds in the class of larger poultry, all being shown in pairs except the turkey cocks:—First prize, Aylesbury Ducks, 17 lbs. 12 oz.; first prize Rouens, 13 lbs. 11 oz.; first prize White Geese, 53 lbs. 8 oz.; Grey Geese, 57 lbs. 14 oz.; first prize turkey cock, 31 lbs. 12 oz.; turkey hens, 37 lbs. 1 oz. the pair. Pigeons were also well represented in nearly all the classes.

### New York Poultry Show.

The second exhibition of the New York State Poultry Show took place in the first week in December, in the Empire Skating Rink. The show was a brilliant success in all respects, save, unfortunately, the important one of attendance, for a terrible snow storm occurred, and the Rink building was hardly accessible even to the citizens, let alone distant residents. A very large proportion of the entries consisted of imported stock introduced during the past season, in despite of an import duty of 20 per cent. A considerable proportion of these imported birds, perhaps not less than one-third, have died from the effects of the voyage and necessary confinement.

The total number of entries of all kinds was 957, the poultry being about 600, and included 38 pens of Dark Brahmas, Light Brahmas numbered 40 pens, eight receiving prizes. Buff Cochins were exceedingly good. Eleven pens of partridge were exhibited, mostly birds from England, and eight pens of white and three of black were entered. Regarding the French fowls, it appears that it was in the classes devoted to them and the dark Brahmas that the greatest advancement had been made.

Waterfowl were good. Among the extra attractions there was a good display of mechanical apparatus shown by Dr. Slack in active operation. The following are a few of the special prizes. The \$0 dollar gold medal for the best treatise on rearing fowls in large numbers (2,000 to 5,000) was not awarded. That for the largest collection was awarded to H. Clay Gavitt, who showed 70 pens. The special prizes for Canadian and British exhibitors stand over. The only prize to Great Britain was a silver medal to W. B. Tegetmeier, for a set of photographs of some old oil paintings of game cocks, trimmed and sealed. There were also prizes awarded for the best coops for feeding, for exhibition, and for hen and chickens; also, the best nest-egg, and the heaviest dozen of hens' eggs.

We learn with much regret that the receipts, in consequence of the inclemency of the weather, did not cover the expenses.

### Wild Turkeys.

The ludicrous display of so-called "wild" turkeys exposed for sale in the market and stores of Toronto during Christmas week, some of them having clipped tails and other unmistakable marks of manipulation, has led me to trouble you again on the subject.

I should be glad of reliable information as to what variation, if any, may be expected in birds from different localities. The points that seem to me to require fuller explanation are: 1st. What extent of light shade is admissible at the end of the tail feathers? By extent, I mean depth of colour. How light may it be to allow the supposition that there is no tame cross? And the same with regard to the feathers that cover the rump.

The feathers on the back are very dark, almost black, if not quite so, getting lighter towards the tail, and becoming a rich brown. How light may it be, and how light the edging of these feathers?

I have now alive, a gobbler purchased as wild, having all the points he should have, but he is certainly much lighter on the rump and end of tail than any of the others that I possessed; this is the only difference.

The colour and quality of leg is a great guide. The crosses all show a roughness of skin and smuttiness of colour not seen in a true specimen. The spurs in most wild birds are black. Should this be so, or are white spurs admissible?

I know it takes four years for a turkey to come to its best plumage; but I want reliable information on the questions I have asked. If authenticated cases can not be adduced, the information will be valueless. It should be given of specimens that were trapped or killed at such distances from civilization as to render a cross almost impossible. I should esteem it a great favour if any correspondent would impart some knowledge on this interesting subject. F. C. HASSARD.

### Wintering Fowls in Canada.

To the Editor.

SIR:—As a supplement to what I have before advocated in regard to the winter care of Poultry, I have after six winters' experience concluded, that both the roosting and day house should be well littered down with straw. In a corner a large box should be placed and filled with dry wood ashes, to be replenished when necessary and a little flour of sulphur dusted in, if required. There will be no frozen toes with this treatment. Oats scattered amongst the straw will give the fowl occupation, and a daily shake up will make all neat. The droppings will fall to the bottom, to be removed once or twice a week, during the continuance of frost, and oftener in open weather.

All soft food should be given only when the hens are hungry, so as to be eaten up at once before it becomes frozen. Water dishes

should be secured so as not to be trodden upon or upset, and to be constantly replenished during the day if they become frozen. Give once a week a small feed of raw meat, and hang up a thawed cabbage for the fowls to pick at. F. C. HASSARD.

THREE HUNDRED HEAD.—Mr. J. J. Mechi, Tiptree Hall, has on his farm three hundred head of poultry. He says that fowls are the farmer's best friends, consuming no end of insects, and utilizing and economizing all waste grain. He thinks that it costs no more to produce a pound of poultry than a pound of beef.

FOWLS RECOMMENDED.—The Bristol (Mass.) Central Committee recommend the Brahmas and Dorkings for the table, the Leghorns and Hamburgs for eggs, the Games and Dorkings when all qualities are required of a high degree of excellence; and if pure breeds are not wanted, at least a game cock to improve the stock of every yard.

A MATERNAL "ROOSTER."—An American paper relates an instance of a "rooster" bringing up a brood of chickens during the past summer. When the little chickens were only two or three days old, the old hen was killed by the hogs, and Mr. Rooster became their protector. He never deserted them till weaning time. He would put on all the agony of a mother, follow the little chickens, and "cluck" just as naturally as any hen. He always gathered them under his wings at night, and laboured most zealously in his new vocation.

The trade in eggs in England increases. From 1843 to 1847 the imports amounted to 73,000,000 of eggs; during the next five years, 103,000,000 on an average; in the following year 147,000,000, and in 1866, 430,878,880 eggs, value £1,007,197. The greater part came from France; and the harbours from which the greatest export takes place are Calais, Cherbourg and Honfleur. At Calais the eggs are packed in chests and straw, 1,100 in each chest; at Cherbourg and Honfleur in chests of 600 to 1,200. The business is very profitable.

POULTRY AT THE LEEDS SHOW.—An honorary member of the Ontario Poultry Association, writing to the secretary of the society, speaks in high terms of the general character of the Leeds Poultry Show. The writer, however, makes some exceptions, and speaks of the dark Brahmas as disappointing expectation. Colour, in England, is esteemed the principal point in these birds, which should be distinguished by dark fluff and thighs, with very little of white on the breast, but white feathers on the feet, always. The combs were, in a large number of the specimens, deficient, and very few faultless pea combs were to be seen. Colour is the first point considered in judging; size next. The price of a good trio of chickens was 17 guineas. The brown and partridge Cochins were truly magnificent, as were also the clear bulls. The white variety were not well shown. There were no light Brahmas. Of Mr. Cooper's birds, the writer thinks too much is sacrificed in aiming at great size.

## The Dairy.

### Canadian Dairymen's Association.

In consequence of the necessity of going to press early in the month, we are not able in the present issue to give a detailed report of the annual meeting of the Canadian Dairymen's Association, held at Ingersoll, on the 2nd and 3rd February, but must reserve a more particular account until next month. In the meantime it may be briefly stated that the convention was well attended, the hall being filled at each session, especially on the evening of Mr. Willard's address, which was, it is needless to say, a most able, instructive and interesting exposition of the subject treated, namely, milk and its products. It was listened to with marked attention and warmly applauded by an appreciative audience, among whom it was gratifying to see so many farmers' wives and daughters.

The President's address referred to the prosperous condition of the Canadian Dairy business, the satisfactory transactions of the past year in the prices realized, the generally improved quality of the cheese and the conditions and prospects of the market. The necessity of the nicest care in maintaining the excellence of the manufacture, and generally of the extension of liberal education among farmers, was forcibly expressed.

The discussion was of a highly practical character, and elicited much useful information. It would be well, we think, if arrangements were made beforehand for some well-qualified person to open each subject. For want of this precaution, there was, at times, a little delay and flagging in the proceedings. Although the various topics were fully commented upon, no decision was expressed by the convention. Each question may be said, in technical language, "to have been laid on the table." In regard to the first question, making cheese once or twice a day, the greatest number of speakers were in favour of the former practice. With regard to the use of curd mills, many seemed to think that the doubtful advantage gained was scarcely commensurate with the increased trouble.

The question of abstracting any of the cream from the milk in cheese-making elicited quite an animated discussion, but led to no decision.

The benefits of cutting and cooking food, though only briefly considered, were abundantly set forth, as was also the advantage of corn for soiling and winter fodder.

The quality of Canadian cheese during the past year was shown to have improved, but it was manifest that the nicest care and increased attention, on all hands, to every particular in the production, manufacture, and transporting of cheese were necessary to maintain the reputation of Canadian cheese and secure remunerative prices.

The quality of Goderich salt was generally commended, but exception was taken to its want of dryness. Were this defect remedied, it would no doubt supersede the use of any foreign article.

The question of holding the convention at any other place than Ingersoll was decided by an overwhelming majority in favour of that town. We cannot but think that the interests of the Association would not suffer, and that considerable advantage would be gained in extending its influence and disseminating information by at least an occasional meeting at some other point.

### Drying Cows of their Milk.

As in most other things, there is a great variety of opinion as to the best time for drying a cow of her milk. Many farmers contend that a cow should be allowed to yield milk up to within a week or two of the time when she is expected to calve, and they do so on the grounds of their having tried the experiment, and found it to work very well; whereas others are inclined to think that fully two or three months should elapse between the time when she is dried of her milk and when she calves. We are of opinion that the latter is the more sensible course; for, although we may act upon the first plan, there is evident risk, and it is perfectly clear that, if persisted in, the constitution of some cows would not be sufficiently strong to stand it, and a loss to the farmer would be the result. We are aware that the constitution of the cow is very similar to that of the human species, and so far from draining from her what should go to recuperate and build up the frame of her offspring, strict attention should be paid to see that she gets strong and nourishing food. It is a false economy which induces farmers to milk, as it were up to the last moment, for it is again sufficiently clear, that the quality of the milk given cannot be equally good. Cows, overtaken and weakened yield milk of a poorer quality than when in vigorous health, and at the same time are more liable to fall into any disease which may be lurking about the place. For instance, the foot-and-mouth disease and pleuro pneumonia, present a formidable appearance to those cows in the condition we have just described, and owners may thank their stars if their stock escape untouched. What we would particularly enforce, however, upon the attention of dairymen, is, that they should provide feed sufficiently nourishing to uphold the constitution of those of their cows that are inclined to give milk all the year round, and are difficult to be dried off. Such animals require something more than hay (which food is generally given only) and an additional feed of ground grain (oat and corn meal mixed) should be commenced to be given in the fall of the year, or, at least, as soon as grass begins to depreciate in its nutritive quality.

Cows, whether in milk or dry, ought not to be allowed to fall off in flesh late in the fall,

or at the commencement of winter. Thin cows are more sensitive to cold, and require more food for their winter keep than they do when commencing the season with a good coat of flesh. It is always less expensive to get stock in condition during warm weather or before winter sets in, and it is, therefore, very poor economy to allow deep milkers to run down thin late in the fall, as it often entails a good deal of careful nursing all the winter through, in order to bring the animals safely over to grass.

In drying cows of their milk, attention should be given that all the milk be drawn from the udder at any one milking. Some are in the habit of only partially drawing the milk from time to time when drying off cows. It is not a good practice, as the milk left in the udder becomes thick and putrid, causing irritation and inflammation, and not unfrequently results in a loss of a teat or a portion of the bag the next season.

When cows are being dried off, they should be examined every few days, and their udders completely emptied of all accumulated milk; and with cows supposed to be dry their teats should be tried at least once a week all winter, to see if there be any accumulation of milk. We have had serious losses ourselves from trusting to hired help in this matter, and taking for granted that it had been properly attended to. There is no safety unless the work is done under your own eye, or an examination made with your own hand.—*Farmer* (Scottish)

### Educating Milkers.

Gentleness and quietness in milk-stock result, in a measure, from education. Improper training makes bad manners in the stable, as well as in the house.

A few weeks ago we saw a young and beautiful cow being driven to the shambles for slaughter. She was a cross between the Ayrshire and Short-horn, and had every appearance of being of large milking capacity. Indeed, had there been no defect in her udder this animal could have been sold at a very high price for the dairy. The history of this case, which we subsequently learned, is no uncommon one, and will indicate the losses that are constantly occurring from neglected or improper education of animals for the dairy. In the case in question the animal when young had been turned into an isolated pasture with other young stock, and with no attention in familiarizing her with persons, she grew up timid and unusually wild. At three years old she had her first calf, and difficulty was had in getting her gently and quiet, so as to be easily milked. Impatience and harsh measures on the part of the milker only increased the difficulty, and the animal became such a confirmed "licker," that resort was had to tying the feet, and in this way she was milked during that season.

The next season the milking of this cow was given to a patient and kindly-disposed

person, who, by various arts of petting and feeding, so won upon the affections of the animal, that after a little time not the least difficulty was had in milking so long as this person was employed in performing the operation. For the past season, circumstances required a change of milkers, and resort was again had to tying the feet. Finally in July one of her teats becoming sore, the difficulty of draining the milk was increased, which led to neglect in thoroughly emptying the udder, and thus a violent inflammation resulting in an abscess, so injured the udder that the animal was sold to the butcher.

We have seen so many heifers ruined which might have been fashioned into valuable stock for the dairy, that we desire to call attention to the importance of early handling and educating stock that is intended for milk.

An animal is not to be taught quietness, and a familiarity with persons in a day or a month. Habits are slowly formed, and if we would secure the highest results, the animal should be petted while young and it should have a constant familiarity with persons, and the feeling thoroughly impressed that man is its best friend, from whom it has nothing to fear, and to whom it may naturally look for kindness and attention. The system should be commenced with the calf and continued until it shall have become a full-grown animal. Then it will have formed those feelings of affection for, and sympathy with, persons, similar to those implanted in the brute for its young. We have seen heifers and cows reared in this way taking to a kind milker, exhibiting strongly marked affection, and showing a degree of patience and consideration that plainly indicated the feeling to which we have referred. Fondling and petting help to create a quiet disposition, so important to a dairy cow, and their education must begin when young. Calves and heifers should be freely handled, but never irritated or plagued, as this will teach them bad habits, which they will not forget as they grow older.

We like to see stock that can be approached at any time in the pasture, and that has no fear of being handled or patted. For a milker we prefer a heifer to come in when two years old, and if she has been well kept so as to have attained good size, she will then be old enough to become a cow. The habit of giving milk is in part a matter of education, and we prefer to form that habit young. The impression prevails with many that good blood is the only important requisite in raising dairy stock. To reach the highest success, something more is necessary—the stock must have good keep and kind care. Good blood is a requisite, but the best milking strain may be rendered inferior by poor keep and bad education. To those who have been raising calves the past season with a view of having them take their place in due time in the dairy, we say, commence at once to educate for milkers. Good feed, good care, with the habit of petting and fondling your animals, will have an important influence in moulding them to your wishes, and securing desirable results.—X. A. Willard in *Western Rural*.

**Composition of Milk of Different Animals.**

The following table of the composition of milk from different animals, will not only prove interesting, but valuable for reference

1,000 PARTS CONTAIN,

	Water	Butter	Casein matter	Sugar	Milk matter
W. mare	875.08	26.66	19.99	43.68	1.50
Cow	864.20	31.30	48.80	47.70	6.00
Goat	844.00	56.87	35.14	56.91	6.18
Ewe	832.32	61.31	69.78	50.43	7.13
Mare	801.50	24.38	33.35	52.70	5.23
Ass	890.12	18.53	35.65	50.48	5.24
Sow	818.00	60.00	53.00	60.70	8.30

**PROPORTION OF SOLIDS AND WATER IN DIFFERENT KINDS OF MILK.**

	Water	Cow	Goat	Ewe	Mare	Ass	Sow
Water	889.03	841.20	814.90	832.32	801.50	890.12	818.00
Solids	110.92	135.80	155.10	167.68	95.70	109.88	132.00
	1,000	1,000	1,000	1,000	1,000	1,000	1,000

**Salting Milch Cows.**

Wm. Egger, of Lowville, Lewis County, N. Y., a Swiss dairyman of experience, gives the method practised in Switzerland, by the best stock keepers, in salting stock. He says that cows should be salted early every morning, and if they are fed in the stable, the salt should be given before foddering. Salting in this way improves their appetite; they drink with more regularity, are kept in better health, and give more milk than when salted in the usual way, as practised by dairymen in America. He thinks it very injurious to salt milk cows only once or twice a week, as they will lick too much salt at one time, and drink too much for the day. To have stock do well, they must be fed with regularity, every day alike, and never given too much of anything at one time.

**Poison Cheese.**

Mr. N. A. Willard gives in the *Rural New Yorker* the particulars of a case where several persons were poisoned by a lot of cheese made in St. Lawrence County, N. Y. No lives were lost from eating the cheese, but several persons were made sick, with pains and cramps and excessive vomiting. Dr. Jackson, who analyzed portions of this cheese, could find no metal or mineral poisons, nor any alkaloids or deleterious vegetable principles. But he did find "a small proportion of offensive purifying animal matter," which does not belong to good cheese. He said he could not give this matter any correct name, but suggested that it might come from the rennet. Mr. Willard says—

"The facts elicited from this analysis of Dr. Jackson correspond in some respects with those discovered, a few years since, by Dr. Voelcker, and from which it would appear that cheese, as well as other kinds of

animal food under certain conditions of decay, generates a peculiar organic poison; but what the composition of this virulent poison is, the chemists are as yet unable to determine."

It would appear that cheese kept in damp, badly ventilated places, or where too much whey is left, or, indeed, all the circumstances which tend to produce a too acid curd and to generate free fatty acids, are apt to produce this peculiar poison. The cheese maker will see, therefore, how important it is to have a properly ventilated curing room for his cheese, and also that the whey be thoroughly expelled from cheese.

The quantity of milk drawn from a cow per annum, depends more than some imagine upon the milker. The best cow in the world may soon be spoiled by careless and irregular milking, whereas an ordinary animal may be made to yield much more of the delicious beverage than usual by the right performance of this simple operation. To find a good cow is not an easy thing but more easy than to find an accomplished milker.

Mr. L. B. Arnold gives the *Country Gentleman* a marked instance of the fact that odours inhaled by dairy cows will affect the milk. In June he lost a calf, the carcass of which was placed where northwest winds carried the stench over his pastures. It was soon found that the milk was tainted, and was tainted or pure as the wind changed. The cause being traced and removed, the trouble ceased. In another case dead horses in the cow pastures caused serious loss to all the patrons of a cheese factory.

**CANADIAN CHEESE IN ENGLAND.**—A correspondent of the *Belleville Intelligencer* says he visited England this summer, and was pleased to find Canadian cheese coming into favour. In some places he found it bringing a penny per pound more than the best Cheshire cheese. Most of the provision shops had large show cards labeled "Canadian cheese." There is no doubt that if the business is properly managed, our cheese will continue to gain favour in the British markets. It will be well for those engaged in cheese factories to be very particular to keep out of this market their culls and any that are in the slightest degree tainted, which can be done by selling to local grocers or retaining them till the bulk of the season's make has gone off. Another matter of importance is to have the cheese put in well-seasoned solid boxes that will run no risk of breakage; fasten the tops on in such a way that they cannot be opened without detection, till they reach the hands of the consignee in Britain. The brand of the factory, when known, should become a guarantee of their quality.

