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THE CANADA FARMER

VOL. IV. No. 8.

TORONTO, CANADA, AUGUST 15, 1872.

NEW SERIES.

The Field.

Beet-Root Sugar.

If appearances are not deceptive, the production of beet sugar seems destined to be one of the important industries of the future both in America and in Britain. In the former country Professor Goessman, and in the latter Mr. Crookes have recently endeavoured to show that it is quite possible to grow sugar-beets with profit, and the evidence, though still scanty, seems amply to bear out this assertion. During the year 1867 beet-root sugar to the value of one million six hundred thousand pounds sterling was imported into Britain, and there seems to be no reason why this large demand should not have been supplied from home sources. It is by no means requisite for the successful prosecution of this branch of agriculture to grow monster roots. On the contrary, the weight of each root should not be more than two pounds, because the larger roots are watery and poor in sugar; nor should the roots fall short of one and a quarter pounds in weight, as the smaller examples are frequently woody. The juice should have a specific gravity of from 1.060 to 1.070; though sometimes, when very rich in sugar, it rises to as much as 1.078. The percentage of sugar in the roots varies considerably, the minimum quantity being 3.62, whilst the maximum is 13.47. The next number below this maximum is 13.19, and is of interest as representing the amount of sugar found in red beet manured with London sewage. Peligot obtained as much as 18 per cent. from some French beets, and some American specimens have produced nearly the same percentage—an amount, therefore, considerably ahead of the best English samples. In Ireland

from sixteen to forty tons of roots may be grown to the acre, so that very satisfactory results might be anticipated in that country. On the experimental farm of the Massachusetts Agricultural College, on the other hand, the amount of roots raised per acre fell short of twelve tons; but there were special disadvantages and difficulties to be allowed for in this case. Calculating from the average yield of a five-hundred acre farm, it is estimated that the producer should possess machinery capable of working up one hundred and fifty thousand pounds of beet-root every twenty-four hours for five months. Such a factory would require nearly two thousand cubic feet of water per hour, and the first outlay for its establishment is calculated at something over fifty thousand dollars. The profits are calculated at nearly twenty-five per cent on the outlay, when six and a-half per cent of sugar is obtained, each half per cent of sugar increasing the profit seven and a-half per cent—so that if eight per cent of sugar could be obtained the profit upon the original outlay would not be less than forty eight per cent. By the concreting process of Mr. Fryer, as applied to the raw juice, the refinery can now be carried on during the whole year, instead of only during crop-time; and the spent beet-root pulp, left after the extraction of the sugar, would appear to be a valuable food for stock. Indeed, so far as chemical analysis goes, this pulp, when mixed with other materials, should prove a more useful food for cattle than ordinary mangolds; but this point can only be properly established by a series of properly conducted comparative experiments on feeding. As regards the United States, it has been argued that the cultivation of beet sugar can never prosper, since the difference in the price of American and European la-

bour renders hopeless all competition with foreign producers. This argument is vigorously met by Prof. Goessman, who remarks as follows:—

“Although duly recognizing the great weight of this point, for with the farmer rests the success of the enterprise in the end, I believe that its influence as an obstacle is frequently overrated and based upon somewhat obsolete assumptions. The government tax of from \$40 to \$50 per acre of sugar beets in Germany and France, as well as our higher prices of sugar, will go far towards covering our most expensive labour. The interests of the Louisiana sugar planters and the sugar beet cultivators of more northern sections of the country are the same, as far as a proper protection of their industry is concerned; and the public opinion, in view of the requirements of the government, is apparently prepared to accord to them, for some time at least, this advantage. Great improvements in agricultural implements and in modes of securing the juice have reduced labour by hand to a considerable extent. A short enumeration of the most conspicuous instances may place this statement in its proper light. Various seeding machines, improvements more or less on Garrett's famous seed drill, are used in planting the seed, in four or more rows at once, and at any desired distances from twelve to twenty inches apart. According to the size of the machine, one or two men, with one or two horses or oxen, may seed from eight to sixteen acres per day; the same implement can also be modified by replacing the seed boxes with suitable knives to be used as cultivators, to clean the space between the rows of plants, and to cover the roots. Ploughs with two knives are used to break up the soil on both sides of the rows of beets, to loosen the latter in such a manner, without lacerating them, that children may do the harvesting of the roots. In fact, the whole work in the field, after the soil is once properly broken up, calls for no extraordinary labour. A good deal of the work can be done by boys. Machines do the washing, the grinding or cutting, and general handling

of the roots to the centrifugal apparatus. The task of handling the pulp of beet roots for the press requires, comparatively speaking, a large supply of hands to do the business connected with that process, but Robert's diffusion method dispenses with a large number of the hands formerly required in the press room—nearly one half."

Beet Sugar Supplement.

COST AND EXPENSES OF LABOUR, AND GENERAL ESTIMATES OF ONE OF THE GREAT BEET SUGAR FACTORIES OF EUROPE.—This is copied from Crocky's work on Beet Sugar, which is the best and most reliable work yet published in English. The reader will see that the allowances for Wages and Salaries are most liberal.

The Factories work day and night, and the wages are reckoned at four shillings sterling per shift of 12 hours, which for the old country is very high. The amount of Beet roots worked up in this Factory is twenty thousand tons in a season. The following is Mr Crocky's language and figures:—"With perhaps the exception of two or three men, no skilled labourers are required in New Beet sugar works, as most of the operations are of a simple Mechanical nature, easily taught to inexperienced country hands, by a competent superintendant and his overseers.

The only skilled hands really needed are, an Engineer, an hydraulic pump man, a defecator, a sugar boiler, and a bone black burner. Of these the defecator and sugar boiler should have already had some experience in a Beet Root Sugar Factory."

We have added as a separate item, the necessary additions to be made for the extra salaries to be paid to specialists in the various departments.

The calculation is based on a campaign of 100 working days.

WASHING AND PULPING,
Transportation and washing of the Beets, 14 men 2 shifts per 24 hours, sterling 2800 days labour at 4s.....£560 0 0

PRESS DEPARTMENT,
28 men 2 shifts per 24 hours=5600 days at 4s.....£1120 0 0
Sack washing and darning, 8 women 2 shifts, 1600 days at 4s..... 320 0 0

DEFECATION.
8 men per 24 hours—equal to 800 days labour at 4s..... 160 0 0

SCUMS.
6 Men for 24 hours, 600 days at 4s..£140 0 0

CARBONATATION.
250 days at 4s..... 50 0 0
Monte jus, (that is steam pump men) 40 0 0
Preparation of Carbonic Acid, (i. e. from the Charcoal),..... 40 0 0

FILTRATION.
3 Men every 24 hours, at 4s..... 60 0 0

CONCENTRATION.
2 Men every 24 hours, at 4s..... 80 0 0

BOILING.	
2 Men every 24 hours.....	80 0 0
CRYSTALLIZATION AND CENTRIFUGALS.	
1500 days' labour.....	300 0 0
GENERATION OF STEAM.	
2 shifts of 3 men, 600 days, at 4s...	120 0 0
BREAKING AND PACKING.	
5 men at 4s.....	100 0 0
MEN IN THE YARDS, ETC.	
5 Men at 4s.....	100 0 0
MANAGEMENT.	
1 General Superintendent and two overseers.....	300 0 0
Book-keeper and Clerk.....	320 0 0
EXTRAS.	
Carpenter, Plumber, Smith, 3 men..	300 0 0
Extra pay to skilled labourers.....	500 0 0
General total cost of labour for one year's Campaign.....£5190 0 0	
The quantity of coal consumed in such an establishment as we have described, would average 600 tons, which, at 15s. per ton, would cost.....	450 0 0
The bone black, 30,000 lbs., would cost for the first outlay 2½d. per lb., £312 0s. 0d., but in succeeding years would only amount to replacing the waste.	
The lime used would amount to 4,500 bushels, and cost £280 0s. 0d.	
The cost of 15,000,000 lbs. of Beet root to be worked up into Sugar would at 12s. per ton be.....	£1,500 0 0
ANNUAL EXPENSES.	
Summing up the above we calculate that the yearly expenses will amount to:	
Labour.....	£5,190 0 0
Coal.....	450 0 0
Boneblack Waste.....	100 0 0
Lime.....	280 0 0
Purchase of beet roots.....	1,500 0 0
Add 20 per cent. for incidentals.....	2,100 0 0
We have a total of.....	£12,620 0 0
To which has to be added Taxes and Insurance, which we have computed at.....	400 0 0
Interest on capital invested.....	960 0 0
Making a Grand Total of.....	£13,980 0 0
The total cost of erecting the works for the above factory, is given at.....	£13,157 0 0
This factory is fitted for the manufacture of Sugar from Beet roots, for the produce grown on 500 acres of ground, which ought to produce at least 1,200,000. One million two-hundred thousand pounds of raw Sugar.	
REALIZATION.	
The products to be realized in our example of a Sugar Manufactory would be as follows : Sugar from 15,000,000 lbs. of Beets at 8 per cent of Sugar,—the Sugar being sold at 24s. per cwt. (of 112 lbs.).....	£14,400 0 0
2,700,000 lbs. pulp calculated at ¾d. per lb.....	5,620 0 0

5,000 gallons of molasses at 40°	
Baamo at 1s. per gallon.....	250 0 0
Residue as fertilizers.....	200 0 0
	£20,470 0 0

Deducting annual expenses and interest as above.....13,980 0 0
Leaves a net annual profit of.....£6,490 0 0
There is every reason to believe that with careful management the quantity of sugar will range as high as 10 per cent, instead of 8 per cent, which we have taken as our basis.

In such a case the net income would be £24,470.00; and the net annual profit £10,090.00.

Other authors make their calculations on an entirely different basis,—and arrive at results equally favourable, though differing somewhat in detail.

That the above is not too sanguine a view to take of the probable yield is shown by the fact that during the season of 1868, 1869 in the Zollverein, 2,500,000 tons of beet root produced 207,500 tons of sugar, a return of 8.40 per cent.

The foregoing quotations speak no doubt of land in the highest state of fertility, and which has been manured for years in the most scientific manner, and also, there is no doubt, of land which has been specially selected for the purpose, and which by repeated crops of Beet root very well manured with the refuse, and the results of the cattle fattened; has been brought into the most favourable state possible for the crop.

One of the most remarkable features of the growth of the sugar beet industry is, the constantly increasing crop and yield per acre which the proper culture of that crop produces, not only in the amount of roots grown per acre, and their richness in sugar, but also in the constant increase of other crops particularly wheat throughout the district.

Exhausted Land.

Horace Greely says in one of his recent agricultural articles.—"That a healthy animal cannot be raised on land exhausted of its phosphorus,"—and he explains what he means by this,—"land that had been used to produce animals, and therefore bones, for many years, without having any bone returned to the soil." This is certainly the gist of his remarks. He also says—"Whenever a steer or heifer can occasionally be caught gnawing or mumbering an old bone, then phosphates are indispensable, no matter at what cost. Better pay \$100 per ton for a dressing of 100 lbs. of bone, than try to do without." Does he imply by this, that the steer or heifer cannot find bones for itself, out of the natural grasses on which it feeds, but must eat the bones themselves, and get it wholesale, exactly on the principle seen practiced of a hen, eating old mortar to make egg shells. There can be no doubt whatever this is his meaning, and if this is "what he knows of farming," and all he knows on this particular point, it certainly is hardly worth recording; and liable to mislead thousands of us, unlearned people, who may be tempt-

ed to cease to look elsewhere for their remedy, than to carry out these absurd abstract principles,—for such this is—and such it can be shown to be. In England, there are Downs that have never had any phosphates returned to them, but have been pastured, probably, for 500, or 1000 years. No timber ever grew on them within any decided record, and hence it may be safely assumed, that they have been devoted to pasture ever since grass first grew on them; and no manure of any kind other than the natural droppings of the animals pastured thereon has ever been applied,—and as a rule, all dead animals, accidentally or otherwise killed, have quickly been removed, and yet these downs and mountainous lands, are the very best and healthiest for sheep pasture in the world, and annually raise an enormous amount of bones, and meat. “Nitrogen and the Phosphates,” the very things that Horace Greely states steer and heifer are, or may be so hungry for, from their absence in the soil, as to be tempted to eat old bones to supply. We know very well cattle bred up round a household, and used to eat house refuse, will eat the slops of the house, and in some cases meat bones and all. We had several that would do so. And hundreds besides, when bred in a similar manner, will eat any thing about a house, even soft soap stock, as many a housewife can testify to her cost.

The American Prairies are another excellent exemplification of the fact; but the illustration is not so decided or capable of being brought home, of cattle raised from grass for generations, as the Buffaloes may have died all over them; one here and one there, until, as “all flesh is grass,” each patch may have had a Buffalo to manure it with, but this source cannot in the mind of any practical man be believed, to be the cause of the power of these immense plains being still able to produce “bone and meat,” especially as it is well known that the great masses of Buffalo do not die here and there, giving each spot a Buffalo to manure it with,—but generally in great droves, from fire, disease, or slaughter,—and we must not believe that because the supply of bone from this cause has ceased, in many localities,—for probably some hundreds of years the supply of grass is any less than it was, or its power to raise stock any less than before the Buffaloes were driven westward. The fact and principle are both wrong in practice in these cases, or if not wrong as applied to our case, are not necessarily the *only* right ones.

A farmer in England, having Downs on his farm on which to recuperate the health of his flock, would laugh at the idea of a lamb not being able to be raised on such grass.—It is here he would use more forcing food than can be had in the winter to get lambs forward so as to be sold at high prices. When from circumstances he has caused intercourse between the sexes to have their lambs born when no other food in such abundance can

be had, but that does not for one moment prove the “position,” principle “or practice” that Horace Greely sets forth to be true. If we want lambs to have food in February, we must grow turnips to feed them and their mothers with, and if we want heavy crops of turnips we must use bones in some form, in many cases, to produce them to the best advantage. But that only proves a means of raising early fine lamb, not by any means that our pastures unmanured by bone, for many generations, would not raise, mutton—in meat, bones and tallow, which every one knows it will do, but not at the season when lambs are high in price. If we were content to wait until September, for our lambs, and have them dropped about the 1st of May, and if the mother never had eaten but down pasture we should have as fine lamb in September (provided there was abundance of down food for the mother)—as if raised in the unnatural manner as to season and food the lambs are at present.

This point and principle are most important, far more so, than any one would at first glance believe. It involves the great fact of nature’s recuperative or non-recuperative forces—and her having the great remedy for our want of crops in Canada, and in fact our very existence as an agricultural community. I say, and always have said, and will maintain, and prove, that, foreign and imported manure, laid down at a cost of, as Greely says, \$90 a ton, may make a return; but I never hear of any farmer here using bone continuously even at half the price, or superphosphate, at about half the price, that is, to any extent,—and if it paid to do so farmers would soon use it. If it pays to a *certainty* to use 500 lbs. on two acres of wheat, say twenty per cent profit, no mercantile speculation will pay better; but we know it does not *pay to a certainty*, or even so much so as to tempt farmers to use one ton of either bones or superphosphate each year, or say even seven acres on their farms,—some few do use it, but more as an experiment than as a *certain* means of making twenty per cent profit, *due alone* and altogether to the use of such manures—and this is not an unreasonable profit to make, considering it only occurs once a year. Farmers ought to make as much, and as much is constantly made, and often much more, in England, by growing turnips where turnips would not grow without, and growing lambs, on the turnips, at a season when lambs could not otherwise be had, and when the price causes such a good return.

But in Canada, we cannot grow, and feed turnips on the land, as in England, nor can we therefore make such a profit,—and it follows that we cannot therefore use such a remedy. All the preaching in the world will not make farming *pay* by the use of artificial manures. When wheat is 90 cents or \$1 a bushel and the crops when grown endangered by the destructive effects of the midge. Here is the beginning and the end of it all—

“dear labor,” “cheap produce,” and danger from destruction from insects, will, I fear, cause scientific farming to be at a discount during our generation, notwithstanding all that can be said by the “savans” of the day. But one great remedy is gradually and surely working in our favor, namely, the gradual learning of the value of gold, as the *current medium of the commerce of the world*—and the consequent increased price in the aggregate of years—of the price of wheat and other produce. Meantime, we must look to our own resources for a remedy, we must each, and individually, try, by enterprise, and industry to amend our farms, by such fertilizers as are within our reach, and we must not sit idly down, and gradually cease to thrive, because expensive remedies are not within our reach. And above all things, must *not* believe that nature is of itself non-recuperative and naturally barren; but that with reasonable fair play, and some assistance, our farms can be kept from serious depreciation—if not enriched by means within our own reach.

