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The Field.

Steam Cultivation.

Enough has been written in the foregoing series of articles to enable our readers to form a fair idea of the apparatus, modes of operation, and advantages of steam culture as practiced in Britain, at the present time. We could have gone more minutely into the actual yearly expense of steam as compared with horse tillage on several "old country" farms; but to have done so would have required more space than we can at present afford. At the same time, it is very questionable whether the method of comparing the expense of the two systems forms a fair criterion by which to judge. By the steam plough, work is performed and results are obtained, which would be literally impracticable by the employment of horses. Incomplete experiments and conventional routine may in some instances, have created a prejudice against the steam plough. Still, the fact is as firmly established in the advanced agricultural mind of Britain, as a mathematical axiom, that the heavy and laborious work of a farm must ere long, be performed by the agency of steam. To this extent the engine must eventually supersede the horse. Although the primary outlay is much greater than that required to purchase a fine large team of horses, yet the several contingencies incident to both systems being fairly estimated, it results that engine-power is more economical than horse-power. When the locomotive is not at work, it has no craving appetite to supply; but whether the team be at work or no, it must eat to sustain life. Then again there are the "thousand ills, which (horse) flesh is heir to" whether during work or during play, by which machinery is totally unaffected. When the living animal has the misfortune to break a leg, or be struck down with any painful disease, there is little chance of immediate relief. But should the machine get out

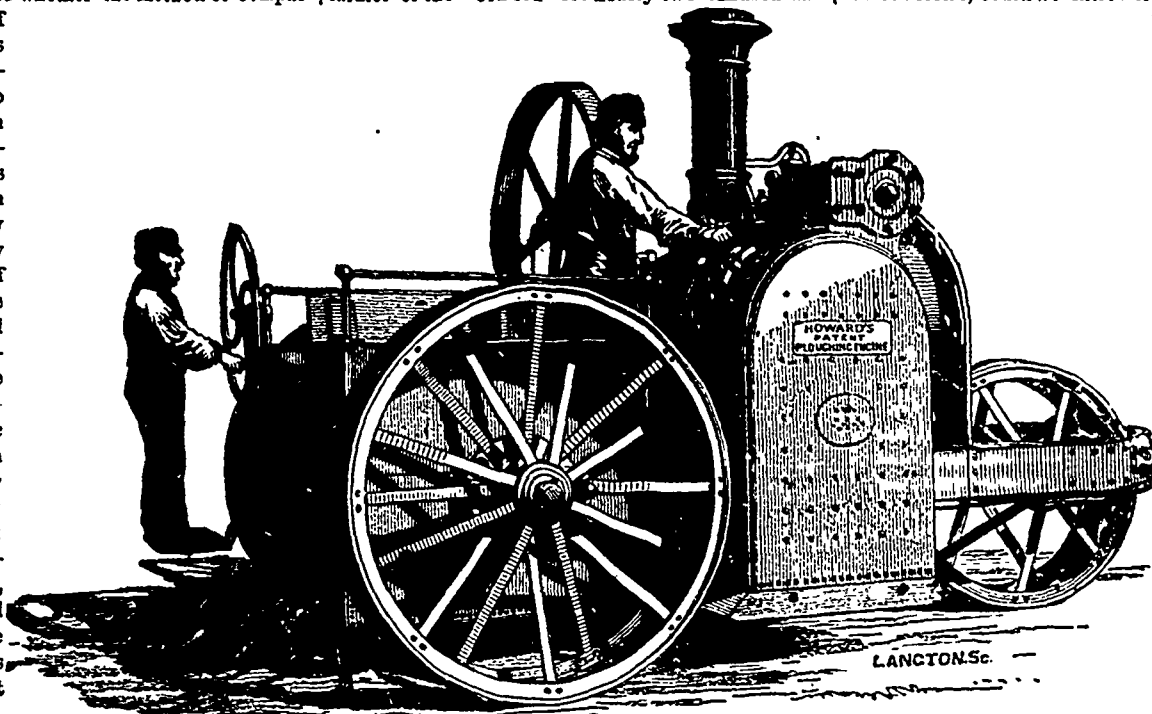
of order, a piece of good iron, a handy mechanic, and a little oil will soon set all straight. We urge our readers to carefully weigh the comparative advantages of the two systems, and we have little doubt on which side the preponderance will be found. Hitherto we have regarded the subject chiefly in its British aspect. In our comparatively young country, we are, not unnaturally, some distance behind that stage of agricultural development, at which the more enlightened "old country" farmers have arrived. The immense reform effected in farming processes in Britain—like most other reforms—has been the growth of centuries. As we have already seen, the subject of steam ploughing has been before the farmer of the "old sod" for nearly two hundred and

that the idea of a steam plough will be laughed to scorn in many sections of this Province, for some years to come. There will no lack of old steady-going, now-and-ever-shall-be farmers to assert that while the machinery of the steam plough is being prepared and started in successful operation, a man could do as much with a pair of horses and a plough. It may be well, in anticipation, to remind such an objector that by the same process of argument, a man could dig just as much while the team and the plough were being got ready for work.

There can be no manner of doubt that on thoroughly cleared farms, in the older settled sections of the Province, that the steam plough, in some of its various forms, could be introduced and successfully used. Want of enterprising capitalists, and the presence of stumps and land-fast stones, seem to us the principal obstacles in its path. The first difficulty may be overcome by the formation of a company, and time and tillage will gradually remove the other two. The steam plough seems to us the only practical remedy for the midge and Canada thistle plagues; while, by its use, deeper, seasonable, and more thorough tillage would, from less seed, insure larger and better crops. In a country like ours, where the season for farm operations is necessarily brief, the steam engine would enable the farmer to perform the largest possible amount of work in the available time. Not seldom is a crop comparatively lost, from no lack of will, energy, or determination on the part of the farmer, but from the want of a power to do the proper work at the proper time.

fifty years. Its present comparative perfection has been the more immediate result of the great impetus given to mechanical science by the inventions of late years. The discoveries of Britain come, without the tedious processes of elaboration, as an heritage to us. All that is demanded on our part is to be satisfied of their applicability to our special circumstances and condition, and their adoption will necessarily follow. This, of course, demands energetic progress, and considerable time. It is always a difficult task to convince mankind that there are more approved ways of operating, more economical processes, and speedier means of obtaining a greater result than those they now practice. Some farmers still affect to treat improved agricultural machinery with ridicule, and it is not impossible

The subject demands the earnest attention, as well of our agriculturists as of our implement manufacturers. A very trifling modification would adopt some of the very excellent engines exhibited at the last Provincial Exhibition to the purposes of ploughing and cultivating. We leave the subject in the hands of our readers, and commend them to turn it over in their minds occasionally, and if a really useful idea occurs to any of them, like "Captain Cattle" of happy



memory, let them "make a note of it." The illustration accompanying this—the last article of the series—Messrs. Howard's engine, showing the reverse side of "bat figured at p. 353 Vol II

Familiar Talks on Agricultural Principles.

WHAT PLANTS ARE MADE OF.

A MANUFACTURER who commences business with a view to the production of a certain article, must know of what that article consists, what raw materials are needed for its manufacture, and how they are to be wrought up into the article desired. Thus the carriage-maker knows that a finished vehicle will require wood, iron, steel, leather, cloth, paint, varnish, &c. He must have a stock of these materials on hand, he must know how to prepare them, how to combine them, and by the joint operation of theoretical knowledge and practical skill, he is enabled to produce a carriage. So in other occupations. The farmer is in a sense, a manufacturer. His workshop is out of doors; the materials he has to work with are found in the air and soil; his tools are the implements of husbandry; and his products are the various plants that form the food of man and beast. If he would produce wheat, ought he not to know of what it consists, out of what raw material it can be made, and by what means it is to be furnished? So if he would produce grass or turnips, ought he not to know what they are made of, whence the raw material is to be supplied, and how it is to be transmuted into the desired articles? Other manufacturers find their material in the form of certain compound substances, while the farmer must look for his material in the simple elements of nature. What these are, and how he is to avail himself of them, it is the office of Agricultural Chemistry to explain.

A plant is a compound thing. It may be separated into its original elements. The simplest way of doing this is by burning it. If a plant be subjected to the action of fire, the greater part of it "burns away" as we are accustomed to say;—that is, it goes off in various gases or vapours, until at length only a little ash is left. That which "burns away" is called the *organic* part of the plant, that which remains in the form of ash is called *inorganic*. Sometimes these two classes of material are called combustible and incombustible. It is a singular fact, that plants of all kinds consist, as to their organic parts, of but four simple substances known as Carbon, Oxygen, Hydrogen and Nitrogen. The inorganic matter found in them, and which is but small in proportion to the quantity of organic matter they contain, embraces a variety of substances, the chief of which are *phosphoric acid, sulphuric acid, silicic acid, potash, soda, lime, magnesia, iron, and chloride of sodium*. As an illustration of the extent to which the organic constituents of plants preponderate over the inorganic, it may be stated, that if an oak-tree be cut down and burnt, for every 100 pounds of wood, there will be left only about 3½ pounds of ash. Small, however, as the inorganic element is, it were a great mistake to regard it as comparatively unimportant. It is absolutely necessary to the life and growth of the plant, so much so, that if any portion of it be absent, the plant cannot be produced in perfection. The following table shows the proportion of the elements just spoken of, as they are found to exist in some of our most common crops. It will be understood that the figures refer to 1000 pounds of each seed or plant in a dry state:

	Carbon	Oxygen	Hydrogen	Nitrogen	Ash
Wheat	455	430	57	35	23
Oats	507	367	64	22	40
Hay	458	387	50	15	90
Turnips	429	422	56	17	76
Potatoes	441	439	58	12	50

Every farmer ought to be familiar with the names and properties of *carbon, oxygen, hydrogen and nitrogen*. They form the four chief constituents of

all that lives and grows on the face of the globe. They are the raw materials as it were, which the tiller of the soil is to manufacture into the various forms of vegetable growth. Once familiar with these elementary substances, it is comparatively easy to understand the functions of plants, and the circumstances favourable to their production. Before going farther, a few words in reference to the nature and properties of these elements, will help to simplify the subject, and prepare the way for future progress.

CARBON is familiarly known as common charcoal, and is widely distributed throughout nature. You have only to charr a piece of wood, to find out how large a proportion of vegetables consists of this substance. It cannot be dissolved in water, but it possesses the property of absorbing a certain amount of moisture, and being at once porous and incapable of putrefaction, it absorbs the offensive smells emitted by decaying matter, and retains the lighter parts of manures. It is when combined with oxygen in the form of carbonic acid gas, that this substance becomes available for plant food. Strange to say, this gas is a narcotic poison, which, if inhaled by human beings in sufficiently large quantities, produces stupor, insensibility and death. It is this gas which destroys life when a person stays too long in a close room where there is a pan of burning coals. By a remarkable provision of nature, what is fatal to the animal system is a great source of life, health and growth in the vegetable world.

OXYGEN is the vital part of the air we breathe. It is essential to animal life, and without it there could be no combustion. In its pure state, it cannot be easily distinguished from common air. It is void of colour, taste and smell. It forms 23 per cent. of the air we breathe, and eight parts out of nine in the composition of water. It is widely diffused, and has a tendency to penetrate everything with which it comes in contact. The rust that forms on iron exposed to air or moisture, is caused by the action of oxygen, which, combining with the iron, oxidizes it, and makes what is familiarly known as *rust*, but is called by chemists *oxide of iron*. Oxygen combines with metallic ores, enters into the composition of most of the rocks and earths on the surface of the globe, and the bodies of animals, while, as the foregoing table shows, it constitutes more than one-third of the weight of most vegetable substances.

HYDROGEN is, like oxygen, a gas, without colour, taste, or smell, and, when pure, is scarcely distinguishable from common air, though it is fourteen times lighter. On account of its extreme lightness, it is used to inflate balloons. It does not usually exist in a gaseous state, though it can be easily obtained in that form. It combines with all animal and vegetable substances, abounds in water, and is found in coal. Combined with oxygen, it forms water; and, with carbon, it forms the common coal-gas, with which the streets of towns and cities are illuminated. Plants derive what hydrogen they contain from the compounds of this substance, chiefly from water.

NITROGEN is another gas, without colour, taste, or smell. It exists largely in the atmosphere, forming about 77 per cent. of its bulk, and being apparently designed to dilute the oxygen of the air, and prevent its acting too powerfully on living beings and dead matter. Combined with hydrogen, it forms *ammonia*, which is a most essential article of plant food. The smell given off by a dung-heap, and lingering about stables, is caused by ammonia, which, being very light and volatile, escapes almost as quickly as formed, unless means are adopted to retain it as a prisoner for future service. It is a most valuable commodity, but one which is recklessly wasted by nearly everybody who keeps a living creature on his premises.

Such is a brief account of the simple elements of which the organic or destructible part of vegetable substances is formed.

Protecting Implements and Machinery.

It is safe to state that more tools and machinery are used up by rust and exposure to the weather, than by the actual wear and tear of use. Very few tools are thrown aside because they are worn out. Harrows are frequently left with 'the teeth in the ground all winter, and many people think because the teeth are iron, they are not injured. But the scale of rust that sometimes forms on harrow-teeth destroys more iron during the winter than is worn off by all the harrowing done in one year. The same is true of ploughs. How often do we see good ploughs standing in the furrow all winter! Water not only fills the cracks in the wood, but enters every joint, causing the grain of the timber to expand and then shrink in dry weather, and at length rot, before the plough is worn out, and the formation of a scale of rust on the iron where it comes in contact with the soil, rapidly uses up the iron parts, so that implements not protected, go to destruction with astonishing rapidity, whether made of wood or metal. If the surface is well painted, water will still find its way into the joints, tenons will decay, and the wood about the mortises will often rot in a few years. Waggon wheels that are allowed to stand in the storms and sunshine, even when well painted, rust out faster than they wear out. Water soaks into joints of the felloes and spokes, and between the tires and wood, rusting the iron and destroying the solidity of the structure. This is why waggon tires must be re-set so frequently. More iron will rust off sleigh shoes in one season, when they rest on the ground, even under shelter, than will wear off while running all winter in a snow track. The same is equally true of hoes, shovels, and many other tools. On a farm properly furnished with cellars and sheds, of course all implements should be kept under cover at all seasons. They ought to be off the ground, the wood-work, except handles of tools, well painted, and the iron-work painted or protected by a simple coating of boiled linseed-oil. But the question may be asked how may a farmer protect his implements and machinery, when he has not suitable buildings which can be appropriated to such a purpose. There are several ways in which it may be done very satisfactorily. The farmer on the prairies with no out-buildings or lumber to make them, can set two rows of posts in the ground, about 16 feet apart, and saw off the tops square about three or four feet high, pin a pole on each row of posts for plates, make rafters of poles, and pin them to the plates, and split out thin rails and pin them to the rafters about one foot apart, then cover the whole with straw two feet thick. The straw should be spread on very evenly, and after it has settled down and the surface is wet, raked lightly so as to turn all the straws on the surface down, to carry off the rain. The rafters should have about "one-third pitch." This will be sufficiently steep to carry off all the rain. By nailing or pinning thin rails, like collar beams, from one rafter to another, and making a straw floor, an excellent warm apartment may be made for fowls of any kind. Even geese and ducks will ascend to it, on an inclined plane. Such a frame may be also covered with fence boards, or saw-log slabs, and subserve an excellent purpose for protecting tools. If it should not carry off every drop of rain, it need not be denounced. It is the drying wind and sunshine, not rain alone, that injures implements.—*American Agriculturist*.

Manx Farming.

THE four course shift is generally pursued on the Isle of Man, although by nature it is adapted for, and would require to be upon, the six-course—viz., oats; potatoes or other green crops; wheat or oats; then turnips, of which at least one-half should be eaten on the ground with sheep; as this has never been done to any extent, it would be something new to it, and would not only consolidate the land but put it in a far richer condition than it ever was before. The high land soil is for the most part thin and stony at the bottom. In proof of this, although it rains for a week (which it often does), so soon as it is fair overhead you can commence to plough with the land in good order. No soil is better adapted for sheep; and as the land gets no manure except artificial, it is much in want of this system; but the farmer would require to have at all times a field of old grass where he could crot on turnips for the sheep. When heavy rains continue, the winds, generally from south-west, are exceedingly high. During the rains and high winds, the sheep poach the land and keep themselves very dirty, having no dry bed to lie down upon; the only way to avoid this is to put them on the lea during wet weather. The land would thus be much

improved, and the grass much superior in quality; from the frequent repetition of grass, by the present system of farming, the land has become clover sick. This is the only season for many years back, that farmers here have had a second crop fit for cutting—no doubt on account of the close system of cropping. The farms are generally small holdings, from 30 to 100 acres in extent, and owned, for the most part, by the farmers themselves; the fields are small in proportion to the size of the farms. As for the fences (if such they can be called), they are made of divots, or what we term "fall dykes,"—they have been built ages ago, and are quite rotten; they are repaired now and again; the money expended on them during a nineteen years lease would more than build two good stone dykes, they are from four to ten feet wide at the bottom and from two to six feet wide at the top, in some instances they are sown on the top with whins, and where the land is good it makes a tolerably good fence, but this is the exception, not the rule. While at pasture the sheep are tied with a rope about one foot or less in length, with a running noose at both ends; in this noose they put a fore and hind leg, so that the sheep cannot walk; this they call a "lancket;" during wet weather the rope swells, and often cuts the poor animal into the bone; the rope is changed occasionally from one side to the other. We saw numbers of sheep whose legs were cut to the bone, in fact the skin almost growing over the rope, and the matter running down the legs. All this is done on account of the "fall dyke" erections; there is no want of stones for the erection of proper fences—these are easily got, and of excellent quality; they can be raised, in most instances, with a crow bar, two feet broad, six inches thick, and three to four feet long. About two years ago Government sent over Mr. Moodie, late of Dunbog, Fife. This gentleman has erected many miles of substantial stone walls around those portions of the mountains which belong to Her Majesty. If the Manx farmers follow his example in this, they will not only benefit themselves, but confer a boon on Mona. Mr. Mackie is also improving large tracts of land by way of drainage. If three or four fields were put into one and proper stone walls erected, the sheep could be grazed loose, as by nature they were no doubt intended to be, and would fatten—thus paying double what they do now; the present system is to all intents the most barbarous and cruel. The boundary fences are the most crooked imaginable; old farmers say this was for the purpose of giving shelter to the stock, as from whatever quarter the rain came, the animals got sheltered in some corner. In conversation with an old proprietor as to the reason why he did not improve by draining the most boggy portions of his estate, and thus get the fields into proper shape, so as to enable him to cultivate them with profit and economy; his answer was, it grew enough for him and his father, and would do the same for his son. No amount of argument on our part could convince him of the fallacy of his argument, and I was obliged to give it up.—*Cor. Bell's Messenger.*

War on the Canada Thistles.