**BUTTER FROM ENGLISH COWS.**—An experienced writer gives the following estimate of the quantity of butter produced by a good English cow: "A good cow should produce eight pounds of butter per week in summer, and half of that in the winter, allowing from six weeks to two months for her being dry before calving. If she produces more, she is a superior cow, if less, below par. To produce this quantity the pasture must be good. Three acres should keep a cow in grass an hay for a year."

## Entomology.

### Emperor Moth Cocoon.

We have lately received from Mr. John Fortune, of Turnberry, Ont., a specimen of the silken pod-like cocoon of the Cecropia Emperor Moth (*Samia cecropia*, Linn.), with the remark that he found it on a pear tree, and that it was the first of the kind he had ever seen.

This cocoon, as will be seen from the accompanying illustration, is about three inches long, and an inch in diameter in the widest part; we have often, however, found them of much larger dimensions. On cutting it open it is found to consist of two envelopes, composed of brownish silk fibres closely agglutinated together; the outer one is wrinkled and very tough, and often bears the impressions of leaves to which it has been attached on the outside; within it is smooth and shining, like some kinds of tough brown paper. Between the outer and inner envelopes there is a quantity of loose lighter-coloured silken fibres, filling the space between the two coats, the inner one of which is also composed of tough closely woven silk. Snugly enclosed within all these warm wrappers lies the actual insect, in the form of a torpid chrysalis, and there it remains all through the winter unaffected by the wildest storms or severest cold. About the end of May the moth emerges—the giant of its race in this country, a handsome

brown creature whose wings expand some six or seven inches in breadth. The caterpillar of this insect, a very beautiful green worm, with curious knobs and warts on all its segments, feeds upon the leaves of the apple, pear, cherry, plum, elm, and many other cultivated and forest trees. It is too uncommon to be considered injurious, and is much more an object of interest than a foe to be destroyed.

A correspondent from Dundas also sent us a still larger cocoon of the same species, but being merely enclosed in a letter, and not put into a box, as all such specimens should be, it was, of course, smashed flat.

### Ants as Hosts.

One of the most remarkable phases in the life-history of ants is the fact of their entertaining guests in their community; that is to say (in addition to the slaves which they carry off by force from other nests and employ as workers), there are insects, not of their own order, whom they allow to share their abode without let or hindrance. This subject has within the last few years been carefully investigated by entomologists, and from the results of their labours we gather that these guests may be ranged in three groups. The first group contains those insects which oc-

cupy the "formicary," in common with the rightful owners, in the larval condition only. Such is the handsome rose chafer (*Cetonía*), the grub-like larva of which is met with in the nest of the great Wood Ant (*Formica rufa*), feeding on the particles of decayed wood, which the Ants have brought together, and have imbedded in the cone-shaped mass which forms the hill or roof of their underground home.

In the second group are classed all those which occupy the formicary in their perfect condition, but which are not found there exclusively. To this class belong members of the Coleopterous genus *Hister*, and some of the Staphyline or burying-beetles, all of which are voluntary denizens. But, besides these, numbers of aphides or plant-lice are constant occupants of the nest, who have not sought its shelter of their own free will, but are kept there by the Ants themselves.

It is a well-known fact that Ants are particularly partial to the sweet fluid which exudes from the two tube-like orifices on the back of the aphid, and not only may they often be seen on rose twigs and elsewhere, where plant-lice abound, licking up the coveted treasure, but they actually carry the little animals into the nest and carefully tend



them, with the sole purpose of using them as so many insect cows!

Among the tree-dwellers, *Lasius fuliginosus* and *L. Brunneus* most commonly entertain *Lachnus longirostris*, which gets its living off the trees to which it is confined, piercing the young shoots with a beak which is quite three times the length of its own body.

Where the nests are underground, the imprisoned aphides support themselves by extracting the sap from the roots of the grasses in the immediate neighbourhood.

Sometimes, instead of transporting the plant-lice to their nests, they secure a colony of them in a kind of earthen case, or they connect them with the formicary by means of a covered way.

In tropical lands, where the aphid does not exist, its place is supplied to the ants by a near relative, a certain small Cicada.

Under the last class are included those guests which never quit the formicary; there they are born, there they pass through their several changes, and there they die. The reader will perhaps be surprised to hear that nearly three hundred species of insects, mostly beetles, are known, in Europe alone, to spend their days in this extraordinary manner. Among them are members of the genus *Pselaphus*, and more than one hundred Staphylini.

Two species of Ant, *Lasius fuliginosus* and *Formica rufa*, seem to be specially given to hospitality, as they harbour between them a very large proportion of these strange guests; but what purpose the latter serve in the colony, what relation they bear to their hosts, or what they do to earn their living—these are still among the many mysteries which have yet to be solved.—*Science Gossip*.

### Those Terrible Tomato Worms Again.

In the October number (1869) of the CANADA FARMER, we published a communication from a Mr. A. C. Osborne, teacher at Fort Erie, referring to the death of a lady and the poisoning of several other people by the terrible Tomato-worm. Having not a particle of belief in any such stories, however common they may be, we asked our correspondent to afford us some definite information respecting the parties injured, the coroner's inquest on the lady, the medical attendants of the others, etc., etc.; but, as we rather anticipated, there was no definite information to give. We have never heard another word on the subject since!

We should probably have forgotten all about the matter till the tomato season comes round again, and produces its annual crop of absurd stories, had we not observed the following highly satisfactory and most conclusive letter in *Moore's Rural New Yorker*, (Jan. 1st, 1870, page 11). "Much has been said in the *Rural New Yorker* about the 'Tomato Worm' not

being poisonous. I do not know as it is poisonous enough to kill, but I do know by my own experience that its sting is poisonous, and very painful. Last fall, while picking Lima beans, in reaching up under the leaves, near the bottom, I felt something prick or sting my left hand near the root of the thumb, which I surmised might be the prick of a Canada Thistle, but on putting my hand back again was stung so severely as to call forth an exclamation of pain. I did not stop to see what it was that hurt me, but went at once into the house and bound moistened soda on the wound, which was plainly indicated by a small red spot. Returning to the garden, I searched for the foe, and found it to be a large tomato worm, which I destroyed on the spot. I could find no Canada Thistle or other cause to produce the sting. Renewing the application of soda several times, the effect was removed in a few days, though attended with pain.

MRS. D. W. WHITE.

Alden, N. Y."

Some ungallant old bachelors are rude enough to say that women never understand logic, and that therefore they cannot be expected to manifest any clear reasoning; of course, we should not venture to subscribe to any such disagreeable statement, but perhaps we may venture mildly to suggest that



the authoress of the above paragraph never learnt Euclid! It appears that when picking beans she was stung twice by some creature concealed beneath the leaves; she did not stop to see what it was that hurt her, but went into the house and made an application to the wound, returning, "she searched for the foe," and found a large tomato-worm, which she killed on the spot! Were it a plainly established fact that tomato-worms can and do sting, we should hardly consent to admit the foregoing story as an instance of the effects produced by their attack, and a successful mode of treating the wound; but as the object is to ascertain whether these creatures do or do not sting, we cannot accept Mr. White's narration as affording us any evidence whatever. It might have been, and no doubt it was, a wasp, a hornet, a bee, or some other Hymenopterous insect that really possesses a sting, that inflicted the injury upon this lady; while she was in the house there was nothing to prevent it from flying or walking away, and so the poor innocent tomato-worm, that chanced to be the biggest and ugliest insect near, comes in for all the blame, and without judge or jury is straightway executed upon the spot. With only such evidence to the contrary as the foregoing and similar statements, we must still adhere to our former declarations, that a Tomato worm (*Sphinx maculata*) is just as physically incapable of stinging as a chicken or a lamb

#### A State Entomologist for Minnesota

We are pleased to learn that at the late meeting of the Minnesota State Horticultural Society in Rochester, Minn., resolutions were passed earnestly recommending the Legislature to provide for the appointment of a State Entomologist. We hope their recommendations will be heeded, and that other States will soon follow the good example. Every State in the Union is cursed with some noxious insects peculiarly its own, and the greater the number of workers in the field, the more quickly shall we become masters of the situation. It is really surprising that in a great agricultural country like ours, subject to such serious insect depredations, so few of the States have appropriated the pitance necessary to the prosecution of proper Entomological studies.—*American Entomologist*.

INSECT DESTROYING ASSOCIATION.—Associations of this kind are being started in New Jersey, with a view to the more successful cultivation of apples, pears, peaches, etc. The object is to adopt a plan which will work to clear orchards of injurious insects of every kind. It is held that if every fruit grower will adopt some established means to rid his orchard of these insects, and sedulously and honestly attend to it, the culture of fruit will be made a certainty and the profitability of it will satisfy the reasonable demands of every one. It is further held that all farmers and cultivators of fruit will be forced to come into the measure on the principle of self-interest; that is, they must either destroy the insects or fail of success.—*Germania Telegraph*.

## Correspondence.

### Preparing for Immigration

To the Editor.

Sir,—The subject of emigration is one of great interest to farmers. All feel that with such high priced labour, farming must always be restricted to a small sphere, in comparison with what it would be if the needful help were more abundant.

The reason for this scarcity of labour is simply the fact, that the working man can make enough on wild land to tempt him to go there, instead of remaining hired out at small wages. There is, therefore, little or no chance of any alteration in this respect. Our present generation will not see all the available land in Canada occupied, and were it even so, the United States will tempt immigrants to their prairies, directly labour is cheap enough to make the working man dissatisfied with his position here. When the writer came to Canada, thirty-seven years since, hired men were plentiful enough, by the year, at one hundred dollars and board; now, the wages are nearly double; but so is the cost of living, and the labourer could do better then than now. We therefore have no chance to get labour cheapened in that way, and we must turn our attention to "utilizing" the labour of the immigrant directly he arrives, and affording inducements for others to come as fast as those previously arrived have been absorbed by the woods as farmers, or by Uncle Sam as raw material for him to make taxes out of.

It has long been an idea of mine that if I were placed in the position of an emigrant, just arrived from home, and delivered by rail at some country station, I certainly would, under present management of emigration matters, go on westward as far as my money or ticket would carry me, with the hope, at least, that I might meet with better organization somewhere by which I could be at once placed in a position where my labour would find remunerative employment. Under existing circumstances the following picture is often realized: The immigrant gets off at a station in Canada with a light heart, feeling as if he had arrived at last at his destination; his family, if he has one, all stand around him, his small stock of baggage is piled up on the platform. The engine whistle screams, and away, with the rest of its living cargo, dashes the train, the only one thing that has hitherto seemed to him like a house of refuge or a place to welcome him since his arrival in Canada. He turns to some bystander and asks for employment, or directions where to seek it, but is answered that he does not at that moment want any one. He tries the next, and often many more with generally the same result. He begins to feel troubled, night is coming on, and he and his must go somewhere for

food and shelter; little children are wearied, the poor mother is tired and half worn out, and all long for home; but home there is none. They go to some little tavern, and expect to find welcome for such small amount of money as they possess, or think prudent to spend; but the tavern-keeper knows full well by experience that they are not always fit for the same beds that the farming community like to have given them, and therefore, as they are "only immigrants," they must do the best they can. Now, can any one deny these facts? Not that this happens in every case, for our few agents do all they can to meet the difficulties of the new arrivals. No wonder the immigrant, sorely discouraged and faint-hearted, falls into an unhappy, depressed state, blaming Canada and all concerned, whilst the fact really is that all over the country his labour and that of his family are wanted, but not at that particular moment, probably, by any one about the station where he has stopped. It follows, then, that if immigrants are to be induced to stop in Canada, some better organization must be had to provide for them on their arrival. It is of little use to trust to Government assistance, or private philanthropy: both are far too slow, and seldom available when most wanted.

The true course is for each township wanting the labour, to assist in appropriating it and maintaining (or assisting to maintain) it until appropriation can be brought to bear. In other words, to assist the newly-arrived acquisition for a short time, until some one comes into the town or village enquiring for help, or the head and effective members have time to seek employment. This can be readily done, and would cost but little. Each township contains about on an average one hundred square miles, and probably some townships would have as many as at least five hundred homesteads, some more and some many less; but we will suppose there are five hundred farms. Now, if each farm paid two dollars towards an immigrant support fund, each year, with the understanding that one hundred families would probably be employed in the vicinity, or were induced to stop at the village, and were during their stay, whilst seeking employment, paid, in some way or other, ten dollars each family, I maintain the farmers would make money by the transaction, and would in many ways be the gainers. The farmer almost at any time could go the village and get any help he may require and when he wanted it, and as the immigrant would be continually changed and would be informed that he must not expect a continuance of the assistance, but only until an application had been made for him by parties requiring his services, there would not be likely to be any impositions on this score. On y absolute staple articles like bread and potatoes would be furnished, and then not given away except in cases of destitution. Many could afford to buy them, or pay, say, half price



for them, and such provisions could, of course, be supplied by the resident store-keeper, under the supervision of the reeve and a board of three magistrates, or some active person to be appointed, and to be called the President of the local Board of Emigration for the town of—in the township of—

The grand desideratum is, of course, to have some building or shelter appointed for the reception of the immigrants with families, divided into rooms; and perfect cleanliness and all necessary details of management to be enforced by by-law of the municipality in which the building was located. There must be some restrictions as to price of employment to be demanded by those requiring it, if obtained by the Board; and a refusal of the sum, as too little, must be construed into a desire for the cessation of any further assistance, and compel the immigrant to undertake his own care. The foregoing crude ideas would only apply to those immigrants who had directly arrived, and a ticket of occupation of room No.—from the President of the Board, or one of the members in case of his absence, should constitute the same right as an ordinary local occupancy, and be always ready for any family on their arrival. I do not mean to say that the foregoing hints are so carefully arranged as to be adopted as they are now expressed. My object is to call the attention of the different municipalities throughout the country to the necessity of acting so as to prevent the immigrant passing away from amongst us, too often merely from his inability to find a home and shelter at any station he may choose to stop at. Of course all needful communication between the present immigrant organization and the local boards above referred to, must be had. Toronto must facilitate the immigrant agent's labours, and I am well assured double the number would stop in Canada instead of passing on to the United States. The present time seems especially suitable for discussing this important matter, in order that plans may be matured and all necessary arrangements made before the spring tide of immigration begins to flow upon us.

C.

### A Settler's Story.

To the Editor.

SIR,—Fifteen years since, losses and depreciation of property caused me to come to Canada. I arrived here with but little over \$600, and a young wife, one child, and an earnest determination to make a living if it could be made by industry and perseverance. The first thing I did was to place my money where it would be quite safe, to be used only in absolute emergency. I soon became more at home, and found, after careful enquiry, that there were but few chances open to a friendless Englishman to make a fortune without going to work, by which alone I could hope to become an independent owner

of a home. I at once hired as a clerk, and was fortunate enough to obtain a salary of forty dollars a month; but my monthly pay did not do much more for me than find us in the necessaries that a residence in the city required. We tried this mode of life for about twelve months, and I saw that it was advisable to try some other course, or obtain a higher salary.

My employer just then required another clerk and also a bookkeeper. I wrote, by his direction, an advertisement to that effect, and took it to the GLOBE for publication, desiring replies to be made in writing. The first day elapsed, and no application was made, and I was greatly in hopes I might obtain the situation as bookkeeper myself, with its increased salary; but next morning all hope of such good fortune vanished. I brought home from the post office no less than thirty-six applications of one sort or another, at offers for salary of sums varying from \$200 to \$600 per annum, and qualifications and references equal, by their own account, to any emergency. Many of the applicants were willing to do all that was required for any salary that was offered, until better chances should occur, and some would name no amount, but wanted employment at any rate. All, however, it was manifest, wanted work, and at my then especial avocation. Some gave the best references, others could give none; but the upshot was that my employer could not decide, and deferred until next day to answer, so that by seeing some of the references he could obtain some idea of the qualifications of the applicants whose mode of answering seemed to fall most readily into his vein. Next day there were twenty-two more letters, and next day seven, and so on for two or three days, each post bringing more or less in number, till the supply gave out, after having exhausted itself by nearly seventy different applications. I saw at once, by such competition, the hopelessness of this course of life for the future, and thereby any chance of increased salary for me. My wife and I were both brought up in the rural districts of Hampshire, and although no strangers to town life and manners, we always had a strong predilection for a farm and home of our own. We could work, and although we were of the style that is called ladies and gentlemen, our dignity was not so nicely balanced as to keep us in continual fear of its being upset by doing necessary work, each in our own department. It is true I often regretted seeing my wife perform menial tasks, but on the whole we considered we were working only for each other and for a home of our own. With these sterling ideas we abandoned the city and went to the woods. I bought a farm, with some improvements, on advantageous terms, paying only a small amount down, and trusting to Providence and a good cause for the future. We got in a fair crop in good order; we lived hard,

worked hard, and spent little; we kept almost entirely out of debt, except for such things as implements which were absolutely requisite for carrying on the farm. We had health and hope, and were happy and contented. Our crops were reasonably good the first year; had it been otherwise we might have "gone under." We realized enough to pay our debts, and have, by great economy, enough for the next year. Stock gradually grew up, and clearing increased. Our land was good, fertile and dry; it cost more to purchase on that account at first; but I determined that I would not break my heart on a poor, wet farm, and I have never had cause to repent my choice of life. My family have gradually increased and grown up in succession until my eldest, a boy, is seventeen, and five more, boys and girls of various ages, ornament our household; and I now feel that I never should have attained to my present happy position had I continued as a clerk in the city. I have often felt that failure might have overtaken me at any time on the farm as well as in the city; but all went ultimately well, although we had several losses and trials. Many others in similar circumstances might do equally well, or better, on a farm in Canada, if they would make up their mind to keep out of debt, and spend no money for anything that could be done without. Many a time during the first year's trials, for a month together we have lived on bread and milk and vegetables. We always raised meat enough for use after our dairy reached five cows, and from that time the butter always paid the summer store bill, and after we milked as many as eight cows we had an abundance and to spare.

Fortunately we had chosen our location amongst a respectable set of "old country" people, who, although of much lower social grade than ourselves, were pleasant enough to live amongst, and a better, more kind-hearted set I never came in contact with; we all helped each other, and there were few quarrels. My motto was universal peace-making, and as I possessed something more intelligence and more education than the rest about me, a higher position was tacitly awarded me.

Now, let me ask those who have patiently read thus far, what better chance can be found in any other part of the world than in Canada, for a man, his wife and child, with \$600 capital? I am convinced that hundreds of cases can be found where parties similarly situated have done as well, and I fully believe every one coming to Canada under similar conditions will succeed, unless circumstances over which they have no control should baffle them, such as sickness or misfortune, and that to a greater extent than usually falls to the lot of every one. But whatever they do, let them keep off a flat, wet farm; it may do for richer men, but it will not do for beginners.

EMIGRANT.