C.

Food for Plants.

An excellent lecture on this subject has recently been given by Professor Odling, as one of the series of “Science lectures for the People,” which have been delivered in Hulme Town-hall, Manchester. After pointing out that the dry organic matter of a growing plant contains on an average about forty-five parts in one hundred, or rather less than half its weight, of charcoal or carbon, the lecturer drew attention to the fact that “on an acre of meadow land, or arable land, or woodland, there are produced in the course of a single season several thousand pounds weight of vegetable produce, containing not unfrequently as much as two thousand pounds weight of charcoal; while the charcoal of an average crop may be taken at over sixteen hundred pounds, or nearly three-quarters of a ton per acre.” An enormous amount of carbon is thus accumulated somehow in vegetable produce, and we are thus led to conclude that “the growing plant, whether large or small, tree of the forest or grass of the field, may be regarded by us simply as a contrivance for producing carbon.” It is quite clear, then, that the carbon which is stored up in a plant when it has finished growing must have been derived from some source external to the plant, and it need hardly be remarked that this carbon can only be obtained from some substance already containing carbon. Vegetable mould, or, as it is technically called, “humus,” is produced by the decomposition of vegetable matter, and unquestionably contains a very large quantity of carbon. Up to about thirty years ago it was generally believed that plants derived their supply of carbon from the vegetable

soil or humus in which they grow. It was shown, however, by Liebig, that vegetable soil is exceedingly insoluble in water, and it is well known that plants have no power of taking into their interior any solid matter unless this be capable of solution in water. It was shown also that the amount of carbon in a crop may be increased two or threefold by the addition to the soil of substances containing no carbon whatsoever, such as mineral salts and ammonia. A still more convincing argument against this notion of the origin of the carbon of vegetation directly from organic matter in the soil, is afforded from the fact, established both by experiments specially made and by the observation of nature, that plants and crops have been, and in many places habitually are, grown upon soils which are either absolutely free, or which are practically and to all intents and purposes free, from organic vegetable matter. Very many such experiments have been made by the French chemist, Boussingault, who has grown plants from seeds in artificially prepared soils, which had been subjected to a red heat, and from which the whole of the organic carbonaceous vegetable matter had been so removed and burned away; and yet the plants have not only grown in these soils but have thriven and arrived at maturity. It is found moreover that many plants flourish best, in a state of nature, upon soils which if not, like the experimental soils of Boussingault, absolutely free from organic matter, are yet to all intents and purposes free. Thus, according to Darwin, rich harvests of maize are yielded in the interior of Chili and Peru by soils consisting of the merest quicksand, never enriched by manure. According to Colonel Campbell the soil of the cinnamon-gardens at Colombo and where else the tree is cultivated is pure quartz sand, as white as snow. Dr. Schiciden again observes that "the oil palms of the western coast of Africa are grown in moist sea-sand; and that from the year 1821 to the year 1830 there were exported, as produce of these palm-trees, into England alone, 107,118,000 lbs. of palm oil, containing seventy-six million pounds, or thirty-two thousand tons, of carbon; these thousands of tons of carbon being furnished by trees grown in a soil that was practically free from organic or carbonaceous matter of any kind whatever."

Now-a-days, then, it is universally admitted that plants do not derive their supply of carbon from the soil in which they grow, but from the "fresh, transparent, intangible, fleeting air" in which their leaves are bathed—improbable as this appears at first sight. The atmosphere universally contains a small amount of carbonic acid gas, this being a gaseous compound of carbon with oxygen. The actual amount of this gas which is present in the atmosphere is exceedingly small, not amounting to more than four parts in ten thousand parts of air by volume; but in the aggregate the absolute amount is very large. "The weight of air overlying every square inch of the earth's surface is fifteen pounds; and this is what we mean by saying, as

we commonly do, that the atmospheric pressure is fifteen pounds on the square inch. Now, fifteen pounds on the square inch is 2,160 pounds on the square foot; so that every square foot of the earth's surface has overlying it 2,160 pounds of air; and these 2,160 pounds of air contain about one and a half pounds of carbonic acid gas, equivalent to very nearly half a pound of carbon. . . . There are produced, in many cases, from an acre of land some two thousand pounds of carbon in a single season. Now, reckoning from feet to acres, we find that not merely at the first instant of the growth of the crop, but that during every instant of the period of its growth—at the end no less than at the beginning—there is overlying the acre of land furnishing these two thousand pounds of carbon some twenty thousand pounds of carbon in the form of carbonic acid, existing, though in such small proportion, in the air. Calculating in this way we find that the amount of carbon existing in the atmosphere, in the form of carbonic acid gas, is not only enormous in its absolute quantity, but that it is far in excess of the wants of vegetation, and far in excess, moreover, of the quantity of carbon contained in all living beings, both plants and animals, existing on the surface of the earth, and in inflammable carbonaceous minerals, such as coal, which exist buried beneath the surface. In this way, then, we come to the conclusion that by their contact with the air, plants are at any rate afforded the opportunity of getting that carbon which constitutes so large a proportion of their structure. The question now is, do they avail themselves of the opportunity afforded them—do they actually absorb carbonic acid gas from the atmosphere, and extract the carbon of the gas which they absorb? The evidence on this point dates from the latter end of the last century, when it was ascertained by the older chemical philosophers, and more particularly by Dr. Priestley, and by Saussure and Sennebiar, that when growing plants are exposed under the influence of sunlight to air containing carbonic acid, they do, as a matter of fact, absorb some of this carbonic acid; and that having absorbed it they do not discharge it again into the air, but instead discharge only its one constituent, oxygen; the necessary inference being that its other constituent, carbon, is retained in their tissues."

It is, therefore, now universally admitted that plants obtain the carbon which they require from the carbonic acid gas existing in the atmosphere, that they have the power of decomposing this gas under the influence of sun-light, and that they retain the carbon and exhale the oxygen which together form carbonic acid. Plants are thus constantly removing carbonic acid from the atmosphere and adding oxygen to it; and this process is most properly to be looked upon as one of digestion and not of respiration, though it was long regarded in this latter light. On the other hand, animals are constantly abstracting oxygen from the atmosphere and adding carbonic acid to it. It follows from this that there is thus a "balance of organic nature," the vital action of plants being complementary to those of animals.

The vital processes of the animal end in the production of carbonic acid, which is injurious to the organism and is expelled into the atmosphere. Plants, however, live upon carbonic acid, and in using it as food they liberate the oxygen which is absolutely essential to the life of animals.

The conclusion of Dr. Olding's lecture treats in a clear and popular manner of the final destination of the carbon of vegetation. After showing that carbon, when actually burnt, unites with oxygen so as to reproduce carbonic acid, the lecturer pointed out that the process of decay of vegetable matter is really a process of slow combustion, consisting in the combination of the carbon of the plant with the oxygen of the atmosphere, and resulting in the production of carbonic acid. When we pass to the consideration of the vegetable matter which is eaten as food by different classes of animals, we find that so much of it as is actually digested by the plant-eating animal undergoes one or other of two principal changes. "A large portion of it gets oxidized in the body of the vegetable feeder, with the production of carbonic acid, discharged principally from the lungs in the act of respiration. Another portion gets accumulated in his body, whereby it is fattened and rendered fit to become the food of the flesh-feeder. And when the flesh-feeding animal eats up the body of the vegetable-feeders, their vegetable-derived fat and lean that become assimilated in his body are found to suffer there a speedy oxidation. Store-animals, intended for food, increase gradually in weight; but hard-working animals, whether vegetable feeders like the horse, or mixed feeders like ourselves, or animal feeders like the hound, go on eating day after day, year after year, without any sensible increase of bodily weight—the carbonaceous matter of the food continually eaten sufficing only to replace that continually destroyed in the process of gradual oxidation or burning away to which the substance of our blood and tissues is ever subjected, in order that the temperature and activity of our bodies may be maintained. Accordingly, we find the air expired from the lungs of both vegetable and animal feeders to be charged with carbonic acid, produced by the oxidation of carbonaceous organic matter—furnished directly or indirectly by the vegetable kingdom out of aerial carbonic acid, and restored by the animal back into the same carbonic acid." The same process also serves to maintain the temperature of the animal body. When we burn carbon in the fire it evolves a very considerable amount of heat in its union with oxygen. The temperature produced depends upon the rapidity with which this oxidation is carried on; but the same amount of carbon will always produce the same amount of heat by its oxidation, whether the combustion be effected rapidly or slowly. And this is true not only when we actually burn charcoal on a fire, but in all cases of the combustion of carbon and of its conversion into carbonic acid by the act of oxidation. "Whether, then, we burn our charcoal rapidly in an open fire, so as to produce a high temperature, or whether we burn it in our bodies

slowly, so as to produce a low temperature, we find that for so much carbon converted into carbonic acid there is exactly the same quantity of heat produced. Now, it is a well-established law in chemistry, established by the careful examination of a great number of instances, that whatever heat is given out by the act of combination as of charcoal and oxygen to produce carbonic acid, exactly the same quantity of heat is absorbed in the corresponding act of separation, as of charcoal and oxygen out of carbonic acid. The conversion of carbon into carbonic acid on the fire is a burning process, attended with the evolution of heat. The conversion of carbonic acid into carbon and oxygen, in the tissues of a growing plant under the influence of the sun's rays, is an unburning process, attended, not with an evolution of heat, but with an absorption of heat from the solar rays, and it follows that there is just as much disappearance of solar heat in the production of the charcoal, as there is evolution of heat in the ultimate combustion of the charcoal produced. So that the quantity of heat which the charcoal eventually gives out in burning on the fire is the exact equivalent of the quantity of solar heat which disappeared in the act of growth of the wood, from which the charcoal furnishing our fire was obtained.

Clover The Renovator.

The value of clover is yet scarcely appreciated by Canadian farmers. Few of them either sow land enough with this crop, or sow it thick enough. Mecchi holds forth, day by day, upon the principles of thin sowing, and upon the advantages that accrue therefrom. Let us not be led astray. When we have brought our land to such a state of perfect culture and great richness as is the soil of Tiptree farm, then may we begin to experiment upon the relative values of thick and thin sowing.

We propose to consider this question of thick or thin sowing of clover seed. Advocates upon both sides are to be found in the January and February numbers of the CANADA FARMER for 1870, but as many of our readers are new subscribers, we would endeavor to lay down a few rules for the guidance of those who wish, by a liberal use of clover, to bring their land into good heart. Of the green manures, undoubtedly clover is the very best. The practice of ploughing under—to rot—full crops of such succulent plants as clover, dates back to the times of the ancient Romans.

The great difference between the effects of exhaustion upon land of green crops and cereals, may be summed in a few words.

The cereal grows entirely from the food which it finds in the soil, while the many-leaved plant draws its sustenance almost entirely from the atmosphere. Why is it that the beneficial effects of a rain storm are so much more quickly observable upon grass than upon a cereal? Because the rain-water, not only carries its inherent plant-

food to the lungs or leaves of the crop directly, but it also heats down the nitrogen and ammonia that have been suspended for many days over the surface of the earth. If we then, expose a large surface of green crop to the action of the atmosphere, and, as the receivers of rain, we shall gather into the body of the green crops, where it will be retained, and not lose itself in the depths of the soil, a store-house of all those foods, carbonic acid, nitrogen, oxygen, sulphur, &c., which are contained in large quantities in rain water.

We store this food in the plant, and if we plough under that plant before it has made its final call upon the food stored away, i. e., before it ripens and dies, we shall give to the earth a large portion of plant-food, which will be available to the succeeding crop, as the green manure gradually decomposes and becomes amalgamated with the contiguous particles of the soil. Therefore we should expose before ploughing down the greatest available surface of green clover; and this can be done most effectually by thick growth of the plant. The more plants, the more surface exposed to the atmosphere, and the more mouths ever sucking in the rich juices of the air and rain.

Again, from a plentiful supply of seed we have a thick growth of plants, and the more closely compacted that growth when we plough the plants down, the more rapidly will decomposition set in.

Let us now look at the growth of clover in another light. Supposing that upon rich, clean land we sow our clover-seed in quantities such as the advocates of thin sowing require; the result will be great coarse hay; the stock will eat the leaves, and will leave the stock. What we require for the cow, the sheep, and the hog, is a sweet, tender, fine clover hay, the chewing of which causes no difficulty, and of which none is trodden under foot and wasted.

We would approve of no rotation in Canada in which clover does not often appear.

In many parts we have no means of buying animal manure, and there is no farmer that can manufacture sufficient at home to thoroughly renovate his land, unless, indeed, under the supposition that he should buy feed other than that raised on the farm.

Let such as would keep the soil rich, and have, at all times, a decomposing vegetable matter, as a nursery from which the tender roots of a crop when first sown may draw their nourishment, provide such by decay of clover. Soil, when first ploughed and a portion taken up in the hand, should show an abundance of these rotting vegetable fibres to be in good heart. Then let us not only sow clover as a crop, but as a manure also, whenever we may look forward to the profitable ploughing down of the same, at any period from one to three years.

It is impossible to lay down any arbitrary rotation for the guidance of our agricultural readers, composed as they are of farmers upon

every variety of soil. But for a light, loamy soil, such as is generally considered the most eligible for Canadian mixed husbandry, we would base the principle of our rotation upon as nearly as possible the following form: 1st year, wheat. 2nd 3rd and 4th year, clover (and timothy, if required); 5th year, hoed crop; 6th year, Spring crops; 7th year, clover; 8th year, Summer fallow, or clover left; 9th year, wheat.

This is a general rotation upon the basis of which may be formed slight practical alterations. The advantages that we claim for such a rotation are: A stiff, but still young sod for our root crops, upon which may also be put fresh or rough manure to advantage.

After the roots upon the clean land thoroughly pulverized and rich, spring crops—in excellent order for seeding down, and guarantee for a heavy crop of clover, to be fed at home—this clover, if heavy land, to be summer fallowed, and fallowed with wheat—thus giving one crop of wheat, four crops of hay, one of roots, one of spring grain, and one fallow, every eight years, allowing of green manuring and barn yard on the 5th and 8th years, making the proportionate crops, in each year, on a 100 acre farm, as follows:—Wheat, spring crop, hoed crop, and summer fallow, twelve and a half acres each, and of hay and pasture 50 acres, allowing the clearing of 25 acres every year, or twice in the full course.

We believe, however, that upon moderately light land, this summer fallow may be cut out altogether, and may either be displaced by Fall wheat, or superseded by a crop of Spring grain, oats, or peas.

Under such a system of farming, the land would be clean at all times with the hoed crop of 12½ acres each year, and will, we think, where cattle enough are kept to consume a large proportion of hay and roots, be rich enough to bear, once in seven years, two cereals following upon each other, especially if the barn-yard manure be so managed that a dressing of well-rotted dung may be applicable to the spring grain, suitable for the immediate benefit of the following wheat crop.

If your land be poor, take every available opportunity to seed down and plough down clover. It is the most rapid and economical method of renovating a worn out soil.

Hops in Kent, England.