"I TELL you, John, we must declare war and pitch into them."

"Pitch into what, father?"

"Into these thistles. See how thick they are in that crop of oats, and along that wall, there is a perfect hedge of them. They seem to have grown very vigorous all over the country this year. I think they are increasing in that old pasture. Oats are so late that they go to seed in them before they can be cut, and it makes me nervous to see the white blossoms flying all over the country, though there is this consolation that not one in ten thousand ever grows. Still you will find in the new clearing there will be Canada thistles, and they, of course, come from the seed. It will take a good deal more time to secure these oats than it would if the prickles were out of them. It costs money to harbour these pests, and we might as well spend the money getting rid of them, besides it would save much fretting. We must declare war against them."

"Well, father, you shall be Major-General Commanding in this Department, so issue your orders, and we are ready to obey. Will you have them cut when the stem is hollow so that the water will kill them? Or will you summer fallow and plough six times, or salt them, or cut 'em off four times in a season with a sharp spade? I've seen men that contend that any of these ways is a sure thing, but I notice that the thistles stick by them yet, and I guess they'll stick by us unless a proclamation kills 'em."

The trouble with JOHN, who carried on the farm, was, that he planned only for the ordinary farm work—the getting in of crops, and securing them, &c. So his work was usually kept well up, but he had no time or help for extra jobs. If anything unlooked-

for came up it threw him behind with his regular work. His calculation was for the present, and did not comprehend in what condition, under such management, the farm would be in years hence, contrasted with the state it ought to be in. But the old gentleman, who took his exercise in rambling about the premises, and his resting spell cogitating on a fence under a shade tree, saw the mistake, and its ultimate consequences, and from his long experience in farming evolved a plan of getting rid of the weed that had insidiously and rapidly gained a foothold on his land.

"Ah, John, we won't trust to any one of these methods, for though all of them have killed thistles in separate instances, yet no one of them will exterminate them from a farm. I have taken time (as such time is always well spent,) and planned, and our campaign shall be this:

"We will cut the thistles down to the ground on the whole farm right away. The field that we plant with corn next year must be kept perfectly clean. If the thistles grow in it after we get through cultivating we will go over the field and pull them up with longs, such as Pat says they have in Ireland. I will have several pairs made. We will go through the grain before it heads out and pull out every thistle. The meadows we will cut early, and on the pastures we will try the frequent cutting below the sod, and the salting. I estimate our expenses for this additional labour at one hundred dollars per year while the war lasts."

John promised to raise the black flag and commence the campaign. As he is great on execution, I expect to hear of the enemy being exterminated in three years—except, it may be, a few skulking guerrillas.—*CHIEF, in Rural New Yorker.*

Culture of the Parsnip as a Fodder Plant.

(TRANSLATED EXPRESSLY FOR THE "MARK LANE EXPRESS," FROM THE "JOURNAL D'AGRICULTURE PRACTIQUE.")

Few persons in our country have as yet tried the experiment of planting many of their fields with parsnips, for the purpose of feeding cattle. Those who have tried it, invariably failed on account of their obstinacy in cultivating the parsnip by the same means used for the carrot and beetroot.

But supposing, on the contrary, rejecting the culture of roots, we treat it as a fodder plant, we shall obtain the most satisfactory results, and it will become a valuable resource in giving green fodder at a time of the year when such food is excessively rare.

One great advantage in the parsnip is, it never suffers from the attacks of frost, and it may be left in the field a whole winter without sustaining the slightest injury. It can be cultivated in any situation where beetroot and carrots have given satisfactory products; but the result will be much more sure and complete if care be taken to choose a fresh earth, substantial and deep.

It may be sown from the commencement of April to the 15th of May, in land prepared as for the culture of carrots; the seed should be sown in ridges nearly 12 inches apart (that distance is sufficient to obtain good results in green food). Two dressings should be given to the crop during the dry season, for the purpose of destroying the weeds, and if the plants are carefully thinned till they are about three or four inches apart, by October the foliage will have attained the height of 12 or 16 inches. It may then be cut with a scythe to within two or two and a half inches of the ground, supplying the cattle with a dainty of which they are very fond.

Thus the fields will remain without culture until the end of February or the beginning of March, according to the season. By that time the heads will have again sprouted to the height of 10 or 12 inches, and may be cut as before, from the 15th of April following to the 15th of May. The vegetation is so active, that the parsnip rapidly reaches the height of 40 to 60 inches.

It therefore yields an abundant crop; in fact it is no exaggeration to say that one acre cultivated with parsnips gives at the first cut as much green fodder as four acres of lucerne.

At the last crop, the root should be drawn with the plant; and before giving parsnips in pasture to cattle, the roots should be cut up, and mixed with the leaves in bits,

Those of my milk cows which have been fed in this manner gave me from one to two pints of milk more than their ordinary produce. I ought to say, that unless green fodder is very much needed in October, it is always better to abstain from cutting it at that season; a much better crop will be obtained in February or March, which will more than compensate for the loss of the first cut.

BELOT-DEFOUGERE.

Farm of Joseph McGraw.

To give some idea of the productiveness of land in this vicinity, [Dryden, Tompkins Co.] we might instance the farm of Joseph McGraw, Esq., lying some mile and a half in a northerly direction from the village. The farm consists of 120 acres and is pleasantly located. Mr. McGraw deals extensively in stock and wool, and was among the first to introduce thoroughbred shorthorns in the county. We looked over a fine meadow of twenty-five acres near the dwelling, which cut, the past season, seventy-five tons of hay. It has been down in grass twelve years, and was seeded with twelve quarts timothy, eight quarts red top and four quarts of clover to the acre. It presented a closely matted sward, with no intervening spaces, the whole ground being filled with grasses. Plaster is used here at the rate of a bushel per acre for top dressing, and it is also top dressed with manure. Mr. McGraw believes in old pastures as producing a better quality of food than recently re-seeded grounds, and says as much meat can be made on cattle pastured in these old pastures as on newly seeded grounds, by the addition of a daily allowance of meal in connection with the grass grown on such fields. The matter has been very thoroughly tested by him, and after years of experience and close observation, he gives his testimony in favour of old pastures, either for the production of milk or beef.

Adjoining the meadow, there are some three acres of old turf that were ploughed up two years ago and planted in corn, the yield being four hundred and twenty bushels of shelled corn per acre. The land had been in sod for a number of years, with an annual top dressing of barnyard manures at the rate of twenty loads per acre. This is one of the largest yields on record this side of the great corn lands of the West, and shows what the soil of Tompkins county is capable of doing under good cultivation and thorough management.

In our slight examination of this farm, we were greatly pleased with the neatness, order, system and intelligent manner in which everything about the premises seemed to be conducted, and only regretted that our time was so limited that we were unable to obtain all the notes desired. Mr. McGraw has a large farm in the town of Caroline, and among other crops gave us the yield of oats on twenty acres; the average was a fraction over 94 bushels per acre. We hope at some future period to make a thorough examination of farms and farming in this county, believing that a record of their operations will prove interesting to the farmers of this section.—X. A. WILLARD, in *Utica Herald.*

Large Crops of Mangel Wurzel.

To the Editor of THE CANADA FARMER:

SIR,—I perceive in your edition of January the 1st, that Mr. Johnson, of Genesee, has obtained at the rate of 33 tons of mangels to the acre, and considers it a remarkable crop. In the hope that it may be interesting to your readers, I give you a sketch of the means often used in Europe to obtain much larger crops. Monsieur Kœchlin, a very celebrated Alsatian agriculturist, imagined that it would be of the utmost importance in the cultivation of mangel wurzel to advance its season of vegetation two months in the spring, when the moisture of the earth and atmosphere would very much favour its development. He therefore raised the plants under glass—500 plants occupying a square yard—and transplanted them out as early as the ground was prepared to receive them, taking care to cut off the end of the tap root, and the tops of the leaves, according to the usual practice with cabbage plants. He obtained in this manner, 340 tons to the "hectare," or 10,000 square yards, (about 2½ of our acres.) Monsieur Kœchlin employed forty square yards of glass, in order to obtain 20,000 plants, that occupied a hectare, being transplanted at one yard distance between the lines, and half a yard between each plant. The success of this system was so great (producing mangels of an average of 17 kilogrammes, (34 lbs.) that it soon came into general use, and has rendered the very greatest assistance to agriculture in France and Italy. Under less favourable circumstances, it was tried in the south of France, by Monsieur De Gasperies, and with the greatest success. I followed M. De Gasperies' example in Italy, and surpassed him, (no doubt from being in a more favourable position.) I think it properly tested, it would answer admirably in Upper Canada, and would be found more economical than sowing, and much more profitable, as an acre of land will fatten seventeen pairs of oxen, allowing seven tons of mangels for each pair.

I am, &c.,

J. M. DECOURTENAY.

Clair House, Jan. 5, 1866.

Farming Facts.

Cabbages as food for milch cows have been singularly overlooked; the animals are very fond of them, and they appear to increase the flow, while they do not impart any taste of a disagreeable kind to the milk. The soil best adapted for the crop is a rich, strong, loamy, and friable one. It is almost impossible to over-manure cabbages. The best kind for a farm crop is the "Drumhead" or "Scotch," although the "Thousand-head" and "Jersey or True Cabbage" affords a large supply of green food. The seed should be sown in seed-bed early in March, in a highly manured soil. The preparation of the field to which the plants are to be removed should be carefully done, so as to secure a considerable depth of well-stirred soil, and be well manured, at the rate of not less than twenty tons to the acre. The plants will be ready for transplanting the end of May or the beginning of June. In taking the plants up from the seed-bed, care must be used to prevent, if possible, the tap-roots being injured. Some think this is of such little importance that they purposely nip off the tap-root, believing that doing so favours the "hearting" of the cabbage. It is scarcely necessary to say that this practice is not dictated by correct theory. The process of trans-planting is an important one; indeed, upon the way in which it is carried out depends the future goodness of the crop. Notwithstanding this, it is surprising how very carelessly it is generally gone through with. In this, indeed, as in every other department of labour, there is a right and a wrong way of doing. It is not the right way to make a hole in the ground and thrust the plant in, careless whether the plant is doubled up or not, or whether it is brought in close contact with the soil. If the root is not straight, the development of the plant will be slow and unsatisfactory; and if the earth is not brought up to the plant, more especially if the weather is dry, it will be likely to die out altogether, or at least languish for lack of moisture. We have seen cabbage plants so carelessly put in, that the slightest pull was capable of removing the plants altogether. They must be firmly embraced by the soil. It is a disputed point whether dry weather is the best for transplanting. Cobbett was a great advocate for transplanting in dry weather, and in a dry soil. The general opinion is that the plants do best when the soil has been wet with recent rain, and the weather moist for some days after plants are in.

If cabbage plants are dibbled-in at distances of thirty-six inches from each other, and the drills are thirty-six inches wide, 4,810 plants will be required for an acre. The plan of setting-out plants in the angles of hexagons has been recommended, the rows in this case being thirty-one inches wide, and the plants thirty-six inches apart in the rows: each plant will stand three feet from its neighbours on all sides. On this plan, with other widths of drill, the following gives the distance between the plants proportioned to such: Thus, for a width in the drill of one foot eleven inches, the distances between the plants should be two feet three inches; with a width of three feet two inches, three feet nine inches distance; width, three feet ten inches—distance, four feet six inches.

In every acre of grass, of an average crop, from 400lbs. to 420lbs. of ash are taken from the soil. The ash of hay is made up as follows, from which will be seen the importance of supplying grass lands with minerals, to restore those fertilizing ingredients so rapidly withdrawn: Of potash, 100 parts of hay have 18 1/2; of soda, 1 3/5; lime, 22 9/5; magnesia, 6 7/5; oxide of iron, 1 6/9; phosphoric acid, 5 9/7; sulphuric acid, 2 7/0; chlorine, 2 5/9; silica, 37 8/9. Of all the four crops, wheat, oats, barley, and hay, the latter takes the greatest amount of nitrogen from the soil—three parts more than wheat does, five more than barley, and seven more than oats.

Mr. Bowditch puts the exhausting nature of the hay crop in this way: "As wheat (ripe), for every 1000 lbs. of its weight of grain and straw, takes 10lbs. of nitrogen from the soil, barley (ripe grain and straw) 11lbs., and meadow grass hay aftermath 14lbs., some notion of the quantity abstracted per acre by each of these crops, may be obtained when we consider that the average crop of each per acre is thus: Wheat, 25 bushels, of 60lbs.; straw, 1 1/2 tons=18 cwt. Barley, 40 bushels, of 63lbs.; straw, 1 ton=12 1/2 cwt. Hay, first crop, 1 1/2 tons; second crop, 1 ton, or in all 50 cwt.

All sorts of opinions, diverse enough, are held as to the period when grass lands should be manured, some maintaining "any time may be chosen, and graphically enough saying, that any "any quantity" may be given, and that it is scarcely possible to give too much. This, of course, refers to the farm-yard manure or dung; when artificial or portable manures are used, the best time for their application is in spring. Autumn manuring with dung seems to be the most in favour, and justly so, especially if the dung is long and not easily assimilated with the crop. One great advantage—and it is not always thought of—obtained by the top-dressing of meadows with long manure in autumn is the protection or shelter yielded by it to the grass in the severe frosts of winter. Some who have paid attention to this maintain that fully one-half of the advantage obtained by autumn top-dressing of grass lands, is owing to the shelter given to the plants during frosts by the comparatively bulky manure.—*Mark Lane Express.*

JOHN JOHNSTON'S SYSTEM OF UNDERDRAINING.—X. A. Willard Esq., thus describes Mr. Johnston's mode of constructing drains: "The old system of cutting off the springs at the foot of a hill was abandoned and the drains led right up the hill, as the water rises on the highest lands. Drains are dug from 2 1/2 to three feet, or until the solid earth is reached and the water flows in from the sides. He says when the water flows in from the sides, and you get a good bottom, it is useless to dig deeper. He has never used any but the horse shoe tile. One drain has been laid that was 150 rods long. He thought it was cheaper and better to lay with tile than with stone, even if the stone was on the ground. Stone drains were not reliable; they were liable to be obstructed, while tile well laid made a permanent thing. If stones were on the ground he would prefer to haul them off and put them to some other use; they could be used in various ways upon the farm that would pay better than in drains—since the cost of digging the drains, when stone was to be used, was much more expensive than for tile. He thought one could hardly drain too close. He had put drains 25 feet apart, but would put them from 15 to 18 feet. In covering, he paid no attention to the position the sub-soil thrown out was to take in the drains, but hitched the teams to the plough and covered in that way."

Rural Architecture.

A Neat Country Church.

We are often painfully impressed with the want of taste and comfort, betrayed by many of our country churches. Instead of finding a substantial, neat, clean structure, we have an oblong box, with large rectangular windows, divided into a multitude of small squares, cracked and covered with dust and cobwebs, while the roof has hardly sufficient pitch to carry off the water. At the ends of the building are two chimneys, scarcely appearing above the shingles. When we enter we are still more pained. The seats are unpainted, the floors uneven, the plastering cracked and broken, and showing the streaks of the whitewash brush all over the dirty walls. Should our visit be in the winter, we are nearly frozen at one end, and roasted at the other. The minister is usually perched up in a box, with his head nearly touching the low, flat ceiling. This is no fancy sketch. It is a fair description of the last country church we were in, and that in a locality where better things might be expected. Of course there are many exceptions to this state of affairs, and it is to be hoped much will be done this year in the building and im-

provement of rural churches. Our present illustrations show a ground plan and front elevation of a small country church. The lobby door is protected by a projecting buttressed pediment, with pinnacles and finials. The lobby extends the whole width of the building, with a stairs leading to an end gallery, if required. If not required, it gives space for a heating apparatus. The side seats are arranged on an angle facing the speaker. The centre ones are straight, and divided into long and short pews, with an aisle at each side 4 feet wide. The pulpit is in an arched grained recess, and is only thirty inches raised above the church floor. The platform holds the table and two chairs. The addition at the rear of the church contains two vestrys, separated by folding doors, which can be opened and thrown into one when occasion requires.

The walls will be 16 or 18 feet high, and the ceiling arched, the principal rafters forming the roof partly exposed; and grained and arnished.

The church can be heated with hot air by excavating a space under the floor sufficient for an apparatus, with a stairs to it under the gallery stairs. This space might be made large enough to hold the fuel, if necessary.

The building may be erected with either wood, brick or stone, without materially altering the design. If built with brick, the following hints will be found useful in forming a specification:

The trenches for the foundation walls should be deep enough to obtain a firm foundation, and wide enough to allow proper working room. The stone footing course should be laid with large, flat stones, and projecting six inches from the face of the wall. The walls should be two feet thick, and built with good large flat stones, well bedded, and flushed up with mortar formed of fresh burnt lime and sharp, clean sand, in the proportion of three of sand to one of lime. The stone work should be carried at least a foot above the ground surface, and the joints should be neatly pointed. As regards the brickwork, the walls should not be less than fourteen inches thick, and the buttresses should project eighteen inches from the face of the walls, and be capped with stone in the manner shown on the elevation. If the walls were built hollow, they would be much drier and warmer. This would also dispense with the lathing on the inner surface, and the plaster would also be much stronger. The whole of the brick should be good, sound, well burnt—red or white—and laid American bind, with thin joints. Before being laid on the walls, they should be well soaked in water, to make the mortar adhere to them. After three or four courses are laid, they should be well grouted with liquid mortar.

The arches should be pointed, as shown in the front elevation, and turned true on proper centres. The chimney flues should be well plastered on the inside. The walls should be eighteen feet high from the floor, and the parapets should be covered with wooden coping, well painted, if stone cannot be obtained.

As to the carpenter's work, it may be observed that the whole of the timber and lumber used in the construction of the building should be good, sound, well-seasoned, pine lumber, free from all imperfections. The roof should have the same pitch as shown on the elevation, and be framed in a workman-like manner, and well bolted and strapped where required. Shingle the roof with sound split pine shingles, well bedded in good hair mortar. The joists should be laid on the beams to form an arched ceiling. The tie-beams—showing under the plastering—should be moulded and planed, then stained and varnished. This form of ceiling is to be preferred to any other, for many reasons.