### On Straw Cutting.

To the Editor

Sir,—When visiting my neighbours' barns this fall in the course of exchanging work in fire-bing, I could not but notice the number of dilapidated straw cutters hurled into the most vacant place, and perhaps, like myself, suffering from rheumatism, a broken leg, or a dislocated joint. We have all kinds amongst us, from the square box with an old cog-worm to cut with, to the high-priced machines with wheels and "fixings" enough for a steam engine. They have all shared the same fate, and been cut off as useless. Not but we all know the value of cut straw; but we also know the labour it takes to cut it. We all regret that we have to haul long straw into our fields without decomposition; it is a nuisance. Now, when a doctor finds out what ails his patient, he can prescribe the remedy, which I will try to do in this case. And that is to hint to our threshing machine smokers that they shall attach a straw-cutter to their machines. I shall leave them to study out the plan they may think best; and when any of them have made the desired improvement I hope that they will appoint me their agent for the sale of such machines in this county. I trust that this will fall under the notice of McPherson, Glasgow & Co., Fingall, as they are personally acquainted with me and would give it proper attention; and if any one wishes to get my opinion how it can be done, let them drop me a line addressed to A. B. Brownson, Bayfield, Ont., and I will give my plan for attaching the straw-cutter to the threshing machine.

A. B. BROWNSON.

### Getting Rid of Stumps

"Inquirer," asks if boring holes in stumps, and filling up with saltpetre or crude petroleum, would make them burn out quickly, especially green stumps.

Ans.—We do not know about the saltpetre, nor should we be inclined to try it. Coal oil has been tried with good success. The plan is to bore a hole with a large auger downwards in the centre of the top of the stump, say four inches, fill that with cheap refined petroleum. It will soak away and penetrate all round through the wood. When the first application has been absorbed, bore the hole several inches deeper, or another one in a slanting direction downwards from a little below the centre of the side of the stump, and fill that with the oil. Two or three may be bored on different sides, and filled with oil. The holes may be bored in spring or early summer, or now, for that matter, and the oil put in at once before any water gets in to wet the wood. Set fire to the stumps in dry weather as soon as the oil has been absorbed into the wood. If the stump does not burn entirely out, try the same process on the portion remaining. A gallon of coal oil probably do for a score of stumps.

### Seeding Bush Land.

"Lera" asks, "what kinds of grass seed would be best to mix with white clover for the purpose of seeding down a portion of bush that has had the small timber and underbrush taken off in order to be made into bush pasture?"

Timothy would probably be of little value in such a situation, or as pasturage in any case. Kentucky blue grass, if it can be had, would be the most desirable, but does not take well when sown as an artificial grass. Perhaps the most certain and easily procurable grass would be Red-top, which, under such circumstances, combined with clover, would make excellent pasturage. As we presume the land could not be ploughed or brought under cultivation preparatory to being seeded, it would, when once exposed to light and air, soon become pretty well stocked with grasses indigenous to the soil, which in combination with the clover ought to yield a very fair amount of pasturage for stock, especially sheep.

STEAMING CORN STALKS.—Corn stalks cut small and steamed make a most excellent and nutritious food for cattle. If but a little musty, the steaming would correct that and render the stalks sweet and palatable to stock. The addition of ground grain would make it very rich and fattening food. Horses do not thrive on such feed, nor would sheep; but for cattle it would be quite desirable and relishing.

## The Canada Farmer.

TORONTO, CANADA, FEB. 15, 1870.

### Steam for the Farm.

Every movement of the present day tends towards this result. In Canada, the labour question, is "the question," and that which meets the difficulty of the cost of labour, must eventually force itself on the attention of all engaged in agriculture. In the early volumes of the CANADA FARMER we explained the method adopted in England for the purpose of steam cultivation. Steam threshing machines are found now on every farm in England and Scotland, and as will be seen in a recent notice of the rotary steam engine of W. Hamilton & Son, of Toronto, steam threshing machines have commenced their career in Canada. Our valued cotemporary, the *Gardener's Chronicle and Agricultural Gazette* of the 20th November, gives us a most interesting account of "Mr. Thomson's Patent Road Steamer," which has at length solved the problem of direct draught in the ploughs, drags, grubbers, etc., instead of the expensive and cumbrous plan of using miles almost of wire rope to haul the ploughs and other implements. By their

new contrivance a six horse power steam engine hitches on direct to a combination of ploughs, which turn four deep and wide furrows at a time, and which do so in first rate style, far surpassing the same work done by an equal force of horses. The engines are also made so convenient and handy, that they can be dispatched anywhere, and made to do any work without more trouble than would be caused by an ox or a horse team. This is what was required, and if this is attained "steam cultivation" will become the rule and not the exception.

We have not yet received a full description of the engine and boiler, but we have heard enough to explain the matter generally; as soon as a full description can be had, it shall be presented to our readers.

The "Thomson Road Steamer" is constructed something like the Traction Engine, of which we gave illustrations, but instead of the surface of the driving wheels being of iron covered with protuberances to prevent slipping, they are covered with a broad and thick band of vulcanized india rubber, made so thick, and so strong, as to pass over broken stone, macadamized roads, and other rough highways with perfect ease, and without jolting or injury either to the wheels or the machinery which they carry. These elastic wheel tires have such enormous tractive power, that they never slip as iron-shod wheels do, and the india rubber is so deep and thick, that such obstructions as are usually met with in common gravel or stone roads make no permanent impression. The impediment is pressed into the surface of the elastic wheel tire, which again springs out to its first position as soon as the impediment is passed. This property enables the wheels to pass over ordinary farming land without difficulty; and although the entire engine with its attachment weighs six tons, the wheels being broad, do not sink materially in the soil, but are enabled to resist and overcome the obstruction of the ploughs, &c., which they madearo to drag. The following is an excellent description of the performance. We condense it to save room.

The last, and perhaps the most remarkable performance of the road steamer, was as follows: At a trial of ploughs and mowing machines at Edinburgh, on Tuesday, the 17th of August last, a good opportunity occurred of testing the engine, which was accordingly on the ground. It passed over all sorts of soil without difficulty, and while awaiting its turn, displayed its manageableness and handiness in various ways, and most strikingly when

requiring water; it ran down a long steep grass hill, with gradients of 1 in 4<sup>1</sup>, to a tarn (or creek), where it filled its tanks, then ran up the hill again. At last the moment came for it to engage in its new task of ploughing. Two of Power's double furrow ploughs were attached to it, and it commenced work. With these ploughs, when the handles are once set, no guidance is needed; and four furrows were turned simultaneously without a hand being put to the plough. Arrived at the farther end of the field it turned with far greater ease than horses could do, and ploughed its way back again up a hill with inclines 1 in 12. The ploughs were set as deep as possible, and the work done was quite first-rate. The contrast between the road steamers and the plough horse was most remarkable; whilst three horses were painfully struggling along with one double furrow plough, through the exceedingly hard, dry, stiff soil, the steamer was drawing its two double furrow ploughs with such facility that it was evident there was an immense supply of power to spare, and that it could have taken another couple of double furrow ploughs behind it. It ran on the unploughed land in front of the ploughs, thus avoiding all possibility of compressing or poaching the soil after it had been turned up. All present were fully satisfied with its performance, and declared its behaviour was perfect. It was at once seen that it could equally well be employed in mowing, reaping, hauling, &c., &c. It could fetch its own water and fuel, carry manure, and, in short, do every description of farm work, even to taking the produce to market, for the whole affair is made so compact, that it passes through towns and crowded thoroughfares with the same ease as any other vehicle, and with enormous power. It can go at eight miles an hour on any good road, and at three and a half or four miles an hour on the worst possible road, and it improves, instead of injuring the ordinary carriage track. If the question of expense of first cost can be so reduced as to be within the reach of ordinary farmers, there would be no doubt of its extensive adoption in all directions.

#### Farmers Need Pluck

So says Joseph Harris in "Walls and Talks," and we are inclined to think he is more than half right. The farmers need to have pluck at such a time as this. They have for the past few years obtained such exceptionally high prices for their grain, their hay, their potatoes and apples, that the present low prices are terribly discouraging, and the more so, as

the crop yield of last season was generally little if anything beyond an average, with the additional drawback of such unfavourable weather at harvesting time, together with dear labour, that the cost of production was in many cases greatly increased. With a share crop of apples, and half of that destroyed by an early and severe freeze, they got but little over half of last year's prices for what was sound; while potatoes hardly pay to take to market. How to account for the low range of prices, with crops in Europe, America, and nearly the world over below an average yield, is a difficult matter. Food is needed, and its consumption does and must increase each year. Yet wheat, the great staple, sells now in most places for a less price than it has actually cost the farmer to raise it.

Such turns will happen occasionally, and we fancy the farmers are themselves somewhat to blame in reference to the matter. The year before, when grain was high in price they held back. When wheat and barley reached a good paying price, they sold only enough to keep them going, allowing debts to accumulate on the strength of their good prospects. Thousands of bushels of grain remained in their hands till late in the season, in many cases till the harvest of 1869 was ready. In the meantime, while farmers were waiting for prices to get more inflated, millers and produce dealers had run out of their bank credits with capital lying idle, and the grain not for the raising, something else had to be found to fill the holds of ocean going ships. The men who were ready and willing to pay high prices for grain, finding they had no chance to obtain it even then, in time to realize before the next European harvest, ceased operating and prices came down on the run, leaving those who held on to their grain to mourn their folly over the prospect of having to take less than half what they could have got had they been less greedy and sold out in good time. Still worse, the accumulated extra credits had to be paid by sacrificing stock half fattened, or selling fruit before prices were established on a basis of the knowledge of the serious loss in the fruit crop.

Prices of grain cannot well stay at the present low ebb; yet unless our present crop goes into the hands of millers and reaches distant points of consumption in good season, or is consumed by stock, and so made into meat and manure, it will but keep down prices of the next crop. The high prices of the past few years have induced many to grow grain to the neglect of their stock and impoverishment of their

farms. This should now be remedied, and while low prices rule for grain an effort can best be made to inaugurate a better system of tillage and rotation of crops.

Let the farmer have pluck, and rather than be content to accept less for his grain and his hay than it has cost to raise, let him feed it out to his stock with a liberal hand, making all the manure he can possibly do, and when the time comes, which it assuredly must, he will then reap the benefit in the larger returns of a better day. Butter and eggs are scarce and dear, make more by feeding the cows each quart or two of boiled wheat a day. Give the fowls abundance of it. Raise all the store pigs that can be had, feed them well but not enough to fatten them unless they are sufficiently matured. Get the horned stock up to a higher standard of excellence by using only pure bred bulls, and give them a chance to grow and become fit to make into meat at from two to three years of age, instead of being but miserable crubs at four or five years old.

Let him give more attention to his pastures, and instead of being content to let his stock browse on the dried-up stumps of timothy and clover, after he has at great expense abstracted from his soil so much more of its fertility by cutting the grass for hay when the seeds are ripe, let him stock the land well with good stock, or cut the grass early, before the seed has formed.

Let him have pluck enough to sow more grass seed, and more varieties of it, on the land he intends to lay down as permanent pasture, instead of following in the old ruts of past generations, giving nothing but a quart or two of timothy and five or six pounds of clover seed per acre, and then blaming everything but his own carelessness and want of pluck, if he finds he either has to plough under his newly seeded grass or be content to cut a ton of hay to the acre, where he might just as well have had double the quantity. If grain does not pay, try something that will, grow more roots, feed more stock, make more manure, and do all that can be done towards renovating the farm before grain again comes round to paying prices.

Last, but not least, let the farmer have pluck enough to stick to his true friends, the agricultural papers, and not be led into the false economy of thinking he can not afford to subscribe for one. It is at the time of his distress and tribulation that he can turn to its pages for information and counsel, as to what he can best do to retrieve his waning fortunes.

### Coming Immigration and Employment

We have always attached very great importance to the question of Immigration, and have given it very special prominence in our columns. What Canada needs particularly is the occupation of her waste lands by an industrious, thrifty and intelligent population. In order to secure this, it is the duty of her Government to hold out all reasonable inducements to healthy, active persons to come and possess the land. Comparatively speaking, the Dominion has been an unknown land to the emigrating masses of Europe; and so little has been done to diffuse information in reference to its resources, that it is not a matter of wonder that so few have come as permanent settlers in her territory; the wonder must be that there have been so many. It is to be hoped that the reign of indifference and red-tapeism in this connection is nearly, if not quite at an end, at least so far as Ontario is concerned; and that every thing will be done which can, in reason, be expected to fill our wide, fair Province with a numerous and hardy population.

As we have mentioned from time to time, agencies have been appointed in different parts of Britain for the purpose of giving all information and assistance to those proposing to emigrate to Canada, and to lead those who may have been thinking of other countries, to consider the claims and advantages of the new Dominion. It is to be hoped that these officials will do their duty with some measure of energy and good-will.

It is now universally acknowledged that far from the really good land of Ontario, having been all taken up, there remain millions of acres of very excellent quality. The barren range of hills which runs across the country, and presents so bleak and uninviting a prospect, has been surmounted in many places; and beyond, stretching towards Lake Nipissing, a wide, fair, fertile land has been explored, destined, we hope, to afford speedily comfortable homes to thousands.

There are in Ontario 77,606,400 acres of land. Of these only 25,297,180 have been surveyed; and of those surveyed only 21,879,048 have been granted and sold. There are thus about three and a half millions of acres surveyed, which are still in the hands of Government, and upwards of fifty millions upon which the surveyor's chain has not yet passed.

The Free Grant System is coming more and more into operation. Some forty-on

townships are now set apart for grants, and the Government promises to lay off more so soon as needed. Instead of having a few townships only at one part of the country, there are many now, as we suggested some months ago, more or less quite across the whole district which stretches from the Georgian Bay to the Ottawa. These townships are all accessible by means of the various colonization roads which have been opened up, and are year by year being extended further back. Eleven townships in the County of Renfrew; three in the Nipissing District, six in the County of Hastings; two in the County of Victoria, and two in the County of Peterborough have been recently opened in the free grant region for settlement under the Act. Let us repeat that, according to the terms of that Act, any head of a family can have two hundred acres of land as a gift on the performance of a few settlement duties in the way of building a house, clearing so many acres, and living for at least six months for each of five years on his location. Besides every child he has of eighteen years of age or more, whether male or female, may have each another hundred, so that a man with a large family may secure a large estate for himself and his children. We have no doubt that very many will take advantage of this arrangement, and the more the better. There is little propriety in crowding about towns, when so much land remains yet to be possessed. These free grants are not specially intended for new comers, but likewise and especially for those accustomed to the country, who may feel that to secure in the older districts as much land as their families need is quite out of their power. A large number have availed themselves of such grants and have had reason to be satisfied with the venture. No doubt many more, during the coming spring, will also make the trial, with the best results, let us hope, to themselves and the country. The amount of work afforded by the projected railways into those new regions will be very great, and the consumption of farm produce correspondingly large. Ontario can, in any average year, take a very large number of immigrants, but everything seems to intimate that never in her history has there been such a demand for all kinds of labour as there will be in 1870.

John Johnston of Geneva

The *Country Gentleman*, of Jan. 16th, gives a portrait of this distinguished agriculturist, and a memoir from which we cannot well forbear to make a few colla-

tions, mainly to show our young farmers how much can be gained by bringing brain work to bear upon the hard realities of farm life, and how necessary it is, if the farmer desires to succeed, when once he has put his shoulder to the work, to persevere in well doing to the end.

Born in New-Galloway, Scotland, in the year 1791, Mr. Johnston married in 1818, and came to the United States early in 1821. In October of the latter year he took possession of the farm where he has since lived, on the border of Seneca Lake, within a few miles of the village of Geneva. It was a stiff and uncompromising clay, some of it swampy, and though favoured in many respects as to situation, (a more charming site could hardly be chosen,) offered at the time a much better prospect for hard work than for a comfortable living. The new owner, however, had a genuine Scotch fondness for work, with the national perseverance to back it, and undertook the task in earnest. Twelve years later, in 1833, Mr. Shirreff, a well known Scottish agriculturist, visited this country, and published a narrative of the journey on his return, in which he spoke of Mr. Johnston's "sixty acres in wheat" as "equal to any crop of similar extent" he had ever examined. At a day when little attention was paid to unusual methods of promoting fertility, Mr. Johnston had constantly used lime and plaster (gypsum), which were admirably adapted to the soil, and, in connection with judicious management elsewhere, they brought him large returns. He began with them on a small scale, until the experiment proved that they were suitable for the purpose.

When underdraining began to be earnestly discussed in Great Britain, Mr. Johnston felt at once a deep interest in the subject. He became convinced of its advantages, and that it was precisely what a large portion of our land requires to enable it to bear the vicissitudes of the season and perfect its harvests. In the year 1835 he sent for a tile from Scotland as a pattern, and became the pioneer of tile draining in America. This necessitated a heavy expense that could only be met on borrowed capital, and people about thought the Scotchman was a little crazy then. However, in this, as with lime and plaster, his judgment was amply vindicated in the result.

The use of draining tile, wherever laid, very much ameliorated Mr. Johnston's land, and added to its productive area some fields that were before too wet to be of any real value at all. The winter-killing of the wheat was much reduced or

wholly obviated; the grass, which perhaps appeared no more thrifty to the eye, was found thicker on the ground, with a heavier burden to go to the barn; quack, which it seems almost impossible to kill on wet land, was much more easily exterminated; the fertilizers applied, whether manure from the barnyards, or lime and plaster, seemed more efficacious than ever, and in these and other ways, the "crockery" soon repaid the loans, and its effects are still viable for good.

Applying an active and thoughtful mind to the work of the farm, and knowing the importance of manure, he followed the Scotch practice of buying stock in the fall and feeding them through the winter, to sell for the butcher in spring. Exercising a sound judgment in the selection of stock for the purpose of feeding to advantage, he also showed skill in the choice of their food. He used oilcake largely, but his chief dependence was upon Indian corn, finely ground and moistened, along with well cured, early cut hay. As he thought it wiser to raise three hundred bushels of wheat on ten acres rather than on thirty, so, in buying cattle, he preferred such as would attach the most pounds of flesh to a single stomach, rather than have two digestive systems at work to produce but little larger net result. He has fed sheep more extensively than cattle, and with even greater advantage. Of course very large quantities of manure were made, and to this day the old gentleman's eye has a quiet twinkle when you lead him to talk of what dung will do for the land.

One of his great innovations was the applying of manure to the soil in the fall. In this practice he for a long time stood nearly alone, it being so contrary to popular notions, as well as opposed by scientific men. But the results of his practice, especially the spreading of composted manure on winter wheat, proved so signally successful, that the practice soon extended, and even science had to own that for once she was behind-hand. The early cutting of grass for hay, which we have of late so strongly advocated in the CANADA FARMER, was steadily practised for years by Mr. Johnston, and he was too shrewd a Scotchman to stick to it unless he found it more profitable than the practice too generally followed by farmers, of leaving the grass seeds to ripen before cutting the grass.

He took a great interest in advancing the knowledge of agriculture among the masses, and often gave his methods of procedure, as well as the results of his practice and experience, to the world,

through the columns of the old *Genesee Farmer*, and afterwards through those of the *Country Gentleman*.

During the past ten years Mr. Johnston has been gradually withdrawing from the direct management of his farm—very gradually, however, as long habit has interwoven its labors, and problems we might almost say, into the whole web of his thoughts and existence—and he still retains quite an area under his own superintendence. The sudden death of his wife, some time previously, from a stroke of lightning, while standing just before her own door, was a sad bereavement; but otherwise the autumn of his life has been for him a peculiarly happy and honorable season. Grand-children and great-grand-children have come in turn to nestle in his arms, and long may he be spared to tell them stories of his own youth and of the great-grand-father in whose arms he in turn was fondled, so many years ago, in "bonnie Scotland."