The following is a statement of the condition of the hop crop in one of the great hop growing districts of England, and will prove of interest to those who are engaged in hop-growing in Ontario:

“The rain it raineth every day’ and often all day long, so that it has been almost impossible to do any work in the hop gardens which are just now like mud ponds—as wet as they were in the dreary days of January and February. In spite, however, of the excessive moisture and the low temperature of

both days and nights, the vine has grown steadily on, and looks much better as to colour than could have been expected. The Goldings in mid-Kent are generally good and are better and more even than the grapes, which have been in many places attacked by flea and slugs. There is a little fly in this important district, but not enough at present to cause much uneasiness. In the weald of Kent there are many acres where the vines are not yet five feet high, and it may be said that in this large hop-growing area it is at least a fortnight behind the average of seasons. Fly may be found everywhere, but not in great numbers, and they do not seem to breed lice to any great extent at present. There are plenty of fly Goldings to counteract their influence if a warm sun, which is indispensable to them, would only shine upon them, and draw them from their semi-torpid state. The vine is variable in East Kent, which produces the best pale ale hops in the world. The strong Golding vine still grows, and looks fairly green, while the weakly vine has again become yellow, and takes short turns round the poles. There are more fin here still than in any other part of the Kent plantation, and as many as seven to eleven can be found upon one leaf. The development of lice has been checked by the cold. All over the country there are many more fly than it is desirable to see, and in many cases where it appears that there are scarcely any it will be found upon examination that they have been blown, or have flown, or have been washed down to the lowest shoots. The position of the plantation is very critical. On the one hand, the wet, cold weather day by day is diminishing the chance of a crop, as the longest day is quickly approaching, and much of the vine is not yet half-way up the poles. On the other hand there is a dangerous reserve of aphides waiting only for more genial skies to increase and multiply and ravage the hop-ground. It might almost be said now that there cannot be a large crop, looking at the dark influence at work, but it will be safer to wait a little longer than to run the risk of false prophecy."

Economy in the Farm-yard.

"Waste makes want." In no department of industry is the above saying more fully verified than in Agriculture. I purpose in this article to point out some of the ways in which farmers are wasting, largely, without perceiving it. How often do we hear the farmer say, if I had the means, I would make this, that and the other improvement. One complains that in order to keep his payments, he must plough broad fields, he cannot replenish with manure; or he must, from the same necessity, sell his choice breeding stock and breed from inferior animals; or rob his timbered land of his best wood and lumber, to sell at ruinous prices

He, perhaps, has not had his attention

called to the fact that economy in another direction would save him this sore vexation. Let me then first urge upon farmers economy in the farm-yard—save your manures! This is the great secret of successful agriculture. It is no trick at all to plough a broad field, but to obtain an abundant harvest from ordinary soil comes under the province of a science. This is the science of agriculture.

The cereals, exhaust the land far more than most other crops, and mainly because we put next to nothing back in payment or part payment for the accommodations we receive, we do sometimes let a field rest but food is as essential to exhausted land as to exhausted nature. I venture the assertion that many farmers lose one third of the value of all manures which should accumulate about the premises. The subtle elements which enter into the composition of the growing plants and ripened grains, are not supplied from crude manure, and while this process of decomposition is going on, pains should be taken that the gases generated by fermentation should be held as far as possible in the mass. If exposed, the wind of heaven dispels them, or the rain floods wash them away. Manures should be housed, as far as practicable, and when drawn upon the land should be at once ploughed under, or if left in heaps should be thoroughly covered with earth until wanted. The stables should be so arranged that the fluid as well as the solid excrements be husbanded; for the former abound the more in ammonia, the most important fructifying principle in most manures. Manures should not be allowed to heat in the yard so as to burn; horse and sheep manures are sure to do so if left in loose piles: mixing such manure with that of neat cattle and hogs will prevent this; in passing I may remark that there is no animal so valuable for making manure, as the hog, and one so little appreciated; for he is allowed to run at large, becoming a public nuisance. I have often heard farmers in the New England States, where from the barrenness of the soil, the making and saving of manures become a law of necessity, say, that they make the hog manure pay for food, and count on the carcass as a most clear profit. In order to make the hog pay thus he must be kept in close confinement, and be supplied with plenty of earth, much straw, leaves, anything in short which will absorb and hold the rich fertilizing elements of the manure. Instead of his running at large rooting up gardens and fruit trees, lying about the entrances of our dwellings, let him root in his own yard, and even encourage him to do so by burying corn or peas for him to scent out and unearth. Take up almost any New York newspaper and you will see advertised for sale by the "Sodi Manufacturing Co." a preparation of night soil. Did it ever occur to you that the vaults of privies could be made serviceable to you; by economising their contents you save sending abroad for the same thing under perhaps a different

name. Throw into such vaults vegetable mould, leached ashes, gypsum, coal dust, or any like substances and cover the whole out at least once a year. Mix the mass with other manures, and you will find it will give a verdure to your corn leaf, and a rankness to your wheat straw no other manure will afford, and at a very trifling expense as compared with that brought from towns. Prepare a heap of compost near your kitchen to catch the waste water from the tub of the washerwoman, and the refuse from the cook room; it will all tell on the growing crop. Let nothing go to waste about the farm-yard, if you would have "corn to sell and corn to keep."

A.

On Turnip Insects in England.

During the summer of 1870 the turnip beetle, or "fly" (*Melica nemorosa*), has been a complete scourge throughout the Border counties. Turnips might be sown early or very late, in either extreme there was no palliative, so long as draught prevailed; and plants, insufficient in force for the maintenance of the devouring myriads, kept up merely a feeble and struggling existence. It was only through the advent of showers long delayed, and a mild atmosphere, that the crops got established, and at length out-grew their persistent persecutors; for not only did they swarm on the seed lobes, but continued to perforate the foliage and delay the growth, long after the plants were singled out; some even lingering in the fields till there were sizeable turnips. Near the seaside the damage was not so great as further inland. My own Swedes did not require to be re-sown; but, as for the white turnips, it was by mere dint of persevering sowing that the ground got covered at all. Some parts of the fields, here, produce wild mustard, or "ranch" (*Sinapis arvensis*). This was found to be a great preservative to the young turnip-plants, in allowing them to assume the rough leaf unbitten. The beetles took as readily to the mustard as to the turnip, it being their natural food; and I noticed that when the Swedes were nearly forward for thinning, the mustard obtained the preference. Owing to this, although the insects in some places lay on plants like gunpowder, after side-hoeing and thinning the blanks were very few. I have heard that in other places, where mustard is in the soil, this also happened; so that it is not an unmitigated evil; being, in such seasons as the present equivalent to thick sowing, in fields not liable to this weed.

The turnip leaves were remarkably free from caterpillars; even the small caterpillar of the diamond moth was absent. In a few spots bordering the outcrop of rocks, which had supplied secure breeding places, I had a space of several yards breadth entirely eaten off by earwig. They stripped the leaves, after the plants were thinned, leaving only the skeleton ribs; weeds and potatoes all

went in the same way; till some change took place, perhaps the acquisition of wings by the young broods, when the nuisance abated. They fed only at night, and used to hide during the day in the soil, the fork at the tail being visible here and there at the surface, or clustered under clods and small stones. The workers killed numbers with their hoes; and for a few days the rooks and jackdaws held a high feast over the spot. This happened also at the sunny-side of stone walls, the turnip leaves being holed for some distance off.

But a still worse source of mischief lurked in some of the fields, and began to develop itself to an enormous extent towards autumn, viz., the turnip louse, or Aphis, of which a notice was given in the Club's 'Proceedings' of last year. I first noticed them here among the Swedes (*Aphis Brassicæ* was the species), about the middle of September, on a few plants; whence in the drought of the last fortnight of that month, which was the most fruitful of all, they spread themselves in spots here and there, but did not occasion much hurt in this quarter. The worst effects of them anywhere that I witnessed was on Swedes, on the gravelly and sandy soils about Wooler. The Aphides had begun to predominate there, when the turnip casts its outer leaves, and while the drought and the mildew kept back the young foliage; and the consequence was most disastrous. The sickly leaves, oppressed with disgusting insects, hung flapping on the ground; and the plants drained of sap grew weaker every day. The smell of decaying turnips rose from the fields, fit to corrupt the air. The white and yellow turnips at the same time were infested with the green and pinkish *Aphis vulgaris*, called also *A. Rapæ*; and the fields wore as many tints of green, yellow, and brown as the woods in autumn. I was told that in one inclosure the turnips were so disagreeable that sheep refused them. Other fields were being stripped of their produce to give to the cattle; thus losing a month or two's growth. One farmer told me, that as soon as the presence of the insects was manifest, he, in order to starve them, had got the tops of the Swedes cut off; and that they were sprouting again, and growing healthy. Crops that were kept growing were certainly best off, such as those latest sown, or those among the hills, on which only a few insects were present, while the earliest fared worst; but the proposed remedy is a desperate one, "more to be honoured in the breach than in the observance."

From East Lothian I have a communication from a competent authority, Mr. R. Scot Skirving, of Camptown. He is of opinion, in which I join him, that in Scotland we have little to fear from the "surface-grubs" of the Lepidopterous genus *Agrotis* which Mr. Newman, in the 'Field' and the 'Entomologist,' considers to be so hurtful to the turnip. A much more deadly

"grub" is that of the *Tipula oleracea*, or "crane-fly," which eats through the root just below the surface, and soon clears half a field. From this grub, this season, Mr. Skirving has lost, at least, thirty acres of turnips. He goes on to say:—"The 'fly' took the first sowing, the drought the second, and the crane-grub the third. From Tranent to Edinburgh, and all round Portobello, the turnips looked magnificent up to the end of August; and they almost caused me to 'envy and grieve at the good of my neighbour,' as I travelled on the railroad; but the turnip louse came and destroyed the Swedes, root and branch, and the fields became bare; whilst the soft turnips became bright orange, then dirty yellow and withered up, as if scorched by fire. This seemed rather *disease* than insect work. Farms between Tranent and Edinburgh seem peculiarly liable to this, though I have seen it come all over the lower half of East Lothian. It does not attack Swedes."

The migrating epoch of the turnip Aphides took place in the end of September, as soon as the wings had developed; and for more than a week, during the calm and genial weather, they rose in succession from the turnip-fields along the valleys of the Till and Glen, till they became almost incorporated with the air, so intensely crowded they became. They grew very troublesome to those who had to go out. One had almost to breathe them. At night, or during dull days, they stuck to the threshold, to the grass by wall sides, or gathered upon hedges or trees. Many fell into the waters, or were swept from the grass on the brink. Beating the bushes for insects at Heathpool, I got my umbrella so filled with the roosting Aphides that I had to desist. Subsequently I saw that the flights had extended to Goldsclough and Langley Ford, among the hills; several having been drowned in the burns. The "plague of midges," as they were called, was universal. At length came some heavy showers of rain and hail, which cleared the air, and perished and scattered the insects; and the turnips got up their heads again. — JAMES HARDY, in *Newman's Entomologist*.

On the possibility of separating Nitrogen from the Atmosphere by Percussive Compression, and rendering it available for Agricultural Purposes.

Under the above heading a very interesting article appears in the last part of "*The Journal of the Royal Agricultural Society of England*," from the pen of James Nasmyth, the celebrated Machinist and Engineer, at Paternock, near Manchester, England. It is now pretty well known outside of scientific circles, that Nitrogen plays a most important part in the nutrition of plants, and contributes the most valuable portion of manures. The atmosphere contains an inexhaustible store of this element, mechanically united to Oxygen; yet, according to the views

of modern chemistry, it does not clearly appear that plants have the power to obtain nitrogen directly from the air; but usually eliminate it from ammonia and nitric acid. All animal substances in a state of decomposition, largely evolve ammonia, (a compound of hydrogen and nitrogen), which the roots and other organs of plants decompose, and the nitrogen is appropriated as food; hence its efficacy as a fertilizer.

The idea of uniting the nitrogen and oxygen of the atmosphere by mechanical and chemical means, so as to form nitric acid, has occurred to more than one scientific mind, and Mr. Nasmyth appears to have been cherishing it for many years, as will appear from his own words.

"Reasoning on this subject full forty years ago, and considering the inexhaustibility of the store of nitrogen we possess in our atmosphere, it occurred to me that, could we but devise some means of laying hold of this nitrogen of the atmosphere, and fixing it in combination with some other element, so as to enable us to present the result directly to the roots of plants; we should, in that way, supply them with their most effective food as manure, derived from an inexhaustible source around us, instead of having to obtain the desired nitrogen, as we do at present, by going all the way to Peru for it in the form of *guano*, which owes its efficacy as a fertilizer chiefly to the presence of ammonia, from which the plants, by means of their roots, abstract their favorite nitrogen. Reasoning on this subject, as I have said, it occurred to me that by some *mechanico-chemical* process we could manage to knock the nitrogen and oxygen of the atmosphere into chemical combination, and at the same moment combine the so produced nitric acid with some mineral substance which would permanently fix the combination in a portable form; we should thereby get hold of a source of fertilizing power as inexhaustible as it would be effective. In following out this train of reasoning, I call to mind the fact that traces of nitric acid are found in the rain that falls during thunderstorms; and the observed increase of fertility which follows such thunderstorm rain is due, it is supposed, to the nitrogen carried to the roots of plants by the minute admixture of nitric acid in the rain which falls on such occasions.

"Also let us bear in mind the wonderful efficacy of *blow*, or percussive action, in bringing about a true chemical combination between certain elements which otherwise might lie for ever in juxtaposition without ever entering into chemical union. The efficacy of percussive force in this respect is well known in case of all fulminating compounds. Viewing the thunderstorm effect above referred to as a percussive compressional agency, it occurred to me that we might attain the grand object of chemically combining the nitrogen and oxygen of the atmosphere, for the service of agriculture,

by subjecting atmospheric air to exceedingly violent percussive compression, in the presence of some cheap mineral substance which had a strong affinity for nascent nitric acid, which I imagine would be the immediate result of such violent percussive compression. Dry slacked lime would appear to be the most suitable substance for effecting this object the result would be nitrate of lime. Should we thus be so fortunate as to knock into combination the constituent elements of the atmosphere, and so produce a fertilizing agent of the most potent efficacy from an inexhaustible source at home, instead of, as at present, going for it, in the form of guano, all the way to Peru, a great result might ensue. Although this scheme has long afforded me subject for many a bit of quiet cogitation, I have as yet, done nothing to bring it to the test of actual trial; but as I have on many former occasions derived high gratification by giving forth such embryo schemes, and seen them come to life by the so planting them into the minds of intelligent men, I venture to promulgate my long formed notions on this subject, in the hope that peradventure they may take root in favourable soil, and spring up and have fruit in due season. Even at the risk of being thought a propounder of a visionary scheme in the meanwhile, and even failing the realization of any commercially suitable result, the issue might prove acceptable in a purely scientific point of view."

Appended to this article is a rough sketch of an apparatus by which this interesting investigation might be brought to the test of experiment. Once establish the fact that by percussive compression nitric acid can be produced by direct combination of the elements of our atmosphere, the solution of the commercial part of the problem, would be in a fair way of being solved. In an age so rich in scientific resources it is much to be desired that a scheme so novel and important should be thoroughly and satisfactorily tested.

NEW VARIETIES OF BUCKWHEAT.—The *Germantown Telegraph* says: Commissioner Watts is distributing what purports to be a new variety of buckwheat. It is something of an innovation on the usual run of things to have a new form of this old plant, which seems to have been the same old buckwheat for so many years. This one is said to have a golden hull, but in what respects it is an improvement does not appear. The buckwheat crop, when the seed has been sown in season, is by no means an unprofitable one, and it is rather remarkable that it should have remained so long without any attempt at selecting any varying forms for improvement; and whether this particular form proves of much value or not, the Commissioner has done well in thus calling attention to a neglected but important crop. Now that a start has been made in the buckwheat direction, we shall expect to see the usual excitement in new varieties.

Talks With Farmers.

SALT AS MANURE.

"I have some idea of using salt on my farm as manure; can you tell me of any one who has used it to advantage to any extent?"

"Yes" I have, and my father and brother have used it for some years. In fact, ever since we could buy it at a low price at the wells. I have used it on all kinds of grain, wheat, oats, barley and peas. On these crops I sow about 5 bushels of salt to an acre, sometimes only three.

As a guide to you, I may observe, that I sow with both hands, and grasp as much as the hand will hold, and as the salt is moist the hand will thus hold about twice the quantity it will of grain; salt will not fly as far from the hand as wheat.

As to benefit derived, I have found the grain average six bushels an acre of wheat, and barley, the first crop, and more from peas and oats; and almost as much benefit the next, especially if clover followed. I have carefully noted this fact, and more especially where young clover followed barley, there was then a marked improvement. The difference was carefully shown by intervals being left unsalted.

Our mode of applying salt, is to sow it on the land just before we sow the grain; one harrowing being sufficient covering for grain, and salt also.