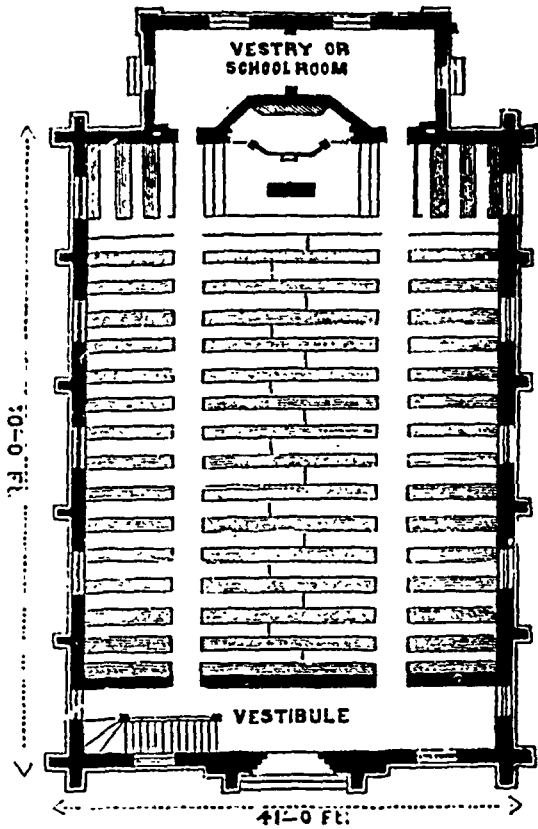
Lay the floors with 1 1/2 in. wrought tongued and grooved, clear, dry flooring. The boards should not exceed six inches in width, and be blind nailed. Sheet all round the walls of the church, school-room and lobby, to the height of three feet six inches, with

narrow wrought tongued and grooved champhired 1-in. sheeting, and cap the same with 1 1/2-in. moulded capping. The whole should be well nailed to the walls and partitions. All the doors should be 2-inch framed doors, and covered with 1-inch beaded

Of course, in many instances, the services of an architect must necessarily be dispensed with, and, in such cases, we hope the plans published in this journal will be found of especial value and helpfulness. But we would particularly urge upon our

good structure is a model and educator in the right direction, a poor unsightly building has an injurious effect. Nature is beautiful in every shape and in every dress. Let art be the handmaid of nature, and seek to conform to her examples and rules. We hope

GROUND PLAN.



sheeting; hang them to the frames with strong butt hinges, and fit to the same good locks and bolts, when required. The whole of the windows should have box frames, and double-hung sashes. The sashes should be 1 1/2-in., made to fit the frames, in a proper manner, and divided, as shown in the front elevation. The pulpit floor should not be more than three feet above the church floor, with easy steps to the same. The front of the pulpit should not exceed two feet eight inches in height, with a bookstand, to slide up and down, to suit the speaker. The backs of the pews should be 17 inches high, and at least 13 inches wide, and they should slope about 4 inches. Book-boards and pew doors are now generally dispensed with. The foregoing hints will be found sufficient to form the groundwork of a specification, but we would recommend parties intending to erect a church to obtain the services of a competent architect. The accompanying diagrams and specifications were prepared by our architect, Mr. Smith, who has had considerable experience in church building, and who will be happy to furnish any information, required on the subject, to parties who intend to add a sightly and comfortable church to the attractions of their neighbourhood.

readers the desirableness of adopting a good style of architecture, in the erection of dwellings, residences, churches, and even barns and out-buildings. Churches being generally built on conspicuous sites, their defects or excellencies are plainly visible, and while a

the time may come when the devout worshipper will be able to say of the country churches of Canada, what certainly cannot now be said truthfully of the great majority of them:

"These temples of Thy grace,
How beautiful they stand?"

Poetry.

Leisure.

BY JEAN INGELOW.

GRAND is the leisure of the earth;
She gives her happy myriads birth,
And after harvest fears no dearth,
But goes to sleep in snow-wreaths dim.

Dread is the leisure up above,
The while he sits, whose name is Love,
And waits, as Noah did, the dove,
To wit if she would fly to him.

He waits for us, while, houseless things,
We beat about with bruised wings,
On the dark woods and water springs,
The ruined world, the desolate sea:

With open windows from the primo,
All night, all day, He waits sublime,
Until the fullness of the time,
Decreed from his eternity.

Where is our leisure? Give us rest!
Where is the quiet we possessed?
We must have had it once—were blest
With peace, who-e'er she yet entice

Sorely the mother of mankind
Longed for the gardens left behind;
For we still prove some yearnings kind,
Inherited from Paradise.



Stock Department.

The Reproductive Powers of Domesticated Animals.

A VERY interesting article on the above subject from the pen of Professor Tanner, appears in the last part of the *Journal of the Royal Agricultural Society of England*, the substance of which is here presented to our readers.

The breeding of animals now form one, if not the most important feature of British husbandry; and every year the practice is attracting greater attention in Canada, where the value of live stock has of late been steadily increasing. Through the exertions principally of enterprising individuals, we now possess excellent specimens of most of the principal breeds of British Domesticated animals, and experience will, in the course of a few years, determine their relative adaptation to our various soils and climatic conditions.

Animals in a purely natural state are endowed with the power of continuing their species, in accordance with the law of similarity, or a fixed, uniform type. But within certain limits, nature permits a deviation from typical forms, to meet the varying peculiarities of soil and climate. Thus on warm, rich plains, animals attain to a larger size, readily fatten, and are sluggish in their habits; whereas, in more exposed and hilly districts they become smaller, more active and hardy, forming muscle rather than fat. Under domestication, these animals are placed more or less under artificial conditions as regards food, exercise, temperature, &c.; and in this manner produce unnatural developments, to meet special requirements. As there is always a tendency in animals to revert back to their natural condition when artificial influences are removed, the skill of the breeder becomes constantly tested, and the highest proof of success, is the attainment of the peculiar development required, with the least sacrifice of constitutional strength. In breeding animals for the butcher, the great object is to attain that symmetry of form which is indicative of an increased aptitude for fattening,—a deep, broad chest, well arched ribs, a broad and level back, with well formed muscles of the fore and hind quarters, and a soft and mellow skin.

Notwithstanding the accumulation of hereditary power in improved or pedigree stock, to transmit their characteristic points and quality to their offspring, when the sexes are skilfully matched, yet it is a well known fact that such stock sometimes become valueless for breeding purposes, because of their inability to exercise their reproductive powers. How can this difficulty be overcome? It unfortunately happens that in many cases of what are termed the pure breeds, excellence has been attained by a great sacrifice of constitutional strength, which renders such animals an easy prey to various forms of scrofula, affections of the lungs and digestive organs, which are too often accompanied, or closely followed, by a deficiency in the supply and quality of the milk, and finally by a depreciation of the reproductive or breeding powers.

The free exercise of the body exerts a most important influence upon the functions of life. Muscular growth is almost as dependant upon exercise as it is upon the nutriment from which it is produced. Nature has implanted in all young animals a strong desire for that exercise of the body by which their growth can be best promoted, and this is particularly shown by the uncontrolled playfulness which they manifest when liberated from a bondage against which nature rebels. The advantages which arise from variations of the surface, and especially in the change from level to hilly land, are great; for they give a breadth to the chest and strength to the lungs, which is not otherwise obtainable. The invigorating atmosphere of hilly land, has also a very beneficial influence upon the health. If we notice the vigorous health possessed by our mountain breeds of cattle and sheep, we see what it is that we require engrafted into our improved stock, to bring them to their highest point of value. In our mountain stock we have muscular development, a rich juicy meat, vital energy to protect the system against disease, and enable its vital functions to be performed in the most healthy manner. In our improved breeds we have symmetry, and an aptitude for fattening, which

renders them economical to the farmer. Can we not amalgamate these qualities more completely than we have done, and by giving to well bred stock greater freedom for exercise, a modified diet, and a purer atmosphere, rear them in a manner calculated to promote their healthy growth and constitutional strength?

The winter management of stock, especially of the improved and more valuable kinds, demands the greatest attention, for much injury often arises from the animals being kept either too hot or too cold, with insufficient bodily exercise, and the free accession of pure air, apart from chilling draughts. The varying seasons of the year are not without their influence upon animal life, a truth, which in an extreme climate like Canada, should be always carefully kept in mind, in the general management of stock. The invigorating action of a moderate degree of cold, after the enervating influences of summer heat, is a necessary condition, but sudden and extreme transitions should be studiously avoided. In the old country, some of the best animals are so wintered in buildings which favour their ripening condition and blooming appearance, but at the same time enfeeble the system, and undermine the health, and predispose to disease, especially of the lungs, rendering the animals unfit for being turned out to graze in spring, without serious risk to health, and often producing deterioration in their general condition. Much of the delicacy of constitution and predisposition to disease, now so much more common than formerly, among pure bred stock, may be traced to injudicious management.

An enfeebled condition of the breeding organs, is one of the first sources of trouble to the breeder. It seldom precedes, but often accompanies, that delicacy of constitution to which reference has been made. Instead of the females breeding in a regular manner, we find them come into season again and again, after most irregular intervals. This results from one of the following causes: either the female does not become impregnated, or else the embryo is imperfectly developed. The non-impregnation of the female may generally be traced to an excessive fatness in one or both of the animals, and an absence of constitutional vigour. The breeding powers are most energetic when the animals are in moderate condition, uninfluenced either by extreme fatness or leanness. The impregnation of the female is in some cases prevented by natural defect or malformation; but I am strongly inclined to believe that such cases are comparatively rare.

We must leave a notice of the concluding and more practically interesting part of this article for another paper.

LAUREL-POISONED SHEEP.—In a former notice of the Sheep-laurel or Lamb-kill, we mentioned some of the proposed antidotes. A correspondent takes us to task for making so light of the decoction of muskrat's tail, and asserts that he has known it to cure. Others have sent "certain remedies" to be used in cases of poisoning by laurel, among which are, placing an onion under the fore-leg of the animal and forcing a ball made of soft soap and corn meal, down its throat. From the remedies said to answer, it seems that the poison is not virulent.—*Am. Ag.*

LICE ON CATTLE.—A correspondent of the *American Agriculturist* says that "knowing larkspur seed would destroy lice on human beings, he collected a quart of seed, ground it fine, soaked it a week in one gallon of strong vinegar, and then applied it with a sponge to all parts of the animals; has never seen louse or nit since." On the same subject T. F. Haynes, Hartford Co., Conn., writes to the *Agriculturist*: "I keep lice off my cattle by keeping sulphur and salt in winter where they can lick it when they choose; my cattle have had none since I practiced this."

GENTLENESS WITH STOCK.—The following lines contain "more truth than poetry," tho' not deficient in the latter. We have all of us from our "youth, yea from our infancy up" been lectured on the merit and advantages of good behaviour, but not informed of its money value in the stock-yard and the stable. A cow that has been trained by a self-controlling person, is worth 25 per cent. more than one of the same physical qualities that has been rendered vicious, or even timid, by being beaten and bawled at. Still greater is the difference in the results of the treatment of horses. We have a six year old horse of medium natural disposition and abilities, whose education makes him a trustworthy family horse, and his cash value is consequently fifty per cent. more than that of one naturally his equal, that by being injudiciously treated, is afraid of his driver, and anxious to get away from his companionship. No man is fit to use any draught animal, or have charge of cows, who cannot control his temper, for, as the superior, he will communicate his own disposition to the inferior that he controls.—*Ex.*

The Dairy.

Making Butter from an Alderney Cow.

Visitors at the recent State Fair at Utica, who looked over the Stock Department, will remember a beautiful little cow in one of the stalls, with deer like eyes—head fine and tapering, ears small, thin, and deep orange colour inside; skin thin, light color and mellow, covered with fine soft hair. In fine a perfect little model of a cow, and attractive from having a peculiar sawn-like appearance. This was "Lady Jersey," bred by J. O. Sheldon, the property of R. H. Pomeroy of the Mohawk Valley Bank, Herkimer Co., and which took the first premium in the class of Alderneys.

People who like nice cream butter, with a rich golden colour, compact, fine-flavoured, and possessing all the qualities understood by the term "strictly prime," look first to the little Jerseys or Alderneys for the milk, and then know how or by whom the butter is manufactured.

A great many persons eat butter all their lives and yet have never tasted that which is "strictly prime." Good butter is one of the luxuries which like gold is "not in general circulation," and which in these times can rarely be had even in exchange for the precious metal. There are many gradations of butter, from the primo to the rancid. Much of that sold in market as of the best quality, is merely passable, having no positive bad taste, but yet destitute of the rich, delicate flavour of the best.

Butter making is a very old and very high art—judging from the miserable samples that one gets everywhere throughout the country. There is reason to believe that the country taken as a whole is losing the art of producing good butter, humiliating as the statement may appear—but the facts and the product warrant the assertion.

We recently saw and tasted some of the butter made from Lady Jersey. Its flavour and beautiful golden colour cannot well be described. You see nothing of the kind in the markets, because the kind is rarely or never sold.

Mr. Pomeroy gives us briefly the manner of manufacturing. The milk is set very shallow in pans, and allowed to stand until it becomes thick or lopperd. The cream is then carefully skimmed, but if any specks or mould makes its appearance in any part, the cream of that pan is rejected. The churning is done in a stone dash churn, and the temperature of the cream raised to 62 deg., by setting the churn and its contents in hot water. Nothing but the cream is churned.

After the butter has come, it is washed in cold water three times to expel the buttermilk, and is then salted with fine salt at the rate of 1½ ounces for a pound of butter. The salt is worked thoroughly through the mass, care being taken not to injure the grain of the butter. It is then put away in a cool place and stands from morning till evening, when it is carefully worked over and either packed or made into rolls. For keeping butter nicely for a great length of time, Mr. Pomeroy finds the best plan to be to make a brine of such strength that it will float an egg and cover the butter. The brine should be tested in the way described, for if the brine is too weak it destroys the colour of the butter. Such is briefly the process of making butter that is of the finest flavour and quality, from an Alderney cow.

Lady Jersey last year gave a product of 300 pounds of butter, and this year, up to October 26th, her product has been 290 pounds, to say nothing of cream used. Is she not worthy of the award made by the New York State Agricultural Society? At 50c. per pound, it will be seen that she brought her owner last year in butter \$150, and this year her product at the same rate will reach, at the close of the season, at least \$175. But such butter, if sent to market, would sell for much more than here named, and counting the sour milk, if fed to pigs, she will give her owner this year the snug little sum of \$200. X. A. WILLARD.

CREAM IN WINTER.—Keep where moderately warm, and add at each milking (or once a day) a little hot milk. Heat the milk till almost to the boiling point; heat it fresh from the cow. The quantity is about a pint to a paillul at each milking. The effect of this is to prevent the cream from turning bitter: the buttermilk will be as sweet and fresh as in summer, and the butter in consequence will be better than without this treatment. We have this from an old, experienced dairyman, who has practiced it for many years, and we are personally known to the excellence of the practice. It is a point that should be known—for there is much bad butter made in winter, and buttermilk unfit to use.—*Colman's Rural World.*

Veterinary Department.

Tetanus or Lockjaw in Horses.

TETANUS is a disease of the nervous system, showing itself in spasmodic contraction of the voluntary muscles of the whole body, involving as well, some of the involuntary muscular fibre. Although essentially a nervous disease, it is the muscular system that is principally implicated. The muscles of the body are rigidly contracted, more particularly those of the head and neck. When the masseter muscles are thus attacked the mouth cannot be opened, owing to the fixity of the jaws, hence the name lockjaw.

In horses that have died of tetanus, the brain and spinal cord have shown symptoms of congestion, and in other cases the roots of the nerves only. The muscles after death become soft and flabby, shewing that in life the process of nutrition had been impaired or entirely arrested, caused no doubt by the continued contraction of the muscular fibre. In describing tetanus, it is divided into two kinds, *traumatic* and *idiopathic*, by the former is understood that kind which is caused by some visible injury; while the latter is supposed to be due to some atmospheric influence, or some other invisible cause. The two kinds are of the same nature, but experience teaches that the idiopathic form is the most fatal. The causes of traumatic tetanus are injuries of any kind, in which a nerve has been implicated. The most common cause is from picking up a nail, or from a prick in shoeing. It often follows the operation of castration, and it has also been known to occur as a sequel of docking or necking the tail. In fact it may occur from an injury to any part of the body, but it is most likely to follow injuries of the extremities. It is most liable to occur in high bred horses, and especially those of an irritable nervous temperament. When the nerve is injured, the irritation is carried by the sensitive nerves to the spinal axis, and then reflected to the nerves of motion, causing rigid contraction of the muscular fibre. In some seasons tetanus appears as a sort of epidemic, great numbers of horses becoming affected with the idiopathic form. At such times it is also exceedingly liable to supervene on injuries. "Mr. Percival" mentions that of twenty-four horses castrated on the same day, and afterwards four times a day made to take a bath in water derived from a very cold spring, the consequences were that sixteen out of the twenty-four died of tetanus, between the tenth and fourteenth days.

Tetanus in the horse is a disease which presents a number of well marked symptoms, and among the first noticeable symptoms is a peculiar stiffness of the body most prominently exhibited when the animal is made to move. As the disease advances, the muscles become hard and firmly contracted, the head is kept poked out, and the muscles of the neck are prominent, shewing the outlines and form of the various muscles. The horse has a peculiar anxious look, and is sensitive in a remarkable degree, being easily excited by the least noise. If taken hold of by the bridle and the head jerked up, the membrana nictitans or law of the eye, will be observed to push forwards over the eye, the nostrils are dilated, and the ears erect. If moved in the least the tail is upraised, and has a tremulous motion. These symptoms may exist and the jaws may not be completely closed. As the disease goes on the masseter muscles are violently contracted, and the jaw becomes locked. The pulse varies considerably, and is easily quickened by excitement. The bowels are almost invariably constipated, and the urine is also scanty. The respiration in some cases is but little altered: in others it is very much disturbed, and the breathing becomes laboured. The duration of tetanus varies, in some instances death will take place on the fourth or fifth day, while in others it will last for three weeks or a month, and then terminate fatally; the

more alarming the symptoms the sooner it ends fatally.