#### Wooden Railways.

It must be interesting to all farmers to know that cheap and yet effective railways can be constructed entirely of wood, at so small a cost as to enable many sections of the Province, (now entirely cut off from such conveniences,) to adopt them without the ruinous system of debt which is but too often incurred by the iron rail.

Several wooden railways are now in actual operation in the States, and succeed admirably. Others are in course of construction in the Province of Quebec, and many more are talked of. There is one, of a very temporary mode of construction, but extremely effective, about seven miles long, which has now for seven years past been worked with the greatest success from a large saw mill establishment in the township of Tossorontio, in the County of Simcoe, Ontario, to the "Angus" Station of the Northern Railroad. It is a simple track, without turn-outs or stations, and is used entirely for private purposes; but it has reduced the cost of the transit of lumber from the mill to the station to one-tenth of what it used to be. The sleepers and all the timber used are of the roughest description, merely small round logs and poles flattened and pinned together with wooden pins, the rail itself is hard maple, cut square, and so sawed and placed, that the wear of the wheels comes on the "silver grain" (or edgways of the grain.) Thus wear is greatly reduced, and lamination avoided. The ground over which it runs being sandy plains, very level, but little grading, and in many places

none, was required, and the work is a thorough success. The cost was only from \$600 to \$800 per mile, but we are not certain on this head. It was in the first place expected to cost less than even these sums, but as in all new enterprises, difficulties arose, and had to be overcome at some extra expense. The success, however, is complete, and the parties are fully satisfied with the result of their enterprise.

Now, such a railroad as this, even with double tracks, and switches and stations, is within the reach of every municipality; and no enterprise could be more profitable either to the constructors or the occupiers of the road. It is true that ordinary vehicles could not be used on it, but light steam engines might be, and if constructed with Mr. Thomsons' india rubber tires and proper precautions by horizontal wheels, to act as guides instead of the ordinary flanged railroad wheel, the road would wear a very long time; indeed, all the wheels of the railroad vehicles might be constructed with india-rubber tires, and thus wear and tear be avoided to a very great extent, while the elasticity of the medium between the wheels and the rails would render the carriages especially pleasant to ride in.

The employment of these elastic tires to wheels on wooden railroads is entirely a new idea, and we trust that some person well calculated to press such an enterprise forward, will adopt it, and urge it on the attention of the country.

#### The English Agricultural Labourer.

Some time ago we drew attention to the condition of the Devonshire peasant, and the statements then published have brought us several communications both from parties in England and Canada, confirming the view we took, and earnestly pressing the importance of energetic action in the matter of emigration. It appears that the condition of the agricultural labourer in Devonshire has its parallel in many other districts of the "old country," and nothing but the inability of the hard-worked peasants to procure the means of removing to any other locality prevents them from leaving the scene of so much hardship, and such hopeless poverty. It is from these agricultural districts that the very best class of emigrants for this country might be drawn; and most assuredly there is ample room and need here for all who can be induced or assisted to come over. Once in Canada, they could command a rate of wages for their labour nearly double that



which they receive in England, while the cost of living would at the same time be considerably diminished; and above all, they would be cheered by the encouraging prospect of laying by something in store for a future day, of achieving a comfortable independence, and securing a farm and homestead of their own—things utterly chimerical in the land of their birth. One of this class of hard working peasants, in a letter of earnest appeal for help to enable him and others situated like him to emigrate to this country, gives the items of a labourer's weekly expenditure in Berkshire, where the highest rate of wages is ten shillings a week; out of which, rent, board, and all the necessaries of life have to be purchased. The following is the account:

	s	d.
House rent.....	1	3
Coal and wood.....	1	6
2 Loaves of bread, (16 lbs).....	2	2
2 lb. of Bacon.....	1	10
1 lb. of Cheese.....		9
3 ounces of Tea.....		6
1 lb. of Butter.....	1	6
1 lb. of Sugar.....		6
Salt.....		..
Pepper.....		1
1 lb. of Candles.....		..
1 lb. Soap.....		6
Starch.....		1
Total.....	11	3

Leaving one shilling and three pence debt, to be pinched out of the next week's earnings, and no allowance being made for clothing and other indispensable requirements. Contrast this with \$14 a month and board, which any farm hand here can command, and all dissatisfaction or complaints of the hardships of the agricultural labourer in Canada should be effectually silenced; and those who have it in their power to assist their less fortunate fellow countrymen to emigrate to this wider field, where their labour is so much needed, should be stimulated to fresh energy in the humane and patriotic enterprise.

Notes on the Weather.

The first month of the new year has been remarkable for its unusually variable weather and sudden changes of temperature. Much rain has fallen near Lake Ontario, while further back the depth of snow fall has been considerable; in some parts of Huron county as we learn by local papers, there has been 14 feet of snow covering on the fields. On the whole the season so far has been comparatively mild on the sky being much obscured by clouds, and the temperature mild when via the wind was easterly or southerly. In Quebec and the Lower Provinces the season is said to be much milder than usual with so little snow that the winter operations of the lumbermen have been much retarded

for want of sleighing. Birds seem to be more plentiful, and active than usual, and the frequency of the sound of the woodpecker tapping trees at all times has been an occasion of remark.

The mean temperature of January, 1870, has been 21°.4, being 1°.5 warmer than average, though 3°.3 colder than January, 1869, which was unusually warm at its commencement. The highest temperature was 15° on the 17th, the lowest 3.2 on the 9th.

The amount of rainfall at Toronto was 3.12 inches, being 2.237 above the average and 2.525 greater than in January 1869, while of snow there was 21.3 inches or .53 above the average, and nearly double the amount in January, 1869.

There have been 22 cloudy days, 7 days partially so, and but 2 entirely clear. The heavy rains or we have had came from the eastward, but the prevailing winds have been W and S.W.

THE AMERICAN FARMER, published at Baltimore, Maryland, U. S. This, the pioneer agricultural journal of America, now in its fifty second year, comes out for 1870 enlarged to quarto size and improved in appearance, while the price has been reduced to \$1.50 per annum. The type is clear and handsome, and the paper of a much superior quality to what is generally used. It has passed into new hands, and the promise is made that more life and energy will be put into its editorials. We wish it the success it has honestly earned through a long course of steady advocacy of the claims of agriculture to rank as the highest and noblest profession man can enter.

THE COUNTRY GENTLEMAN.—The first number for 1870 of this favourite agricultural journal, the best and most practical of all on our extensive exchange list, comes to us in a greatly enlarged and improved form, with a handsome new heading. The size has been enlarged to a full quarto, and each page now contains four columns instead of three. It is graced by a very fine portrait and memoir of John Johnston, of Geneva, the cunning Scot who first introduced underdraining in America, and by his persistent example, and his writings in the agricultural press, did much to make American farmers the intelligent class they are now acknowledged to be. Though eminently sensible, he was equally practical, eliciting the highest commendations from such men as Dr. Voelcker, who acknowledged that his practical wisdom often outstripped and baffled theoretical philology. Published weekly by L. Tucker & Son, Albany, N. Y., at \$2.50 per annum.

HEAVEN AND HELL.—With the current year the excellent periodical commences its second volume, which continues to maintain a well earned reputation and popularity. It is the only ideal of a family paper, each weekly number containing a vast amount of useful information in agriculture, domestic

economy, and rural affairs. It is abundantly illustrated in the very first style of wood engraving, and the paper and typography are all that could be desired as a fitting vehicle for the reading matter, replete as this always is with instruction, interest and variety. The general scope and character of the journal are well expressed in its title. The publishers are Petengill, Bates, & Co., New York. The subscription price for a single copy is \$4 (Am. cur.) per annum, with the usual liberal reduction for clubs.

HORACE GREELEY ON FARMING.—Mr. Greeley purposes to write a series of essays on farming, to be published each week during 1870, in THE NEW YORK TRIBUNE. The essays will all appear in the Daily, Semi-Weekly, and Weekly editions of THE TRIBUNE. He means to demonstrate that Agriculture in the future is certain to be very different from what it has been in the past, and hopes to embody words of cheer as well as hints for guidance to the future farmers of our country. The first essay was published in the WEEKLY TRIBUNE of Jan. 7.

SMITHFIELD CATTLE SHOW. Some time since a telegraphic dispatch brought us the information that rinderpest had broken out at the Smithfield Club Cattle Show. It now appears by the detailed reports of our exchanges that the real state of the case was somewhat different, and far less serious. On the last day of the exhibition, and after the larger number of the animals had left, it was discovered by Professors Simonds and Brown, the veterinary inspectors appointed by the Privy Council to keep observation of the Show, that a Devon steer was affected with *foot-and-mouth* disease. The diseased animal and all the rest, numbering forty-five, that had not left the Hall, were detained. Three others were found similarly affected. The origin of the outbreak is attributed to the proximity of some of the show animals, while on the train, to a drove of foreign beasts driven past them. One of our latest exchanges states that all the animals detained were subsequently ordered to be slaughtered.

BRITISH AGRICULTURAL RETURNS.—From the agricultural returns recently published in Great Britain, the *Agricultural Gazette* give the following items: According to the official returns, there were in the United Kingdom in June, 1868, 9,083,000 cattle, and 35,000,000 sheep. The Irish returns for this year give 3,727,791 cattle, and 4,658,158 sheep for Ireland. With respect to the number of animals annually slaughtered for consumption, and the mean number of pounds of meat furnished by each animal, we have only conjectural estimates. Assuming that 2,600,000 head of cattle are annually brought to the shambles, and that the average of all is about 500 pounds, we have a total of 650,000 tons of beef and veal, and if we reckon half the sheep slaughtered, and the average weight of 66 pounds per head, we have a further total of 415,000 tons mutton and lamb.



## Horticulture.

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### On the Improvement of Plants.

#### HYBRIDIZING AND CROSS-BREEDING.

By hybridizing we understand the crossing of two different genera or species, by cross-breeding the intermixture of two different varieties of the same species. Practically speaking, the work is the same. It would be out of place here to enter into a lengthened description as to how far the different species of plants may be hybridized. Doubtless there are limits: I have tried on various occasions, and in various ways, to obtain a hybrid between the *Pyrus spectabilis* and the *Cydonia japonica*, two different genera, but without success. On the other hand I have succeeded in raising hybrids between the Moss Rose (*Rosa centifolia*) and the alba Rose, two different species; also between a hybrid China Rose (*R. gallica* x *R. indica*) and *Rosa multiflora*. Then, again, I have often tried, in vain, to obtain crosses between certain varieties. So that it does not seem to be exactly a question between species and species, or between variety and variety, as these are at present classified by botanists. I have found, however, as a rule, that the more nearly allied the varieties the more certain is the cross. The Tea-scented and Noisette Roses are found to cross readily, but then, although these form separate floricultural groups, they belong to the same species, *R. indica*. But the hybrid Bourbon and Moss Roses also cross readily, and here we have intermixed three different species according to most botanists—*R. indica*, *R. gallica*, and *R. centifolia*. The grandest and the most beautiful of all the floral groups of the Rose—the hybrid perpetual—has a curious genealogy; *R. gallica* crossed with *R. indica* produced hybrid China; the latter crossed with an autumn flowering variety of the *R. damascena* produced hybrid perpetual.

My first attempt at crossing the Rose was made in 1843. I crossed three flowers of the Tea-scented Rose known as Goubalt with the Bourbon Rose Souchet, with the view of obtaining a dark-coloured Tea-scented Rose. Of these seeds four only germinated. Three of the plants were curious cross-breeds, of no floral value, and having little in common with either parent; and one, in leaf, habit and flower, was very similar to the wild Dog Rose! As the seeds were sown in pots, and placed under glass, I do not think any stray seed could have found place among them. I was here, no doubt, unfortunate in the choice of my parent or parents, and regard this issue as an instance of the well-known tendency which the offspring of some cultivated plants have of reverting to the normal form. The same year I crossed about forty other flowers,

but the crop of seed was indifferent, and the result nothing worthy of record. This non-success led me to submit to microscopical examination the flowers of a number of varieties of the Rose, with the view of ascertaining which were likely to prove the best seed-bearers. The conclusions I drew were:

1st. That certain varieties are sterile, and incapable of forming perfect seeds under any circumstances. Of these I found such kinds predominate as roll the petals inwards, the centre of the flower being quartered in the manner of a crown. In others the pistils were weak or imperfect. 2nd. That many kinds where the pistils are perfect, which in their natural state form seed-pods that wither before arriving at maturity, may be induced to perfect their seeds by artificial fertilization. This class of Roses is the best for him who intends raising seedlings to choose his female parents from, because there is little here to interfere with, mar, or counteract his plans. 3rd. That those kinds which we find seeding abundantly in their natural state are self-fertilized, and that their abundant production of seed is due to this point mainly, the more perfect development of the organs of reproduction, especially the polleniferous parts of fructification.

Thus fortified I selected some twenty sorts of Roses, planted them in a separate corner of the nursery, and in the month of June, 1846, crossed nearly a thousand flowers. Success in seeding was complete. On the 30th of September in that year I gathered 223 well-ripened pods of seeds, some of them of extraordinary size. Two successive gatherings, of about 100 pods each, were made at intervals of about a month, the whole number of hybridized and crossed pods gathered and stored amounting to 444. The seed was sown the same winter, vegetated during the succeeding spring and summer, and these seedlings bloomed at intervals over the next six years—that is to say, some bloomed the first year, others were six years old before blooming. The result of the hybridizing and cross-breeding was apparent in many cases, but not in all. Two of the most striking and complete I will describe.

I had long thought that a bright dark-coloured climbing Rose was a desideratum, as at that time nearly all our climbing Roses were white or yellow. To obtain this I hybridized the Rose Athelin (hybrid Bourbon) with *Russelliana* (*multiflora*). Paul's Vivid, a bright crimson climbing Rose, of great repute in its day, and even now sought after, was raised from this effort. Again, I had conceived that if anything could add to the beauty of the Moss Rose, it would be to impart to it the exquisite tint of the *R. alba* or Maiden's Blush. To obtain this I hybridized the Moss du Luxembourg with an alba Rose, and among the offspring was a Moss Rose, with flowers like the Maiden's Blush, and afterwards named Princess Alice.

The next flower with which I experimented was the Hollyhock. I crossed numbers of these flowers in the years 1857. A bluish seedling crossed with White Globe, with the view of obtaining better bluish flowers, gave, among others, ten seedlings answering to this end. Fireball Superb, crossed with Metro-

politan, with the view of obtaining a better scarlet Hollyhock, gave one plant of the character sought. A pink seedling crossed with Lizzie, with the view of combining the bright colour of the former with the quality of spike and flower of the latter, gave a large number of seedlings, 23 of which were realizations, more or less complete, of the object sought. These are three cases selected from many of similar import. With regard to the results in crossing the Hollyhock, I may add that Mr. Rooke, of Clewer, at one time a most successful raiser of seedlings, obtained three of his most marked improvements, all differing in colour, from one fertilized pod of seed, whereas with seedlings raised from seed-pods not fertilized, he found the degree of progress slow and uncertain.

Some of my latest efforts in hybridizing and cross-breeding have been directed to Zonal Pelargoniums. Attempts to hybridize the Zonal varieties with the Unique have never succeeded; and yet Mr. Willis has obtained hybrids between the Zonal and Ivy-leaved, species probably as distantly removed. He tells me that he hybridized some thousands of flowers without success, until he thought of dipping the hybridized flowers into water after applying the pollen, by which means he obtained seeds and seedlings, two of which, evidently hybrids, are now before the public under the names of Willis's and Willis's roses.

Leaving flowers, let us glance momentarily at fruits. I have now growing in my nurseries a brood of seedling strawberries, the result of various crosses, the parentage on both sides having been carefully preserved. As they are not yet named, I can only speak of them as seedlings. Two seedlings, raised from Sir Charles Napier, crossed with Myatt's Pine, are worthless. Of eight seedlings, between Eleanor and Carolina superba, four are worthless, one is flat and rough in flavor, one resembles Keen's seedling in appearance, but is of a much richer flavor; one bears large fruit, remarkable for its solidity, of the shape of British Queen, with the fine rich flavor of Myatt's Pine; and one is a full-sized handsome fruit, of fine colour and good flavour, bearing abundantly and of hardy constitution. Two seedlings, between Oscar and Myatt's Pine, are deficient in flavour. Of eight seedlings, between Sir C. Napier and Crimson Queen, three are large handsome fruit, solid, heavy, of good colour and rich flavour; one is flat and insipid, one is very acid, and three have no prominent character. Of five seedlings, between Filbert Pine and Myatt's Pine, one is large, of fine flavour, and very juicy; one is small, of good colour and flavour, solid—the flesh notwithstanding very tender; and three are deficient in flavour, one of which is a prodigious bearer. Four seedlings, between Oscar and British Queen, are all deficient in flavour. Of seven seedlings, from British Queen crossed with La Constante, five are worthless from the fruitist's point of view, although one is so distinct in habit as to be scarcely like a strawberry, and one so positively nauseous in flavour that it leaves an unpleasant sensation on the palate long after tasting, yet from the same fruit and parentage one is of good flavour and another of positively fine flavour. Of eight seedlings, raised from Admiral Dundas crossed with Crimson Queen, four are small and almost flavourless; two are large handsome fruit, of fine colour and fine flavour; one is very late, of pleasant but not rich flavour; and one is early, the fruit large, of moderate flavour, and produced in extraordinary quantities.

I shall now conclude these remarks with a few practical deductions. In the improvement of races much may be accomplished by mere selection, but hybridizing and cross-breeding, if in some cases and with some experimentalists unsuccessful, are in the hands

of others shorter and surer roads to the attainment of a given object. Our best vegetable physiologists are of opinion that hybrids and cross-breeds derive their form and habit from the female, the colour of the flowers from the male, while the constitution may be acquired from either parent. This is some times, and may be generally true, but the exceptions are so numerous that they cannot, according to my experience, be said to prove the rule. It is generally admitted that the most perfectly developed flowers and fruits are the best for the improver to work upon, and this is, I believe, true as a rule, although still attended with exceptions. Personally I have learnt from my labours in this field never to lose heart or hope. For sixteen years, from 1843 to 1859, I had laboured with such qualified success in raising seedling Roses, that I had then minimised the amount of labour by omitting the costly process, in point of time, of keeping notes of parentage, &c., when in the following year, 1860, I was more than compensated for all past labour by the extraordinary flush of success already stated. I say then to my brother horticulturists who may be working in this field—Never despair; persevere and wait.

My experience in selecting, hybridizing, and cross breeding tells me that he who is seeking to improve any class of plants should watch narrowly, and seize with alacrity, any deviation from the fixed character, and the wider the deviation the greater are the chances of an important issue. However unpromising in appearance at the outset, he knows not what issues may lie concealed in a variation, sport, hybrid, or cross-bred, or what the ground newly broken is capable of yielding under careful and assiduous cultivation. If we would succeed in this field we must observe, and think, and work. Observation and experiment are the only true sources of knowledge in nature; and while observing and experimenting, we should above all things guard against prejudices—*From an address delivered by William Paul at the Manchester Congress, July 21st, 1869.*

### Horticultural Progress

It is gratifying in the extreme to visit such a floricultural establishment as that of Mr. James Fleming, Toronto, and see in the extensive arrangements there made for the propagation of all kinds of flowers, the evidence of a growing taste for these beautiful things.

Mr. Fleming has eight different houses devoted to the cultivation of flowers; all but one are span-roofed, and average about twenty feet by forty, and heated with about 2,000 feet of hot water pipe, and filled with heavy glass of the best quality.