If sown on the surface, salt will remain a long time unchanged, especially in dry weather; and applied thus, it does not produce as good results. I have seen the land look quite whitened after sowing salt on the surface; the rain and dews not being sufficient entirely to dissolve it, and its immediate contact with foliage, I am sure, is bad at any time. I am therefore of opinion it is far more advisable to bury the salt somewhat below the surface.

I have not found this objection to apply so strongly to grass lands, unless the meadow fescue abounded, and too much salt was used. No doubt the moisture carries the salt directly downwards amongst the roots, and dry weather does not affect it in the same way, but still it must be very carefully applied. Many years since I tried sowing salt on a walk in my garden, much infested with twitch grass. I sowed at the rate of about 15 bushels an acre; the result was complete destruction of the twitch grass. I saw from this experiment that I had sowed too much to assist vegetation; and many times since I have scattered, as experiment, small quantities of salt over grass lands, enough to make it look a little whitened,—the salt just discernible, in fact, and always with the effect of killing the grass, showing that as a top dressing to meadow lands, salt must be very carefully used. I attribute this to the fact, that the salt does not do so much injury to the roots, when mixed with the soil, but if it remains in contact with the herbage, any length of time, it seriously injures it.

In all these cases of top dressing I noticed the land to be somewhat whitened by the salt for some time after applying it, notwithstanding some rain had fallen at intervals.

In the case of the salted walk, there was however a most marked effect, produced the following summer, on some clover accidentally sown on it.

This walk had been formed by removing all the surface soil to a depth of about six inches, for the purpose of exposing pure red sand, which formed the subsoil, and was very poor—almost in fact barren. Near this was a small patch of clover, saved for the low, but not being required, had been allowed to go to seed. During the following winter, (succeeding the salting), the clover heads broken off by the wind, had been driven into the depression formed by the walk, and the snow and rain had buried them in the soil during spring thaws.

From this seeding, the following summer there was a most remarkable thick crop of clover, quite a mat in fact; and this crop continued equally abundant during two or three years that succeeded. I attributed this rank growth, on such poor soil, entirely to the salt.

Numbers of visitors saw this experiment. The quality of the soil being so poor, left no doubt on any ones mind that the growth was entirely due to the salt. I have used salt in my garden many years to free the walks from weeds; and on our asparagus bed in particular, I use abundance of it. But although it kills all the fescue meadow grasses, many of the large coarse grasses, that seed the first year, and all the clover seem to thrive wonderfully well where it is carefully used. I had a tulip bed much infested with weeds, and as they could not be hoed out, I was advised to saw salt thickly over it in the fall. But certainly the end was not answered, for next spring I had a most extraordinary growth of clover and timothy, the seeds of which were in the manure applied. A further proof that salt when not in actual contact with herbage does not injure the following crop, but instead benefiting it to an immense extent.

VECTIS.

MULCHING.—A correspondent of the *Cincinnati Gazette* says:—For the last ten years in setting my trees I have used a compost composed of about equal parts of rotten wood, leached ashes, and light barn-yard manure. Pursuing this plan I have succeeded beyond my most sanguine expectations. Especially is this true in regard to light soils.

HOPS.—The *Michigan Farmer* says it is evident that there will be an early and lively market for the new crop when it comes in, and it is generally understood that the crop of American hops will not be sufficient to supply the home demand. The crop of old hops will be entirely used up, and but little if any stock left on hand.

Propagation of Thistles.

—
 "Thistles cut in April,
 Come up in a little while;
 If in May,
 They grow the next day;
 If in June,
 They'll grow again soon;
 If in July,
 They'll hardly die;
 If in August,
 Die they must."

These lines, rude as they may be, are still meant to express what had been observed on the subject, how with the underground buds as described there can be no wonder at the quick re-appearance of the plant on early cutting—a fact we yearly experience in weeding out this thistle. At the same time when we consider that the whole of the above ground parts of the plants would naturally die at the first approach of cold, we conclude that the decree of

"Die they must,"

is more apparent than real, and the farmer is too apt to fancy that he has killed his enemy if it does not reappear the same season; but not so; its rhizomata carry on its life; it comes again next year though he has not let it seed, and so he concludes that "thistles do not grow from seed, but are natural to the soil."

Never to let it perfect any leaves, much less to flower and seed, is the way to get rid of these pests; and the way to do this is to cut them up whenever and wherever seen, or what is even better than cutting is to pull them, which can easily be done with a glove-protected hand.

2. The Dwarf or Stemless Thistle is a common denizen on poor upland calcareous pastures. Whatever tends to the growth of good grass herbage, and so allows thick depasturage by sheep and cattle, soon destroys it, and one of the earlier evidences of its succumbing to such treatment is for it to grow a stem, which it sometimes does, several inches in length—this is usually sufficiently tender to be eaten down, and so it is that plethora, even with severe bleeding, becomes destructive.

3. The Meadow Plume Thistle is so little prickly that it may be almost considered as innocuous, as it occurs in the lowland meadow; at the same time, when it occurs in large quantity charming as is the species, as a farmer we should be better pleased with grass.

4. The Marsh Thistle sometimes grows so rank in wet pastures as to be a decided nuisance, as it takes up great space, and its foliage is exceedingly prickly. Where it occurs in quantity it is an evidence of want of drainage; this and cutting out the plants as they appear, is the best way of getting rid of the pest.

5. The Musk Thistle is the common species of the arable farm and is usually sown

by the farmer in dirty seeds, in most samples of which the seed of this plant may be detected. If it once gets established in a district and is allowed to seed, one soon gets the question settled "do thistles grow from seed?" as neighboring fields will not be long before being cropped. We are now suffering from a lot of these which were allowed to seed four years since on a neighbor's farm, and do what we will, some few examples will escape detection these seed in their turn, and thus the old adage—

"One year's seeding

Is seven year's weeding."

becomes especially true in regard to thistles 6, 7, and 8. These forms may be mentioned as particularly subject to waysides and waste places. 6 and 8 everywhere, 7 being more particularly a sea-side denizen. These from neglect get into fields and pastures from hedge rows and way-sides, from which they should ever be assiduously removed. Road sides especially should be kept clear of thistles, for as a proof that they do come from seed, a neglected road-side, or a careless neighbor, will certainly scatter the pest all round.

9. The Cotton Thistle is a handsome plant, and so thoroughly indicative of limestone, that one may be quite sure of a calcareous stratum whenever it occurs. Though seldom found in the open field as its size would cause it to be cut down before it had arrived at maturity, it is yet frequent about old quarries and limestone banks.

10. The Scotch Thistle is here noted, not that it is at all general; but as we have for a season or so marked a stray specimen, which had evidently been brought in seed, in its turn seeding, and leaving a large colony behind, it shows how thistles are indeed propagated from seed.

Having now pointed out how thistles are propagated, we would say to our farming friends, never let a thistle ripen its seed. Not only observe this rule for yourself, but induce all who have to do with land to do likewise. Waste ground should in this case be looked after, as, like riches, thistles make themselves win and flee away, and thus we shall find the adage true—"Wasteful waste makes woeful want."

Preparation of Fire Wood.

The manner in which fire-wood for domestic purposes is prepared and managed by a large portion of the rural population, argues a great want of economy, as well as stupid management. Hard working mothers, and faithful female domestics often have their patience tried to the utmost by miserable fuel, miserably prepared, or by an abundance of the best quality of fire-wood provided in such an unsuitable manner that it can not be made to burn at all satisfactorily. And, strange as it may appear, people who are in straightened circumstances, and who aim to exercise rigid economy in all their affairs, seem to

have no thought touching economy in the proper preparation of fire wood. A large number of families never know how convenient and economical a wood-house or simply a wood shed is. Their practice has always been to shelter their fuel with a snow bank in the winter, and beneath a thunder cloud at other seasons of the year. Consequently, the music of the kitchen consists of the hissing and steaming of the consuming fuel, and the discordant symphonies of the fretting, and stowing domestics over unsatisfactory trees.

A great many prudent fathers seem to think that their duties are ended as soon as the fire-wood has been dropped near the dwelling, where it is allowed to remain and soak in the storms, and to mold and deteriorate in the dampness. Is it any wonder that scowls and permanent corrugation disfigure the faces of our mothers and loving wives, when strong men, luxuriating in their easy chairs, are reveling and dissipating with kindred spirits, spend more time thus than would be required to cut, and split, and pile, every stick of a large wood-pile in a good wood-house.

We are all after a little more money—just a little. Now then, here is an excellent chance to save not only a few dimes but many dollars. One cord of good wood, cut and split fine and corded up beneath a shelter while the timber is yet green after it has become seasoned will furnish more heat than two cords of the same kind of fuel which is allowed to remain in the open air, exposed to alternate storms and sunshine. If a family without a wood-house has been accustomed to consume twenty cords of wood annually worth say, five dollars per cord, they may by properly preparing ten cords in a wood-house six months before the fuel is to be burned, save wood equivalent to fifty dollars ready money. More than this, contemplate the convenience and luxury of a quick, lasting and hot fire, when compared with the perplexities incident to the incessant sissing and simmering of a poor fire; and the stewing and frying must be endured before one can get the fire up to a baking heat.

The truth is that tillers of the soil, and in fact all persons who labor out of doors live wet days enough, when they cannot work in the field, to prepare every stick of fire wood in a proper manner for the stove, and to pile it up beneath some kind of a shed, where domestics will always have access to wood that will burn like tinder.

The main consideration in providing a wood-house is, simply, a roof to carry off the rain. A tight wood house is a miserable place to keep fire wood, unless it has been well seasoned before it is carried in. Let the wood be cut short and split fine while it is green, and then be corded up in an airy wood-house, before the sticks have lain long enough to become water soaked, and in six months you will have a wood-pile that will dispel the scowls and corrugations from the vexed brows of patient cooks.—*Technologist.*

Deep Ploughing.

One case in which deep ploughing proved injurious is stated by Col. Waring in his "Ogden Farm Papers," in the *American Agriculturist*:

"It is not pleasant to enter the lists of so free a fight as that now raging between deep and shallow ploughers. Indeed, I think that each is right according to his success or failure under certain circumstances. But it is undoubtedly safest to advise all enterprising young farmers to leave well-enough alone, until they have found, by actual experience on their own land, that deeper ploughing will not be injurious. One ploughing, ten inches deep, has cost me 'ready four years' use of eight acres of land which, had I left its vegetable soil at the top and its "pizen" clay at the bottom, would have given me a fair return for the seed and manure and labor I have thus far squandered upon it. Four summer's heats and four winter's frosts, with manure enough to have made the adjoining land highly fertile, have hardly had an appreciable effect in overcoming the detestable impoverishment of the very unferile, subsoil we brought to the surface. I am now struggling to get it down to grass and clover, with some prospect of a fair catch. If we could once get it in good clover, the battle would be won, but how or when that can be done yet remains to be seen. As the case now stands, I might better have given \$100 per acre, and kept the ploughing within six inches of the surface.

This means, understand me, that deep ploughing on *that soil* is a failure. It does not mean that on your soil and your neighbor's it would not be a most brilliant success."

Wheat after Clover.

If there is no tough soil, but a tolerably clean clover lay, the soil may be pretty well fitted for wheat by plowing once after harvest, and working the surface thoroughly. The clover may be pastured or mowed. This method of preparing the land for wheat is practiced quite largely by English farmers, and very successfully, too. It will work well here if previous cultivation has enriched and cleaned the land so that weeds will not choke the grain, and it will find in the soil sufficient food. But if the land is both foul and poor it is a course not to be recommended. If possible it is best to refrain from either pasturing or mowing the clover, previous to plowing it in, but let the full growth remain on the ground during the heat of mid-summer, thus shading it and retaining its moisture. When in full bloom it is a good plan to roll or harrow it down when the new growth will start quicker, and the shade become denser. Soil thus shaded will plow up much more loosely and be in finer condition for wheat, than if it has been exposed to the sun by close pasturing or mowing. If the farmer can afford to use his clover crop to this purpose on his land, it is quite as likely to return a much greater quantity, as it would otherwise be in a hay or fed off by stock.

Stock Department.

Mode of Establishing a Breed.

In proceeding to establish a breed, it is of the utmost importance to start from a right foundation. It is comparatively easy to select good animals, but it is a slow and difficult task to improve them. For example, if we were to take a lot of those bad Highland beasts, which Mr. McCombie has so strongly denounced, and, try, by gradual selection and careful weeding, to rear from them a fine race of cattle, our chances of success would be small indeed. It is an old saying that you cannot get grapes from thorns nor figs from thistles, neither can you get good beasts out of bad ones. The progress of improvement in the individuals of any race, when kept entirely by themselves, seems to be very slow indeed. A rapid advance may be made by crossing with animals of superior blood, but unless this can be obtained, we cannot expect to make any very speedy improvement. Accordingly we see that our most successful breeders have taken great pains to procure the best animals they could anywhere find as a commencement to start from, and their prosperous results have in a great measure arisen from the judgement and skill with which they made their first selection. The late Hugh Watson of Keilor made a very great improvement upon the black polled breed of cattle, and it would perhaps be difficult to point to any old animals of that race nearly so fine as those he succeeded in producing. He was the first great improver of the breed, and all the finest herds of polled Angus and Aberdeenshires are more or less indebted to his blood. It may be said, here was a great and rapid improvement effected, and a succession of fine animals reared from ancestors much inferior in type. I am aware that I may be treating on somewhat delicate ground when I say that many people, however, believe the great and notable advance made by Mr. Watson and our modern breeders of black polled cattle in the form and quality of that race has not been entirely effected without the aid of other blood. As a well-known breeder once remarked to me, while pacing along the polled ranks at one of our shows. 'We never used to see these finely modelled hindquarters in the black cattle until the short-horns found their way to the North.' It is a well-known fact that the produce of even the first cross between a short horn and a black-poll will sometimes turn out to be quite black, and destitute of horns, although in other respects it may retain many of the excellencies of the English breed. So of these first crosses have actually won prizes at our cattle shows as pure animals; so that it is perfectly clear a great improvement might have been effected at the outset by some measure of this sort. I doubt, therefore, whether the marked advance effected in the polled breed forms an

exception to the rule I am insisting on, namely, that we cannot very rapidly improve a race by mere selection from themselves, we cannot get animals to produce stock much better than either themselves or their ancestors. Any great stride will usually be effected by the introduction of some better blood, if such can be got.

THE SHORT-HORNS—BATES AND COLLINGS.

When we inquire into the history of the Short-horn breed, we find a similar method of procedure.

Thomas Bates tells us that the Dukes of Northumberland had cattle of this sort in their possession a couple of centuries ago, and that Sir Hugh Smythson, one of the ancestors of the family, paid the greatest attention to the breeding of these cattle, regularly weighing the animals, together with the food they ate, so as to ascertain the improvement made in proportion to the food consumed. This was more than a century ago, and prior to the time when Bakewell became celebrated as a breeder of live stock.

Bates's famous Duchess tribe is descended, he tells us, from this old stock of Sir Hugh Smythson. Bates got them from Charles Colling, who, he says, repeatedly assured him that they were the best cattle he ever had or ever saw, and that his first cow of this tribe was better than any he could produce from her, though put to his best bulls which improved all other cattle. Colling had bought her from the Duke of Northumberland's agent at Stanwix in 1784.

Such is Bates's account of the matter, and at any rate it is quite clear that Charles Colling, the great breeder of Short-horns, who first brought the race into prominent notice, took the utmost pains to find out the finest cattle in the neighborhood, and that he at length succeeded in gathering the cream of the best tribes that then existed in the North of England, and from this nucleus he developed his herd, to which, as to a fountain head, we trace all the best blood of the present day. By this means he availed himself of the previous care and skill which had for generations been bestowed by former breeders, and thus saved whole centuries of time; for improvement of any pure stock is, as I have already said, a very slow process.