As tetanus is a disease of the system, in treating it we recommend the animal to be kept perfectly quiet. Place him in a darkened loose box, and if possible away from any noise; give him a large dose of purgative medicine, from eight to ten drachms of aloes, combined with a drachm of calomel, as the bowels are inactive, and if got to more freely it is a favourable symptom. Encourage the patient to take soft sloppy food, as linseed tea, oatmeal gruel, &c. If the medicine can be easily administered, give every three or four hours two drachms of the extract of belladonna. If the jaws are firmly closed, place the belladonna into his mouth, between the incisor and the molar teeth. A newly flared sheepskin applied over the loins in some cases is of decided benefit. Blistering the spine is also spoken of by some practitioners, but we object to any treatment which is likely to set up irritation, as this disease is a nervous fever, we think soothing remedies are the most successful. When caused by a wound, it should be fomented and poulticed, and carefully attended to. Some eminent practitioners recommend hydrocyanic acid, in doses of thirty drops, to be given five or six times a day.

DEATH FROM GLANDERS.—The papers report that a negro in Maryland lately died of glanders, the disease being contracted from a glandered mule.

The Apiary.

"Miller Traps," "Comb Guides," and "Condensers."

SEVERAL correspondents have recently addressed enquiries to us as to the utility of these contrivances. We have referred the questions to our experienced apiarian contributor, Mr. J. H. Thomas, of Brooklyn. He states his opinions as follows:

"In reply to the questions submitted, I would say that, in the hands of bee-keepers generally, 'miller traps,' 'comb guides,' 'condensers,' and all other like 'fixings' in a hive are not only useless but worse than useless. A miller, or moth-proof, hive would be a very desirable thing: but many an ingenious 'yankee cousin' has racked his brain, striving to invent a miller trap, which, attached to a hive, would make it a *moth-proof* hive, and yet it has never been accomplished. I would not be understood to say that miller traps are of no use; for, if of the right kind, they may be and are of use about the apiary, but not in or attached to the hive. Time will not permit me to speak of all the ingenious contrivances for entrapping the miller; but nearly all are so constructed that, being attached to the hive, they allow the miller to enter and deposit her eggs, secure against attack from the bees, instead of entering the hive to be unceremoniously ejected by its occupants; the intention being to remove the trap occasionally and destroy the miller grubs. But, I may safely say, that not one bee-keeper in fifty will take the trouble to do this, the consequence is that the eggs of the miller are hatched and the larvæ find their way into the combs and commence their work of destruction, or feed upon the chippings of comb that fall into the trap, until the time arrives for their transformation, when they wind themselves up in cocoons, and in a few days are transformed into millers, which in turn deposit more eggs, producing other larvæ; and so on during the season. It will, then, at once be seen that what is intended for a miller trap, for the safety of the stock, becomes a secure retreat for the miller, where she can propagate her species and infest the whole apiary with her numerous progeny. W. M. Lee, of Wisconsin has invented a very ingenious miller trap, but it has the same objection of others, instead of destroying the miller, it allows her to deposit her eggs unmolested by the bees. The same may also be said of

the wire-cloth bottom board, which was invented a few years ago by a Canadian, who obtained a patent for it; but proving worthless, it soon fell into disrepute. It has, however, been revived again, and was on exhibition at the recent Provincial Fair, where it was spoken of as something new and useful: but as W. M. Lee said when questioned as to the utility of his miller trap, "It is a good thing to talk about," so I say of the wire-cloth bottom board.

I believe it to be generally acknowledged by all leading apiarians that hives containing miller traps, in the hands of bee-keepers generally, are objectionable. Says Langstroth, "The careless will obtain a 'moth-proof' hive only when the sluggard finds a 'weed-proof' soil." Although Langstroth uses a simple contrivance for entrapping the miller, yet he says "all such contrivances instead of helping the careless bee-keeper will but give him greater facility for injuring his bees. Worms will spin undisturbed, and moths lay their eggs; his traps only affording them more effectual aid." There may be one in a hundred bee-keepers that would attend to a simple contrivance, and destroy many miller grubs. For the benefit of such I have given in the *Canadian Bee-keepers' Guide*, a description of a trap similar to that used by Langstroth, which is applicable to all hives. I have, however, for reasons above stated, connected no miller trap with my hive; but have so constructed it that the miller can find no place to secrete herself from the bees, while depositing her eggs, and grubs can find no place to wind up, where the bees cannot reach them. The bottom board is so constructed that the attentive bee-keeper may drop it at pleasure and destroy any grubs found thereon; and should he fail to do so, the bees having access to them, will be likely to do it themselves. I find it to be a better arrangement than any miller traps, for bee-keepers in general. I have already remarked that a right kind of miller trap was a good thing to have about the apiary. Any contrivance that will trap and destroy the miller before she has time to deposit her eggs, is what is wanted. Dishes containing milk or sweetened water set about the apiary at night answer a very good purpose; with a little care, large numbers may be destroyed.

"Comb-guides" and "condensers" hardly require notice, as no bee-keeper with a properly constructed hive will use them. "Comb-guides" are thin boards placed between each comb-frame in a moveable comb-hive, in order to ensure straight combs, and also to prevent the building of drone comb. R. P. Kidder, of Vermont, claims to be the inventor of comb-guides. May he long enjoy the honour! Last year they were introduced into Canada, and will constitute another feature in a hive to "talk about." They are of some use, however; for their appearance in a hive is positive evidence that it is not properly constructed. In a hive properly constructed—adapted to the nature and habits of the bees—combs will be built straight without the comb-guides. Hence, they should be rejected alike with all other useless "fixings."

A condenser in a hive is nothing more than a lining on the inside of the cover, for condensing the breath and vapour arising from the bees. It may be glass, tin, or zinc. The idea of a condenser was begotten last year in Canada, and delivered in public at the London Provincial Fair. The idea of a condenser being necessary in a *bee-hive*, is, of all others, the most unphilosophical and unsound, and has only to be considered to be condemned. Would we not say that a person was not *compos mentis*, who, instead of ventilating his sleeping apartment, should provide it with a condenser? It appears to me the same may be said of that bee-keeper, who, instead of properly ventilating his hives—allowing the breath and vapour arising from the bees to escape—add to them condensers, thereby creating a dampness which it is so desirable to avoid. Away with all such useless contrivances, which not only add to the expense of a hive, but interfere with the nature and habits of the bees."



Bush Farming on a Small Scale.

To the Editor of THE CANADA FARMER:

Sir.—In November of last year, you thought proper to insert in your very useful paper an extract from a letter addressed by me to the Secretary of the Canada Company, upon whose lands I have settled. It may interest you to know the result of my second year of farming in Dysart. I must note that Dysart is in the County of Peterborough, and is one of ten townships owned by the Company I have named. As you, probably, do not remember the nature of the statement of last year, permit me to repeat the figures. I settled in Dysart in May, 1864, contracted to have 2½ acres cleared by June 5th, and my first crop was worth oats, \$20; potatoes, 100 bushels, \$50; corn, \$6; turnips, \$12; total, \$88. My lot consists of 40 acres, for which I paid the Company \$10, and the clearing the 2½ acres cost me \$38; total, \$78, so that my crop the first year paid for the purchase of my land and the expense of the clearing, and left a balance of \$10 in my favour. It really did much more than this, for the vegetables I raised could not have been worth less than \$20 to me. So far for my first year; now of my second. During the winter I chopped 3½ acres, and so started in the spring with a clearing of six acres. The Company have just been taking a census of the population of Dysart, and an account of the produce raised by each settler. I copy from this my account of produce raised. Number of acres in lot, 40; number of acres cleared, 6; bushels of spring wheat, 20; bushels of oats, 60; bushels of corn, 20; bushels of potatoes, 300; bushels of turnips, 400; bushels of carrots, 20; bushels of parsnips, 20; beans, 3 bushels; peas, 4 bushels; timothy hay, 1,500 lbs.; millet, 1 ton; mangel wurtzel, 40 bushels; buckwheat, 2 bushels; onions, 1 bushel; maple sugar, 20 lbs.; sunflower seed, 2 bushels. What the money value of my crop may be, I cannot say, for I have no intention of selling any of it, calculating that I can consume it on my own premises to better advantage. With the exception of some flour, I hope to have nothing to buy this year in the shape of provisions for my household. I have abundance of food both for the house and live stock. I make my own butter, raise my own pigs, and keep my own poultry; and, please observe, I keep everything well. Everything around me is well fed, and fat. In fact, I am doing very well, and my farming is paying me an abundant return. But then I must note that the labour is great. I keep no oxen, and with the exception of hiring a yoke for a few days to log and drag in grain, and draw some logs to the house for firing, I have had no expense. There has, however, been work constantly going on, for when I have not been at work myself (having another occupation), I have frequently hired a man to work on my farm in my place. You must know I cultivate the whole of my little farm with the spade and hoe. My belief is that a small piece of land thoroughly cultivated will be infinitely more profitable than a large piece tilled in the slovenly fashion, so common in this country. Of course it's hard work—there's no doubt about that. I am now on my third new spade. The roots are hard on spades; but it pays me better to use the spade than the axe. I reckon I obtained as much from my six acres as most new settlers obtain from twelve, and so saved my labour in chopping and clearing six acres. My calculation is that I can cultivate about fifteen acres in this way with the spade and hoe, and so raise abundance of everything to maintain a household. What land I shall be able to seed down will give me hay, and this hay will give me butter and cheese and beef for sale to obtain the ready cash that is so much

needed in the back country. You must please observe that in advocating bush farming on a small scale, I am not opposing it on a large scale. All I say is that for the first few years of a new settler's life in the bush—especially if he be an Englishman—it will pay him better to depend on his spade and hoe, and cultivate his land as though it were a garden, than to rush into the woods, make a large clearing, keep oxen and horses, and incur all the expenses of a large farm. A few words more, and I have done. If you look over the list of produce I have raised, you will see how varied it is. The land here will raise anything you wish, if you only deal fairly with it. We have no trouble with any crop, we know no failures, and the collection of farm produce from Dysart, exhibited at the Provincial Show at London, elicited special commendation from the judges, and obtained a special prize of \$10. As a proof of the fertility of the soil, I may mention that the three hundred bushels of potatoes that figure in my list were raised from ten bushels and a half that were planted on about an acre and a quarter of land, and it was a sample of these potatoes that was exhibited at London.

I am,

"A SMALL FARMER ON LAKE KASHAGWIWAMOU."

Bound Volumes.

The Second Volume of "The Canada Farmer" is now ready, consisting of 24 numbers, and comprising 384 pages of reading matter in a bound form. The binding will be charged 30 cents in addition to the subscription price, making \$1 30 in all for the volume. Parties desirous of having their Nos. for the past year bound, will please send them to us, securely packed, with their name and address, together with 30 cents in stamps or otherwise, and we shall return them bound, free by post. Vol. 1, containing the numbers for the year 1864, may also be had at the same price.

Subscribers will please notice that it is not necessary to pay postage on numbers of The Canada Farmer returned to this Office for binding,—but 30 cents must be remitted to the Publisher, to defray binding expenses.

The Canada Farmer.

TORONTO, UPPER CANADA, JAN. 15, 1866.

Our Cattle Trade with the United States.

THE American Government, as if too impatient to wait for the expiry of the Reciprocity Treaty in the natural course of events, has to all intents and purposes, abrogated it three months before date, so far as one important branch of international commerce is concerned. An Act of Congress forbidding the importation of cattle into the United States, was duly approved by the President on the 18th ult. It was at first supposed to apply only to the introduction of cattle from European countries, but to the astonishment of everybody, and the especial consternation of buyers for the American market, it was at once officially interpreted as applying to Canada. As a precautionary measure against the cattle plague which has been raging so fearfully in the Old World, this was doubtless a wise piece of legislation, but its application to Canada, is an uncalled-for and vexatious procedure which there is nothing to justify or even excuse. Not the first symptom of rinderpest has been detected among the herds in this country, and that there is no apprehension of that sort on the part of the American Government, is clearly shown by the fact that cattle are still allowed to pass through Canada on their way from the Western to the Eastern States. The history of the disease in other countries, conclusively shows that this would be most hazardous, were there any trace of the disease in this country. It is a matter of regret to be obliged to see in this movement the first turn of the wrench by which the process familiarly known as "putting on the screws," is to be brought into operation in

reference to this country. This is indeed the only subject of regret in connection with the matter. We have already disposed of all the live stock we can well spare the present season, and commercially the order will do us little if any harm. The suddenness with which the prohibition came, caught a number of American traders in the act of getting stock across the frontier, and upon such the weight of injury and loss has fallen. The *New York Times* has declared, on the authority of buyers for the United States market, that at least forty thousand dollars' worth of live stock would be thus prevented reaching its destination. The order has been made as sweeping as a comprehensive definition of the word "cattle" would admit, and it is somewhat amusing to find Secretary McCulloch associating the great American lexicographer with himself in the explanatory circular issued to collectors of customs; "cattle, which term in its broadest sense, includes, according to Webster's dictionary, domestic quadrupeds collectively, not only of the bovine genus, but also sheep, goats, horses, mules, asses, and swine." Had the United States officials kept in view only the ostensible object of the Act, "To prevent the spread of foreign diseases among the cattle of the United States," they would have adopted another policy. There ought to have been added to the title of the Act, "and for other purposes," as is sometimes done in setting forth the object of a legislative measure. Leading organs of public opinion, both in this country and the United States, regard this piece of high-handed procedure as the initiatory step towards the policy advocated at Detroit, last July, by Consul Potter. American journals that are keen for the annexation of Canada to the United States, are chuckling over the destruction of the cattle trade, and the prospective stoppage of the Reciprocity Treaty on the 17th of March, under the mistaken idea that their pet scheme will be promoted by these means. A few months will convince them of their mistake. We shall seek other markets, and open other avenues of trade. The inconvenience to us will be temporary, and may in the end be beneficial by throwing us upon our own resources, and developing our latent energies. When our neighbours across the lines begin to reap the fruits of a non-intercourse policy, in the loss of their Eastern fisheries, the cutting off from its legitimate outflow the produce of the Western States, and the increase of smuggling along a thousand miles of frontier, they will perhaps bethink themselves, and be glad to return to those friendly relations which have been so mutually advantageous for the past few years. Meantime we advise our readers quietly to await further developments, and to rest assured that a restrictive, selfish policy will, in the long run, react upon itself. The tendencies of the age are too liberal, and the currents of public opinion too strongly set in the direction of free trade, to render it possible for legislation of an opposite character to prevail among an enlightened people for any great length of time. Until we are compelled to relinquish it, we shall cherish the hope that after a brief trial of non-intercourse, high tariffs, brisk smuggling, and the loss of fishery and transit privileges, our neighbours will pocket their imaginary grievances, give up the idea of coercing us into annexation, and be content to renew the terms of good fellowship and neighbourliness, which have been happily established so long between us.

CIRCULATION OF THE CANADA FARMER IN HAMILTON.—Mr. Geo. Laing, Secretary of the Hamilton Agricultural Society, calls our attention to an error in the "Publisher's Notice to the Farmers of Canada," which appeared in a late issue. Respecting our circulation in that city, it is stated in the article that "this fine list is chiefly due to the activity of the Horticultural Society of that city"; whereas it should have been "the Agricultural Society of that city." On the principle of according "honour to whom honour," we gladly make this correction.

Unmerchantable Western Wheat.

It appears that not only have the Chicago grain-buyers speculated unwisely in sound marketable wheat, but a large quantity of what has come into their hands is quite unfit for consumption, and will probably prove a dead loss to them. Large stocks now stored in Chicago, are said to be diseased, and their use for human food would endanger the public health, especially if the cholera should make its appearance the coming season. The *Rochester Union* in an article on this subject says:

"We are told that so general was the disaster that befel the crop of Illinois and Indiana that no number one wheat came to Chicago. The Board of Trade of that city resolved to change the number, and gave what was before styled number two the rank of number one. The wet harvest extended everywhere in that region, and as the wheat grown was naturally soft, it was the more liable to injury from dampness. Our information is that there is no dry, hard, sound wheat at Chicago, unless it be a little brought from the northward—from Wisconsin, Iowa, or Minnesota, where the crops were fine and the harvest dry. There is a large fleet of sail craft and propellers lying at Chicago this winter, and holders of this damaged wheat intend to ship as early as possible to get the foul stuff off their hands before the warm weather makes it wholly worthless. They will push this grain to Buffalo, Oswego and other ports below, and make the best disposition of it that they can, provided the health authorities do not interfere. A New York grain dealer says this wheat will not find a market there in the spring. He adds that the Chicago wheat now lying in New York is badly heated and nearly spoiled already, and he wants no more of that grain at any price. It is now pretty well understood that the health authorities of New York will take action to exclude this rotten and damaged wheat from coming to that port. If that is done, then, of course, Buffalo and Oswego will decline to receive it, and it will go back upon the lands of the west to enrich the soil, or be fed to the swine. The millers in Rochester, so far as we have conversed with them, fully concur in all that we have stated with respect to Chicago wheat. They ground some of this in the fall, which was purchased for sound grain, but which proved the reverse. The flour would not pass, and they lost more or less by the operation. They decline to have anything more to do with Chicago wheat. Their mills will stand idle if they cannot procure grain elsewhere. They inform us that the crop of last season in Wisconsin, Minnesota and Iowa was not only large, but the grain was fine. They will rely upon those States for supplies next season, and they do not anticipate any scarcity that will greatly enhance values. One miller, who travelled through that north-western region last fall says the quantity of wheat brought out by the farmers exceeded his expectations fifty fold, and all he saw was very choice."

DISCONTINUANCE OF THE "GENESEE FARMER."—This able and widely-known agricultural journal is now merged into the "AMERICAN AGRICULTURIST," the enterprising proprietor of the last-named paper having purchased the *GENESEE FARMER*, and secured the valuable services of Mr. Harris on the editorial staff of the *Agriculturist*. In this arrangement, Mr. Judd has shown much business shrewdness, while it will relieve the late proprietor of the discontinued journal from much care, and afford him more time for the gratification of his rural tastes. We part from the *GENESEE FARMER* with regret, having been familiar with it for several years, so that we have come to view it as an old friend. Since the commencement of this journal we have found it one of our most helpful exchanges. We are glad that the "WALKS AND TALKS ON THE FARM" are to be continued by Mr. Harris in the journal with which he is now connected. This has been a most interesting and instructive feature in the *GENESEE FARMER* for some time past, and will doubtless form an attractive characteristic of the *AGRICULTURIST*. We are pleased to know that Mr. Harris is not lost from the ranks of agricultural journalism, though he has ceased to publish an independent paper. We wish him all success in his new position.