The first of these houses is devoted at this time to Scarlet Geraniums. Of these beautiful bedding plants there were some sixty varieties, including the celebrated Donald Beaton collection, and four varieties of the beautiful new double geraniums, Gloire de Nancy, Princesse Alice, Madame Lemoine and Romanule flora.

In the second house were grouped a number of interesting plants, among which were the beautiful variegated leaved creeping grass *Panicum variegatum*, so much esteemed for hanging baskets; the Smilax, so much sought for by the ladies as an ornament for the hair or trimming for evening dresses, and the new zonal geranium, "Incomparable," whose flowers are a soft shade

of salmon beautifully striped and spotted with white.

In the third house was a miscellaneous collection of plants, which are brought into flower at this season to furnish beautiful bouquets for the winter evening parties.

There were some lovely monthly carnations in bloom, the Libonia Floribunda, covered with its profusion of orange and yellow flowers, and quite a collection of Begonias, with many other plants in flower: giving to this house a very gay and attractive appearance.

The fourth house is devoted to the large flowered fancy and show Pelargoniums, of which Mr. Fleming has seventy-eight varieties surely enough to furnish a fine selection to the most fastidious.

The fifth house is devoted chiefly to Camellias and Azaleas, which will soon be in bloom, being now covered with a profusion of buds.

The sixth house is filled with Stevias, Salvias, and other plants for winter blooming.

The seventh house contains but little besides roses. Of the Tea, China and Bourbon Roses, Mr. Fleming has seventy varieties, among which we noticed the grand tea-scented Marechal Niel, with the Canary and Isabella Sprunt. He has also the new climbing rose, "Gem of the Prairies," which combines the climbing habit of the Prairie Rose with the fine color and scent of the H. P. Rose.

In H. Perpetual Roses, he numbers some fifty varieties, comprising such beauties as Vulcan, Prince Camille de Rohan, Beauty of Waltham, and Madame Charles Crapelet.

The eighth house is set apart for the cultivation of verbenas, of which Mr. Fleming has over fifty sorts, and to which he is continually adding all the new and desirable varieties that are offered.

In addition to these houses we noticed a cold grapery—a lean-to of eighteen feet in width by eighty-five feet in length—in which the choicest exotic grapes are grown.

There must be an increasing demand for choice plants and flowers in our Province, for already Mr. Fleming has upwards of three thousand plants of the different kinds of Scarlet Geraniums, to which, before the time for bedding out arrives, he will add many thousand more of Verbenas and other bedding-out plants, which will be sent out to give a charm to our gardens and make our homes attractive and beautiful.

CUTTING OFF SPRAWLING LEAVES.—The *San Francisco Record* says:—We have found a very beneficial way of cutting off the top of the wherry plant after it is through bearing. If it is done, the plant commences a new growth immediately after, and by fall becomes a rank, luxuriant hill. It will be found that many cuts are as much weakened and exhausted by leaving on the old dead leaves, stalks, etc., as by the crop of fruit. Cut the top off by all means, and scatter a liberal supply of manure among the roots, and work the ground well.

### Influence of Trees on Climate.

Attention has been called to the great influence which trees have upon the temperature and rainfall, by W. H. Mills, Esq., in his address before the Fruit Growers' Association in September last, and we now lay before our readers the substance of a short paragraph from the *Gardener's Chronicle*, bearing upon this subject.

M. de Lesseps, the engineer of the Suez Canal, made his headquarters at Ismailia, which, a few years ago, stood on a dry sandy desert on which rain was never known to fall. A fresh-water canal was cut from the Nile to the old dried-up basin of Lake Gimsah, and trees and shrubs were planted, and irrigated with the water. These grew rapidly. Accompanying this change there has been a corresponding change in the climate. Now during eight months of the year, Ismailia is one of the most healthy places in Lower Egypt. From June to September the mean temperature is 91°; from October to January 71°, and February to May 45°. Rain was unknown here until two years ago; now during the year ending with April, 1869, there were forty-seven days on which rain fell, and on one Sunday in April a tremendous shower, something that the oldest Arab there had never seen before. "Rain ceases to fall on a country deprived of its forests, or only falls in violent storms. Here we see rain returning to the desert on restoring the trees."

### Impositions by Tree Agents.

(To the Editor.)

Sir—I want to tell people to look out for these Tree Agents. They are great scamps. They go around the country telling you they are agents for some nursery, most always one of our best Canada Nurseries, and get you to subscribe for some trees which they promise you they will bring from that nursery. When they get a lot subscribed for, they go off to some place where they can get some cheap trees and buy them up for little or nothing, and then put what names they like on them and bring them to you and tell you they got them at the nursery they were agents for.

I know that is a fact, for I caught them at it this summer. A fellow came to me last winter and said he was agent for Mr. Beadle's Nursery, and I subscribed for some of his trees; and when the trees came in the spring, they were such a mean lot, I wrote right down to Mr. Beadle about them. Pretty soon I got a letter back, and he said he knew nothing about it,—that he did not send out any agents now, but sold them wholesale to dealers; but anyhow, he was sure he had not sold any to this fellow, for he never heard of him before. Then I showed the letter to him, and at last he owned up that he didn't bring the trees from Mr. Beadle's nursery, but bought them of a man that was selling out.

Mr. Editor, I expect that there's a good many of these lying tree agents going round, and if they find any nursery has got a good name, why then right off they say they are agents for that nursery. Somehow, they will contrive to get one or two of the catalogues and other fixings, so as to look all right, and then they will go and get a lot of cheap stuff and bring it to you, and make you believe it came from that nursery. And then you will be mad at the nurseryman, and swear you'll never buy another tree from him in the world. Round here the people used to have a pretty good opinion of Mr. Beadle's nursery, but since that agent brought those miserable sticks here this spring, I don't believe you could sell another tree from that nursery to any person that saw them things last spring.

I wonder, Mr. Editor, if there is no way to punish the scamps that go around telling such lies. And how are we ever to know where our trees are coming from? I want to get some good trees to set out next spring, but I am afraid to subscribe for any more, for I don't want to be cheated in this way again. Will you be so kind as to tell us what we are to do?

J. J. N.

St. Mary's, Dec., 1869.

**NOTE BY HORTICULTURAL EDITOR.**—If every farmer, when buying trees of travelling dealers, or, as they call themselves, agents would take the precaution to get from the seller a guarantee that the trees shall come from the nursery which they say they are selling for, and that they shall be of a specified size, age and quality, then if the dealer fails to fulfil his contract and brings trees of a different quality or from a different place, the buyer can prove the bargain and refuse to take them. But that does not meet the whole case. Having prepared to plant, it is a great disappointment to be put back another year. To obviate this, he must take care not to buy of any man that he does not know to be an honest man. There are honest dealers in trees who can be relied upon. Nurserymen have tried to prevent this sort of imposition by giving those who were dealing with them a certificate to that effect over the nurseryman's signature, but it was found to be a very easy matter to forge these certificates by any dishonest man.

Another remedy is to apply directly to the nurseryman. If farmers would club together and make up an order of a thousand trees or more, and send to the nurseryman they wish to deal with they would doubtless get their trees at a reduced rate, and be sure of being free from the impositions of a dishonest agent. This remedy would be effectual but it requires too much painstaking.

We know there are many very dishonest tree dealers, men who make it their practice to buy trees of the very cheapest quality wherever they can find them, and supply them to their customers as the produce of any of the most reliable nurseries of the

province. It is but a few weeks since we called at a nursery establishment in the State of New York, and the proprietor told us he had sold a thousand dollars' worth of second quality trees to a dealer who took them to Canada, but took great care to scratch off every mark which should indicate that the trees had come from the State. And this will continue just so long as there are careless men to be cheated by cunning knaves.

### The Gardener's Dream.

BY THE REV. S. REYNOLDS HOLE.

On the 14th of September last, I waited for the train at Coventry—no, not Coventry, at Ratcliffe-on-Trent—and waiting with me were two working-men, of whom the one was sober and the other was not. The other was what is called by a mendacious g'oss, one of those flimsy cloaks out by the evil one to hide the ugliness of vice, *fresh*. In truth, he was so especially stale that the sober man, wearied by his beery bosh, requested him to depart, as having had "too much drink." Whereupon he drew himself up with the solemn imbecile air of drunkenness, and said: "Now, just you listen to me. Do you think a mighty power'd mak' barley grow in the fields, and mak' 'ops grow, and then put it into the minds of other parties to mak' 'em foment, and me not meant to drink 'em? Why, you know not." "I know this," said the sober man; "a mighty power never meant you to go and mak' a be-ast o' yoursen." Whereupon I got into two trains—the Great Northern and a train of thought—and I thought what an excellent sermon I had heard and seen upon the text, "using this world as not abusing it." I thought that the sermon taught a lesson concerning the moderate enjoyment of other things as well as of beer, and among them I included tobacco. Believing that tobacco was made to be smoked, and not being an aphid, nor a red-spider, nor a mealy-bug, nor the Dean o' Carlisle, I smoke it. I had attached myself, consequently, the other evening to the summer end of a big Broseley pipe, and my mind in musing about many things, settled, finally, like a weary butterfly upon a rose, on the recreations and amusements of life. And when I had asked myself which of them all brings the longer and larger happiness, there appeared amid the smoke the vision of a man.

He was tall, erect and active, and though Time's snow lay on his broad brow, his winter days were those of a merry Christmas, when the air is pure and bracing, and the heart is full of love and hope. He took a few preliminary puffs, as if to test the quality of my Latakia, and then addressed me thus: "You call yourself a gardener and a florist, but if you were so, earnestly and thoroughly, you would not be now inquiring what recreation brings to man the longer and larger happiness. You would have known ere this that 'gardening,' as Lord Bacon tells us,

'is the purest of human pleasures, the greatest refreshment to the spirit of man,' and that 'the life and felicity of an excellent gardener is,' as truly now as when Evelyn wrote, 'to be preferred before all other diversions.' Hear evidence which you cannot dispute, but must sign, seal and deliver as your own act and deed. This very day, in the most dismal month of our English year,—

No sun no moon,  
No morn, no noon,  
No—vember

you have had your chief enjoyment from your garden. After breakfast you went into your rosery, and you cut a bouquet from Glorie de Dijon, Madame Masson, Jules Margottin, Madame Domage, Senateur Vaisee, and Souverin de la Malmaison, which placed on your writing table, brightened your room throughout the day. Tired with a long correspondence, you refreshed your spirit with a survey of your little greenhouse, gay with chrysanthemums—with those Hybrid Pelargoniums, which recall so pleasantly dear, quaint, old Donald Beaton—with Primula, and Fuchsia and sweet with Violets, Genista and Heliotrope. At luncheon you feasted on the half of a Marechal de la Cour pear, whose growth you had watched for weeks, and which weighed eighteen oz. when it fell. In the afternoon you opened, with the keen glad interest which a schoolboy feels when he cuts the string of his hamper from home, a bundle of new rose trees from one of the great nurseries. Then having looked into your fruit-room, and counted, like a miser, your golden store, you went into your vinery and out those grand bunches of Muscats and Hamburgs, which not only made you a dessert fit for an Emperor, but taken in part to a sick neighbour, brought you a far greater luxury 'the luxury of doing good.' And so it is, that every day brings to a gardener its especial interests. There is always something worthy of his care and admiration, some new development of beauty, some fresh design to execute, some lesson to learn, some genial work to do, \* \* \* And not only is the gardener's happiness thus in its duration sure, but it is in its peculiar essence of a very sweet and gracious quality. It ministers health to the body, and it ministers health to the mind. It brings pure air to the lungs, and pure reverent thoughts to the heart. It makes us love our home, content and satisfied with those two pleasures which neither sting nor pall; and yet, when we leave that home, it follows us wheresoever we go." \* \* \* I looked up to express my consent and penitence, but my ghostly adviser was gone. I awoke from my dream, and from my doubts. My eyes were opened from a darker blindness than sleep, and I had learned to verify in the happiness of a life the lessons of my Gardener's Dream.—*Gardener's Magazine.*

**THE SABLE QUEEN BLACKBERRY.**—The *Horticulturist* considers this new variety to be worthy of being added to our present list of blackberries; having this year found it exceedingly productive, perfectly hardy, not as luxuriant in growth as the Lawson or Kittatinny, and therefore more easily kept within bounds and cared for. The berries, it says, are of good, large size, though not equal to some of the mammoth specimens of the Kittatinny, yet averaging as good size as the Lawton (or new Rochelle); in color, a fine black, of excellent flavour, pleasant and sweet, entirely free from the acidity to be found even in the Kittatinny, and ripens a week later than any variety now grown.

The Cut-Leaved Weeping Birch.

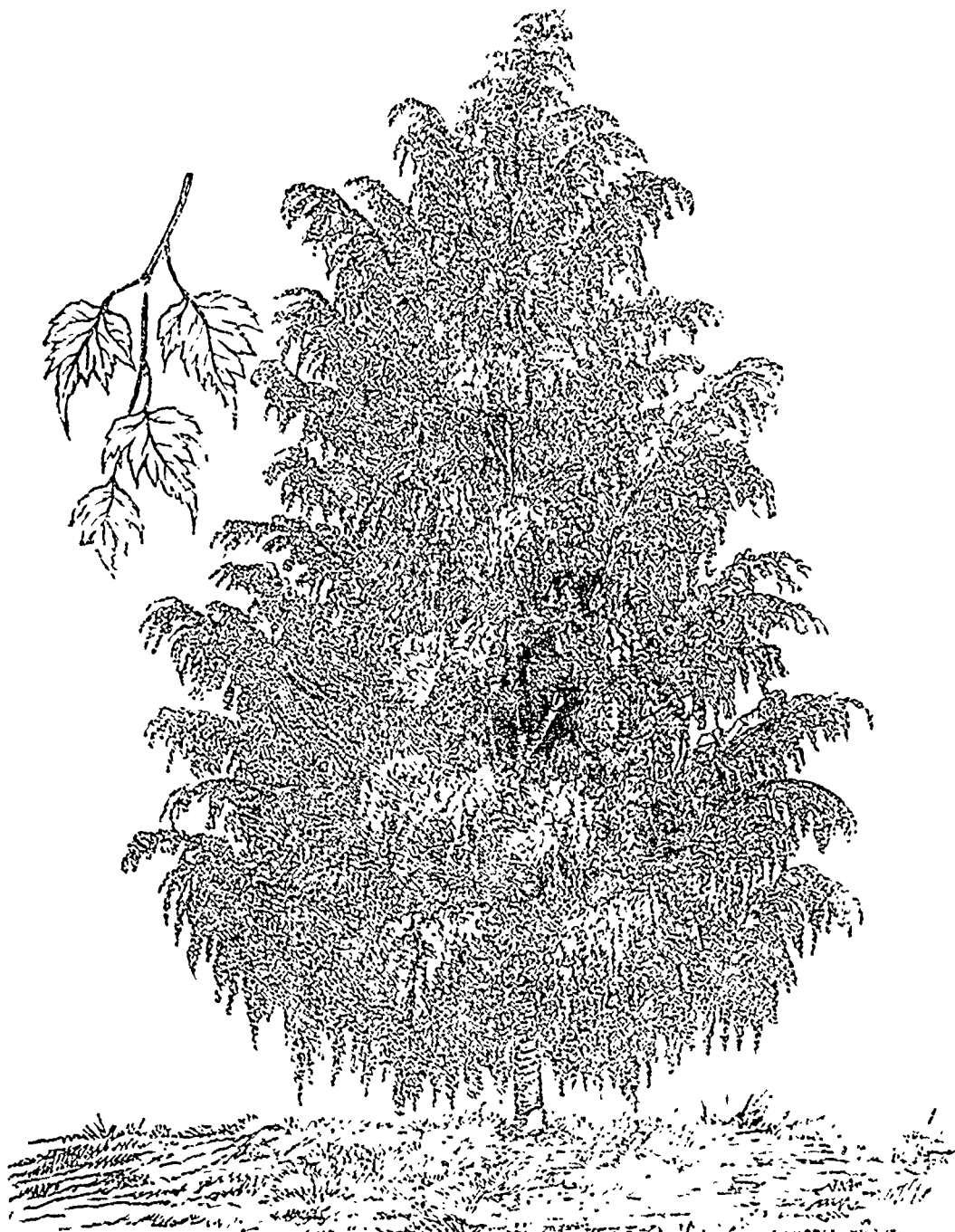
We have been so much pleased with this most handsome drooping tree that we have had an engraving prepared, so as to give our readers some idea of its beauty. The trunk of the tree grows quite erect, the main branches are stout and curve gracefully upward, while from

lawn it presents a most charming appearance. It is propagated by working it on the common birch, and can now be had of any of our nurserymen.

Grape Culture in Canada.

Few people are aware of the extent to which this new branch of agricultural in-

vines as would from its extent reduce the cost to the lowest wholesale rate. The consequence was a subscription of eight hundred dollars, which accompanied the order to one of our leading nurserymen for vines alone. Thus, between five and six thousand vines were set out in that immediate neighborhood alone, in one season: and as vines are the most easily propagated fruit tree we have, by cuttings and layers, it may easily be



these main branches there grow innumerable long slender branchlets, hanging perpendicularly downwards, many of them reaching to the ground. The leaves are deeply cut, giving them a most beautifully light and pleasing appearance. As the tree attains age and size the bark of the trunk and main branches becomes white, contrasting finely in summer with the green foliage and in winter with neighbouring trees. Planted singly upon the

dusty is now being carried in Canada. The wonderful success of the Vine on Kelly's Island, and other islands on Lake Erie, has set thousands of farmers on the shores of that lake, on both the Canadian and American sides, to the cultivation of the vine, and the consequences cannot but be beneficial. All round the shores of Essex and Kent farmers are waking up, and cultivating the vine largely. In the township of Gosfield alone, a few neighbors met, a short time since, and clubbed together to give such an order for

supposed that when once a plantation is established, our thrifty farmers will become their own nurserymen. Grapes, throughout the Niagara peninsula, are becoming as common as apples, and this may well be imagined when one man this last season had fourteen tons of grapes so injured by the frost, that he (not knowing that they were really not injured for wine,) sold them at two or three cents per pound, for the manufacture of either wine or vinegar. Throughout the present vineyard of Kent and Essex, the

"Catawba" comes to perfection, as do, also, most of the sorts grown at and about Cincinnati, which was the cradle of vine culture in America. The sweet kinds, such as the Delaware, and others of that class, yield good wine without additional saccharine matter; but to grapes more redundant in acid, large quantities of sugar are added, so as to give body and strength to the wine. The demand for grapes in their natural state is now so great, however, and they carry so well to market, that most of the crop is boxed up in small parcels fit for the retail trade, and sent off to the nearest city markets. And this will continue until the quantity produced becomes so great as to flood the market; the chief part of the crop will then be made into wine, and other things which naturally spring from that manufacture.

LECTIS.

### New Apples at Goderich

Mr. Adamson, Secretary of the Goderich Horticultural Society, says there are two native varieties there which have attracted considerable attention.