One of the very best tribes in Mr. Colling's possession was got by him from Mr. Maynard of Eryholme, who had carefully bred them for a long time. It was the custom of the Maynards to bring 16 bullocks and heifers to Darlington market on the first Monday of March. The bullocks were from four to five years old, with fine wide horns, good bone, and very deep flesh, and were keenly looked out for year after year on the pavement opposite the King's Head. Mr. Thornton tells us that Charles Colling's farm-overser had previously been with Mr. Maynard, and some remarks of his led Colling and his wife to take a drive one fine day over to Eryholme. When they arrived, their attention was attracted by a fine cow

which Miss Maynard was engaged milking Colling offered to buy the cow and her calf, and after some haggling on both sides, the purchase was made for thirty guineas, and Maynard gave him a long pedigree of them, going back as far as the time of the murrain in 1745, which would show that their breeding had been carefully attended to, and recorded half-a-century before the *Herd Book* was thought of. Robert Colling is reported to have told Mr Wey that neither his brother's cattle nor his own were better than those of their neighbors, until they got these two beasts of Maynard. This same cow which was bought from Mr. Maynard was the grandam of Colling's famous bull Favorite, to whose blood almost all the best short-horns of the present day trace their lineage.

Colling, therefore, appears to have picked up all the plums he could find and to have started from the best stock that was to be got in his day; and all subsequent breeders of short-horns who have attained to any great celebrity have drawn from the blood of his famous herd. Bakewell, who seems to have been as skilful a breeder as Colling, nevertheless failed in producing so fine a tribe of cattle, probably because he began from a worse stock.

Breeds of Farm Animals for Hilly Regions.

Mr. W. S. Rand, of Lewis County, Kentucky, gives the results of his experience in raising cattle and sheep in different localities. In 1860 he removed from Mason County, which is comparatively level and of a limestone soil, to Lewis County, which is mountainous and its soil a sandy loam. In the latter he found the poorer grazing compensated for, in part, by the beneficial effects of pure, soft, running water, as contrasted with the deleterious effects of the hard and still water of the former. Finding in the county no other than small native stock, he procured a large short-horn bull, of pure blood. The result was that nearly all the native cows had to have needed assistance in calving, and in many cases both cow and calf perished. Moreover, the bull proved to be too heavy and clumsy for grazing on a mountainous region, and finally died in consequence of falls and sprains. A large short-horn cow met with a similar fate. Mr. Rand observed that the light Alderneys, and especially the light and nimble Devons, requiring less food and less travelling, as well as having less weight to carry about, would satisfy their wants by feeding a few hours, and then lie down and ruminate as long. Alternating in this way through the day at its close they would be plump and unwearied, whereas the heavier cattle, having to toil and climb all day in ineffectual endeavors to satisfy their larger wants, would look gaunt and wearied out. His conclusion is, that the smaller and nimbler species, particularly the red Devons, are the most profitable for mountainous grazing,

while the short-horns and kindred species are more desirable for fertile plains. He had a somewhat similar experience with sheep. With a view to improve the mutton and wool-bearing and fattening qualities of the very small but hardy, fleet native sheep in the county, he crossed them with South Downs with very satisfactory results. But an attempt to cross this improved grade with Cotswolds resulted in the same difficulty that occurred in crossing large with small cattle. The lamb, at the time of birth, was so large that in many cases both it and its dam perished. He claims, however, to have succeeded in breeding a flock of mixed blood, in which the best qualities of the South Downs, the Cotswolds, and the natives are united.

Convention of Short-Horn Breeders of the United States and Canada.

The following circular, of which copy is just received from a member of the committee, speaks for itself. Conferences of the character suggested seldom fail to benefit the parties in whose interest they are called. The Short-horn breeders of the United States and Canada are about as well able to take care of themselves individually as any body of men in the country, but an interchange of views on some questions, and an understanding as to the policy to be pursued in regard to others, are desirable, and may, perhaps, be had by means of the Convention. There are points connected with pedigrees, there make up, publication, authority, &c., &c., upon which full discussion, and, if possible, full agreement are needed. Differences of opinion in regard to some of these are not confined to the breeders of Canada on the one side, and those of this country on the other, but are common to individuals of both countries. What constitutes a thoroughbred Short-horn and entitles its pedigree to registry, is not yet settled authoritatively, but should be at the earliest possible moment, and when so settled, the rule should be scrupulously adhered to by the Editor of *Herd Book*, whether he be also the proprietor of it or not. This is mentioned as only one of the many subjects to which the attention of such a convention may be profitably directed. The circular is as follows, and we presume the parties addressed will generally respond:

The following resolutions were adopted by the Indiana Short-horn Breeders' Convention, held at Indianapolis, Ind., May 21st and 22nd, 1872:

WHEREAS, In view of the great benefit resulting to each and all of us, as breeders of Short-Horn cattle, during this Convention, by the free interchange of thought and pleasant relations, it is, therefore

Resolved, That it is the sense of this Convention assembled that great good would result from a grand National Convention of Short-Horn breeders of the United States and Canada.

Resolved, That we suggest the propriety of holding such Convention, at some central point, convenient of access to the whole country and recommend it to the careful consideration of all breeders.

Resolved, Also, that the Convention appoint a committee of three to correspond with prominent breeders, whose addresses can be ascertained, and if this should meet the approval of a large number, that said committee be empowered to appoint a time and place of holding such National Convention as seem best to the committee.

In accordance with the last resolution, the following committee was appointed, Claude Mathews, Clinton, Vermillion county; Gen. Sol. Meredith, Cambridge City; J. G. Kingsbury, Indianapolis.

Training a Heifer.

Cows usually become addicted to kicking when heifers, from being milked by abusive milkers. I have never seen an old cow become a kicker unless abused. Instead of cows being averse to being milked when giving a large quantity, I have ever found it the reverse. When pasturage is good, and cows come home at night with udders distended with milk, our "down east" cows seem grateful to have it removed. Milking a heifer for the first time requires patience, for they will almost invariably kick. In such a case put a broad strap around her body, just front of the udder, and buckle it up moderately tight, and as soon as she gets quiet (for she may dance around a little at first), take your pail, sit down and go to milking, for she is as helpless as a kitten. Do not attempt to use a rope instead of a strap, for it will not answer. This is a much better method than tying the legs, &c., as it does not hurt the animal in the least. A few applications of the strap with plenty of patience and kindness, will cure the most obstinate case.—*Rural Home*.

Buying High-priced Cattle.

The writer of "Ogden Farm Papers" in the *American Agriculturist* makes the following remarks in reference to the purchase of thoroughbred cattle:—A retired merchant, who pays \$500 for a cow for his lawn, and for the sake of Jersey cream for his coffee, commits a great extravagance, but a farmer buying the same animal to improve his stock for practical dairy purposes, makes a wise and prudent investment.

My own experience tends to show that the great sale of thoroughbreds and high prices is to practical farmers and not to 'wealthy' men. The latter class are fast learning that good grades or thoroughbreds without pedigrees are as good for their purposes and the farmers are learning equally fast, that while they can not disregard quality in making their purchases pedigree is the *sine qua non* of successful breeding.

How much Work a Horse can do.

At a meeting of the British Association at Dublin, Mr. Charles Bianconi, of Caspel, read a paper relative to his extensive establishment after which a gentleman stated that at Pickford's, the great English carrier, they could not work a horse more than ten miles a day, and wished to hear Mr. Bianconi's opinion on the subject. Mr. B stated he found by experience, he could better work a horse eight miles a day for six days in the week, than six miles a day for seven days. By not working on Sunday, he effected a saving of twelve per cent. Mr. Bianconi's opinion on this point is of the highest importance, for he has over one hundred horses working sixty-seven convalesces, which daily travel 4241 miles. It is also the result of forty-three years' experience. — *Scientific American.*

Thoroughbred and Full Blood.

The question as to the distinction between thoroughbred and full blood, although it has been much written upon, is not, in our judgment, sufficiently defined. Among the people they are generally used as synonymous terms, and really very few, if any, can give a rational reason why they should not be so used.

But as it is necessary in stock breeding that the same words should mean the same thing at all times and places, we beg to suggest:

1. That the term "thoroughbred" be used to define a registered animal, with a published pedigree dating back to such time as will insure the reproduction of itself.
2. That the term "full blood" shall mean only the result of a cross between two thoroughbreds of different strains, as Devons and Durhams
3. That "cross bred" shall mean the same as full blood.
4. That "grade" shall mean the result of a cross between a thoroughbred male and native female, and when there is not more than three-quarters of the blood of said progeny thoroughbred.
- 5 That "high grade" shall mean an animal in which more than three-quarters of the blood is thoroughbred.

Probably the only objection that will be made to the above is the second proposition, to-wit: "full blood." Our reasons for offering such a definition is that it is suggestive—carries definition with it. Among the royal (?) families of Europe the blood, in its absolute physiological construction, is supposed to differ from that of the people, and a mixture of the two, while it improves the latter, deteriorates the former; but the daughter of the queen of England can marry the son of William in Prussia, and the progeny of that marriage is still royal and full blood—nothing has been taken out of it. *Chambers's Encyclopedia.*

Veterinary Department.

Prevailing Diseases Amongst Horses.

During the spring and early summer months, a great many horses have been affected with diseases of the air passages and respiratory organs, varying from common catarrh to inflammation of the lungs and pleurisy, and in many cases the disease has assumed a typhoid form. In nearly every case there has been great debility and languor; the animal becoming extremely weak and entirely unfit for exercise. Where the disease is accompanied by low fever the symptoms are well noticed, the horse breathes heavily, shown by flapping of the nostrils and a quick movement of the flanks, the mouth is hot and dry; the pulse quick and weak, varying from sixty to ninety beats per minute; the ears and legs are alternately hot and cold; and the animal has a severe hacking cough, easily excited by slight pressure on the throat, as in swallowing; the bowels are active, matter is discharged freely from the nostrils, of a yellowish white color, and in other cases of a brownish red; showing that the lungs and bronchial tubes are severely affected. The breathing is very much increased during the heat of the day, or if the horse is put in a close stable with other horses a significant symptom which should not be lost sight of in the treatment of this type of disease.

The sufferer seldom lies down, but keeps standing. When walked out the weakness can be readily noticed by the dull eye, languid step, and loss of nervous influence. The appetite is almost gone and for days the poor animal will scarcely eat enough to sustain life.

In this class of disease although the symptoms are very alarming, and the patient soon becomes very much reduced, yet the mortality where a rational and careful mode of treatment is pursued is not great, but where depletion is largely practiced either by bloodletting or by the incautious use of purgatives a great many cases prove fatal.

In the treatment of such cases, the animal must have plenty of pure air; therefore it is often more desirable during the warm weather to turn the horse out or place him in an open shed, than to leave him standing in a close stable where he breathes impure air. Exposure to the hot sun should also be avoided. The strength must be supported by encouraging him to take a little nutritious food, and where the appetite completely fails, stimulants must be freely given, as good ale, gruel, &c.

The preparation of ammonia and potassium, are also useful, but their administration must be regulated according to the urgent symptoms presented.

We have merely endeavored to point out a rational and general course of treatment to be adopted, but in all severe cases the services of a qualified practitioner should be immediately obtained.

Straw vs. Sawdust, for Bedding Horses.

A correspondent of the Turf, Field and Farm lately made some, as they seemed to us, very sensible observations on the use of straw and sawdust as material for bedding horses. The latter, especially in cities, is in very common use, partly because it is more cheaply and easily obtained than the former, but if what the correspondent referred to says be true, it is dear at any price and horse owners should be apprised of the fact. He goes on to say: It is about four years since my particular attention was directed to the great advantages of straw as a bedding for horses during a season's training in Belgium, and the learned physiologists of the day, including the late Sir Benjamin Brodie, Sir James Pagget, Professors Varley, Simpson, Spooner, and others equally competent to judge, bore such testimony as to the injurious effect of the chemical changes taking place in moist sawdust, that little scientific doubt can remain as to the practical wrong in using it, where straw of any kind can be got. As this matter seems not to have been commented upon in America by either veterinary surgeons or trainers of horses, I humbly crave permission to mention a few physiological and chemical facts dependent upon a sawdust as a bedding.

In the first place, it will be admitted that where there is wet, disintegrated vegetable matter (especially in such small particles as sawdust) chemical changes take place very quickly, and certain acids are formed, such as tannic, sulphuric and acetic, which are not only in themselves injurious to the horny substance of horses' hoofs, but create still further chemical changes with other agents so that an unhealthy miasma exudes and pulmonary and gastric diseases are caused. But the wet sawdust is not alone faulty; dry sawdust is equally hurtful, for horses when snorting, with their heads down, cannot fail to deposit small particles in the air passages of the lungs by inhalation nor can they escape the dust falling upon the conjunctiva of the eye—in the one case setting up inflammation of the lungs, in the other an inflammatory condition of the eye and its coverings, commonly called ophthalmia.

I do not intend now to expatiate fully upon the many objections (indisputable) to the use of sawdust as a bedding. My object is to call the attention of the experienced veterinary surgeon and trainer that the grave importance of such a subject should no longer go un-commented upon. My experience (so far as questioning those using sawdust is concerned) convinces me that nothing can be adduced in its favor beyond temporary economy, which too often terminates in almost endless expense, and I cannot believe that sawdust will be continued to be used in stables where the interior economy of a training establishment is understood.

Straw which is equally soft and much warmer upon which chemical changes take no

longer to mature, and when matured are harmless (although a scarce and expensive bedding) is far preferable, because "condition," the main-spring of success, is greatly facilitated by its use, assisting as it does in many functional irregularities, and even when straw is acted upon by urine, a harmless drug is formed which passes off in phosphate leaving but an armonial fume objectionable to neither man nor beast.

I am acquainted with many racing stables in England and other parts of Europe, and can say without fear of contradiction, that where sawdust was generally used it is now vigorously condemned. Opinions may differ, but seventeen years' experience has taught me to use straw or nothing. There are other good reasonable objections to sawdust, but these I have mentioned are so evident that it would be useless to make further remarks

The Prevailing Disease among Cows.

The prevailing disease amongst cows alluded to by Latona, appears to be mammitis or inflammation of the udder, and accompanied by a rheumatic inflammation of the joints, very likely arising from the sudden changes of temperature.

In the treatment of these cases the cow should be sheltered from the hot sun or from wet, and the udder fomented several times a day with tepid water, and afterwards rubbed with the following lineament.

Tincture of camphor, - four ounces.
 " opium, - - - one ounce.
 Liquor ammonia, - - - one ounce.

A good dose of purgative medicine should be given when the disease is first noticed; and after it operates, give Iodide of Potassium in doses of one drachm morning and night.

Different poisons give rise to different symptoms, but it would require a very long treatise to describe the various poisons and their actions on the horse. We will endeavour so far to comply with the request of Latona.

Corrosive Sublimate, gives rise to severe intestinal irritation, colical pains, a quickening pulse, short and difficult breathing, great weakness, the animal lies down and suffers great pain, and death may occur in from one to four days, according to the quantity of the poison taken.

Albumen is a good antidote for corrosive sublimate and can be easily procured in the white of an egg. Milk and flour gruel are also useful in counteracting the poisonous effects of the drug.

Rod Precipitate somewhat resembles corrosive sublimate in its effects but is not quite so active.

Strychnia is a most potent and active poison, and causes violent twitching of the muscles with tetanic spasms, and convulsions, frothing at the mouth and laboured breathing, causing death by asphyxia or from exhausting the irritability of the heart. This poison is so powerful in its action that there is no reliable antidote. The preparation of ammonia and other stimulants are useful, and a decoction of tobacco is also recommended.

The Dairy.

The English Cheese Trade.

The London Milk Journal for June gives some interesting statistics in regard to the cheese and butter trade of Great Britain. These statistics are furnished by the Government, and give the imports of the first four months of the present year, 1872, as compared with those during the same period in 1871 and 1870. As American dairymen are interested in knowing how far England is supplied with the dairy products from other countries, we reduce the figures to our own standard weights and gold currency, that they may be more readily comprehended.

During the first four months of 1872, or, up to May first, there were imported into England 13,309,744 pounds of cheese, the value in gold being put at \$1,687,555. During the same period in 1871, the imports were 25,678,128 pounds, valued at \$3,339,625. During the same time in 1870 the imports were 15,460,816 pounds, valued at \$2,342,235.

Thus it appears that the imports of cheese into Great Britain were about two millions of pounds more in 1870 than in 1872, for the first four months of the year, while in 1871 they were nearly double what they were in 1872, during the same time. But what will strike American dairymen rather forcibly in these statistics, is that in 1872 the cheese cost the English only a trifle above 12½ cents per pound, while in 1871 their imported cheese cost a little over 13 cents per pound, and in 1870 over 15 cents per pound.