THE "CULTIVATOR" DISCONTINUED.—This well-known agricultural monthly, so long issued by the Messrs. Tucker, of Albany, N. Y., is now discontinued. It has been for some time the intention of the proprietors to take this course, so soon as their weekly, "The Country Gentleman," should have a circulation sufficiently large to justify the step. We congratulate them that the time has arrived for carrying out their long-cherished plan. The Messrs. Tucker have done very much to originate and cultivate a taste for the right kind of agricultural reading among the farmers on this continent, and we sincerely hope they may long continue their labours with profit to themselves, and advantage to their readers. Without disparagement to other journals of the kind, we are free to say that *The Country Gentleman* holds the first place in the affectionate regards we distribute among our exchanges.

ROYAL ENGLISH SOCIETY'S SHOW OF 1866.—We learn from our late British exchanges, that at a recent meeting of the Bury St. Edmunds local committee, a communication from the Council of the Royal Agricultural Society was submitted, in which it was intimated that in consequence of the prevalence and mortality of the cattle plague, the Council deemed it better to postpone the Exhibition till 1867. After some little discussion the local committee concurred in the opinion, and it has accordingly been resolved that the Royal Society will hold no show this year.

As the Exhibition of the Royal is not usually held until towards the latter part of July, this action of the Council and local committee is surely premature. It is certainly seizing time by the forelock, and anticipating the worst. If it were necessary to suspend the cattle, and even the sheep departments of the show for the reason assigned, there seems to be no sufficient cause why there might not be an exhibition of other departments. The resolution of the Council will be a great disappointment to implement manufacturers.

Agricultural Intelligence.

Agricultural Notes of Oxford.

To the Editor of THE CANADA FARMER:

SIR,—Having recently spent nearly a fortnight in the County of Oxford, a few remarks in connection with my tour may not be devoid of some interest to the readers of your useful and widely circulated journal.

The following are the places and order in which I held public meetings:—Woodstock, East Zorra, West Zorra, East Nissouri, Drumbo, East Oxford, Norwichville, and Ingersoll. It was arranged that I should lecture at Mount Elgin, but on arriving at the place I found that no notice had been given of the meeting, and have since heard that a considerable number of people assembled the same evening in another village, from some misunderstanding or other, so that I had not the pleasure of meeting the farmers of that part of the township of Dereham. The attendance on the whole was good, especially in the country; but in towns, farmers' meetings do not succeed, when held in the evening. I think that in populous places it would be better to hold a farmers' meeting in the afternoon, and another for residents in the evening. At the latter, subjects relating to horticulture and popular sciences, as well as agriculture, might be advantageously treated of.

The chief objects that I have kept in view at these meetings are the following:—To induce the members of agricultural societies to take a higher and larger view of the capabilities of their organization than the mere holding of an annual exhibition. This is, no doubt, a principal function, and the results have unquestionably been on the whole satisfactory and beneficial. Something more, however, than a show is needed to realize all the benefits which agricultural societies, when efficiently supported and conducted,

are calculated to confer. The agricultural mind should be roused and diverted; habits of patient and careful observation and deduction should be formed and strengthened, and sound principles of political economy elucidated and enforced. Mind as well as muscle is as necessary to improvement and success in farming as in other pursuits; and this great truth needs to be kept before the attention of the cultivators of the soil, in every part of the world. I have, therefore, in these visits urged upon the members of agricultural societies the importance and advantages of stated meetings, especially during winter, for the consideration and discussion of subjects relating to the science and practice of husbandry. In a word, an agricultural organization should, in my estimation, be a *bona fide Mutual Improvement Society*. I trust that results will show that I am not over sanguine in flattering myself that a favorable impression has been made in this direction. Nearly every society in Brant, as well as in Oxford, appointed a time to meet for the consideration and carrying out of this object. I also, as a matter of course, explained the provision which has been made by our Provincial University and Board of Agriculture, for imparting to young men agricultural and veterinary instruction.

Another object I have kept steadily in view,—the procuring of material for a Provincial Agricultural Museum. This project, it is obvious, cannot be carried out, without the active co-operation of societies and enterprising individuals in different localities; and it is encouraging to observe that wherever this object has been explained, assistance has been offered. A permanent and well arranged exhibition of the agricultural products of this section of the Province, under the supervision of the Board of Agriculture in Toronto, where a spacious and suitable room has already been provided, would be a means of affording much information to farmers, travellers, and emigrants. In the United Kingdom and other European countries, they have not only national, but also local museums, embracing all the characteristic productions of nature and art. In some places, even parochial museums have lately been established.

The dairy business is assuming every year greater importance in this country. I had but a slight opportunity of visiting the principal dairies, and the season for making cheese was nearly or quite over, yet I could see that this important department is making sure, if not rapid progress, and that it is capable of great and profitable extension. Mr. Adams, of West Zorra, has recently commenced a dairy of eighty cows, which he keeps on his own farm. He finds a ready market for his cheese in London, C. W.; the demand at present is so active that the article has to be sent out in a very unripe condition. I spent a few hours with Mr. Smith, of Norwich, the maker of the world-renowned cheese, weighing two tons, that was exhibited to admiring thousands at the late New York State and Upper Canada Shows. This cheese, the largest, probably, ever made in the world, was of excellent quality, and it was Mr. Smith's intention to have sent it to England after exhibiting it in Montreal, but before reaching the latter it met with a disaster on the railway, which so injured it that the owner disposed of it in Toronto. This result is to be regretted, on public as well as private grounds, for although such a gigantic production involved an amount of anxiety, trouble, and expense, which no purely commercial advantages could compensate or justify, and was in fact more of a curiosity than a legitimate object of trade, yet it would, on these accounts alone have attracted public attention in England, demonstrating the capability of Canadian soil, and the skill and enterprise of her people. Mr. Smith keeps himself about one hundred cows, and purchases the milk of five hundred more. This he steadily collects, morning and evening, in a waggon specially constructed for the purpose; each farmer bringing his milk to deposit on the main road, at convenient distances. Mr. Smith's factory is as large as any I have

seen in the State of New York, and the arrangements quite as complete. The vats are very capacious, the milk being warmed in a very uniform manner by a steam engine, which pumps the water, and performs many other useful operations, to the great saving of manual operations. More time is of course yet required for the enterprising proprietor of this large establishment to complete all the arrangements, and it will be well worth a visit by such as take an interest in this important department of rural industry.

Mr Harris, near Ingersoll, erected a cheese factory last season, and the experiment has, so far, proved encouraging. This establishment is conducted on a different principle to that of Mr. Smith's. Mr. Harris keeps about 80 cows himself, and has made cheese during the past season from the milk of upwards of 300 cows belonging to his neighbours, on the American system, that is, charging two cents a pound for the making of the cheese, which is sold by a joint committee at stated periods, and the proceeds divided proportionately among those that contributed the milk. I regret that Mr. Harris was from home when I called; but I obtained sufficient information of his proceedings to justify the conclusion that his enterprise is conducted with ability, and the promise of success.

I had the pleasure of a night's abode with one who may be termed the founder of the dairy system, at least, as far as cheese-making is concerned in this section of Canada. Mr. Hiram Ranney, of Dereham, who possesses, probably, the largest private dairy in the Province, and who has been a well-known and successful exhibitor of cheese at our Provincial Exhibition from its commencement. Mr. Ranney commenced cheese-making with only three or four cows, about thirty years ago, when this part of the country was almost an unbroken wilderness. From this small beginning he went on every year increasing, gradually overcoming difficulties—always more or less incidental to a settler of scanty means in a new country—till he became the proprietor of a well-cleared-up farm of 700 acres, with a substantial and commodious homestead, and a dairy of one hundred cows! Mr. Ranney, who is now getting into the vale of years, has the good fortune of possessing a helpmate who was early initiated in the art and mysteries of cheese-making on her native hills in Vermont. And I must say that I never saw a private dairy more cleanly kept and conveniently arranged, with all the modern and improved appliances of the art, than the one which this good and exemplary housewife has presided over for so long a term of years. I would advise every young farmer who has had the misfortune of commencing business in a state of what is strangely, and often inaccurately called—"single blessedness," to get married as soon as he can; for, with a suitably-qualified partner, he will find his home more attractive and his business more profitable. We too often overlook, or, at best, but inadequately appreciate the value of those qualifications which constitute the character of a good farmer's wife. The reader will find more detailed information respecting these Canadian cheese factories in the last volume of THE FARMER.

I observed around the fine homestead of Mr. Dunlop, of East Zorra, some young hedges of white willow and buckthorn. The former had been planted only a year, and a considerable number of the plants were dead, or in an unthrifty condition. The buckthorn was decidedly more healthy, making good progress, and the proprietor expressed, so far as his experiment had gone, a decided opinion in its favour. Some hedges of English hawthorn I noticed on the farms of Mr. Garbutt and Mrs. Peters, in East Oxford, that had been planted several years. The plants were apparently strong and healthy, but the hedges were too thin at the bottom, arising probably from not being sufficiently cut back during the earlier periods of growth. The subject of live fences is beginning to attract more attention in the older-settled portions of the country.

A very simple, and, as I was assured, effectual means of preventing mice barking fruit trees during snow, came under my notice in an orchard belonging to the Hon. George Alexander, of Woodstock. A small quantity of earth is thrown by a spade around the stem of the tree in a conical form, about eighteen inches high, before the setting in of severe weather, and it is found that mice will not ascend it, if made smooth and properly tramped down. Mr. Alexander had also fully restored some moderately-sized apple trees, whose trunks had been split by the action of storms on the boughs, by bringing the parts together with an iron bolt inserted through the stem, having at the end a nut and screw. The unusual rain storm, accompanied by severe frost, at the beginning of November, when both fruit and forest trees had not lost the whole of their leaves, produced serious havoc in this section of country—a great number of trees being seriously injured, and some entirely destroyed, by the weight of ice on their boughs. So destructive a phenomenon had not oc-

curred within living memory. On the lower grounds, nearer the Lake, but little mischief was occasioned.

I think I never saw a more uniformly better soil than is to be found in the County of Oxford. The surface is beautifully undulating, admitting, therefore of easy drainage, and the woods are characterized by those species of deciduous trees that infallibly denote first-class land for general agricultural purposes. There are signs, too, in the people, indicating progress and enterprise, and I shall be happy to learn in due course, that my intercourse with them and the suggestions I made, have been productive of the desired results. I found THE FARMER both here and in Brant more or less circulated in every township, and its usefulness appreciated. As a medium of agricultural information, no intelligent and improving farmer can afford to do without it.

Yours truly,
GEO. BUCKLAND.

University College, Jan. 7, 1866.

Meeting of the Board of Agriculture.

A MEETING of the Board of Agriculture took place at the Board Rooms, Agricultural Hall, Toronto, on Wednesday, 27th Dec., the following gentlemen being present, viz.:—Hon. D. Christie, President; Hon. A. Burnham Hon. G. Alexander, Hon. H. Rattan, F. W. Stone, Dr. Richardson, R. L. Denison, J. C. Rykert, Prof. Buckland, Dr. Beatty.

The following communications and Reports were submitted and severally disposed of as stated:—

From Col. Askin, of London, suggesting a competition in horse-shoeing at the Annual Provincial Exhibitions. Acknowledged with thanks.

From Hon. A. J. Fergusson Blair, containing his special prize, "The Fergus Cup," for grade heifers. Thanks voted to Mr. Blair for his valuable prize.

From Mr. Griffin, Deputy Postmaster-General, on the postage of prize lists, &c., of the Board. Secretary instructed to write to the Postmaster-General.

From Mr. George Jarvis, Westminster Township, statement of mode of cultivating sorghum and manufacturing sugar and syrup therefrom, entered for the prizes offered by the Association, samples of the sugar and syrup being also submitted. Prizes ordered to be awarded.

From Professor Buckland, proposing to place his services for a considerable portion of the year at the disposal of the Board for the purpose of making tours through the country, giving lectures, &c. Proposal accepted.

From Mr. Taché, Deputy Minister of Agriculture, asking for some samples of flax fibre for the Bureau. Samples to be sent.

From the same, explaining that the grants for the County Societies for 1865 could not be placed at the disposal of the Board till the latter part of September, in consequence of the late date at which the Supply Bill was voted by Parliament. Filed.

From Mr. John A. Donaldson, Report of progress in flax cultivation and preparation for market. Received with thanks.

From Mr. Walter Riddell, Cobourg, Report of experiments with English wheat and other seeds distributed by the Board in the spring of 1863. Received with thanks.

From the City Clerk, London, urging the payment of a certain part of the expenses of entertaining the guests from the Maritime Provinces at London, during the recent Exhibition. Reported against by committee.

From Mr. Taché extract from the Official Report of the late Dublin Exhibition, with analysis of honours gained by each country exhibiting. Received. Synopsis to be published.

From the same, three letters in reply to communications from the Board, urging upon Government the importance of putting the Act passed last session of Parliament in force, so far as to prevent the importation of cattle from countries in Europe where the cattle plague is prevalent, in the last of which letters Mr. Taché states that the Minister of Agriculture does not deem it expedient to take any steps at present which might endanger the reciprocal trade in cattle with the United States. Secretary instructed again to address the Government on the subject.

From Mr. W. A. Cooley, of Ancaster, suggesting the formation of a Wool Growers' Association. Laid over.

From Mr. John A. Donaldson, proposing to continue his services in lecturing, and otherwise endeavouring to promote the cultivation of flax. Mr. Donaldson's services accepted for six months.

From Mr. Wm. Ferguson, M. P. P., recommending Mr. J. H. Dickson's machinery and improvements in the preparation of flax to the notice of the Board. Laid over.

From Victoria, South Australia, Board of Agriculture, copy of Transactions. Received, with thanks.

From Mr. Taché, Board of Agriculture, desiring to be informed whether, if Government should import a certain quantity of Riga flax seed, there would be a certain prospect that it would be taken by the farmers of Upper Canada at cost price, for immediate sowing. Secretary instructed to obtain information and transmit the same to the Bureau.

Order.—That the Secretary be instructed to request the attention of the Government to the desirableness of taking measures to insure a suitable representation of Canada at the approaching Universal Exhibition, to be held at Paris, 1867.

After some further detail business, the Board adjourned.

A mammoth cabbage, weighing thirty pounds, was recently sent to the Department of Agriculture at Washington by Hon. J. F. Briggs, of Saginaw, Mich.

A Vermont farmer counted the product of one kernel of buckwheat, and found the yield to be 3,270 kernels.

A Hog was exhibited at a Fair in Fountain County, Indiana, recently, that weighed 1,118 pounds. The fact is well authenticated.

GRAIN DESTROYED BY LOCUSTS.—In the province of Samaria, Russia, the grain this year has been completely destroyed by locusts. They visited the same province in 1863.

CLOVER.—An agriculturist reports that he keeps his lands rich without manure, by occasionally ploughing in a second heavy crop of clover in the fall. The seed is sown thick the previous fall or spring for this purpose.

GOOD PRICE FOR TWO-YEAR-OLD CATTLE.—Mr. Marr, Cairnbrogie, sold his two-year-old stots, which took the first and second prizes at last Viny Show, to Deacon Stewart, Aberdeen, for £80 the pair.

THE CATTLE PLAGUE IN RUSSIA.—Mr. Clay, the American Minister, writes from St. Petersburg that the Russian cattle plague is fearful—cattle dying by hundreds and sheep by thousands. Nothing is done to avert it, as the superstitious villagers think that would be a sin.

A FROG IN A TREE.—The *Whitby Gazette* states, that recently Mr. Angus McDonald, of the township of Mara, cut down a white ash tree, and on splitting it, a live frog was found embedded in the wood. The tree was about fifteen inches in diameter and perfectly sound; the cavity in which the frog had been enclosed appeared as if carved out for its reception. The solving of the question how the frog got there, would be an interesting one for naturalists.

NO FENCES IN GERMANY.—The Secretary of the Ohio Agricultural Society has been travelling in Germany. Spraying of the country near Dresden, he says: "Every foot of land not in forests is cultivated. There are no fences; the field is ploughed up to the roadside, and fruits and flowers are grown by every roadside that I have travelled: no one disturbs them. The cattle, sheep and swine are kept in the stables, or, if taken out, are under the charge of a shepherd or herdsman. Here and there dotted over the landscape, we saw sheep in pasture, but have seen no cattle or swine running around loose. The genus 'loafer' is unknown here."

SHEEP DISASTER.—An extraordinary accident has occurred near Marselles. Some shepherds were driving a flock of 1,400 sheep to a pasture which lay at the foot of a high hill, the sheep, instead of following the path, no sooner came in sight of the pasture, from which they were separated by a wall six feet high, which was protected by a quick-set hedge, than they bolted for the wall, intending to leap over it. The first sheep were checked by the hedge, but the whole flock was in motion, and sheep tumbled over sheep until 214 perished, suffocated by the superincumbent living mass. A shepherd who attempted to check them was knocked down, and likewise perished of suffocation.

WILD CATS.—This troublesome species of quadruped is unusually prevalent at the present season. From different portions of the County come accounts of their depredations, and hundreds of dollars worth of property has been lost through them during the past few months. On the 26th instant, Mr. Geo. McKeig, of the Township of Erin, killed a wild cat, which makes the third one since the 6th December. He has lost all his poultry through their agency. Mr. Jno. McMillan, of the same township, with his dog, killed a very large cat on Wednesday, the 26th. Mr. John Walker attributes the destruction of his pork to wild cats, though it has been conceived possible that the real mischief was committed by feline domestics. —*Guelph Advertiser*

British Cleanings.