One was raised by Mr. Daniel Wilkinson, about 51 years ago, and the original tree is yet standing on Lot 25, of the 3rd Con., Goderich township. It has been in bearing for over twenty years, and is still very thrifty and prolific. Grafts taken from it have borne fruit of the character of the original, but showing a marked improvement in size of fruit and height of colour. Trees are thrifty and free from disease. Fruit large, conical, striped with bright red or pink, or light red on the sunny side, and covered with a beautiful bloom. Flavour is delicious; flesh, juicy and melting. Season October and November. Has been pronounced the best autumn dessert apple now known in Canada.

The other was raised by Mrs. Mary McInosh, Lot 32, 6th Con., township of Goderich. Has been grafted into several orchards and is much esteemed. The tree is a rapid grower, hardy and strong. The fruit is oblong, very deeply ribbed; skin smooth, glossy, and nearly covered with a very beautiful red, shaded portion, clear whitish yellow. Flavour something like the wine-apple; flesh crisp, with pink streaks, or a light wine colour; size, large to very large; will keep until March. Tree a good and constant bearer. When packed, the fruit gives forth a very strong vinous aroma on opening the barrels.

GRAPES AT GODERICH.—It is reported by Mr. Peter Adamson, Secretary of the Goderich Horticultural Society, that all the varieties of Grape whose period of ripening is not later than the Concord, ripen their fruit well in that vicinity. The rainfall there in 1868 was 23 1-10 inches; snow (melted) 10 inches; clear sky 12 1-10; cloudy 57 6-10; extreme temperature 59°, to 10° 9 Fahrenheit.

### Grape Vines for Trial.

The Directors of the Fruit Growers' Association of Ontario have issued the following offer to the members, in a circular from the Secretary:

"Sir, The Directors of our Association desire me to ask you if you are willing to accept of a new variety of Grape Vine, on the condition of taking good care of it, and making an annual report to the Secretary, for five years from the time of planting, of the results of your trial.

D. W. BEADLE,  
Secretary."

We are much gratified to see the public spirit that animates the Directors of the Association, and have no doubt the offer will be accepted by a large number of the members. It is in this way that new varieties of promising fruits can be rapidly disseminated and their value in the different parts of the country reliably ascertained. The Society is doing a good work, and every person who cultivates fruit should be a member. One dollar a year is the condition of membership which can be sent to the Secretary at St Catharines. Each member will receive a copy of the annual report, worth twice that sum. The offer contained in the circular is open to new subscribers, and any such who may wish to avail themselves of it are requested to forward their subscription, and intimate their wish in the matter, to Mr. Beadle as soon as possible.

### Fruit Growers' Association of Ontario.

The following circular has been addressed to the members of the Association by the Secretary:

GENTLEMEN, —When my Circular of 16th December, 1869, was sent to you, it had not then been ascertained by the Directors which variety of Grape they would be able to send you, though they were then in negotiation for the variety they now have the pleasure of offering to you, but feared that its cost, at this time, might exceed our means.

I have now much pleasure in saying that, through the liberality of Messrs. Dudley and Merrill, of Geneva, N. Y., who, for this purpose made a reduction of fifty per cent. from their lowest wholesale rates, as a gift to our Association, the Directors are able to announce that they will send, without cost, to each member, and to those who shall become members before April 1st, 1870, who are willing to give the vine good care, and report annually, for five years, to the Secretary, the results of their trial with it, one vine of the ERMELAN GRAPE, now selling at two dollars each.

It is claimed for the ERMELAN—that it is the choicest of all Black Grapes; that it ripens before the Hartford Prolific; that it is unequalled in vigour and hardiness; that it is largely productive; that it possesses superior flavour, and that it makes the best of American Red Wines.

Those who take the vine are requested to bear these points in mind, and to report fully whether these allegations are realized in their experience with it.

I am also able to state that the annual report is in the hands of the printer, and will be mailed to all members as soon as it is ready.

D. W. BEADLE,  
Secretary

St. Catharines, 12th January, 1870.

### Hardy Canadian Apples

Mr. P. C. Dempsey, of Prince Edward county, reports two very valuable and perfectly hardy varieties of apple, which originated in that county. The one he calls "Redner's seedling," size, medium to large, form, oblong; stem short; colour, green becoming yellow at maturity, with red stripes on the sunny side; basin, small; fruit nearly even; flesh yellowish white, juicy rather acid; ripe in September. Tree, a good grower with a spreading top; productive and hardy.

"Albury" he suggests as the name of the other, also raised by Mr. Redner. This apple is rather large, ovate conical; colour, yellow, with a dull brown, in the sun; covered with light spots; stem, an inch long, slender, inserted in a small cavity; flesh tender rich, acid, of fine flavour; ripens in September. Tree is very productive, perfectly hardy, and a good grower. Mr. Dempsey esteems it the best and most profitable apple of its season that they have.

Another fall apple is mentioned by another person, as growing on the farm of Mr. Buck, in Darlington, so much valued that Mr. J. P. Lovekin, of Newcastle, has propagated it. The tree is one of the first trees planted in those parts, and the seed was brought from Virginia by the early settlers, upon the close of the Revolutionary War.

### Another Trial of Grapes.

At Newburgh, N. Y., on the Hudson River, a gentleman tried the saccharine quality of several varieties of grapes, all grown on the same soil, in the same exposure and gathered and kept in the same manner.

Here the Diana stood at 91, the Isabella at 76, Concord at 73, the Hartford Prolific at 74, Iona at 94, Clinton at 97½, and the Delaware at 113.

From this it appears that the Clinton contains more saccharine than any of the other grapes usually grown here, except the Delaware, which in this case stood 15½ degrees higher than the Clinton, and 19 degrees higher than the Iona.

KILLING CROCODILES.—Mr. John E. Glover, at Kalamazoo, Mich., has put a fence around his plum orchard, and turned in his fowls and pigs, and now raises plenty of plums, and finds it a paying investment.



**Northern Spy Apple—Grape Growing.***To the Editor.*

SIR.—I have about one hundred Northern Spy apple trees that were set twelve years ago on a stony ridge which cannot be cultivated; the trees have grown well, but have not borne ten bushels of apples. Now, I am tired of waiting for them to bear. What I wish to know is this, would it not be better to graft them to Baldwin or R. I. Greenings than wait longer? Mr. Leslie, of Toronto says the Northern Spy needs good cultivation and that I cannot give them.

I also wish to ask your opinion of the profits of future grape-growing; also, the best kinds to plant. Would wire not be cheaper than lumber for trellising.

By answering the above questions you will much oblige.

**AN AMATEUR FRUIT GROWER**

REPLY BY HORT. EDITOR.—If your Northern Spy apple trees have been planted twelve years, it would be a great pity now to graft them over. They come into bearing late, but if you can get such Northern Spy apples from your trees as Mr. O. T. Springer, of Wellington Square, gets from his, they will pay you well for waiting a few years longer. Besides, you will gain nothing by grafting over your trees, for it will take four years to get a new top on and into bearing, and by that time you will surely have fruit in abundance from your Spy trees. All the cultivation that you need to give your Spy trees is a top-dressing of manure when they begin to exhaust the soil, which is when the tree makes very poor growth and yields small fruit. Your trees have been making good wood growth, and may require to have the top thinned out; indeed, they certainly do if you have not kept the heads open. Will Mr. O. T. Springer be kind enough to give our readers the benefit of his experience, and tell them how he takes care of an orchard of Northern Spy apple trees, and whether he has a profitable variety?

The profits of future grape growing are as sure as those of any agricultural production and will be reaped in fullest measure by those who do not expect great profits in a very short time, but are patient, persevering, and attentive to their business. So far as climate is concerned, there is no better than yours at Buckhorn, County of Kent. But grape growing in America is a new branch of industry, and although much has been learned in a very short time, we have, no doubt, much more to learn, and the observing and thinking cultivator will soon distance those who depend on others to do the thinking for them. We have learned that the old north European methods of cultivating the vine are not adapted to our varieties of grape; but it is not quite certain whether we have yet ascertained the very best methods for training our vines.

You do not say whether you intend to sell your fruit or to manufacture wine; nor do you mention the character of your soil.

Please inform us on these points, and then we can better advise you as to the varieties. What varieties are now growing in your neighbourhood, and how do they succeed?

Good galvanized wire is both cheaper and more durable than lumber for trellising.

**Pruning Grape Vines to Death.**

The *Gardener's Chronicle* thinks that the vines which are termed "worn out" and have to be rooted up and give place to new ones, have been pruned to death. Speaking particularly of the Bishop Stortford vines, that ought now to be in their prime, he says they are used up because they have been systematically deprived of that breathing space of foliage which was not only necessary, but quite indispensable to their profitable existence. They have been kept to the single-rod, restrictive and close-pruning system and have failed, as thousands of vines have done before them. If, instead of being confined to a single rafter, one vine had been allowed gradually to have filled fifteen or sixteen of them, it is not improbable they would annually have accumulated strength, and been now in the full vigour of their youth. *By the process of restrictive pruning, we must have restrictive root action.*

Will our Canadian vine-growers, who are blindly following the close pruning system, pause and ponder?

**Fruit in Enniskillen.**

Mr. Richard P. Smith says, there is a ridge of light soil running obliquely through this township, on which fruit trees do remarkably well and make a rapid growth, and he has no doubt but that this ridge will become one vast orchard. At present there are not many orchards in this township, but the people are beginning to pay more attention to fruit, and Mr. Smith has no doubt but that the hardy kinds of fruit can be grown there. The adjoining township of Moore seems to be more favored, at least the inhabitants are able to exhibit better fruit than has yet been shown in Enniskillen.

**Fruit Growing in the Township of Scott, North Ontario.**

Mr. A. Turner, in his report to the Fruit Grower's Association, says that the soil found to be most suitable for the different kinds of fruit is a clay loam with gravelly subsoil. He complains that the interests of fruit growing there have suffered much from the impositions of dishonest tree dealers, who rarely, if ever, furnish the varieties ordered. He concludes by saying that if intending fruit growers could be impressed with the necessity of planting none but the hardiest known varieties, and would take the pains to procure them direct from reliable nurserymen, he sees no reason why Scott should not take a first place among the townships of Northern Canada in regard to fruit growing.

**House Plants.**

The reason why it is so difficult to keep plants during the winter in our sitting-rooms is that our rooms are too dry and hot for their healthy growth, and oftentimes too dark. Plants thrive best in a moist atmosphere, the heat varying with the natural requirements of the plant, and where they have plenty of light. It is not easy to overcome the difficulty, but the suggestions of the *Buffalo Express* on this point are valuable. It is suggested by the *Express* that the flower-pots be set in a box in which they can be plunged to the rim in moss, and the whole surface, except the earth in the pots, be nicely covered with green moss. This moss can be kept moist by sprinkling it with tepid water, and the evaporation arising from the moss will give a moisture to the air surrounding the plants. It will be found that plants treated in this way will not require to be watered as often as those standing with the pot exposed in the usual way. As often as once a week, the leaves should be freed from dust by a good sprinkling from a fine-rosed watering pot, or what is better, a fine syringe.

**New York City Grape Market for 1869.**

The *Horticulturist* has a very interesting article on this subject. It appears from this that the Concord has increased greatly in popular favour, the demand being greater than the supply. The demand for Isabellas was very great, the crop was large and the fruit good, selling at wholesale from eight to ten cents per pound.

The Isabella turns out to be a good market grape, selling a little higher than the Isabella.

The Catawba did not ripen as well as usual last year, and sold much lower than former years, and the Isabella was taken in preference.

Jonas were plenty, but not much demand for them, because they were not well-ripened. The berries are apt to drop from the bunch after being packed a short time.

There was not much demand for the Diana, though the crop was small and the fruit good.

The demand for Delaware grapes was much larger than heretofore, but a break in the railroad caused a detention of ten days, and consequently a great quantity was thrown on the market at once, and some of the fruit in a damaged condition, so that a large proportion of the crop was sold at low prices.

GRAPES IN VICTORIA.—At Lindsay, County of Victoria, the Clinton Grape proves to be perfectly hardy, bearing the exposure of the winters; but in some unfavourable seasons does not ripen. We would suggest to our readers there to try the Sherman Grape, which here seems to be perfectly hardy, and is very much like the Clinton, evidently belonging to the same family, but ripens here nearly a month earlier.



### The Sweetest Grape.

A committee were appointed to test the saccharine properties of several varieties of grapes at the meeting of the Vine Valley Grape Growers' Association, held on 20th October, 1869.

The committee report that in every instance the sweetest grapes were from the vineyards having the highest altitude. They used Coehle's must scale.

Of several samples of Isabella the highest stood at 85; the best Catawbas at 90; the best Concord at 85, Diana at 90, Iona at 97, and Delaware 107.

According to this experiment it will be seen that the Delaware contained the most saccharine, standing ten degrees higher on the scale than any of the other varieties.

### Bugs.

Several of the reports to the Fruit Growers' Association complained very much of *humbugs*. One from Durham village, County of Grey, says "the largest bug we have had here was a supply of apple trees that did immense evil to the poor farmers in this locality, the trees being the off-scouring of some yankee nursery," (though represented to have been grown in Canada,) "and consequently put back the settlement for many years, and many were so much discouraged they have not tried again. Your society should try to get the Legislature to pass an Act to prevent such a thing occurring again. Many new settlements will be so victimized unless there is some punishment for such deeds. Years wasted by such roguery is bad for the poor."

### Gladiolus for Small Gardens.

"D, of Deal," names the following six varieties as his choice for a small selection, viz:

*Shakespeare*, which is a beautiful white flower of fine form with large rose spots, possessing a good constitution and forming a 'model of a spike'

*Adolphe Brougniart*, which is not known to us.

*Meyerbeer*, with a spike not easily excelled, very showy, brilliant vermilion orange flamed scarlet, and spotted with amaranth.

*Thomas Methven*, which we have not seen.

*Ulysses*, fine rose color, unsurpassed in form.

*Madame Furtado*, a rosy white, flamed with deep carmine rose, a large flower.

### Catalogues Received.

Vick's Illustrated Catalogue and Floral Guide, for 1870. James Vick, Rochester, N. Y. A beautiful catalogue of flower and vegetable seeds and summer flowering bulbs, containing over eighty pages of descriptions, profusely illustrated with engravings executed in the highest perfection; to which are added a very beautiful coloured frontispiece, and an excellent likeness of Mr. Vicks.

Descriptive catalogue of Fruit and Ornamental Trees, Shrubs, Grape Vines, Roses, Dahlias, Green-house Plants, &c., &c. St. Catharines Nurseries, D. W. Beadle, St. Catharines, Ont., 1870.

### New Books.

The Fruits and Fruit Trees of America, by A. J. Downing. Second Revision and Correction, with large additions, by Charles Downing. New York, John Wiley and Son, 2 Clinton Hall, Astor Place. 1869.

It is very gratifying to every grower of fruit to have such a work as this at hand to aid him in determining the correctness of varieties as they come into bearing, or in making a selection from those that are most esteemed by a man who has had such long acquaintance with fruits and has had such opportunities of testing their qualities in a variety of soils and climates, and who withal has the honesty to state his opinions frankly. There is not another man in America so well qualified to give us such a work as this; and what a work it is, of over a thousand pages, filled with concise descriptions and outlines of fruits.

There are over eighteen hundred different varieties of apples described, and pears, plums, cherries, peaches, grapes, &c., &c., in proportion. In this edition the attempt to classify the fruits according to their season of ripening is wholly abandoned, very wisely as we think, and the alphabetical order substituted. The list of varieties is brought down to the present time, thus making it a complete guide in matters of pomology. We all owe a debt of gratitude to Mr. Charles Downing for the patient labour he has bestowed upon this herculean task, and the thorough manner in which he has done the work.

TRANSPLANTING.—The secret of success in transplanting trees, is in carefully covering the ground after the trees have been well planted, with a good, thick mulch.

MICE.—To keep the mice from gnawing your fruit trees, just wrap a piece of tarred paper around the trunk of the tree, extending upwards from the ground for about two feet.

Madame la Baronne de Rothschild is one of the finest roses grown, a most beautiful satin pink, and ought to be in every collection.—*Cottage Gardener*.

SEEDLING PLUM.—Mr. Alexander Glass, of Guelph, promised to send to the fall meeting of the Fruit Growers' Association, a Seedling Plum, very large, purple, good quality, ripe about middle of October.

THE BORER.—Mr. James Cowherd, of Newport, reports to the Fruit Growers' Association that the Borer attacks more or less such Apple trees as lean to the northeast. Can any of our readers give the reason why, or corroborate the statement?

JUCUNDA STRAWBERRY.—Mr. Knox, of Pittsburg, Pen., after no little trial of different methods of cultivation, has decided that the best method for this variety is to set the rows two feet apart, the plants a foot apart in the row, and keep the runners carefully cut off. His fruit is very large and fine, ten or twelve berries making a pint.

THE RURAL NEWYORKER.—Our acknowledgements are due to the worthy editor and proprietor of the *Rural New Yorker* for a most handsome card of invitation to celebrate with him in his hospitable mansion the occasion of his fiftieth birth day, and of the twentieth anniversary of the *Rural New Yorker*.

For many years we have enjoyed the acquaintance of the Rural and its very able editor, and take much pleasure in putting on record at this time our high esteem for the man and high appreciation of the *Rural New Yorker*. We congratulate him on having attained to so distinguished an age and so distinguished a place among the rural journals of the day, and can but hope there are yet in store many years of usefulness and prosperity.

THE SMALL FRUIT RECORDER, for January, 1870, comes to us in new type, giving a third more reading matter than formerly, and running over with good, plain, practical advice on all matters relating to the cultivation, gathering and marketing of small fruits. Subscription, only 50 cents per annum. Published by A. M. Purdy, Palmyra, N. Y.

SOUND ADVICE TO THE GROWERS OF SMALL FRUIT.—Mr. P. C. Reynolds, of Rochester, who is, we believe, an extensive fruit dealer, in a letter to the *American Farmer*, advises all those who propose to go into the growing of small fruits, such as strawberries, raspberries, blackberries, gooseberries, currants, and grapes, to locate near some pleasant, growing village, on the line of a live railway; begin modestly, feel their way, raise the best fruit, and place their chief reliance on the home market. If the supply at any time is getting too great for the home market, then ship off the surplus, even if but little be realized from it.

NIGANOR STRAWBERRY.—We notice that the *Small Fruit Recorder* does not place a very high estimate upon this berry, saying that it is "small, and of only middling quality," and has nothing to commend it above the *Ida*, *New Jersey*, *Scarlet*, *Downer*, or *French*.

STRAWBERRY PROFITS.—A correspondent of the *Gardener's Monthly* sent strawberries from New Jersey to the Philadelphia market. He paid three cents a quart for picking them. His consignee sold them for four cents a quart. What were his profits? Will the author of "Five acres too much" please make out a balance sheet?

THE GOLDEN RUSSET APPLE.—The climate of Wisconsin is known to be very trying to apple trees, and it is worth while to note that Mr. John McLees, of Harmony, Vernon Co, Wisconsin, says the Golden Russet is there a good bearer, a strong, healthy tree, and stands the winter like a Burr Oak.

BEURRE D'ANJOU PEAR.—This variety is worthy of extensive trial in all parts of Ontario where any pear tree will thrive. The tree promises to be quite hardy, healthy and very productive. The fruit is large, handsome and of excellent flavour, ripening in December. We expect it will become a favourite sort.

## Apiary.

### Bee Hives

*To the Editor*

Sir,—Allow me, though thus late, to make a few observations on the report in your journal respecting the bee-hives at the Provincial Exhibition. Your reporter says:

"A hive is also exhibited by Messrs. Miniely and Wallace, of Warwick. It is a modification of the Gordon hive, having triangular frames. It is claimed the bees can not glue the frames in the hive, but this is a mistake."