As a rule, so far as American cheese is concerned, the prices during the four months named are generally higher than for any other season of the year, and although the first four months in 1871 show that the cheese imported into England cost a higher price than for the same time in 1872, the low prices during the balance of the year 1871, would probably put the cost of cheese imported into England considerably below the price named for the four months of the present year. The English must regard their cheese trade this year as opening at the most favorable rates. By their own showing the cost has been only a trifle above a York shilling per pound, during a third of the year when the highest prices prevail. For the rest of the year they can reasonably expect lower figures, so that 1872 promises to them a cheaper cheese than they have had for a long time. Whether American dairymen will be so favorably impressed with the situation as this exhibit indicates is another question. But the fact that England starts this year in her cheese trade with a balance of about a half cent per pound in her favor over 1871 is significant, and may well set our dairymen thinking.

Comparing the value of the cheese imported into England for the first four months of the years, 1870, 1871, 1872, respectively, we find the drop in prices last year was about two and one-half cents below 1870, and now this year we have a further decline of half a cent below 1871. The imports of Dutch cheese, it is true, are figured with American in the above estimates, but as prices on Dutch cheese have been remarkably uniform for the last few years, the difference in rates during the seasons named may be credited, we think, for the most part to the American product. As American cheese is supposed to be improving in quality and in handling capacity from year to year, it is not easy to reconcile the falling off of prices on American without a corresponding decline on the Dutch brands. But perhaps some of our commercial men can explain the anomaly.

Setting Milk—Butter for a Quart, etc.

E. R., in the *Country Gentleman*, discourses on this subject, and the experiments connected therewith will be of interest to our readers. There are several topics of interest which have been written from time to time in the *Western Rural*, and among them the quantity of milk for a pound of butter. E. R. says: Last October, at our annual exhibition, when I made the statement that I had made a pound of butter from nine quarts of milk from my Alderney heifer, Topsy, the chairman of the committee received the statement with some caution, informing me that he had never heard of a pound of butter being made from less than ten quarts of milk. I have made butter from grade Alderneys repeatedly when it took twelve quarts to make a pound of butter, and I consider this milk of fair, ordinary quality. In cases where sixteen quarts are necessary to make a pound of butter I should consider those cows best adapted for selling milk or making cheese. Since I made my trial, a neighbor of mine, a member of our Farmers' Club, made a trial of his Alderney heifer, now three years old, and fresh with her first calf. The result was, she gave nine quarts of milk per day, and made seven pounds of butter in seven days. There is another case in which it has been demonstrated that nine quarts will make a pound of butter, but in both these cases the milk was of very superior richness, and might readily have been sold in our large cities for cream. I have recently seen statements in our agricultural papers—one in which fifteen quarts made two pounds of butter; another in which six quarts produced one pound of butter, and latest and most astounding of all comes the statement that twenty-two quarts of milk produced four pounds and four ounces of butter, which is only a small fraction over five quarts of milk to each pound of butter. Without doubting these statements, I can only say that I would like to see such milk. If five quarts of milk

will make a pound of butter, it must contain ten per cent, of its weight in butter.

Our club appointed a committee to experiment in relation to deep and shallow setting of milk. The first series of experiments have all resulted in favor of shallow setting. The more surface exposed to the light and air, the better. These experiments go to show that it is better to set milk three inches deep than five, that it is better to put five pounds of milk in a pan, than eight pounds. During the month of January of this year we kept our milk in the cellar, and it did not get fit to skim for five days a week. Testing the temperature with the thermometer, it marked 40°. A stove was procured and placed in the milk room, and endeavors were made to keep up a uniform temperature of 60°, as I had so often seen that stated in our agricultural papers as the proper temperature for keeping milk, in order to obtain the most cream, and make the most and best butter. We soon found this temperature of 60° entirely too high. The milk would get thick in less than forty-eight hours, and the cream assume a wrinkled appearance, as though it had been scalded. We now keep the thermometer at 56° during the day, and at night it sinks to 52° and 50° according to circumstances. Our experience so far is, that 56° is nearer right for the milk room than 60°. We intend trying setting milk twelve and sixteen inches deep, as many consider even five inches shallow setting, but that is as deep as can be set in the ordinary tin pans in use in this locality, and holding about six quarts or twelve pounds of milk. My present opinion is that four quarts of milk, and four inches deep, is the proper quantity and depth for one vessel.

Effect of Electricity on Milk.

Mr. N. A. Willard, of New York, in his address before the Northwestern Dairymen's Association, gave the following interesting facts:

Mr. Andrew Cross, the celebrated English experimenter, considered that the roots and leaves of plants were in opposite states of electricity. Some of his experiments in this direction are very interesting. He cut two branches from a rose tree. They were as nearly alike as possible, with the same number of buds, and both equally blown. An arrangement was made by which a negative current of electricity was passed through one, and a positive current through the other. In a few hours the negative rose dropped and died, but the positive continued its freshness for nearly a fortnight; the rose itself became full blown, and the buds expanded and survived an unusual length of time. Again, he was able to keep milk sweet for three weeks in the hottest weather in summer, by the application of a current of positive electricity.

On one occasion he kept fishes under the electric action for three months, and at the end of that they were sent to a friend, whose

domestic knew nothing of the experiment. Before the cook dressed them, her master asked her whether she thought they were fresh, as he had some doubts. She replied that she was sure they were fresh, indeed, she would swear that they were alive yesterday. When served at table, why a quarter like ordinary fish, but when the family attempted to eat them they were found to be perfectly tasteless: the electric action had taken away all the essential oil, leaving the fish unfit for food. However, the process is exceedingly useful for keeping fish, meats, &c., fresh and good for ten days or a fortnight.

Now, this is consistent with our observation and the facts known to every one in the habit of handling milk. When the condition of the atmosphere is in a negative electrical state, or shows a deficiency of positive electricity a state of weather which we designate as sultry, close, muggy, and the like, there is always difficulty in keeping milk sound. Even in good, healthy milk, the fungus germs common to all milk increase and multiply with great rapidity, producing the common lactic acid fermentation or souring of the fluid; but in case fungi from decomposing animal or vegetable matter come in contact with the milk, rapid decomposition takes place, and we have rotten milk, putrid odors, and floating curds. The exposing of such curds to the atmosphere as well as the aeration of milk to improve its condition are both philosophical, because these minute organisms of fungi are affected by the oxygen of the air, which checks their development and multiplication.

The influence of electrical action is a question entirely new to the dairy public, but it is one concerning which I think some useful suggestions present themselves for our consideration. When the electrical equilibrium is disturbed, or when the state of the atmosphere indicates a preponderance of negative electricity, we are all made aware of the fact by its depressing influences. At such times it is important that we take more than ordinary care in the handling of milk; that it be kept out of harmful odors; that attention be given to its aeration and such treatment be given it as shall be inimical to the growth and development of fungi. And again, the fact that milk may be kept sweet a long time in hot weather by electrical action will offer a very important suggestion to inventors in the preservation of milk, and perhaps in the improvement of cheese factories. I believe that we are only on the threshold of the cheese making art, and that as we become better acquainted with the laws of nature and their application, great progress is yet to be made in every branch of dairy husbandry.

HOLDING UP MILK—A writer in the *American Agriculturist* says he has found his cows will always let down their milk when inclined to hold it up if he gives them some salt to lick.

Pastures and Butter.

The local requisites for the manufacture of good butter are air, wholesome water, and a sufficiency of sweet, nutritious herbage. Fresh, rich, juicy feed will enhance both the quality and quantity of milk and butter.

Cows, to yield the best returns, should always have ready access to plenty of good water. This is almost indispensable, for it is impossible to make good butter without a good supply of pure water. Those having pastures where the water falls in a dry time have probably observed how rapidly their cows shrink in their milk when water is scarce, and the animals do not get their usual supply. When we consider that about eighty-seven parts of the constituents of milk are water, a cow that gives a large quantity of milk would require a good supply to keep up a uniform flow of milk. It would be far better to induce them to take all the water they will, than to have them put upon short allowance. Inducing cows to drink large quantities of water will increase the flow of milk certain: but to what extent the quantity of milk may be increased without detriment to the quality, by inducing the animal to drink an abundant supply of liquid, I am not prepared to say. But I am satisfied that milk of good quality may be increased by this method.—*Ex*

Seventh Annual Report of the American Dairymen's Association.

The Seventh Report of this Association (for 1871) contains about 180 pages of matter, and will be found of great value to those engaged in this rapidly growing interest. A catalogue of the various Cheese and Butter factories in the United States and Canada shows that there are now about 1500 of these factories in operation, one of them taking the milk of 1250 cows, several others from 1000 to 1200, while the average number of cows per factory is probably about 500. Of these 1500 factories, about 1000 are located in this State alone. The others are mainly scattered through Ohio, Illinois, Wisconsin, Vermont, Massachusetts, Michigan, Pennsylvania and Canada, while Iowa has four Kentucky and Minnesota each three, Nova Scotia two and Virginia, North Carolina, Tennessee, Kansas, Connecticut and Indiana each one. The rapid growth of the dairy interest is a most auspicious omen for the future prosperity of the farmers as a class.

The subjects of the addresses at the last meeting of the Association will give dairy men some idea of the value of this report. They were as follows:

"The Practical Value of Chemical Analysis of the Dairymen's Raw Materials, and the products of his Manufacture," by Prof. Geo. C. Caldwell, of Cornell University; "Condensed Milk Manufacture," by N. A. Willard;

"Poison Cheese," by L. B. Arnold; a short speech by ex-Gov. Seymour, Pres. of the Association; "The Lesson of my Experience in Cheese Making in 1871," by L. L. Wigh.; "The Manufacture of Butter in Creameries," by H. Cooley Greene of Pa.; "the Standard of Excellence in Cheese-Making," by T. D. Curtis; "the Commercial View of the Dairy Interest," by M. Folsom; "the Winter Food of Dairy Stock," by Harris Lewis; "Root Culture and Steaming Food" by J. B. Lyman; "Is it Policy to take any Cream from the Milk before making it into Cheese—and if so, How Much?" by Wm. Blanding; and "Dairy Farming in Connection with Grain Raising," by S. A. Farrington; In addition there were discussions on "Airing and Cooling Milk," "Preparing Rennet," "Sowed Corn as a Soiling Crop," "Root Culture." "Steaming Food for Cattle," "Sunday Cheese Making" and "Butter and Cheese from the Same milk," with reports on a "Justice Apportionment of Milk," on an "Experimental Dairy Farm," "Abortion in Cows," "Annatto," and various factory reports in detail. Some valuable illustrations are also given, one of them a plan for a Condensed Milk Factory, another of a model Creamery; a third is a Microscopical View of healthy and diseased Cream, Milk, Blood and water. Extracts from some of these papers and discussions we shall make hereafter.

Important to Dairymen.

The Lorain county *News* tells how a dairyman in the vicinity of Oberlin managed to keep a cow from flirting her tail in his face while milking:

"One rainy evening Mr. Jones as usual went out with pail and stool to milk the cows. The animals were not in the cleanest condition, and when the wet and muddy "narrative" of one was provokingly lashed across his face once or twice, Mr. Jones got his "dander" up. He was mad, and he vowed he would fix that cow so that she wouldn't lash him for once at least. So he carefully tied her tail to his boot strap.

Everything went on smoothly for a time and Mr. Jones congratulated himself on the success of his experiment. He was feeling pretty well, and perhaps would have sung a hymn or psalm if he had known one, when the cow took a notion to lash a fly that was biting her. Mr. Jones chuckled some when he felt the pull at his boot strap, but his chuckling was soon cut short, for "bossie" finding she could not touch her tormentor suddenly started and as Mr. J. was not prepared for such a demonstration he was upset with the contents of the pail distributed over his person. The cow stopped for a moment, but in that time our hero had gained his feet; a moment after he was seen with his hand on the hip of the cow making the tour of the farm yard with prodigious hops upon one foot, the other being suspended by the boot strap which was still attached to

the cow's tail. At every hop he would ejaculate "so boss, so boss," but "boss" didn't "so" worth a cent, until, almost used up, the boot attachment suddenly broke, and Mr. Jones was free. He returned to the house a wiser if not a sadder man, and so far as we know has never repeated his novel experiment."

The Butter Trade.

Few people have a just idea of the immense amount of capital invested in the butter trade. According to statistics the dairy product of the United States aggregate in value \$600,000,000 annually. From official sources, the total sales of dairy products in the United States for 1870, from 8,935,337 cows, was; Butter, 514,092,683 lbs., at an average of 30c. per pound, or \$171,364,236 cheese, 53,492,153 pounds, exclusive of factory product, statistics of which are not at hand, at an average of 45c. per pound, or \$802,382,29; milk, 235,508,599 gallons, at an average of 30c. per gallon, or \$70,652,879,70, making a grand total of \$242,819,488. This is exclusive of the enormous amount consumed by producers that cannot be reached, as it goes into consumption without sales or account, and can only be estimated. This, with the increase of production since 1870, is currently estimated to make up the balance of the \$600,000,000, which, without statistics given, might seem too high. The butter trade in New York centers in Orange county to a considerable extent, furnishing that city over half a million pounds during the season of six months. Probably there is not a trade of the same magnitude that is so wholly without organization as the butter trade and has so many errors and abuses.

Advices from the wheat-growing departments of France speak with considerable confidence to the probability of an abundant harvest, now that bad weather has been followed by a warm and stimulating atmosphere.

Kicking Heifers.

(To the Editor.)

MR. EDITOR,—I observed a correspondent in your paper some time ago relating to the breaking in of kicking heifers, from a gentleman that was obliged to fat one which had been given up as incurable. I have had some experience in that line. This year I had a fine heifer, in all save the kicking. I tied her in the stable at milking time, and fastened the unruly foot to a ring in rear of stable, until she would let me milk her quietly without the rope. I then took her to the yard and used the rope there, fastening her to anything that might be at hand, until she finally gave up, and is now as quiet as any one in the yard.

I never used the whip, but treated her as kindly as possible.

I think there are but few cases that might not be cured with proper care and perseverance.

Yours, &c.,

A. FARMER.

Brighton, July 20th, 1872.

Apiary.

Progressive Bee-Culture.

A correspondent of the *Country Gentleman* thus states the old and new in bee culture:

The commencement of true and successful bee-culture dates with the use of moveable comb bee-hives; and it is only a few years since such culture began to be rapidly extended in this country. The importation and breeding of the Italian bee marks the second era. This feature did not assume anything of a general character until about five years ago; but since that time, great progress has been made. The third era is marked by the invention and use of the honey extracting machine, and it may be said that the present year is the time of its coming into somewhat general use.

These three steps are all very important, and each marks a distinct advance in bee-culture. Previous to the introduction of moveable combs, it may be said there was no such thing as *bee culture* only *bee-keeping*. Farmers hived their swarms into boxes or gams, and set them beside the parent hives in the long row. No special care was bestowed upon them. If queens were lost, as they often were, the colony inevitably dwindled away; and as the worms generally took possession, the loss of the colony was attributed to the depredations of the bee-moth. But now if queens are lost or become infertile, prolific mothers are promptly supplied and the colony saved. Clonies are not permitted to swarm to excess, and the increase is almost completely controlled by the bee-master. A healthier, hardier, more industrious, and more vigilant race of bees is cultivated; the moths are no dread, for the bees are always their masters. No bees are brimstoned, but an abundance of honey is taken in boxes or frames, and the industrious insect is saved.

The extractor next comes to our aid, and the combs are emptied of their honey, and then returned to the colony without injury, to be again filled and emptied, and refilled and emptied, till hundreds of pounds of the purest nectar are taken from a single colony.

And as though perfection could never be reached, we are now told that the annual increase of stocks can be successfully made in the Fall, after the honey harvest is over, and these divided colonies wintered with less consumption of honey, and with greater increase of bees, than by the original method indicated by the instinct of bees. And thus, as it were, we may get the benefit of increase a whole year in advance of its natural occurrence.

The use of woollen gloves when operating among bees is objectionable, as everything rough or hairy has an extremely irritating influence on bees.