TAMM HARES, &c. *The Field* publishes the following interesting communication.—"While waiting for dinner at the residence of J. Hooper, Esq., of Hoddesdon, in Hertfordshire, with whom I had had a long ramble by the side of the River Lea, with a view to the publication of my trip upon that stream and its tributaries in *The Field*, I was asked by the lady of the house whether I would like to see 'Harry' before he retired to bed. In the full expectation that I was about to be introduced to a juvenile member of the family with whom I had not been previously made acquainted, I descended to the parlour, where Harry was presented to me in the guise of a tame hare. Harry has been in the family for five years, having been taken, when a leveret, by a woman while harvesting, and reared by hand. It runs about the house and rooms like a cat, and will eat almost everything, showing a great partiality for sweet cakes, and will do almost anything it is told for a few pieces of macaroon. It has partaken of four Christmas puddings, and will not permit such gustatory viands to be on the table before his well-known inquiry is heard, and if not attended to, Harry is rude enough to jump on the table; very often to the surprise of a guest not previously aware of the presence of so 'tame' an animal, and, after scattering the glasses right and left, help himself from his mistress's plate. The memory of this interesting creature appears to be no less remarkable than his perfect docility; for the family having occasion to quit England for a tour on the Continent for eighteen months, left Harry with a trustworthy person in the neighbourhood, and when it was restored to the mansion at Hoddesdon, it not only clearly recognized its old haunts beneath the chairs, &c., but manifested the most intense delight at the sight of Mrs. and Mr. Hooper, from one to the other of whom it ran, and leaping upon their laps, licked their faces and hands in obvious joy. Two puppies were, by way of experiment, introduced into the same room with Harry, when Harry, without first seeing the pups, sniffed the air, and raising himself upon his hands looked, with erected ears, cautiously around. Then perceiving his natural enemies, his frame shook for a while in a paroxysm of fear, and the poor fellow rushed up the corners of the room, and fell back in his futile attempts to escape. One way in which Harry shows his delight when his master and mistress arrive after a few hours' absence, is to scamper madly round and round the room, and finish his spree by a spring upon one of their laps. He knows full well then, that so splendid a circus-like performance will be rewarded by a slice of bread-and-butter and sugar, and without the latter accompaniment, he very plainly tells that he has been deprived of one of his luxuries; but he eats the proffered food, *sans* the saccharine, notwithstanding. Harry is getting a little stuff in his hind quarters; but whether this is from age or a cold it is difficult to tell. One of the poet Cowper's hares, I believe, lived until it was thirteen years of age; therefore Harry would be a mere boy in comparison, and ought not to be succumbing yet. In going through Belton Park a few months since, Mr. Mitchell of Grantham, my companion, informed me that it was no uncommon thing for the hares to run away, in the first place, from the little pet dog by which he was always accompanied; but that after looking back at their pursuer, and stopping once or twice, the hares would in turn commence to run after the dog, and thus to enter into a regular romp together. I am assured by more than one keeper that they have known fawns to be worried to death, or to fall with sheer exhaustion, after being pursued by hares, which at certain seasons bite at the hind legs of the fawns, as if in arrant wantonness.

A NOBLE WEATHER PROPHET.—A writer in an English exchange says:—"An Irish nobleman, the Earl of Portarlington, made a very lucky guess, or prediction, about the weather some six months or so ago, and we now regard him as our clerk of the weather. To do his lordship justice, I expect there is a good amount of science in his predictions; and seeing that he has been quite right once, where all chances seemed against him, his opinion is certainly entitled to some consideration. Our late summer set in with such an amount of rain and humidity that all our farmers got frightened; when, one fine morning, an Irish newspaper came out with a letter, over the signature "Portarlington," calling them to keep up their spirits, for the approaching summer promised to be exceptionally long and dry. And Portarlington was right, by the Lord; right to a strange extent; for we have had what I never heard of before in Europe, an Indian summer—trees blossoming and leafing anew in the latter part of October, and two crops of strawberries in one year. Well, his Earlship has come out with a fresh prediction, addressed

to the *Leinster Express*. It reads as follows:—"Sir—I shall advise all our farmers to husband their resources as much as possible, there being every symptom of the approach of a severe winter, and most likely setting in with the next moon. I hope I may be mistaken this time. I am, sir, your obedient servant, Portarlington, Nov. 20. We are on the lookout for the aforesaid moon, &c., the 18th inst.; and such confidence does your correspondent feel in Portarlington's predictions that he has ordered a devil-may-care overcoat to welcome the weather."

PIG CHALLENGE.—Some correspondence has lately appeared in the *Irish Farmer's Gazette* in reference to the age of certain pigs which took prizes at a recent Agricultural Exhibition. Doubt having been expressed whether the pigs in question could have attained their size at so early an age, the exhibitor offers to stake £50 or £500 that he will produce some of the same sort to weigh 2 cwt. (224 lbs.) before they are seven months old. He says:

"My sow, Alexandra, farrowed 11 pigs on the 13th of February, 1865; on the 9th of August she farrowed 8 pigs, and is now, I hope, in young again; if so, her time of farrowing will be about the 4th of February, 1866, producing three litters within 12 months. It will be from this litter I propose to take the pigs to prove the bet; and to give every chance to the party who is of a different opinion, he shall have due notice given him when the sow shall farrow. He shall send his own man to see the pigs farrowed, and that man is to have liberty to see the pigs every day until they are seven months old; and also to be at their billing and weighing, so as never to lose sight of them for a single day, and I will agree to pay that man 10s. a week for seven months if I lose the wager. The experiment is worth trying, as it would let the world see what can be done with pigs."

The breed of pigs is not named, but it must be a prolific as well as a precocious one.

GUANO.—We clip the following from the *Mark Lane Express*:—"The imports of guano have very largely increased this year, although they are not quite up to the standard attained in 1863. In the nine months ending September 30, this year, the total receipts were 170,945 tons, against 82,683 tons in 1864, and 187,382 tons in 1863 (corresponding periods). To these figures Peru contributed 150,472 tons, 69,217 tons, and 159,390 tons, respectively. From Bolivia we received to September 30 this year, 6,432 tons, while in the corresponding period of last year the receipts from the same quarter were nil, and in the corresponding period of 1863, 11,286 tons. The British West Indies sent us 4,193 tons, against 2,145 tons and 4,620 tons; and the west coast of Africa, 3,754 tons, against 1,035 tons and 1,369 tons. The imports from the United States had declined this year, having only amounted to 1,082 tons, against 5,325 tons in 1864, and 9,885 tons in 1863 (corresponding periods). The imports in September from all sources were 20,972 tons, against 12,828 tons in Sept., 1864, and 13,215 tons in Sept., 1863. The value of guano imported in the first eight months of this year was computed at £1,655,803, against £756,070 in 1864, and £2,009,675 in 1863 (corresponding periods). We have thus been spending rather more than £200,000 per month, this year for guano."

THE PRIZE SHORTHORN BULLOCK AT BIRMINGHAM.—

The seventh annual fat cattle show for Birmingham and the Midland Counties, was recently held in that town. Respecting the prize Shorthorn bullock the "special reporter" of *The Farmer* (Scottish) thus writes:—"The cream of the show was found in Mr. Wood's shorthorn bullock, which took all he could win—namely, £15 as the best of his class, £25 as the best shorthorn, and Lord Aylesford's prize of £15 as the best shorthorn fed and bred by the exhibitor, the President's 25 guineas, as best ox or steer bred and fed by the owner, the gold medal (£25) for the best ox or steer in the yard, the hotel-keepers' 25-guinea cup, Mr. Otley's 5-guinea medal for best animal in the cattle classes, and the silver medal for the breeder, making a total in value of £140, a figure never before attained in the Bingley Hall by any single animal. As may be supposed, this was a rare animal, and in all respects as near perfection as possible."

The following particulars respecting this fine animal are supplied by the *N. B. Agriculturist*:—"The ox is three years ten months old, is large and symmetrical; girth 9 feet 6 inches. With the exception of being a little light in the twist and plain in the quarters, he is a very perfect animal of the Shorthorn breed, and is perhaps the best ox or steer ever shown in his class in Bingley Hall."

THE VINTAGE OF 1865.—On this subject the *London Times* has the following:—"The extreme heat which prevailed during the vintage produced a curious result. The grapes being in general very ripe, fermented in the vats with extraordinary rapidity. A great portion of the saccharine matter had not time to be converted into alcohol, and in countries like Burgundy, where wine growers do not leave the wine very long in vat, fearing it may become hard and rough, the wine, on account of the saccharine matter remaining in it, will ferment for a long time in the cask. These wines will consequently require much care, not only from the danger of excessive fermentation during their transport while young, but even after they are lodged in the consumer's cellar. The excess of saccharine matter will render the wine liable to ferment at every change of weather, and if the cellar is not sufficiently cool the fermentation may produce acidity. There is no doubt that the wines of this year's growth are of excellent quality, but they will require great attention before they arrive at maturity."

AMUSING SIMPLICITY.—Some days ago, says the *Caledonian Mercury*, at one of the Dumfries fairs, a young woman, too obviously "from the country," was seen standing with a very perplexed air at the pillar letter box at Nith-place, in front of the Mechanics' Institution. She was observed to knock several times on the top of the iron pillar, but, obtaining no response, she passed round to the opposite side, and raising the cover of the slit in which letters are placed, she applied her mouth to the aperture, and called out, loud enough for the amazed by-standers to hear, "Can ye let me hae a postage stamp?"

A FOSSIL SPIDER.—An English paper recently contained a description of a fossil spider discovered by Professor F. Romer. The fossil was found in a piece of scale from the coal measures of Upper Silesia. The specimen is perfectly preserved, and shows the four pair of feet with all their segments, the two palpi, and even the coriaceous integument of the body and the hairs attached to the feet. Spiders have not hitherto been found in any rocks older than the Jurassic, but by this discovery their presence in Paleozoic rocks is proved.

MOST EXPEDITIOUS WAY OF FATTENING FOWLS.—On this subject the *Irish Farmer's Gazette* says:—"Coop them in a moderately warm, dark quiet place, with good ventilation, and keep them perfectly clean, and fed on boiled or steamed potatoes, mixed with crushed oats or oatmeal, and blended with sweet milk with a little fine sand added, and given warm, but not hot. If in health and well attended, they will be fit for use in a fortnight. They may also get bean, pea, or barley meal mixed with the potatoes."

THE PLAGUE IN THE ZOOLOGICAL GARDENS.—A correspondent of *The Farmer* (Scottish) states that "the cattle plague is spreading among the animals in the Zoological Gardens of the Bois de Boulogne. It has attacked the goats, four of which have been killed, making eighteen deaths among the animals since the arrival of the gazelles from London. All animals suspected of being infected are immediately killed. This system seems to have succeeded in Germany and in the north of France, where the disease appeared some weeks ago, and is said to have died out."

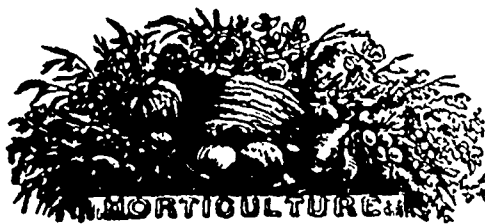
SECOND CROP OF OUT-DOOR FIGS.—A correspondent of the *Collage Gardener* writes to that paper from Hampton Court:—"I picked, on the 20th ult., a dozen and a-half ripe figs of the second crop in my garden here. This is the second time that I ever knew the second crop of figs to ripen in this country, and I believe it to be a very rare occurrence, even in the most southern parts of England. The fig is of the large white Genoa kind."

ACCLIMATIZATION OF OSTRICHES.—*The Farmer* (Scottish) states that "there has been received at the Garden of Acclimatization of Paris, a hen ostrich bred at Grenoble, and four chickens hatched at Algiers. The ostriches in domestic life are quite farmyard birds; they lay, sit, and bring up their young like ordinary fowls."

The American plan of laying down grass land in the fall without a grain crop is claimed as "my system" by a Mr. John Sanderson, in the *London Times*.

The English agricultural journals are urging upon English farmers the American factory system of cheese making.

An Onion Fair lately held at Birmingham, Eng., was attended by 40,000 people, and many were so overcome by the magnificence of the "silver skins" that they shed tears copiously!



Orchard Culture.

1. We believe in selecting a good site
2. We believe in a most thorough preparation of the soil.
3. We believe in enriching the soil according to its wants.
4. We believe in planting none but good trees.
5. We believe in planting trees not more than two or three years old, if bought at the nursery.
6. We believe in "setting" said trees after the most careful and approved manner.
7. We believe in pruning and training said trees.
8. We believe in setting the branches low down on the trunks.
9. We believe in keeping those branches and trunks free from moss, caterpillar, and all other pests.
10. We believe in cultivating orchards.
11. We believe it to be a great fallacy to suppose that cultivating an orchard means to grow crops in it.
12. We believe the perfection of orchard culture consists in giving up the soil exclusively to the trees.
13. We therefore believe in excluding all grass, corn, grain, roots, weeds, cattle, mice, borers, and every "unclean thing."
14. We believe that orchard trees may sometimes be profitably root pruned.
15. We believe that this should not be done promiscuously with the plough.
16. We believe that orchards may be cultivated without injuring the roots of the trees.
17. We believe that orchard trees may be planted in too rich a soil, and make too rank a growth, thereby becoming unfruitful, and also liable to "winter-killing," and other ills.
18. We believe in checking this redundancy of growth.
19. We believe this may be done in various ways, such as summer pruning, root pruning, laying down to grass, growing crops, &c.
20. We believe that summer pruning and root pruning are the most direct, certain and satisfactory modes of accomplishing the end proposed.
21. We believe that grass robs the trees of nourishment very little if any less than some root crops.
22. We believe that an orchard in grass suffers much more in time of drouth than one well cultivated.
23. We believe that orchards laid down to grass, and kept so, should be top-dressed from time to time.
24. We believe that the lime, ashes, ground, raw bones, composts of muck, &c., are capital top-dressings.
25. We believe that orchards laid down to grass should be ploughed up at the first sign of "giving out."
26. We believe that old and decaying orchards in grass may often be renovated and made good by manure and cultivation.
27. We believe that a cultivated orchard yields fairer and better fruit than one not cultivated.
28. We believe it is a great mistake to except fruit trees from the universally recognized laws of cultivation.—*Horticulturist*.

Planting Trees.

"PICNLER" in the *Prairie Farmer* says on this subject:—"I have transplanted many hundred forest trees in the last ten years, and I have rarely lost a tree, and most of them set in the fall. One of the most important rules to be observed is, before taking up a tree, mark it in some manner, so that you will know which is the north side, so as to be able to re-set it in exactly the position it grew in the woods. This may seem to many of no importance, but to those who know that there is in the bark and wood of all trees a radical difference between the north and south sides, the north side being close grained and tough, while the south side is invariably more open grained and brash, or soft, the importance will be seen. If this is done, your tree does not have to undergo a complete change in all the parts, and is ready to start off and grow at the proper time as readily as though it had not been moved."

A PRESERVATIVE FOR FLOWERS.—As much nitrate of soda as can be held between the thumb and fingers will preserve flowers for the space of a fortnight.

AN EVER-BLOOMING VIOLET.—At the Philadelphia exhibition was a stand of violets which diffused a most delightful fragrance, and attracted much attention. It is called the Schenbrunn Violet, and is said by the exhibitor, Mr. J. Gerney, of Philadelphia, to be ever-blooming, affording flowers even in mid-summer.

FINE CRANBERRIES.—The *American Agriculturist* says:—"Our office has been ornamented for some weeks by a hanging basket filled with cranberry vines, loaded with large and finely coloured fruit. This very beautiful specimen came from Dr. H. B. Stevens, Essex, Conn., who has experimented very successfully in the cultivation of the cranberry."

THE FLORA OF SPITZBERGEN.—Mr. C. Martius, Professor of Natural History at Montpellier, has presented a report to the French Academy on the botany of Spitzbergen. According to this, Spitzbergen, situated at the extreme limit of European Flora, contains 215 species, of which ninety-three are flowering. Of the former species, sixty-nine occur in Scandinavia, twenty-nine in Britain, and twenty-three are exclusively Arctic.

RESTORING OLD ASPARGUS BEDS TO FERTILITY.—A gardener in the department of the Nord has discovered a new mode of restoring exhausted asparagus beds. He spread during the spring 120 pounds weight of common salt over a piece of ground, thirty feet long by six wide. The asparagus plants, though old and exhausted, produced a crop double what might be expected from the youngest and strongest plants. Although salt is dear in France, the gardener got a handsome profit by it. It seems that the middle of March is the best time to employ the salt.

NOT BURNING PINE.—Much attention is now being given, and we believe most rightfully, to the improvement of our nut-bearing trees. The *Agriculturist* for December figures and describes some American chestnuts which have been greatly improved in size and flavour by simply manuring the land about the trees. Some idea of their size can be obtained when we state that forty of them weighed one pound. They are also much improved by grafting. In Europe there are over thirty catalogued varieties which may be had of nurserymen. In this country they bring from \$7.00 to \$13.00 per bushel.

CUTTING GRAFTS.—The *Country Gentleman* has an excellent article on grafting the pear, and says where a large amount of grafting is to be performed the grafts should be procured in winter in good season. It is safer and better to cut them before the severity of the winter sets in, as intense cold sometimes injures the shoots. If cut and housed early, they are sure to be fresh and vigorous when used. They may be kept bedded in damp moss, or in slightly moist sawdust, care being taken that the sawdust is not in very large boxes, where it might heat and spoil the grafts. These remarks apply as well to scions of the apple as the pear, and should be heeded by all intending to graft another spring.

AGE OF VINES.—The age to which the vine continues to bear well, ranges ordinarily from 60 to 70 years, often more, and, under favourable circumstances of site and soil, it is long-lived. In the Gironde, when properly attended to, it will last from 100 to 150 years. In the commune of Pauillac, in a gravelly soil, there are vines 200 years old; whilst at Pessac some are shown of a yet greater age, planted, as is there traditionally believed, in the fourteenth century, during the pontificate of Clement V. A vine in Burgundy is creditably recorded to have lived 400 years, and in Italy plants three centuries old continue to flourish productively.—*Denman's Vine and its Fruit*.

FRUIT TREE SEEDS.—Tree seeds that have pulp should be washed at once on gathering, and dried in the shade gradually. Pulpless seeds dried gradually also. Sun-dried seeds are generally worthless, especially those of a dark colour. The sooner seeds can be got in the ground the better. They should not be sown any deeper than is necessary to keep them from the light, nor so near the air as to get dry—moisture, air and darkness are the three essentials for successful raising of tree seeds. Seeds that are usually spring sown, and are found to "damp off," should be sown very early, so that the young wood may get hard before the hot weather comes. The Soft Maple will not keep more than a few weeks good enough to grow. It should be sown as soon as ripe in June. Not sown deep—on the surface, and slightly covered with sand is the best way.—*Gardener's Monthly*.

Poultry Yard.

Pigeons as Farm Stock.