Now, in the first place, now it comes that our hive is a modification of the Gordon hive, more than of any other, is a mystery to me, inasmuch as the Gordon hive has a square cap, and square honey boxes; so had all the others on the ground, and ours has a roof-shaped cap, and a triangular honey box, besides a honey lid, which the Gordon hive has not. The Gordon comb frame is hung on wooden bearers; so were all the comb frames exhibited, except our own, which is hung on nails. The Gordon comb frame is made of four sticks, and so were all the frames exhibited, except our own, which is made of three sticks. Our hive, in common with others, has a revolving bottom board, and sits upon its own bottom. The Gordon hive has no revolving bottom board, neither will it stand up; you have either to hang it up or lay it down. Then, again, it takes six boards to make the body of the Gordon hive, whereas our hive takes only four, the same as any square box hive. In fact, the only difference between it and a square hive in its construction, is simply that the sides of our hive are drawn together at the bottom, until within about one half inch of each other, so as to form a self cleaning hive.

My partner and myself have therefore come to the conclusion that your reporter has either spoken ignorantly, or with the full determination to mislead the public, inasmuch as many practical apirians consider the Gordon hive a failure, and it is now publicly known to be a Yankee "sell," and his words would imply that ours is no better. Further, he says that what we claim with regard to the glueing of the frames to the hive is a mistake. How your reporter could make such an assertion in the face of proof positive to the contrary, is what I would like to know; for if he took any notice of the hive in which the bees were exhibited by us, he could not but see that the bees had never attempted to glue the frames to the hive.

In conclusion, I would just state that there are over seventy of our hives now in use, and that not one of them has its frames glued to the hive; and furthermore, we do hereby agree to pay your reporter the sum of one hundred dollars for each and every comb frame of our construction he finds glued to the hive by the bees, provided they are hung

three-eighths of an inch clear of the sides of the hive. And not only so, but we are also prepared to prove to your reporter that our hives have other important advantages over the much-lauded Thomas hive, besides their freedom from liability to the glueing of frames. I may also add that our comb frame is a triangle hung with nails on the slanting sides of the hive.

We claim the privilege of having the above inserted in your journal, inasmuch as every man has a perfect right to make his own defence, and at the same court in which he has been charged. In granting the above attention in your paper you will much oblige

ALEXR. H. WALLACE.

REPLY BY APRIAN EDITOR.—The Gordon hive is called a triangular self-cleaning hive, and was among the first, if not the first, made in Canada, and certainly the first brought into public notice, and the fact that Mr. Wallace admits that his is a triangular self-cleaning hive, though in many points unlike the Gordon hive, is proof that the reporter was quite correct in saying it was a modification of the Gordon hive. Mr. Wallace further says the frames in his hive are "hung with nails on the slanting sides of the hive." If Mr. Wallace considers the nails on which his frames hang no part of the hive, he may say that his frames are not glued to the hive; but that they were, and will be, glued to the nails, or the nails to the hive, is a fact, which if he does not now admit he will after a longer experience. It is a fact long known to experienced bee-keepers that frames held from each other, or from the hive, by nails or small wires, will be more or less glued to the nails or wires, and this is the every day experience of those long using movable frame hives. This statement is not made to show that the glueing is any detriment in properly constructed frame hives, or in any way interferes with their practical utility, but to show that the reporter for the GLOBE was not incorrect in his report. We may here add that so early as 1851, a triangular hive was constructed in England, called the "Munn hive," since which several modifications of the same have appeared in the United States, nearly all of which have long since been discarded. Of late, however, the triangular form of hive has been revived in Canada—a thing of the past, not new to experienced bee-keepers and, without doubt, of short duration here, as it has proved to be in England and the United States.

### Smoking Bees.

Amateur bee-keepers frequently ask if smoking bees when operating with them does not injure them, or, at least, irritate them. Now, while it is quite certain that we can smoke bees to death yet a judicious amount of smoke is not injurious. If human beings were placed in a room and confined there, and sufficient smoke blown or forced into the room, they would be suffocated; and the same

is true of bees. Again, as with individuals, so with bees, different kinds of smoke, or rather smoke from different substances, will affect them differently. They are quite easily stupified with the smoke of tobacco, and the smoke of "puff ball" is even still more powerful, and should be used with care.

The object of smoking is to cause the bees to fill themselves with honey, in order that they may not sting while the bee-keeper is operating with the swarm. The process is called subduing them. But very little smoke is required to do this, and the smoke of chips or rotten wood is preferable to the smoke of tobacco or puff ball. The former does not irritate, while a frequent use of the latter seems to make them vicious after the operation is over. I have never been able to discover that the smoke of chips or rotten wood irritates the bees in the least, but rather prevents them from becoming irritated. If we operate with a stock of bees without using smoke, they soon become very wicked; but if we first subdue them with smoke, we may operate with them frequently and yet perceive no greater inclination to sting afterwards; that is, provided we use chips or rotten wood to produce a smoke.

The amount of smoke to be used depends somewhat upon the season of the year and the condition of the stock. In cool weather more smoke is required, particularly in the fall, when nearly all the honey is capped over. Stocks that are very populous and well supplied with honey, and stocks that are raising young queens, always require more smoke to subdue them than other stocks not in the same condition. As we can neither weigh nor measure the amount of smoke required to subdue a stock, we would say that a few puffs at short intervals for five or ten minutes will be found sufficient, as a general thing. As soon as a stock is subdued the bees make a peculiar noise or roaring, leaving the combs and clustering together on any unoccupied space in the hive. The noise made at such times is in all respects the same as made by a swarm entering a hive. When this is heard, sufficient smoke has been used.

The most convenient method of using it is to puff it off from a pan of smoking chips or rotten wood held in the hand near the bees, or at the entrance to the hive. Many smoke pipes and fumigators have been invented for smoking bees, and some of them work very well; yet I find a pan of smoking chips, or a piece of rotten wood lighted at one end and held in the hand, far more convenient than any fumigator, as the smoke may be puffed off or blown among the bees without difficulty, while it is more easily lighted and replenished than a fumigator. Nothing is better than dry rotten elm, or, in fact, any dry wood that will continue to burn without flaming.

The proper time to use smoke is at any and every operation with the bees. Whenever it is desirable to examine a stock for any purpose, then is the time to use smoke! Even though one is protected so that the bees can not sting, yet it is advisable to use smoke, as they will be far less irritable after the operation.

J. H. THOMAS.

Brooklin, Ont

## Agricultural Intelligence.

### Agricultural Produce Trade of 1869

From a full and elaborate report of the trade of 1869, as gathered from the transactions of the Toronto market, we very briefly state the general conclusions affecting the dealings in grain and other strictly agricultural products.

#### WHEAT.

The year's operations in this grain have, with few exceptions, resulted unsatisfactorily. Commencing the year with prices for Spring at \$1, and for Fall at \$1 10, there was some ground for expecting a fair business at such reasonable rates, for the wants of Great Britain were known to be large, and there were constantly recurring reports of distress in the North of Europe; a great part of Russia, especially, was said to be short of supplies. Under these circumstances free buyers were found for all the winter deliveries. But towards the month of April, or about the opening of navigation, the prospect for dealers became cloudy, for, instead of the presumed deficiency, there was unexpectedly a large abundance, especially of California white wheat, the estimates of the shipping stocks of which having been much under the mark, and the arrivals from that wonderfully productive country into British as well as United States ports were so large and frequent that holders at all points were obliged to succumb to the ever increasing weakness of the market.

This state of affairs existing in all the primary markets of the world, it was only natural that when our wheat began to go forward and meet the competition of large and depreciated stocks there should be entailed upon shippers some very heavy sacrifices, made all the more from the fact that a large proportion of our white wheat suffered from the plague of smut, which, in former years, had to a very serious extent injured its reputation. It is surprising that so little has yet been attempted, in the way of arresting the spread of this evil which threatens to ruin entirely the whole of our once splendid foreign trade in white wheat. To such an extent has it suffered in reputation that it has actually been sold in New York at lower prices than were current for good sound Spring.

We regret that so large a proportion of the Fall wheat of the North and West has suffered from rust, and wet weather, and that much of the Spring wheat in the poorer, and more inland townships is no less injured by frost.

#### BARLEY.

The splendid reward which attended the cultivation of barley in 1868 naturally stimulated its production in the following year. Long before harvest the probabilities of the trade were canvassed and discussed with minute carefulness. We were not without hope that good prices would be paid for the new crop. Great stress was laid on the reported failure of the corn crop of the United States, while it was said that much destitution prevailed in the north of Europe; but, however these circumstances might have operated in ordinary seasons, they were powerless in view of the superabundant yield with which the year was crowned. Estimates of the barley crop of 1869 have ranged from 50 to 100 per cent increase over that of 1868, which was in the neighbourhood of 4,500,000 bush.

The climatic peculiarities of last season would seem to have demonstrated the radi-

cal unfitness of the soil of the greater part of the United States to produce a first-class barley; but if further evidence is wanted of their inability to cope with us in the cultivation of a cereal so indispensable to them, we have only to point to the shipments of our barley to the Western and South western States, which, notwithstanding, their own enormous production, have, this year, been in excess of any previous season.

#### PEAS.

The trade in this grain for the past year has been moderately active, and upon the whole profitable and satisfactory. Rarely have our agriculturalists been so fortunate in realizing such prices for peas as during the last two years. The limited supplies from the Baltic and Black Sea into Britain, with the high prices current for corn and all feeding stuffs, left a vacuum which raised the value of this cereal in the English market almost to a par with wheat. The year opened with high prices, which continued to prevail with little alteration till the spring, when shipments met a declining breadstuffs market, and of course had to share in the sacrifices thereby entailed.

We regret that in addition to the unfortunate prevalence of sprouted and damaged grain, there is, in most of the sections of the country tributary to this market, hitherto singularly free from reproach, a large proportion of wormy or "buggy" peas.

We recommend our farmers to inquire into the cause of this, and if possible adopt some remedy. Toronto peas have for years stood first in the market; let us by all means endeavour to maintain this reputation.

#### OATS.

The years 1868 and 1869 have been exceptional for the high prices realized for feeding stuffs in general. Coarse grains of all kinds brought unusually high prices, and proved most remunerative to the grower. So short was the crops of 1868 that not even by the thrickest hoarding on the part of consumers could we have eked out the year, and, consequently large importations were made from the Western States and the Lower Provinces, to meet the steady demand, multiplied as it was during the entire part of the year by the requirements of the troops in garrison.

Up to the harvesting of the present crop therefore, high prices had been current; but so soon as the first deliveries were made, the market dropped from 58c. to 30c. Whether the partial failure of the Western corn crops may have a stimulating effect on later quotations we are not prepared to say; but however remote the contingency, it is about the only one we can think of at all likely to affect the question of present rates. A pleasing feature in connection with this grain is the very large increase in its manufacture into oatmeal—a breadstuff of equivocal reputation with moralists like Johnson, and punsters like Sidney Smith, *et hoc genus omne*—but after all getting to be extensively used both here and in the United States. The development of this trade is a source of great satisfaction, affording, as it does, an additional outlet to our surplus production, and at the same time adding a new branch to the tree of national industry.

#### WOOL.

The past season has been one of the most remarkable in this business which has come under our notice for some years.

During the month of February there was a considerable demand from American manufacturers, and prices were maintained in the near vicinity of 35c per lb., but gave way on the approach of the wool season. The new clip opened at 26c. and steadily advanced

to 36c. As a general thing the season was a profitable one to the country, and to the trade. Nearly the whole of our clip went at once into the hands of the American manufacturer, instead of as formerly into the Commission Warehouses of New York and Boston—thus transferring to the pockets of the producer, what, in most previous seasons, went to pay the exorbitant charges of intermediate handling.

Since November, wool has fallen very much below the price paid for it in the early part of the season, and the new year opens with rather a poor prospect for the trade. On an examination of Walter Brown & Son's annual statement of last year, in which the monthly values of wool since 1855 are given, we find that, taking gold at its present value and reducing the value of wool in New York to the normal gold standard, present quotations are lower than they have been for many years. It is satisfactory to find that the trade in pulled wools is growing into importance in this city, there being several pretty large establishments in active operation in which about 4,000 skins per week are pulled. This class of wool has naturally sympathized with fleece wool, and could now be contracted for at a reduction of from 4c to 5c on the September and October values. This has been contrary to expectation, as the number of slaughtered sheep was known to be under that of former years, and calculations were based on a belief in the obvious effect of a scarcity of skins; but the large importation of foreign wool during the year disappointed expectation, and very considerably interfered with the demand for pulled wool.

It is essential that our market should have a high reputation for its accumulations of wool, and farmers will only be taught through their pockets, that care and attention in the preparation of their wool products are of the most primary importance.

### The Smithfield Cattle Show.

The annual exhibition of the Smithfield Club, following close, as usual, on the Birmingham show, came off at Islington in the new cattle market for London, during the second week in December. English agricultural journals, without exception, speak of it most favourably, not as presenting any features of extraordinary interest or merit, but as worthily sustaining the world-wide fame of the Smithfield shows and of British cattle. The highest prizes were awarded to Lord Aylesford for a Short-horn steer as the best animal in the show. Lord Aylesford's prizes in money and plate amounted to close on £300. As regards the various breeds of cattle, Short-horns were, as usual, good; the Devons particularly good—as a class perhaps the best in the yard; Herefords were below the mark; and Sussex cattle unusually fine; there were also some very meritorious cross-breeds.

Her Majesty the Queen was one of the foremost exhibitors, with twelve lots, taking a first prize for a Short-horn steer, second for a Hereford, and third for a Devon steer. The Prince of Wales also exhibited in several classes, and gained a first prize for a cow of the Sussex polled breed.

The sheep, though not making up a large collection, were beautiful specimens of their respective breeds; Lord Walsingham's

Southdowns especially eliciting universal admiration. Lord Berners took the lead in Leicesters. Cotswolds were very slenderly represented.

The show of pigs was larger than that of last year, and in general excellence quite up to the average mark.

In the other departments of the exhibition, including agricultural implements and productions, there was a fine display, equal to that of any previous year. Some of the prize hams, we are told, exceeded forty pounds in weight. The general show of roots however, particularly in turnips, was more distinguished by well-proportioned, well grown and solid specimens than by mammoths, which are deservedly not much in favour, and are less nutritious and profitable than roots of medium size. Monster beasts are also less popular than formerly. The live weight of every animal is taken down as it enters the yard; that of Lord Aylesford's prize steer was a little over 2,100 lbs.

### Board of Agriculture.

The Board met in the Agricultural Hall on the 11th January—Mr. Mallory, of Napanee, President, in the chair.

The minutes having been read, the Treasurer presented the yearly financial statement showing a balance on hand on January 5th amounting to \$1,649 97.

The report was adopted.

The following resolution passed by the Directors of the Fruit Growers' Association at a meeting held in Hamilton on the 8th December, 1869, was presented. "Resolved that the Directors of the Fruit Growers' Association recommend to the Board of Agriculture to take such steps as may to them seem advisable to induce the people to plant trees for shelter; and that our President is authorized to state to the Board that this Association is prepared to co-operate with them in efforts to accomplish this object.

"D. W. BEADLY,  
"Secy. F. G. A. of Ont."

The subject was deferred for further consideration.

Professor BUCKLAND submitted to the Council a statement from Messrs. Aldwell & Co., respecting the malting qualities of the Chevalier Barley grown by Hon. Geo. Brown, and urged the importance of giving this variety a full trial in different parts of the Province.

The matter was deferred for further consideration.

The subject of Mr. Glackmeyer's claim was next brought up. After a long discussion, Mr. RYKERT moved, seconded by Mr. GIBBONS, "That the Treasurer be instructed to pay Mr. Glackmeyer the sum of one thousand dollars, in full satisfaction and discharge of all claims against this Board for supplies furnished during the visit of the Prince, for carriage hire, and other expenses, and also for the use of his house, upon his furnishing a bond indemnifying the Board against any claims for or by reason thereof; said bond to be approved of by Messrs Shipley, White and Gibbons." Carried.

The subject of importing and testing new varieties of seeds was next introduced, and after a short discussion, it was moved by Mr. WALTON, seconded by Mr. GRAHAM, "That

it is desirable that this Council take some steps to procure new seed from foreign countries, be it therefore resolved that the matter be considered at the next meeting of this Council." Carried.

Dr BEATTY moved the following resolution, "That this Council highly appreciates the value of the subject suggested by the communication from the Ontario Fruit Growers' Association, viz., of planting shade trees by the rural Municipalities for protection against wind, and for preventing the diminution of rain fall; and this Council will adopt any scheme, having for its object the introducing and fostering any system for securing the general planting of shade trees throughout the Province; and that the societies be instructed, if possible, to ascertain what system has been adopted in any of the neighbouring States for the purpose." Carried.

The business of the Council having all been transacted, the Chairman said, this being the last meeting of the Board, his term of office expired with it. According to the agreement last year, some other member should now be elected as President.

Mr. RYKERT moved, seconded by Prof BUCKLAND, That the thanks of this Board be tendered to the President for the able and impartial manner in which he has discharged the duties of his office; that it is a matter of regret that any arrangement should have been arrived at, whereby our President cannot again offer himself for re-election.

Dr. BEATTY concurred in the sentiment expressed by the resolution, and thought the rule a rather absurd one which prevented the most competent man from being re-elected. Mr. Mallory had only time to learn the duties of his office rightly when he was compelled to vacate the chair. While acknowledging the necessity to submit to the agreement arrived at last year, he hoped a better arrangement will be made for the ensuing year.

The motion was then carried, and the meeting adjourned at ten o'clock.

### West Northumberland Agricultural Society.

The Directors in their report stated that, after paying all demands, they had a balance in hand of \$64 23; that they had 192 members for the past year; that their show had been a very successful one; that they had paid in prizes \$740 25; that the crops in the county were rather over an average; that the harvest was very late; and that owing to the frost setting in nearly a month earlier than usual there had been many fields of roots left frozen in the ground, and many apples frozen.

At the annual meeting it was resolved "that the ex-President (Mr. G. Bennett) and the Treasurer be a committee to purchase, and present, in the name of this society, some suitable present to the Secretary, C. BOURN, Esq., for the faithful, zealous, able and efficient services he has rendered to this society for the long period of upward of twenty-one years.

The foot and mouth disease is now very prevalent in all parts of the Russian Empire. At the Agricultural Exhibition, which was recently held at St. Petersburg, 257 cattle died of this disease.

## Household.

### Drainage of Houses

This is a matter that is far too much neglected, not only by farmers, but also by those living in towns and cities. It is no uncommon thing to find families suffering greatly from sickness, even to the length of death to some members, and running up a bill for medical attendance, from no other cause than such a simple and lightly thought of matter as a few inches of water in the cellar, in early winter or spring, or after some unusually heavy rainfall. Last year there was much more of this to complain of than usual, owing to the wetness of the season, and in instance that came under our notice it seemed to be regarded as almost a personal affront to tell the inmates of a sickly house that a few dollars spent in draining the cellar would restore them to health, and save payment of a heavy medical account. It was not so much the mere presence of water that caused the trouble, as the fact that the water was foul and stagnant, and had become impregnated with bad odours, in the form of gases, arising from the decomposition in it of vegetable matter, such as half rotten potatoes, onions, turnips, cabbages, &c., and also the decayed wood of the bottom or sides of the cellars, which in many farm houses are constructed of logs and planks.