Poultry Yard.

Carbolic Acid and Poultry.

All amateur and poultry breeders are but too well aware that parasites are the pest of poultry houses, more especially in towns and cities where poultry are kept in confined limits. Without, as the owner thinks, any real cause, the fowls begin to droop and look sickly, and, after a while, one by one die off. He then becomes alarmed, examines them, and finds them covered with parasites; he looks into his fowl house, and then examines the cracks and chinks in the boards, and finds them filled with insect-living insects; he is astonished; he cannot account for it; and then the question arises in his mind, "How can I get rid of them!" Scores of times within the last few months has this question been asked of us, and our answer invariably has been use carbolic acid. But how to use it is a matter of importance. There can be no doubt about its efficacy, but it becomes every one to exercise care in handling it. The acid is sold by all druggists in its crystalline and liquid form. In crystal, it dissolves in twenty times its weight of water, that is, one ounce of the crystals require twenty ounces of water to dissolve them. Thus dissolved, it is entirely too strong for ordinary use.

Dr. Emerson gives recipes for preparing this powder for disinfecting and other purposes. As a whitewash for walls, for protection against insects, bugs, etc., he says: "Put three ounces of carbolic acid into twelve quarts of lime water and whitewash the walls of the poultry house well with this wash, and no living parasite will then be seen—their death is inevitable. A weak solution may be made to wash fowls in; one part of the acid to sixty parts of warm water; let it cool; and then dip the fowls in until the feathers become thoroughly wet and the solution reaches every part of the body. Afterward place the fowls on clean, dry straw, where the sun will reach them, until they are dry. Another form in which it is recommended to use it as a soap. The soaps are for sale by various manufacturers, and have a high reputation for cleansing animals and the cure of skin diseases. A mode of making this soap is as follows: Dissolve three pounds of common bar soap in hot water; add two to four ounces of carbolic acid, according to the strength desired. Allow to cool as usual in making hard soap. As these preparations may be bought ready prepared, and as carbolic is by no means a safe article to keep about the house, we would advise persons to buy rather than to attempt to make them, except in case of whitewash, when they must get the pure article and dilute it." — *Canadian Veterinary Journal*.

Correspondence.

Notice to Correspondents.

The columns of the "Canada Farmer" are open at all times to liberal discussions upon any purely agricultural subject, and our readers will receive, in our columns, answers to any practical or sensible questions upon farming matters.

THE NEW YORK STATE FAIR will take place on the 30th September, and October 1, 2, 3, 4. The premium list is very comprehensive and liberal, and we have not a doubt but that it will prove as great success as any of its predecessors. As we have before mentioned, Elmira is the point selected for the exhibition this year. The general classes for premiums are as follows: 1. Cattle; 2. Horses; 3. Sheep, Swine and Poultry; 4. Implements and Machines; 5. Farm Produce; 6. Flowers, Plants, Designs and Fruit; 7. Miscellaneous. It is worthy of remark that under the head of horses, we find premiums for everything *except for speed*.

"A Word to Young Beginners."

To the Editor.

SIR,—If I should be allowed to speak on behalf of that class to whom in your last issue you kindly devoted an article under the heading, "a word to young beginners." I would say it is a subject fraught with interest, not only to us as beginners but also in its bearing on the prosperity of our Dominion. Care bestowed on the young yields a two-fold interest; and as that which begins wrong commonly ends wrong, it is wise to use every endeavor to secure a good beginning. Nor should this be lost sight of, successful farmers are to be made.

It has too long been supposed that farming is a profession which does not require or repay the exercise of the brain. The popular idea I fear is that it is an occupation which gives very extensive play to the bone and muscle—good for developing a strong and robust frame, but affording little scope for the exercise of the brain. We must grant that in a new country like this—a country on which our fathers saw standing the towering monarchs of the forest, and under whose own strong arms these forests fell—there is a reason why such a belief should possess the popular mind. With our fathers it was a work of the muscle more than of the head. They but tickled the soil and it laughed in golden harvests; to them it gave and gave liberally at but trifling cost, but the overtaxing of its sources to which they unwillingly subjected it by injudicious cropping has now reacted, so that to realize half the result we have in many instances to double the outlay.

But here your correspondent, and he believes many others, while agreeing with you, not only, in the necessity of an education, but in the course of studies which it should embrace, is met with difficulty which we would be pleased to have you take up in some future issue of the C. F. viz., the means of obtaining this knowledge.

There are many who would gladly devote a year to the study of the several branches you named, if there were any place where such a course was to be got; yet even were there an Agricultural College at which a knowledge of these branches could be acquired, the item of expense would to a large number of us still present an insuperable barrier. Therefore I think, home or self-culture must for the present be that course most largely to be pursued. I am certain there are many, who though not able to meet a College bill, are capable of diligent and self-denying efforts in any direction which would lead from ignorance to knowledge.

By a few progressive hints in a future issue in the direction of your above-mentioned article we hope to profit, and in a measure fit ourselves to take place in the ranks of one of the noblest of professions; were writing my hobby I would be apt to send to you Mr. Editor for your consideration a remonstrance on a point or two touching Canadian Agriculture.

A FARMER'S SON.

N. Dumfries, March 25th, 1872.

NOTE BY ED. C. F.—The education that our correspondent requires we hope will be placed within the reach of the sons of any well-to-do farmers by the contemplated Agricultural College for Ontario. Self-culture and home instruction may be obtained by the taking of one or more family papers, especially for a farmer by an Agricultural paper, and generally by the cultivation of any refined tastes that may from time to time shew themselves among the members of the family.

Education of Farmers.

To the Editor.

SIR,—On conversing with a gentleman a few days since on Agricultural and farming topics generally, I find that a great evil is likely to result to the farming interest of Canada by a class of gentlemen from the Old Country, who like many others, "mistaking their foot," come out here and settle down as farmers, and for want of the proper channel in which to direct the overflowings of their educational powers take up agriculture for their theme and through the medium of the CANADA FARMER, and many other excellent publications, sow broadcast throughout this Country and United States, a lot of theoretical trash which tends to do a great deal of mischief to the farming interest generally, and for this reason, viz., farmers as a class, (and I say this with all due respect), are not generally very highly educated, consequently many of them are as likely to adopt the unsound views of the mere theorist, as the more sound ones of the thorough practical, and scientific farmer, and writer, and it is to warn my brother farmers against this fatal error that I have ventured these few remarks.

Let them study carefully every article and letter, on Agriculture they read before making a practical application of either, taking pains to ascertain who, and what the writers are, that they may be enabled thereby to weed out the mere theorist, and writer for hire, and adopt the views of the real practical farmer.

In a country like Canada, where the seasons are so precarious, and so short, scientific farming, and a thorough knowledge of Agricultural Chemistry, is I think indispensable, and altho' in many instances, every effort may prove abortive; the general result would be very beneficial.

A PRACTICAL FARMER.

If you will allow me a small space for these few remarks I shall feel obliged.

Our staff are all gentlemen of practical knowledge in their respective departments.

We shall however be glad to receive any practical correspondence from "a practical farmer."
Ed. C. F.

"The Canada Farmer."

I have now been a subscriber to the "CANADA FARMER" for seven years, or since its birth under its present title, and I was considering tother day whether my one dollar a year or interest at 10 per cent. on \$10 capital, had brought me in its equivalent in value.

In the first place indirectly it has led me into a position upon the staff of an Agricultural paper which brings me in quite a little addition to my income.

One year we had a very dry spell about the season for sowing turnips and the "fly," "Haltica Memora" was playing frightful havoc in the crops. I turned up piles of the C. F. and from them I learned to apply hen manure and water to my young crops. The consequence of such an application was nothing less than the salvation of my turnip crop.

Another year I read of the great benefit of petroleum upon the woodwork of implements; I can hardly say how much that knowledge has saved me in several years. And so on through every year something is learned of practical value, the mind is stocked with the wisdom of others, and we have in the course of a few years, a series, of theories, practices and actual experiences amongst which we can by reference, find useful information, upon almost any point that may arise in the farmer's daily avocation.

As connected with the Agricultural press I often receive questions from correspondents which have been answered time and again most fully in the columns of Agricultural papers. Thus plainly shewing the amount of information which may be gained by reference to back numbers of such papers as out home institution, "THE CANADA FARMER."

"CANADA."

Cultivation of the Swede Turnip.

To the Editor.

SIR,—As I have noticed from time to time, a great deal of discussion concerning the cultivation of the Swede turnip, and with regard to the best mode of taking them up, in the FARMER. I take the liberty of giving the mode adopted in this locality, which renders the operation, both simple, and expeditious. Take a round log of wood about 10 or 12 inches in diameter, and 8 or 9 feet long (hemlock does very well), attach a piece of chain to each end, making a notch for the chain round the log about a foot from each end, meet the two pieces of chain at equal length, and attach to the double whiffletree by means of a clevis, drive your team across the drills, the log will drag the turnips all out; then it is best to throw them into heaps, then into the waggon or cart, and if the cart is dumped at the outside of the root-house, and the turnips thrown in by hand it will be all the better, they will then be entirely free from dirt, so that they keep much better. Before using the log the turnips require to be topped; this is done with good sharp hoes; with a little practice a man can strike to a hairs breadth.

A team with the log will go over a ten acre field in a day; with me there is no crop so easily harvested as the turnip. This plan has been in use for the last four or five years in this neighborhood, and I would recommend it to all turnip raisers

Yours,
D. G.

For the Young Folks.

A BOY'S LETTER FROM NEW JERSEY.

To the Editor.

SIR,—Father takes your paper, and we all think it is a right smart paper, but you do not print a boys' column. We wish you had part of a page for boys and girls; and Father says I may write a few lines to you if I will write plain, and good sense.

We live away down in the Southern part of New Jersey, nearly one hundred miles south of New York City, and near Cape May. There are all sorts of Farmers down here; some of them can hardly make a living out of their farms, and then again others make lots of money. Most money is made out of fruit raising of all kinds. Some farmers have 3000 grape vines; our next neighbour had 45 girls picking blackberries at one time; he pays the pickers two cents a quart for picking. Some girls that are right smart make two dollars a day. We raise tobacco, peanuts, water-melons, cucumbers, pears, peaches, grapes, and all other kinds of fruits. Father says your country is too cold to grow nice fruit, except apples. Then we dont have snow down here, except at odd times, and we can plough

and plant trees almost all winter. In the first week of December we were ploughing all day till the rain came on in the evening. The little grey-birds, and robins, and blue-birds stay here all the winter, but in summer they go away. Father says they go up into York State: I wonder if they go as far as Canada. If some of the Canada boys will tell us all about their country and about their birds and fishes, I will tell them about the great big porpoises that swim in the ocean at Cape May; they look like great big pigs jumping about in the water; and about the crowds of men and women that dress up and go in swimming. Some of the dresses look awful. Men put up shanties on the beach and hire out the clothes. And I can tell them about the way we farm down here, and the crops we raise, and where we sell our stuff, and how we often get cheated in New York, and how we make wine, and about our Jersey cows, and goats, and rabbits. We have no fences here, and no whiskey shops. I will tell you why another time if this letter is printed.

CHARLEY.

Vineland, N. Jersey.

NOTE by the Ed. C. F. The above has been held over for some time.—We would correct our young friend's ideas about the paucity of fruit trees in Canada, but on consideration would rather leave it to some of our Canadian boys to answer "Charley" through our columns.

To the Editor CANADA FARMER,

SIR,—In the "Canada Farmer" you avoid as far as possible all articles of a political nature; but as this question peculiarly affects the Canadian farmer, we would shortly consider it as affecting our own class.

Are we protected? we are not—but rather we build up our manufacturers, and out of our own pockets we help to amass fortunes for them—we give them the chances of making such profits as enable them to pay great and almost extravagant wages to mechanics, so that we as farmers cannot obtain labour at a rate to carry out successfully the operations upon the farm—while we receive no corresponding increase of value for our products, which are entirely governed by the foreign markets.

Do not our wives, when they go shopping, flock to the cheapest stores; then why not make Canada a store, at which the nations of the world can compete on equal terms, and thus shall we obtain the choice of cheaper and better clothing, implements, &c. We now pay 25 per cent. extra on all clothing imported, or in other words, when a farmer buys four pairs of boots for four children he pays, what, were it not for protection, would well supply five children.

The *prima facie* difference is 25 per cent., but as a matter of fact, duty throwing so many obstacles in the way of importation, the difference is very much greater.

It is said that protection builds up a home market, to this we answer the home market in Canada for farmers' products, amounts to a mere nothing.

Supposing we had free trade, we should build up large importing houses, and what has made Montreal and Toronto the two best markets in Canada? why, we answer, without hesitation, *Importation*,—and with *Importation* is built up a shipping trade; when vessels come into Canada with imported or manufactured goods they must return with exported or farmers' goods, i.e. essentially grain, which necessarily will reduce the freights, and as a natural sequence increase the value of grain, at the farmer's door.

Look at our Agricultural implements; they say we get them cheaper than we did years ago—such is true, but for this reason; in those days there were few well-to-do farmers, and there was no demand for such implements:—there is now a daily increasing demand, and we can get our Implements cheaper, because more can be sold; how much cheaper then could we have them if duty was cut off.

Manufacturers say, that farmers used not to be able to get cash for their produce, but we can tell them that that was solely owing to the inferior means of transit, to the fact that the removal of produce was much more expensive than now, so that in its cost, the market price in Europe was eaten up. Cut off our means of transit to day, and what value would we receive for our products? Could the manufacturers consume all the wheat that we produce? far from it; the production of grain has increased very much more rapidly even than have the demands of manufacturers' hands, and were our means of communication cut off from Europe and America, we should be in a worse box than ever.

Bring our markets down to only home consumption and we question whether our wheat would bring 25 cents per bushel in Canada. Why did our wheat fetch over \$2 per bushel during the Crimean war, was it owing to the wants of our manufacturers in Canada or to the demand from Europe?*

If our wire could be brought from England free, wire fences would be the cheapest yet, in the older sections where wood is becoming scarce.

To sum up.—Farmers, you pay duty on every article upon your breakfast table, such as tea, coffee, sugar, knives and forks, spoons, &c. Upon every implement that you use, upon every stitch of clothing, from your hat to your boots, and you receive no adequate return for your grain and produce, but rather pay for your labour, in proportion as you pay into the manufacturer's pockets so much to outbid you in the labour market.

* Farmers pay \$150 for a combined Reaping and Mowing Machine.—The chains, the cutter-bars, and we believe other portions are imported from England. We farmers then pay the duty on these.

Answer to C. E. W. on Cahoon's Seed Sower.

(To the Editor.)

I got one of Cahoon's Broad cast Seed Sowers last spring. I sowed 300 bushels of grain with it. I found it to work well. I sowed when there was no wind, and I sowed in rather strong wind. I regulated the distance according to the wind.

In grass seed it sowed better than any hand; nothing could be more regular.

I would recommend it to every farmer that has a cleared farm, unfortunately mine got burnt this summer, but I intend to get another, as I think it a very valuable machine.

Farm Wright,
Victoria, Aug., 1872.

R. BOWDEN

Farmers' Clubs.

(To the Editor.)

SIR,—I would suggest to farmers the advantage of associating together for the purpose of mutual instruction and improvement. There are already a few Associations of farmers throughout the country; but only a few, and some of them, if not all, are formed on too large a scale and are too pretentious, to engage sympathies of the more illiterate and unassuming of our farmers. Local clubs are preferable to these large societies because they are more likely to benefit a class of farmers whom it is most desirable to benefit, and are more manageable and effective for the purpose of co-operation. With a little effort I believe clubs could be found and sustained in nearly every neighborhood. Why can we not have Farmer's Clubs scattered throughout the country in the same way that we have Temperance, Masonic, Odd-fellows and other associations? We may have them so, if we will only work for it. It is by agitation and systematic efforts the different societies I have named have multiplied. I believe it would be well to give the Agricultural Associations power to establish branch societies, and to require them to use means to encourage and aid their formation. Clubs established by law would have a comparatively higher status, and an authority would be given to their action which would greatly promote their object.