The following article, published in *Our Young Folks*, is worthy of general attention:—"No matter at what time of year a pigeon's crop may be opened, it will be found to contain at least eight times as much of the seeds of weeds as of wheat, or rye, or corn, or other grains. It is also very remarkable that the grains thus taken from the fields are the defective ones. They take only the worthless seeds. For these reasons, these birds should be regarded as the best weeders that a man can employ; for while he merely chops up a weed, often when it is so well grown that it ripens its seeds on the ground where he may have left it, the pigeons come along and make clean work by eating them. The farmer removes merely the weeds, but the pigeons remove the cause of them.

Any one who has kept these birds on his premises must have noticed how fond they are of pecking among the rubbish which is thrown out from a barn floor after threshing wheat or other grains. They will search there for many days together, hunting out the shriveled grains, the poppy seeds and cockle, and other pests of the farm, thus getting many a good meal from seeds that barnyard fowls never condescend to pick up. When the latter get into a garden they scratch and tear up everything, just as though they were scratching for a wager; but a pigeon is better bred by nature—he never scratches, hence he disturbs no seed the gardener may have planted. When he gets into the garden it is either to get a nibble at the pea vines or the beans, as he is extravagantly fond of both, or to search for weeds.

This fondness of the pigeon tribe for seeds of plants injurious to the farm is much better known in Europe than with us. At one time, in certain districts of France, where large numbers of pigeons had been kept, they were nearly all killed off. These districts had been famous for the fine, clean and excellent quality of the wheat raised within them. But very soon after the number of pigeons had been reduced, the land became overgrown with weeds that choked the crops. The straw in consequence grew thin and weak, while the grain was so deficient in plumpness and weight as to render it unfit for seed. Every farmer remarked the difference when they had only a few. The people therefore returned to pigeon keeping. Every landlord, in renting his farm, required his tenants to build a pigeon house or dovecot, in order to ensure crops. Many of these were very expensive structures. It has been further observed in other districts in France that where pigeons are most abundant, there the wheat fields are most productive, and that they never touch seed which has been rolled in lime."

Tested in water, if eggs are good they rest upon the side. If one floats end up, you may be sure of a bad egg.

A strange disease has broken out among the poultry in Ohio. The chicken's comb and gills turn black, it gapes, sneezes, and falls dead in a few minutes.

HENS' Nests made of Sycamore leaves instead of hay or straw, protect fowls from lice, and with white-washing, banish vermin from the building.

PICKLED EGGS.—Boil the eggs until very hard; when cold, shell them, and cut them into halves length ways. Lay them carefully in large mouthed jars, and pour over them scalding vinegar, well seasoned with whole pepper, allspice, a few pieces of ginger, and a few cloves or garlic. When cold, tie up closely, and let them stand a month. They are then fit for use. With cold meat they are a most delicious and delicate pickle.—*Country Gentleman*.

PROFITABLE POULTRY KEEPING.—In a recent letter Mr. Sylvester Lehman, of Schoharie county, sends to the *Rural New Yorker* this report of what he has received the past season from a small flock of poultry.—"Last spring I had 33 hens. They began to lay in March. Through the month of June eight of them set; two of them died in the summer, two I killed, and from the lot up to the 1st of November I received 3,600 eggs, or 500 dozen. All who can figure can judge whether or not it pays to keep hens at that rate. The receipt of eggs each month was as follows: March, 100; April, 716; May, 720; June, 590; July, 420; August, 556; September, 316; October, 152. Breeds, Golden Pheasants and Hamburgs. Feed, buckwheat standing in a box, so that they could eat when they wished."

Canadian Natural History.

Bald or White-headed Eagle.

(Haliaeetus Leucocephalus.)

There are several varieties of the Eagle; but that so artistically delineated in the accompanying illustration is most common in this country. Eagles belong to what is scientifically termed the Falconidae family, the members of which are distinguished by their powerful hooked beaks, great strength, and destructive instincts. Generally speaking they are not cruel birds, for although they deprive many birds and beasts of life, they effect their purpose with a single blow; sweeping down upon the doomed creature with such lightning velocity, and striking it so fiercely with the death-dealing talons, that in most instances the victim must be unconscious even of danger, and be suddenly killed while busily engaged in its ordinary pursuits, without suffering the terrors of anticipation, or even a single pang of bodily pain." The fearfully destructive power of the talons of the Eagle is due to a beautiful and simple arrangement of the muscles of the leg and foot, and the tendons which form the attachment of the muscle to the bone. By this marvellous contrivance of the Creator, the mere bending of the legs, and the weight of the body enables the Eagle to retain a firm, but involuntary hold of its perch, or to drive its talons into the body of its prey, without the exercise of any muscular exertion.

In ancient times the lion was the representative of Kings, but the Eagle soaring in the sky was exalted by Heathen Mythology to be companion of the gods, and the associate of Jupiter him-elf. The noble-looking bird which forms the subject of this notice, has been chosen as the representative emblem of the United States. The name Bald Eagle applied to him, is in reality a misnomer. The head is as thickly feathered as in any of the species; but the feathers are of a snowy white colour. "The remainder of the body is a deep chocolate brown, inclining to black along the back. The tail, and upper tail coverts are of the same white hue as the head and neck. In its earlier stages of existence the creature is of more somber tints, not obtaining the beautiful white head and tail until it is four years of age."

The flight of the White-headed Eagle is imposing, powerful, and majestic. He can ascend, with little apparent motion of his wings until he disappears from mortal view; while his descent is frequently characterized by a terrific velocity. The manner in which the White-headed Eagle hunts for and kills his prey is graphically described by Mr. Audubon in his Ornithological Biography. He says:

"The Eagle is seen perched, in an erect attitude, on the summit of the tallest tree by the margin of the broad stream. His glistening, but stern eye, looks over the vast expanse. He listens attentively to every sound that comes to his quick eye from afar, glancing every now and then on the earth beneath, lest even the light tread of the fawn may pass unheard. His mate is perched on the opposite side, and should all be tranquil and quiet, warns him, by a cry, to continue patient. At this well-known call he partly opens his broad wings, inclines his body a little downwards, and answers to her voice in tones

not unlike the laugh of a maniac. The next moment he resumes his erect attitude, and again all around is silent. Ducks of many species—the teal, the widgeon, the mallard, and others—are seen passing with great rapidity, and following the course of the current, but the Eagle heeds them not; they are at the time beneath his attention. The next moment, however, the wild, trumpet-like sound of a yet-distant, but approaching swan is heard. A shriek from the female Eagle comes across the stream, for she is fully as alert as her mate. The latter suddenly shakes the whole of his body, and, with a few touches of his bill, aided by the action of his cuticular muscles, arranges his plumes in an instant. The snow-white bird is now in sight; her long neck is stretched forward, her eye is on the watch, vigilant as that of her enemy;



her large wings seem with difficulty to support the weight of her body, although they flap incessantly; so irksome do her exertions seem, that her very legs are spread beneath her tail to aid her in her flight. She approaches, however. The Eagle has marked her for his prey. As the swan is passing the dreaded pair, starts from his perch the male bird, in preparation for the chase, with an awful scream, that to the swan's ear brings more terror than the report of the large duck-gun. Now is the moment to witness the display of the Eagle's powers. He glides through the air like a falling star, and, like a flash of lightning, comes upon the timorous quarry, which now, in agony and despair, seeks by various manœuvres to elude the grasp of his cruel talons. It mounts, doubles, and willingly would plunge into the stream, were it not prevented by the Eagle, which, possessed of the knowledge that by such a stratagem the swan might escape him, forces it to remain in the air, by attempting to strike it with his talons from beneath.

The hope of escape is soon given up by the swan. It has already become much weakened, and its strength fails at the sight of the courage and swiftness of its antagonist. Its last gasp is about to escape, when the ferocious eagle strikes with its talons the under-side of its wing, and with unresisted power, forces the bird to fall in a slanting direction upon the nearest shore."

Water fowl of smaller size are also devoured by this bird, while young pigs, lambs, fawns and poultry are equally acceptable to his rapacious appetite. He is also partial to fish, and, although he sometimes wades ungracefully into the water to catch them for himself, he is not above plundering the fish-hawk, when the latter makes a capture. The new American Cyclopædia describes this habit as follows:—

"When the fish-hawk follows the shoals of fish in the rivers, in spring, the representative of American prowess sits watching from the top of a tall tree; as soon as the hawk rises with a fish, and bends his course for the shore to devour it, the Eagle mounts above him, and, by most unmistakable signs, forces him to give up his prey, to save his own life; the Eagle closes his wings, drops down with great quickness, and seizes the fish before it reaches the water; and this marauding and mean career the Eagle pursues till the migrations of the fish cease, and the fish-hawks depart." This description seems to justify the remark of Benjamin Franklin, who, objecting to the use of the White-headed Eagle as the type of the American nation, urged, "he is a bird of bad moral character, and does not get his living honestly."

Wilson, the celebrated ornithologist, states that Niagara Falls was a favourite resort of this bird. Fish, and various animals that had been victims of the fatal cataract, are supposed by this author to have supplied him with an occasional repast. His appearance there has been described in the harmonious numbers of poetry, as follows:

"High o'er the watery uproar, silent seen
Sailing sedate in majesty serene,
Now midst the pillared spray sublimely lost,
And now emerging, down the rapids tossed
Glides the Bald Eagle, gazing calm and slow
O'er all the horrors of the scene below;
Intent alone to mate himself with blood
From the torn victims of the raging flood."

Most modern authorities are agreed as to the cowardice of the eagle. A game cock confined in the same cage with a full grown male, at once attacked the eagle and beat him in the

most approved manner. The females are larger than the males. When they pair, the union generally lasts for life. The period of incubation varies with the climate. In Mississippi it commences in January, but in this country it is somewhat later. The nest is generally built on some lofty pitch pine, and is composed of sticks, four or five feet in length. This nest is used by the same birds year after year. They are very affectionate to their young, and will not forsake them, even if the tree on which they are settled is enveloped in flames.

All the varieties of the eagle are remarkable for their longevity. We saw at the seat of a gentleman in North Wales, a venerable specimen, that we were assured had been kept in confinement for over half a century. At the time of our visit, his eagleship was savagely tearing the vitals out of a cat. The old keeper informed us that all the hapless "tabbies" caught ranging in the woods were secured for the greedy bird.

The Household.

Homedale Farm.

A TALK ABOUT PLANT GROWTH.

THE young Perleys watched most impatiently for signs of coming spring, and were sometimes half tempted to think it would never come at all. In the eagerness of childhood's longings for new scenes and new pleasures, they found the few weeks they had to wait a weary age. When the snow began to melt, it seemed to go away so slowly, that they were quite out of patience with it; and when rain fell, as it did a number of times, they really thought the ground got wetter and wetter, so that they sometimes nearly despaired of ever seeing their new home at all. When they gave vent to their impatience in ill-tempered complaints, their mother would reason with them and tell them that winter could not go away all at once, that rain melted the frost and ice quicker than sunshine, and that if the showers did not come to soften the ground, and start the roots of trees, grass and flowers, there would be no growth. "Very often," said she, "not only children, but older people, murmur about things that are, after all, great blessings. We ought to trust in a kind Providence, and believe that whatever happens is for the best." Thus pacified and instructed, they came at length to welcome a rainy day, and would enjoy themselves in talking about the way things must be growing at the farm. Mr. Perley, overhearing one of these conversations, took the opportunity of asking the young folks a question or two, to set them thinking.

"Are you sure the rain makes things grow?" said he.

"Yes, father," said Charles, "the eldest of the group, 'I know it does.'"

"But," replied his father, "it sometimes rains in winter, and we see no growth come of it."

"Oh, it is too cold then," said Charley.

"It seems, then," continued his father, "that something more than rain is necessary; there must be some warmth as well. But it is possible to have too much wet, and too much heat. If a pond is made in a low spot of ground, the grass, trees, and bushes in the deeper places will die. A house-plant put too near the fire will wither, and suffer very much—perhaps be killed outright. You have been in Mr. Bruce's conservatory, and have seen what an amount of heat the orange-trees and other tropical productions require. If they were treated like the apple-trees and spruces, they would soon die. You have also seen lilies and rushes growing in ponds where grass and trees would not live. All plants need more or less moisture and heat in order that they may grow, but each must be treated according to its nature."

"There is," continued Mr. Perley, "something else almost as necessary to the growth of plants as moisture and warmth. Can you tell what it is?"

Charles could not tell what it was, nor could any of the interested group of young listeners.

"It is light," said Mr. Perley. "Plants make a very weak and sickly growth, if not supplied with light. You have sometimes lifted up a board that has lain upon the ground for some time. How did the grass look that had been underneath the board?"

"Very white," exclaimed two or three voices.

"Just so," replied their father. "In cellars, under buildings, and in the deep shade of a wood, plants are very weak, slender and pale. This is for want of light. If there were no light whatever, they would not grow at all. But in the darkest cellar where you have seen plants growing, there must have been a little light. Sometimes there will be a little crevice in the wall, through which a ray of light will come in, and though it seems to you a very dark place, it is far from being entirely dark. A cat, an owl, or a bat, would see to walk, or fly, or catch mice in it, though there is not enough light for

us to see by. Put a plant in a dark place, into which faint glimmerings of light steal from a far-off aperture, and it will struggle towards the feeble beam, as if to meet and welcome it. Just as all plants must have water, but all do not need the same quantity; and as all must have warmth, but in different degrees; so all plants need light, but all do not need the same amount of light. Some need very little, and will grow in the densest shadows of the forest, others grow best in a rather shady place, while others yet do best in the bright sunshine. I have known a pretty wild-wood flower transplanted to a garden, because it looked so beautiful, but there was too much light for it, and it would not grow at all. There is a very nice piece of poetry about seeking the light, which Mr. Bradbury has set to music, and which, I think, you would like to learn. Shall I read it to you?"

"Oh, please do," exclaimed the entire group.

"Well," said Mr. Perley, "here it is; now listen very attentively to it:"

"I saw a little blade of grass
Just peeping from the soil,
And asked it why it sought to pass
Beyond its present clod?
It seemed to raise its tiny head,
All sparkling, fresh, and bright,—
And, wondering at the question, said,
'I rise to seek the light.'"

"I asked the eagle why his wing
To ceaseless flight was given,
As if he spurned each meaner thing,
And knew no home but heaven?
He answered, as he fixed his gaze,
Undazzled at the sight,
Upon the sun's meridian blaze,
'I rise to seek the light.'"

"I asked my soul, what means this thirst,
For something yet beyond,
What means this eagerness to burst
From every earthly bond?
It answers, and I feel it glow,
With fires more warm, more bright,
'All is too dull, too dark below,
I rise to seek the light.'"

"Children," continued Mr. Perley, "it is one of the advantages of rural life, that its scenes are so full of instructive lessons. A thoughtful mind cannot but be constantly reminded of some important truth shadowed forth by Nature. As the plant struggles after light, so there is that within us which tends upward and Godward. We must not repress this feeling, but rather nourish and encourage it. God's favour is the light of our being. We cannot live without it. To 'walk in the light of His countenance' is to be supremely happy. Our language ought at all times to be—

"Come, for I need thy love,
More than the flower the dew, or grass the rain;
Or plants the cheerful light."

(To be continued.)

French cookery is the science of making inferior food palatable, and making good food go a great way.

A VENERABLE CAT.—On Christmas Eve there died at the residence of Mr. Charles Logie, Lifford, a tortoise-shell cat which had reached the extraordinary age of twenty-seven years and nine months. It was bitten at the Logie homestead, near Lindsay, and there can be no possible mistake about its age. It was undoubtedly the eldest feline inhabitant in this part of the country.—*Lindsay Advocate*.

A GOOD PICKLE FOR HAMS.—Our correspondent who wants "a recipe for pickle for hams," is answered as follows:—To 1 gallon of water take 1½ lbs. of salt, ½ lb. of sugar, ¼ oz. of saltpetre, ½ oz. polish. In this ratio the pickle to be increased to any quantity desired. Let these be boiled together until all the dirt from the sugar rises to the top and is skimmed off. Then throw it into a tub to cool, and when cold pour it over your beef or pork, to remain the usual time, say four or five weeks. The meat must be well covered with pickle, and should not be put down for at least two days after killing, during which time it should be slightly sprinkled with powdered saltpetre, which removes all the surface blood, &c., leaving the meat fresh and clean.—*N. Y. Tribune*.

Entomology.

Remedy for the Onion-Fly.

THE "black onion-fly" has for many years past been very injurious in various parts of the neighbouring States, and we remember having seen it in this country also, though not very recently. In the last number of the *Practical Entomologist*, a simple and apparently efficacious remedy is mentioned, which may be found useful for the destruction of this and other similar insect pests. It is nothing more than the use of boiling water, which, when poured over the plants, destroys the larvæ of the fly, but does not injure the vegetable. The editors remark that "there is authentic proof that the larvæ of the peach-tree borer may be destroyed on the same principle, by hot water, without injuring the tree. Vegetable organisms will often stand, without damage, a degree of heat that would be destructive to animal organisms. For example, every one knows that locust seed grows all the better for being scalded; whereas we are satisfied, from long experience, that there is no insect that can survive immersion for a few minutes in water that is too hot to hold one's finger in it for a second or two." In the *New York Tribune*, there was published, some years ago, a letter from Dr. O. W. Drew, of Waterbury, Vt., in which he stated that for many years the onion crop had been entirely destroyed in central Vermont, by the onion maggot; that many experiments had been tried with lime, salt, ashes, and plaster, without benefit; and that he himself, finding his own plants infested in the usual manner, had, when they were about four inches high, poured a full stream of boiling water from a large tea-kettle directly upon each row, and repeated the application. The result, as he adds, "was that the plants looked as bright and trim as after a May shower; that he lost no more of them; and that for the first time in ten year's experience, he had as fine a crop of onions as was ever seen."

A New American Silk-worm.

AFTER numerous experiments, Mr. L. Trouvelot, of Medford, Mass., U. S., has succeeded in rearing successfully, and in great numbers, *Attacus Polyphemus*, Linn., and in preparing from its cocoons an excellent quality of silk, possessing great lustre and strength, and pronounced superior to Japanese and all other silks, except the best Chinese, by competent judges. The silk is unwound by a simple process, perfected by Mr. Trouvelot, each cocoon yielding about 1500 yards. This insect is very hardy, being found throughout the Northern States and Canada; and, as it feeds upon the leaves of oak, maple, willow, and other common forest trees, may be reared easily in any part of the country. Mr. T. has gradually increased his stock from year to year, by raising young from the eggs of the few individuals first captured, until he has at present seven waggon-loads of cocoons, the entire progeny of which he proposes to raise during the coming season.