The door yard in too many cases, is also a great source of unhealthiness. All the dirty water is unceremoniously thrown out at the back door, where it collects in a little pool, to be dabbled in by geese and ducks, wallowed in by pigs, soon festering into a mass of pollution, the very smell of which brings disease to those who may have to pass in and out near it, as well as to the animals which frequent the spot.

It is of the first importance to secure proper drainage to every dwelling house, and to make provision for the comfort and health of its inmates, by seeing that its whole surroundings are kept clean, and in good order. If a farmer cannot have a dry cellar, or one that is well drained, he had better have none at all to his house, but rather have one under the barn, or make a good root cellar near the barn-yard, and as for the slops of the house, it would be but a little extra trouble to throw them in a barrel, to be emptied when full on the barn-yard manure heap, or used to water the garden with.

### Damp Cellar Walls.

Tarring cellar walls, to protect the occupants from damp, has long been practised in Cornwall, England. In that wet-favoured portion of Great Britain, where a fine day is the exception, and not as here, the rule, every precaution is requisite to protect walls from dampness, and amongst these none are found more effectual than the use of coal tar

after being carefully prepared. The preparation consists simply in boiling the tar in any convenient kettle, until all the watery parts are evaporated and driven off by heat. The tar is then laid on the walls with a common whitewash brush, one or more thin coats being used, and as the tar is always laid on in as hot a state as possible, without destroying the hairs of the brush, it can be spread over a very rough surface of stone work with an even thin coat, and the stone or bricks never after become impervious to moisture. I have often seen buildings so covered, that were first plastered with a smooth coat of mortar, and laid out in squares to imitate cut stone work, and on this coal tar takes remarkably well. It would not perhaps be advisable to use tar for outside protection, against the weather, where the black color would be a serious objection and an unsightly object, but for utility there is no substance so cheap and at the same time so efficient in its action as a protection to walls against dampness. One great cause of wet walls is variation in temperature. If the wall so affected is exposed to cold on the outside and a warm, moist atmosphere within, a damp surface on the inside is absolutely certain to be the result. This arises from the condensation of the humid internal air on the chilled walls, and the remedy in this case must be looked for in another way. To exemplify this principle, let any one convince himself by laying a saw or axe out of doors, into a cold atmosphere, when the thermometer is about zero. After ten minutes of such exposure, bring the article again into the warm, moist air of the house, and the axe or saw will be at once covered with dew, from the condensation of moisture from the internal air on the cold surface. And this principle is always more or less active in cellars. The remedy is to keep the temperature up on the outside as much as conveniently may be, by covering and partial protection, and down in the inside by absence of heat, and your cellar walls will at once dry up. Attention must also primarily be paid to the matter of drainage, so often neglected altogether.

### Ease in Society.

"I'd rather thresh wheat all day in the barn," said Reuben Riley to his sister, who adjusted an uncomfortable collar about his sunburnt neck, "than go to this pesky party. I never know what to do with myself, stuck up there in the parlour all the evening. If the fellows would pull their coats off, and go out and chop wood on a match, there'd be some sense in it."

"Well, I hate it as bad as you do, Rube," said sister Lucy. "The fact is we never go nowhere, nor see nobody, and no wonder we feel so awkward when we do happen to stir out."

The remarks of this brother and sister were but echoes of the sentiment of many other farmers' boys and girls, when invited out to spend a sociable evening. But poor

Lucy had not hit the true cause of the difficulty. It was not because they so seldom went to any place, but because there was such a wide difference between their home and company manners. The true way to feel at ease in any garb is to wear it often. If the pleasing garb of good manners is only put on upon rare occasions, it will never fit well, and never seem comfortable.

Learn to behave properly at home - to cultivate yourselves. Do not sit, or stand or lounge about in ungainly attitudes, but acquire a manly, erect, graceful bearing. I have never seen such vigorous, hearty manhood in any class as among cultivated farmers' sons. Let table manners be especially looked after. If you are so unfortunate as to have a mother careless in this regard, you must do the best you can to remedy the early defect in your home training. Note carefully how well bred people behave, and do your best to imitate them. It is noble to be an imitator of that which is good and beautiful. Above all, if you wish to be at home in society fill your brains with ideas. Set your mind to work. Wake it out of the sluggishness it would naturally sink into, if you were only a plodder and nothing more, by good, stirring thought. Take the newspapers, and read them thoroughly. Knowledge is power in more senses than one. If you go into society with something in your mind worth talking about, you will not fail to find listeners who will treat you with respect, and where you are well received, you will not fail very soon to find yourself at ease.—*Country Gentleman.*

## Poetry.

### The Lights of Evening.

Softly over the river,  
And softly over the shore,  
The beautiful lights of evening  
Their tender radiance pour

I see on the rocky islet,  
That lies on the stream above—  
A stately beacon shining,  
Like the watchful eye of love

I see on the stately vessel,  
That's anchored just below,  
Two sentinel stars of safety  
Thro' the gathering darkness glow

I see in your distant cottage  
A lamp that will cheer and guide  
The weary fisherman homeward,  
Who comes with the incoming tide

I see here in my neighbor's window,  
The taper that gleams so mild  
It's trimmed by a tender mother,  
Who watches her suffering child

As I turn from these lights around me,  
To the starry lights above,  
Where numberless angels seem keeping  
Their vigils of care and love

I think, with a grateful spirit,  
That still, at the evening fall,  
Somewhere there are beacons shining  
To comfort and guide us all

## Miscellaneous.

### Cleaning and Preserving Metals.

Oxalic acid is very commonly used for cleaning brass, German silver, and similar goods. It answers the purpose very effectually, but the metal should be carefully cleaned, well oiled, and the oil thoroughly rubbed off. Polished steel and iron can be cleaned only by friction with some abrasive substance, such as emery, or polishing powder of some kind; most of the polishing powders are worthless. Rouge or oxide of iron is best for very highly polished articles.

When a powder is required which will cut more rapidly, flour of emery, or washed emery which is finer, should be used. Emery cloth and coarse emery powder should never be applied to articles which have a high polish, as they will inevitably scratch them. In cleaning tin ware no acids should be used, because they attack the metal and remove it from the iron of which it forms a thin coat. We refer to articles made of tin plate, which consists of iron covered with tin. Rub the article first with rotten stone and sweet oil, then finish with whitening and a piece of soft leather. Articles made wholly of tin should be cleansed in the same manner. In a dry atmosphere, polished tin ware will remain bright for a long period, but it soon becomes tarnished in moist air.—*Manufacturer and Builder*

### Mechanical Items.

REPAIRING PUMPS.—When the tube of an endless chain pump has become so large that the buckets, or carriers, do not fill, take some light sole or heavy harness leather, and cut into circular washers large enough to fill the tubing; cut holes in the centres and slip them on the chain next above the carriers, by taking the links apart, but do not use too many; four are enough, let the well be deep or shallow, not more than two should be in the tube at a time. Many, in repairing pumps with leather, put a washer to every bucket, and make the suction too great.

WELDING STEEL TO IRON.—To make a good weld, the steel should be heated to a less degree than the iron, as it is more fusible. Sal ammoniac cleans dirt from steel, and borax causes it to fuse before it obtains that heat which will cause it to burn; consequently a mixture of these two substances form one of the best materials for welding.—*Ohio Farmer.*

TO PRESERVE STEEL FROM RUSTING.—The simplest way of preventing the oxidization of polished iron and steel goods is to dust them over with quick lime. When articles are required to be preserved for many months, such as polished steel grates, strips of paper freely covered with powdered lime oils are better for the hair than animal oils. They do not become rancid and offensive so rapidly, and they are subject to different and less objectionable chemical changes. Olive oil and that derived from the cocoa nut have been largely employed, but they are far inferior in every respect to that from the castor bean.—*Boston Journal of Chemistry.*



Advertisements.

**VINEGAR.** HOW MADE FROM CIDER, WINE, Molasses or Sorghum in 10 hours without using drugs. For circulars, address P. I. SAGE, Vinegar Maker, Cromwell, Conn. A2161

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THIS very handsome double flowering shrub is a great acquisition. The flowers are white, delicately tinted with rose. Worthy of a place in every gentleman's lawn, and every collection of shrubs. For sale at the St. Catharines Nurseries. 2211

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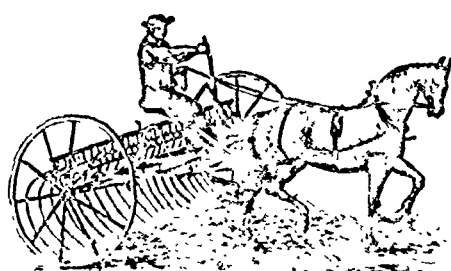
Was awarded the First Prize over all other competitors at the late Provincial Fair, and at nearly every other exhibition where shown, and universally acknowledged to be the best implement in use.  
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**MY ANNUAL CATALOGUE,** containing a list of many novelties, besides all the standard vegetables of the garden, (over 100 of which are of my own growing), with a choice selection of Flower Seed, will be forwarded gratis to all. I warrant my seed shall prove as represented. I warrant it shall reach each purchaser. I warrant all money forwarded shall reach me. Send for a Catalogue. JAMES J. H. GREGORY, MARBLEHEAD, MASS. 2-21

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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 it once.

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I shall continue to furnish Hives at the following rates, which include an individual right to make and use both Double and Single Bearded Hives, with a full printed description thereof.

- Single-Bearded Hive ..... \$5
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All persons purchasing a Hive at above rates, which always include the right to make, and I preferring to order Hives from me rather than make, will be supplied at the following prices:—Double Bearded, \$3.50; Single Bearded, \$2.50; or, if ordered in lots of three, to one address, Double Bearded, \$4.25; Single Bearded, \$2.25; in lots of six, Double Bearded, \$3; Single Bearded, \$2. Individual rights, without the Hive, \$3. Hives sent safely, as freight, by rail to any part of Canada. Three Hives sent to one address for the same freight as one Hive. Bee-keepers would do well to form clubs, and order three or more Hives sent to one address, and thereby save freight.

Hives at the above rates are made with one honey-box. Persons ordering Hives made with two honey-boxes, must send 25c. more for each Hive; with three honey-boxes, 50c. more for each Hive.

"THE CANADIAN BEE-KEEPER'S GUIDE" always on hand. No Bee-keeper should be without it. Price, post-paid, 25c. To parties wishing to purchase territory I make this offer—Any person sending me ten orders for the Single-Bearded Hive, at \$5 each, from any one Township, will receive in return the ten Hives to fill his orders, and the right of the Township for himself. Now is your chance. J. H. THOMAS, Brooklyn, Ont. v2-1-31

**GREAT REVOLUTION IN BARN BUILDING.**

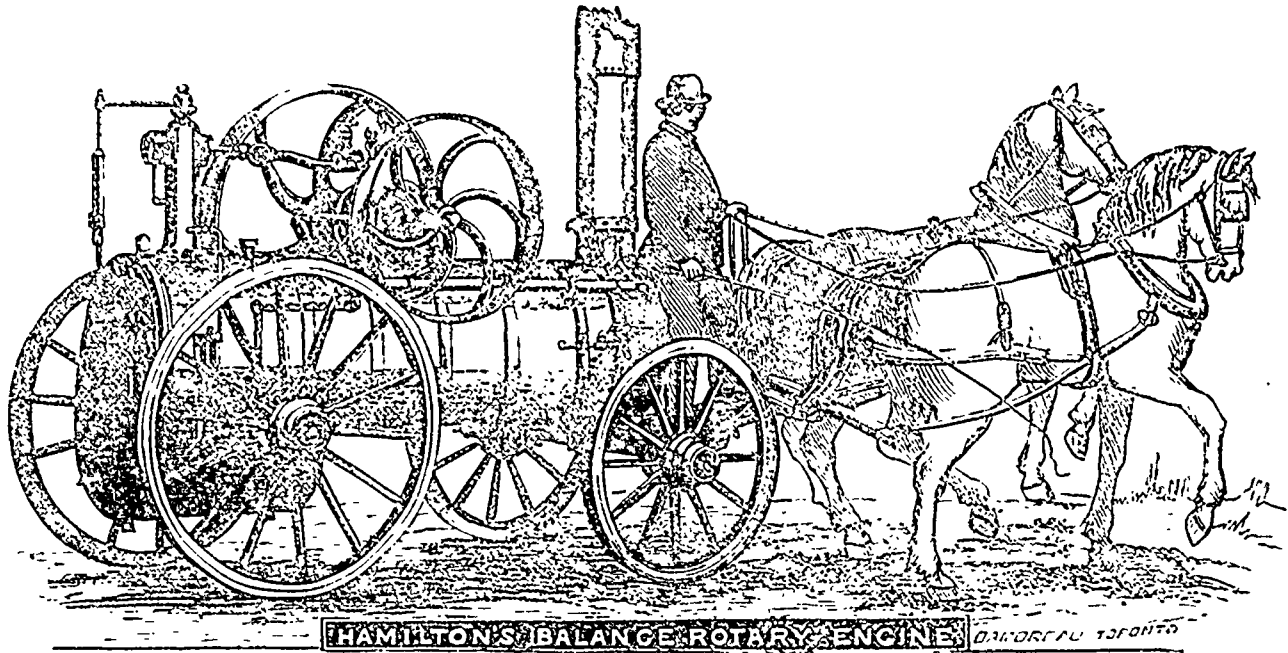
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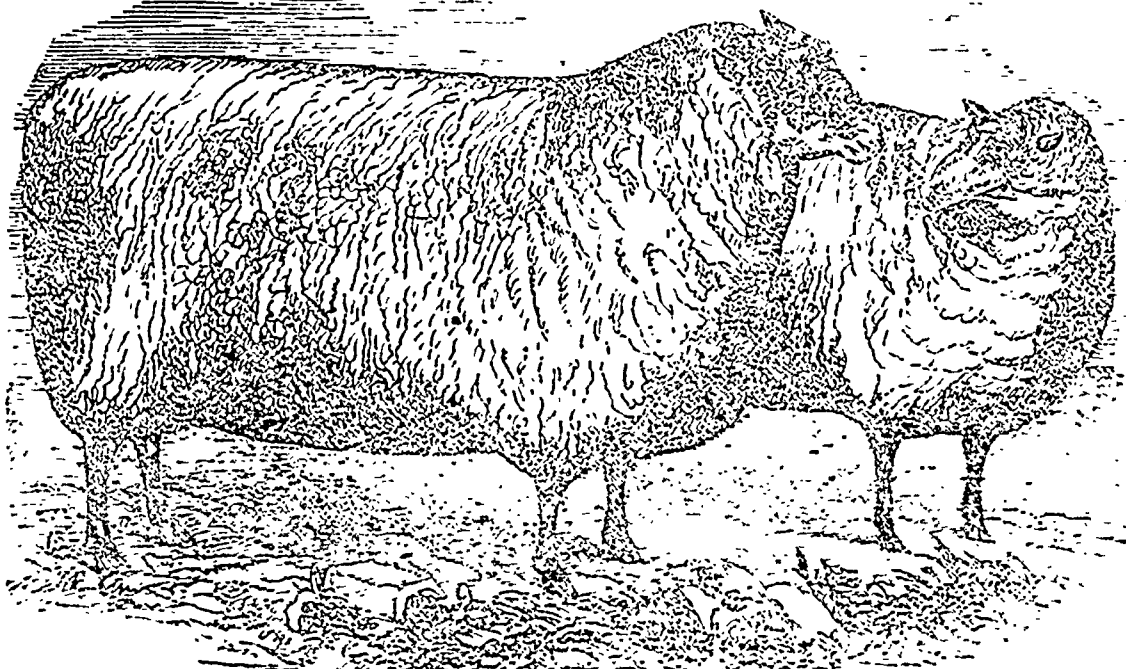
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JOHN CARLING

Commissioner of Agriculture and Fisheries, Works for the Province of Ontario.

Department of Immigration, Toronto, October, 1869

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Markets.

Toronto Markets.

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

FLOUR AND MEAL.

The market remains dull, with a continuance of low prices, and even some tendency to decline.

Flour—Extra, nominal at \$1 95, Fancy, \$2 65; Super fine, \$3 40 to \$3 50. Oat Meal, \$3 62 to \$3 70.

GRAIN AND SEED

Wheat—The market is firm and active, though low rates continue to rule, Fall selling at 8c. to 8 1/2c., Spring 8 1/2c.

Barley—But little shipped; deliveries on the street market considerable at from 50c to 5 1/2c. Oats—Not much doing; 5 1/2c. to 5 7/8c. Corn—Coming in freely—30c. to 3 1/2c. Rye—Limited supply and demand at 5 1/2c. to 5 5/8c. Seed—Clover \$5 25 to \$5 50. Alsike, \$4 50 to \$9. Timothy, \$2 to \$3.

HAY AND STRAW

Hay—in good supply at from \$10 to \$11 for good quality.

Straw—Abundant at \$4 to \$7.

PROVISIONS

Pork—M. S., \$25 to \$25 50, Extra prime, \$18 to \$19. Bacon—Cumberland cut, 10 1/2c. to 11c. Hams 12 1/2c. to 15c. Lard—13 1/2c. to 14 1/2c. Butter—16 1/2c. to 25c. Cheese—12 1/2c. to 14c., Ross's Station, 15c. Eggs—Fresh, 16c to 25c, Packed, 17c to 18c. Dried Apples—9c to 10c. Salt—Goldenrich, \$1 36; American \$1 35, Liverpool \$1 36. Dressed Hogs—\$7 50 to \$8 25. Potatoes, per bush, 50c to 50c, Apples, \$1 50 to \$2 50; Turnips, per bush, 15c to 20c; Parsnips, per bush, 50c to 55c; Carrots, per bush, 20c to 25c; Cabbage, per doz, 30c to 40c; Green, each, 50c to 70c; Turkeys, 75c to \$1; Chickens, per pair, 50c to 75c.

CATTLE MARKET

Bees—From \$4 50 to \$7 per 100 lbs. Sheep—From \$3 to \$6 each. Lambs—From \$2 50 to \$4. Calves—From \$3 to \$7. Hides—34c to 7c. Calfskins—10c to 12c. Sheepskins—75c to \$1. Wool—24c to 26c.

Montreal—Flour—Extra, \$4 30 to \$4 55; Fancy, \$4 15 to \$4 20, Super fine No 1 Canada wheat, \$4 05 to \$4 15. Bag Flour, 100 lbs, \$1 80 to \$2. Wheat, Canada fall, 55 1/2c. Oats, per 32 lbs, 25c to 27c. Barley, per 48 lbs, 45c to 50c. Butter, dairy, 17c to 18c. Pork, Mess, \$25 to \$25 50, prime, \$10. Dressed Hogs, \$8 50 to \$8 75. Prags, 70c.

Hamilton.—Best Flour, per 100 lbs., \$2 25 to \$2 50; Fine Wheat, 85c to 90c; Spring Wheat, 80c; Oats, per bush, 25c to 30c; Barley, per bush, 50c to 55c; Prags, per bush, 50c to 55c; Dressed Hogs, \$7 50 to \$8 25; Butter, roll, 25c; Potatoes, 62 1/2c to 75c; Hides, \$5 50 to \$9 50.

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