The thanks of the community are due to the ingenious and persevering author of this successful attempt to introduce a new and interesting field for industry and enterprise, which cannot fail to be a source of profit to those who intelligently engage in it, and of increased wealth and prosperity to the people, should it be developed to the extent that now seems possible.—*Silliman's Journal*.

NOTE BY ED. C. F.—The above mentioned insect is very common in Canada, and has been successfully bred in captivity by a member of the Entomological Society. Its silk-producing capabilities have been often discussed, but the difficulty has hitherto been how to unwind the cocoons, the silk being closely cemented together by some glutinous substance. This difficulty appears to be now removed, and we trust that the manufacture will ere long be introduced into this country. Any one who desires to try the experiment of raising this insect, can easily obtain cocoons during the winter while the trees are destitute of leaves; they are usually fastened to twigs or branches of low shrubs and bushes, in the neighbourhood of the trees on which the larvæ feed.

Miscellaneous.

Agricultural Regions.

(BY J. M. DECOURTENAY.)

AGRICULTURAL regions upon the surface of the globe are governed by certain laws. Some, inherent to the nature of the soil and climate, are *invariable*. Others, on the contrary, depend upon the progress of civilization, the distribution of population, and other *variable* causes.

They may all be classed within four limits:—

- 1st. Meteorological.
- 2nd. Economical.
- 3rd. Statistical.
- 4th. Agricultural.

METEOROLOGICAL.

The Meteorological limit may be established,—

- 1st. By the temperature of the atmosphere and the soil, under the influence of solar heat, during the season of vegetation of each plant.
- 2nd. By the Hygrometric state of the atmosphere, the frequency and direction of the winds, and the moisture of the earth during each season.
- 3rd. The temperature of the atmosphere and soil during the winter.

Arthur Young was the first who endeavoured to determine, in a precise manner, the limits of agricultural climates.

In his voyage through France, he established for that country four distinct agricultural regions. The first region was the north, or cereal region, where neither the vine nor Indian corn could be cultivated. In the west one, towards the south, wine was produced, but Indian corn could not ripen its grain. The third division was composed of both vine and Indian corn. The fourth was that of the olive. The Count de Gasparies admitted that this attempt of Arthur Young's had not been surpassed. Founded upon the observation of facts, it was generally true, although sheltered places, altitudes, and many other circumstances transformed his straight lines into very sinuous ones. The limits imposed upon all cultures must materially affect, in a remarkable manner, the important and highly valuable ones I am endeavouring to bring before public attention. Before entering upon the *variable* limits mentioned at the commencement of this chapter, I must prove that we are *far within* the circle of the most important of all limits; because the natural and invariable one—that which has been ordained by our Creator.

In order to explain such limits with any degree of lucidity, I must compare two *distinct* climates,—the one *decidedly within*, the other *absolutely without* the limits in question. I shall therefore establish the comparison between Paris and Brussels. In the first of these situations, vine-growing has been successful. In the last it has never been able to succeed.

PARIS.

Atmospheric heat during the season of vegetation	1325.67
Solar heat	751.00
Total heat.....	2076.67

This appears the *lowest* degree of heat required for the production of wine,—the season of vegetation for the vine commencing when the temperature rises to an average of 12° centigrade, terminating when it returns below that degree.

At Brussels the thermometer descends below 12° centigrade (as in Paris) by the 1st of October, and it possesses up to that period.

BRUSSELS.

Atmospheric heat.....	1914.02
Solar heat.....	619.00
Total heat.....	2533.02

Thus a simple difference of 144 degrees of heat, separates the region where the production of wine is

possible from that where it is not. Ten days more heat added to the climate of Brussels, and the Vine would ripen its fruit. The Count de Gasparies says: Ten days more heat added to the climate of the South of France; and cotton could there be successfully cultivated, and thus may everywhere be distinguished the limits of agricultural climates.

I formerly published meteorological observations made at the observatory in Quebec by Lieut. Ashe, R. N., F. R. S., and kindly furnished to me by that gentleman, who authorised me to state that the atmospheric heat at the citadel was *some hundred degrees* beneath the ordinary temperature of the climate.

QUEBEC OBSERVATORY.

Atmospheric heat during the season of vegetation of 1861.....	3079.3
Solar heat.....	1026.4
Total heat.....	4105.7
And for the year 1862.	
Atmospheric heat.....	3294.3
Solar heat.....	1098.1
Total.....	4392.4

I desire to explain for the benefit of those who may not be conversant with calculations of Agricultural Meteorology, the meaning of

SOLAR HEAT,

Which differs essentially from the Atmospheric heat daily represented by a given thermometrical figure giving the heat of the air,—a transparent body that only absorbs about a fourth of the solar rays in their passage through it, and which arrives afterwards on the earth, and upon plants, who absorb in their turn a much greater portion. Solar heat, therefore, is a question of immense importance as an element exercising considerable influence upon all vegetation, and very materially upon the classification of agricultural climates, according to its power of action, either from the absence or abundance of opaque vapours interposing themselves between the sun and the earth, or from the inclination and exposition of the soil, or from any other shelter that may reflect, or intercept the solar rays.

In calculating the temperature of a country, we must not forget that the slopes of hills of a Southern aspect transport such situations to a more meridional latitude. The heat of the sun is in proportion to the number of its rays that strike a *plane*, and proportionally to the *sines* of its angle of incidence. Before arriving at the earth, the solar rays traverse the atmosphere, and a part (about a fourth) of the colorific are absorbed by the air, and by the vapours that enter into its composition. It is according to the density of those vapours that the calorific rays penetrate to the surface of the earth, and their density, quantity, and state of dissolution, renders them an element most variable according to the period of the year, or of the day, and indeed dependant upon numerous causes scarcely appreciable.

The air becomes less saturated as the temperature of the day increases, and *vice versa*, which will enable us to calculate the extinction of light or heat produced by a relative humidity of atmosphere. From the zenith, each degree that removes the sun from the vertical position, augments the angle of inclination, and consequently diminishes its colorific power. Its angles, with an inclined plane, will be the same as those it would make with a country whose horizon would be parallel to the same plane. Suppose the ground inclined to the south, its plane would be parallel to the horizon of a more meridional latitude to the west, with an occidental longitude.

In the intermediate positions, a south-east inclination, for example, it will change both its latitude and longitude. Thus the effect of each inclination will be: If north or south, to transport the position to another climate. If east or west, to change the hours of the day when the heat will be the greatest. A slope exposed to the south, with an inclination of 25 degrees, and in latitude 45 at the "Solstice," will obtain its rays at right angles, the solar heat being therefore 27° .72, and atmospheric 27.8, will produce a heat of 55-6 degrees (centigrade.)

As the effect is often altogether local, scientific men had long neglected its application; but they have now perceived the enormous influence it exercises upon the march of vegetation. Monsieur de Humboldt never ceases to recall the necessity of studying its effects, in order to be enabled to judge with any accuracy upon the comparative maturity of plants, although he had at one time attempted to furnish a classification by the following

MAXIMUM TEMPERATURE.

Cacao.....	29° cent.	to 23
Indigo.....	28	" " 22
Banana.....	28	" " 18
Sugar cane.....	28	" " 22
Coffee.....	27	" " 18
Cotton.....	28	" " 20
Dates.....	23	" " 21
Citrons.....	17	minimum 7° 5
Chesnut.....	19	" " 9
Vine.....	27	to 20
Wh:at.....	25	to 15
Barley.....	11	to 8 or 9

No one has more felt than Monsieur de Humboldt himself, how insufficient a proof can be offered by a maximum of temperature. The climates of France have been classed so accurately, that their vines have also been classed in seven divisions, according to the heat required for the maturity of each.

Division.....	DEGREES.
" 1. Total heat.....	2264
" 2. "	3400
" 3. "	3565
" 4. "	4133
" 5. "	4238
" 6. "	4392
" 7. "	5000

"The first division are eating grapes alone, and unfit for the manufacture of wine."—*De Gasparies* vol. 4th, page 606.

On some future occasion I will give a list of French vines, and their classification into each of the above divisions; and it will be found in theory (as I proved it correct in practice) that the best Burgundy vines can flourish in the climate of Quebec.

Now the season of vegetation in Burgundy, Mons. De Gasparies informs us, varies from 168 to 174 days, with an exceptional year of 162. Whilst our season of vegetation (calculated as in France when the temperature rises to 12 centigrade, and falls below that degree) varies from 135 days to 150 days, our amount of heat during that season is *far superior* to that of Burgundy with its 174 days, notwithstanding that our contrasts between the temperature of day and night are much greater. And these very variations of temperature demonstrate our purity of atmosphere as the former is produced by radiation of heat, which is the consequence of the latter.

If the best authorities in Europe are correct in asserting, "That the best wine is made where the greatest heat is concentrated into the shortest season of vegetation, and where there exists the greatest contrasts of temperature," I must be correct in my estimation of our climate, based not only upon the testimony of such undoubted authority, but also upon my own most successful practical experience in both provinces, and upon the fact that I have produced a good sound wine in both sections of the Province.

Moreover, M. de Gasparies, vol. 2nd, page 354, states a simple rule without an exception:—"The climate of the vine is characterised by the possibility of attaining a total heat (solar and atmospheric) of 2680 degrees centigrade."

To those who may suppose that the severity of our winters can effect our position as the best climate upon this continent for "the agricultural region of the vine," I can only say, let them visit Clair House vineyards during the winter, and examine if a single plant is protected from the inclemency of the season, or if any suffer from such exposure.

In the following chapter I shall endeavour to explain the remaining limits of agricultural climates.

The Ohio Farmer says that a coating of three parts lard and one part resin, applied to farm tools of iron or steel, will effectually prevent rust.

Signs of Rain.—When the odour of flowers, is unusually perceptive, rain may be expected, as the air when damp conveys the odour more effectively than when dry. Damp air being also a better conductor of sound than dry, the sound of mills, railway trains, distant bells, &c., may be heard plainly just before rain.

FARMING TOOLS.—There is a plough out in the snow, and the horse-rake is up in the middle of the field. Neglect left them there when he went off fishing instead of finishing his work. Neglect will always be a shiftless, thriftless fellow. Bring them in and see if they want repairing. Yes, a tooth is gone, and a handle of the plough is split. Well, look about, examine all the tools, and place those that want repairing in the shop. The first stormy days day that comes they must be repaired, and so of all other tools that need mending; devote the stormy to them till all are in order and ready for use. Every farmer should have such tools as are necessary to do the ordinary repairs of his farming tools. If he has not got such, let him get them forthwith. It will be money in his pocket.—*Mirror and Farmer.*

Markets.

Toronto Markets.

"CANADA FARMER" Office, Jan. 15, 1866.

The weather during the past two weeks has been very cold, the temperature continuing for several days a few degrees below zero. It is too early in the year to record any very marked fluctuations in the markets. Uninterrupted dullness still characterizes all departments of trade, and until the advent of sleighing it is not expected that any great improvement will take place.

The produce market during the past fortnight has been almost deserted, as is usual at this season. Transactions were almost wholly confined to small lots to supply the immediate wants of consumption. Dressed Hogs continue to form the principal article in our market.

Flour—The feeling is not quite so good. Market rather duller; receipts very light. No. 1 \$5.15 to \$5.25, Extra, \$6.00 to \$6.25, Double Extra, \$6.50 to \$7.00.

Fall Wheat dull at \$1.15 to \$1.25.

Spring Wheat—Sales at \$1.00 to \$1.05.

Barley—prices ranged from 60 to 60c.

Peas quiet, at 58c to 61c.

Oats quiet, at 30c to 31c.

Rye 50c.

Provisions—Butter from 14 1/2c to 17c for keg; choice dairy, 15c to 20c.

Cheese—American prime, 14c to 15c.

Eggs—selling at from 18c to 19c for packed.

Hogs—selling at \$7.00 to \$7.35 per cwt.; pork quiet prices nominal; mess, \$20 to \$23 per barrel; prime do., \$19 to \$21.

Lard—from \$7.50 to \$10.00 per ton.

Straw—\$2 to \$7.50.

Live Stock.—The market is moderately active and prices are firm. The figures here given are offered by the butchers and drovers in this market per 100 lbs., dressed weights.—Cattle, 1st Class, \$6.50; do. 2nd class, \$6; do. inferior, \$5 to \$5.50. Calves, \$5 to \$6. Sheep, prime heavy, each, \$5 to \$6; do. light, each, \$4 to \$4.50. Lambs, each, \$2.50 to \$3.

Butter—Apples, farmers' packed, \$1.75 to \$2.00.

Hamilton Markets.—Jan. 12.—Spring Wheat, \$1 to \$1.10; white wheat, \$1.15 to \$1.25; red do., \$1 to \$1.15. Peas, 50c to 55c. Barley, 60c to 65c. Oats, 31c. Flour, XXX, \$7.30, extra, \$8; superfine, \$5.50. Corn meal, per 100 lbs., \$1.75 to \$2. Oatmeal, do., \$2.75. Buckwheat Flour, do., \$3.50. Beef, do., \$1.75 to \$2. Mutton, do., \$4 to \$6. Lamb, do., \$1.50 to \$2. Pork, do., \$7.50 to \$7, live at factory, medium weights, \$5, hams, 16c to 18c, shoulders, 12 1/2c, bacon, 14c to 16c. Potatoes, per bushel, 15c. Butter, per lb., 18c to 20c, do. in brins, 15c to 16c. Eggs, per doz., 25c to 27c. Lard, per lb., 15c to 16c. Hay, per ton, \$9 to \$10. Straw, per ton, \$7 to \$8. Tallow, rough, per lb., 7 1/2c; do. rendered, per lb., 10c. Hides, green, per 100 lbs., \$5.50 to \$5.75; do. dry, \$9 to \$10. Sheepskins, \$1.50 each.—Specialist.

London Markets, Jan. 12.—Fall Wheat—superior, \$1.20 to \$1.40. Spring Wheat \$1.05 to \$1.09. Barley, 50c to 55c. Oats, 25c to 27c. Peas, 60c to 65c. Corn, 50c to 55c. Hay, per ton, \$7 to \$8. Oat Straw, per load, \$2 to \$4. Beef, per cwt., \$5 to \$7. Butter, fresh, 20c to 25c; kog, 18c. Potatoes, 35c to 40c. Flour, per 100 lbs., \$3 to \$3.50. Eggs, 25c. Hides, per lb., 10c; green, 5c to 5 1/2c. Sheepskins, fresh off, \$1.25 to \$1.50. Calveskins, per lb., dry, 14c to 16c; green, 8c to 9c. Dressed hogs, per 100 lbs., \$7 to \$7.25.

Galt Markets, Jan. 12.—Flour, per 100 lbs., \$2.50 to \$3.25. Fall Wheat, per bushel, \$1.15 to \$1.20. Spring Wheat, per bushel, 95c to \$1.12 1/2. Barley, per bushel, 60c to 62 1/2c. Oats, per bushel, 25c to 30c. Butter, per lb., 15c to 17c. Eggs, per dozen, 14c to 16c. Straw, per load, \$2 to \$2.50. Peas, 60c to 62c. Beef, per 100 lbs., \$5 to \$6. Pork, per 100 lbs., \$8 to \$7. Hides, per 100 lbs., \$5 to \$5.50. Calveskin, over 8 lbs., 8c. Lambskins, \$1 to \$1.25. Potatoes, 31 1/2c to 40c. Hay, \$8 to \$10. Apples, 37 1/2c to 75c.

Guelph Markets, Jan. 12.—Fall Wheat, per bushel, \$1.12 to \$1.36. Spring Wheat, 95c to \$1.05. Flour, per 100 lbs., \$3 to \$3.50. Oats, 28c to 25c. Barley, 50c to 60c. Peas, 50c to 55c. Potatoes, 45c to 55c. Onions, 73c to \$1. Butter, per lb., 14c to 17c. Eggs, 15c to 16c. Cordwood, \$2 to \$2.50. Hay, per ton, \$8 to \$9. Straw, per load, \$2.50 to \$3.

Montreal Markets, Jan. 11.—Grain per bushel—Wheat, U. C. Spring, per 60 lbs., \$1.16 to \$1.20; Peas, per bush, 70c to 72 1/2c. Mazze—mixed per 50 lbs., 67c to 65c. Barley, per 48 lbs., 65c. Oats per 32 lbs., 30c to 32c. Flour, do.—Superior Extra, per 100 lbs., \$7 to \$7.25, Extra Superior, do., \$6.25 to \$6.75, Family Superior, nominal, do. \$5.75 to \$6, City Brands of Superior, do., \$5.40 to \$5.50; Superfine from Canada Wheat, do., \$5.40 to \$5.75, Superfine from Western Wheat, \$5.40 to \$5.50, Rye Flour, do., \$5.75. Corn Meal, do., \$3.25 to \$3.50. Oatmeal, per 200 lbs., \$4.00 to \$5.10. Seed—Flax Seeds, per 50 lbs., \$1.50 to \$1.60. Hutter, in kegs—Choice Dairy, per lb., 19c to 20c. Cheese—Factory made, per lb., 15c; Dairy do., 12 1/2c. Beef, per 200 lb., nominal \$14; Prime, do., \$10. Pork, in barrels—Mess, per 200 lbs., \$25 to \$25; Prime Mess, do., nominal, \$17 to \$17.60.

New York Markets, Jan. 11.—Flour—Receipts 7,453 barrels; market opened dull and without decided change, and closed dull and nominally lower; sales 6,000 barrels, at \$7 to \$7.45 for superfine State; \$7.75 to \$8 for extra State; \$9.05 to \$9.30 for choice do.; \$7 to \$7.45 for superfine Western. Canadian flour quiet and heavy; sales 230 barrels, at \$8.05 to \$9.35 for common, \$8.45 to \$11.25 for good to choice extra. Wheat—Receipts 1,467 bushels, market is dull, and spring 2c to 3c lower; sales 6,600 bushels; prime No. 1 Milwaukee at \$1.80. Rye quiet. Barley dull. Oats dull; 60c to \$2 for State; 46c to 50c for unsound Western; 61c to 62c for sound. Pork firmer; sales 7,600 barrels, at \$29.37 to \$29.50 for new mess, closing at \$29. regular. Beef quiet.

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1866.

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OF

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