These societies would be useful as a means of instruction and mental discipline and for the diffusion of knowledge where it is most needed. For this reason they would be generally popular, for whatever farmers may think of improvement in farming they certainly appreciate improvement of mind; for the discussion of various matters of public interest, for the spread of agricultural papers and periodicals; for the formation of libraries; and for co-operation in introducing or experimenting with new seeds, implements, &c., &c., clubs, such as these, are just what is needed. Costly experiments, whether with

implements, machinery, cereals, or high-bred stock can be more easily made by a few neighbors co-operating, than by individual effort, and generally with more judgment and success.

A. M.

Experience in Farming.

(To the Editor.)

SIR,—As you invite discussion on all subjects connected with the farm, through the columns of your valuable journal, that is always open freely to farmers to give the results of their experience, for the benefit of their brother farmers, and as I have derived a great deal of information and advice through it, I thought I would add my mite also.

My experience in farming has not been very great, but one can learn something almost every year that may be useful to himself or others in the future. Observation and experience are invaluable teachers in any pursuit, and in farming their services have been incalculable, and we might derive still greater benefits from them if we could but induce our old practical farmers to give more of their observation and experience through the columns of our Agricultural journals.

Our hay crop here was light as it was generally throughout the province, owing to the extremely dry season; but I desire to add another testimony to the beneficial effects of ashes and plaster of Paris, sown in the spring upon grass lands. I had two meadows that had been reeded down for some time and needed breaking up, but as there was no other land seeded, the seed not having taken that had been sown the year previous. I was compelled to raise my hay off these. On one field I sowed a mixture of plaster and ashes, about one bushel of ashes to two of plaster. Of this mixture I sowed about two bushels to the acre. The other field I did nothing with, excepting to scatter about the droppings of the stock. The result was that the field which I sowed the mixture on cut almost double the quantity of hay the other did. I place this result to the effects of the plaster and ashes, for there was very little difference in the amount of hay per acre from either field the year previous. My opinion is that plaster has a tendency to retain moisture, and consequently to lessen the effects of a drouth.

My land is a sandy loam

Turning from hay to corn Mr. EDITOR, I ploughed and prepared my corn ground which was an old sod, just before planting not having time before to do it. The corn came up very well excepting a few hills on a little knoll in the foreground. At first the young corn looked fresh and green, but in a few days it turned to a pale yellow color, and appeared to be dying; the weather was dry, and had it continued so, I have no doubt the corn would have been entirely destroyed, but a good heavy shower of rain

came, and the corn commenced to grow and turn to a natural color again. I worked it well with hoe and cultivator after this and it grew fast, but it had been thrown back by this check that it had received, and although it was well eared, the frost struck it before it was ripe. The consequence was about one half of the corn was soft and the fodder was injured by the frost.

I think that corn ground especially if it is sod should be ploughed in the fall, or early in the spring, in order to permit the ground to settle by the rains, for if an old stiff sod is ploughed but a short time before planting the furrows thrown up do not lay compactly upon the ground, and leaves holes below. The ground dries out quickly in this state, and unless the weather is very wet checks the growth of the plant, and it seldom recovers in time to ripen before the frosts strike it in the fall. I think a good sod is the very best ground for corn, but it should be well prepared, cultivated and harrowed thoroughly fine, the finer the better; this checks all grass and weeds, besides leaving the ground in a good state for working with the hoe and cultivator.

JUNIOR.

Amster.

Curing Hay.

There is probably no branch of farm husbandry that requires more care and attention, or is more necessary, especially in northern latitudes, than securing the crop of hay, from the fact that it is to form the basis for the sustenance of the farm stock during the winter season; and as the thrift of the animals depends much upon the quality of the food, as well as the quantity, it is plain to see the desirableness of using proper care in curing and securing the crop. A crop of hay may be properly secured and still literally spoiled in the curing; so too, the same may be properly cured and still great injury be sustained in the securing.

There has of late years been much discussion upon the point of time in which hay should be cut in order to obtain the same in a condition best adapted to use by the cattle, and also contain a maximum quantity of nourishment that can be assimilated. It is undoubtedly with hay as with the food of the vegetable kingdom, while the soil may contain a great quantity of plant food, it is so combined that it cannot be made available for plant use without somewhat extensive manipulation; so in the case of some of the food of animals, while it actually contains the elements of nutrition in a great degree, the manipulation by the animal necessary to render the same available causes a muscular waste on the part of the animal, nearly equal to the increase from the use of that particular kind of food, so that, in reality the animal is but little better off than it would have been had it not been consumed at all.

It is now generally conceded, that, without mentioning other changes, grass if allowed to stand late becomes greatly changed to woody fiber, which is highly indigestible and hence any condition that involves an increased exercise of the organs of digestion, as stated above, occasions a loss of muscle, and hence, in effect, a partial loss of the food provided. This being admitted, it is clear that the food should be secured in such condition as to unite the greatest possible nutriment with the least liability of waste to render it assimilable. But it is already admitted that the later hay is allowed to stand the more increase of indigestible woody fibre; hence one point is settled, and that is, that grass should not be allowed to stand too late.

The *North British Agriculturist* has said, "that the most common error is in allowing grasses to become over ripe previous to cutting." Also "there is a very common mistake as to the nutritiousness of a second crop of hay," and says, "for fattening, second crop of clover if properly saved is superior to first crop, 'and sums up' as a rule, all grasses intended for hay should be cut as soon as the pollen of the flower is observed to rise in a gentle breeze in a cloud of dust from the field; this will be about three weeks after the heads of the grass have burst out of the hose."

It is reasonable then to suppose, that the time of cutting is properly established, and the manner of curing comes next to be considered. And here is found great diversity of practice. One of the principal things to be avoided is what would properly be termed excessive drying, or reducing the hay to that state in which it has more the appearance of straw than of hay, and which is particularly obnoxious to the cattle. In this position it breaks easily, and does not pack in the mow; in fact, it has been estimated that more hay has been injured from excessive curing than for the lack of curing. For this reason, some objections have been made to use of hay traders, inasmuch as from the violence of their action, the hay is badly broken, which occasions a too rapid evaporation of the juices of the grass, rendering the hay hard and brittle.

As a general rule, the cutting of hay should be avoided when covered with excessive dew or wet from rain. This can be avoided by so arranging as to cut a portion of the grass just before night, which is much sooner in condition to work upon than if allowed to stand and cut in the morning. In fact the main point to be observed is, to be sure that all external moisture is removed.

It is a false idea that the bright sunshine is absolutely necessary to the successful curing of hay, since the best possible results have been obtained by a gradual stirring in a wholly cloudy day, leaving the hay when the moisture was removed nearly as green as when cut; which condition with a remarkable fragrance it held in the mow. Some of

the best authorities of the present day express the opinion that a removal of hay to the mow as soon as all wet is out of it (referring to external moisture), will result in no ill effects. If this point can once be satisfactorily established in the minds of farmers, very much labor, to say nothing of anxiety, will be removed.

Practice can prove the correctness of the proposition as it has done already in many instances, and what a farmer learns by his own experience, he is much more likely to regard than if given to him from another.

With regard to curing clover, there is the same diversity of practice that marks the curing of ordinary hay, but it must be admitted that the method that will leave the clover in the most natural condition, retaining the leaves and blossoms, is the most desirable mode. It is perfectly plain then, that the method which involves the least handling, will of necessity occasion the least fall of leaf, and is therefore the best. How often do we see lots of clover hay, that are nothing more nor less than an accumulation of the dry coarse stalks, almost entirely destitute of both leaves and blossoms.

The proper time for cutting clover seems to be just at the period of full bloom, and the most successful curing ever experienced was as follows, which is only one trial and might again fail. The clover was as large as could grow and stand up, just fully in bloom, thick with leaves; it was cut in the middle of the day and remained in the swath, (being cut with a scythe), with the intention of turning over before much fall of dew; this was however prevented in consequence of a press of labor in other directions; the night proved to be cloudy with no deposition of moisture; the day had been excessively warm, and the next threatened rain, which came in the afternoon; this hay was carted to the barn in the forenoon in a very moist atmosphere, being pitched directly from the swath, and was allowed to stand upon the cart until the next day. When pitched off there was no appearance of moisture nor heat, nor was there afterwards. Now, as to the condition of the hay, it was the most perfect specimen I ever saw, possessing a bright green appearance, thickly dotted with the red bloom, possessing a sweet fragrance seldom observed, and not only that, but every leaf remained in its place giving the hay the appearance of a mass of leaves, rather than, as above mentioned, a collection of dry stalks.

It is reasonable to suppose that no ill effects will arise from the presence of juices in the stalks of the grass; in fact this is the method furnished by nature to induce that chemical action which is necessary to better prepare the same as food for animals, and when this is prevented by excessive drying, poor hay is the result.

WILLIAM H. YEOMANS.
Columbia, Conn.

Immigrants and Immigration.

To the Editor.

SIR,—There appears to be a general demand amongst farmers for more labourers, and a strong feeling in favour of immigration as the only source of supply. While I have no doubt there is some scarcity of labourers I think there is a danger, which some persons in their selfishness may overlook, of getting an overplus. The demand for labourers in the country is very irregular, or rather, periodical, and we cannot hope always to have the supply equal to the demand without, at times, having it in excess. During the winter months, farmers generally in those districts most exclusively agricultural, have no more work than they can easily do themselves and some not even that, for instead of hiring others, they hire out themselves. The help we need is chiefly of a transitory, temporary character, coming and going like our wants. Of immigrants who will come and work for a season and then leave to take up lands of their own, we can hardly have too many, for some years to come. But of permanently resident labourers, the country (leaving railroads out of the question) will not absorb, many more, unless a very rapid change and improvement takes place in the common style of farming, and our farmers make up their minds to obtain greater results, by putting more labour on their land.

It seems a pity our government should have done so little to open up the unsettled parts of the country, and to promote immigration. Years of precious time have been allowed to pass without, hardly anything being done to divert the stream of immigrants that has been continually flowing from our own British Isles, and from the other countries of Europe to swell the population and resources of other countries, and especially that vast confederacy of which our rulers stand so much in awe. Population is what we need above all things to develop our country, and give it that place amongst the nations which its natural advantages warrant us in hoping for; yet our rulers, both Colonial and Imperial, allow others to reap nearly the whole of that golden harvest of humanity, of which Europe is the fruitful field. Thousands of Britain's worthy sons and daughters of toil, yearly leave her, however unwilling, forced by circumstances—without her making the slightest effort to retain them within the bosom of the Empire. Britain can spend millions of treasure, annually, on iron-clads, and on standing armies, but she cannot spend even a few paltry thousands in sending her surplus population to strengthen and develop her colonies, which may prove her strongest bulwark; or to prevent her people from going where they may yet, either in peace or in war, turn the scale against her and reduce her to a secondary place amongst the nations. The United States have come to

compete with her for the first place, and it is mainly British capital and energy, and British brain and muscle that has made them what they are. Our own Ministers tell us that the population of the States is to ours as "forty to four," but they do not, and cannot, tell us that they are doing all in their power to lessen the disparity. Instead of croaking about our weakness it would be better to seek by every means to add to our strength. Canada possesses advantages which the United States can no longer equal, and with honest energetic effort we may yet hope to gain rapidly in the race. But if we gain—if we were nearly level the scales, it must be by energy, by zeal and by liberal expenditure. We have a wealth of river, lake and mine, of soil and of climate, which, if properly managed and made known, will be sure to attract a large population and a large capital, and will warrant us in a liberal expense in inviting both. We have not such a treasury—such ready capital as would warrant us in bringing many immigrants to our shores, but we have treasure for all that, which may be a security for the expenditure of that of others. If we have faith in ourselves and in our own resources, if we have faith in humanity—in the honesty and gratitude of the struggling, toiling thousands of Europe, we may yet secure an immigration which has never been equalled, and such a rapid development of resources and national greatness as the world's history affords no parallel.

A. M.

CONSTANT READER.—The first volume of the *Canadian Herd Book* is published and can be obtained through Hugh C. Thompson, Secretary of the Provincial Agricultural Association, Toronto.

The Canada Farmer.

TORONTO, CANADA, AUG 15, 1872.

The Agricultural College, Ontario.

We are glad to see by the Annual Report of the Secretary of the Bureau of Agriculture, that it is the intention of the Government authorities to combine, in the carrying out of the proposed Agricultural College and Farm of Instruction; as far as possible, economy with efficiency.

Too many of the State Colleges instituted from time to time, have sunk much money in highly conceived, and expensively executed scientific theorems. In a young country like Canada, where large capitalists are scarce, we can only find a small portion of gentlemen, who engage in farming with the view of carrying out systematically high experimental farming—and the College will, we hope, be made an efficient means of educating the young in such a manner that

when they leave, they may be able to take hold of an ordinary farm and work it in a common sense practical and economical style.

The object of the farm will doubtless be to elevate the tone of Canadian farming, that elevation should be given in a healthy shape, and should lead to the carrying out of present systems, in an improved, but not in an expensive form. We trust that the authorities in charge of the College will carry out Professor Buckland's very sensible advice, will adopt for their motto, "*practice with science*;" that is, practice improved by science, not as the operations of some State institutions read, science with little practical application.

It is a wise plan to compel students, when not incapacitated from work, to turn in and apply themselves for a portion of the time, to practical operations, although we must confess to the fact, that in our own experience, it has been very hard to find but a very small proportion of pupils that can while at College, be brought to this way of thinking; and we believe that the authorities will do well not to count upon the work of the pupils as an item of economy, but rather as an additional charge upon the working expenses of the institution.

The grand failing points of the average Canadian farmer are neatness, method and power of administration.

Particularly should neatness be inculcated on the Agricultural students.

Let money be expended not so much on a large stock of expensive animals or elaborately gotten-up implements and machinery, but upon perfect order and symmetry.

Let all the out buildings be of plain material, and of such a form as to be, in perhaps smaller dimensions, within the reach of the Canadian farmer.

Let the barn yards be of the most improved form and shapes, and let every contrivance that can possibly and practically be planned, be adopted, for the saving of every pound of manure.

Let the very best plain plans be adopted for the securing and wintering of stock, let the necessities of warmth, ventilation and cleanliness, be taught by the practical arrangements, and the daily performance of the feeding of all stock.

In fine the whole arrangement of the farm and buildings; and we consider a proper arrangement of more value than years of teaching to students, should be performed under the immediate supervision of intelligent men, but let the men be associated with others of practical knowledge, and who are well posted in the peculiar wants of Agriculture as existing in Canada.

The buildings, the stock and the management of the farm should be such as a student may in after life adopt, perhaps on a smaller scale, when he embarks in Agriculture upon his own responsibility.

Annual Report for 1871 of the Commissioner of Agriculture and Arts, for the Province of Ontario.

Professor Backland, in his annual report as Secretary to the Bureau, refers in high terms to the successful state of Agricultural progress in this Province for the last year. He also draws attention to the fact, that the tendency of our exhibitions is working towards the absorption of the smaller shows into combined, and larger ones. We agree with him in wishing to leave this to be worked out or discontinued at the option of the public freely, without any attempt at control by enactments.

The Professor also draws attention to the progress of Agricultural education among our Canadian youths, and, in referring to the formation of farmers clubs, contends: that every Agricultural Society should be practically a Farmer's Club, in which members should have the chance to meet together, for the purpose of comparing experiences and discussing questions, appertaining to their profession.

Allusion is also made to the vast increase of the number of Fairs or periodical markets, that are now being established in various parts of the Province, and attention is drawn to the success that has invariably attended the establishment of all such.

It appears that the Provincial Exhibition at Kingston was, judged by the number of entries, successful; there having been only 218 less entries than in that held at Toronto in 1870; while it exceeded in number of entries the one held at the same place in 1867, by 2072.

The financial aspect of the fair at Kingston was not however, so good; although a very much more satisfactory statement occurs for Kingston in 1871, than for the same city in 1867. The total receipts amount to \$7593.51 against 5521.49 in 1867.

In the trial of implements held at Paris, shortly after the Exhibition last year, \$679.00 was offered in prizes of which \$575 was awarded among 167 entries.

In the report of the Committee of the "Association of Mechanics' Institutes of Ontario," we find; that, during the year 1871 eighteen Mechanics' Institutes affiliated with the Association in participating in the Legislative grant under the Agricultural and Arts Act.

During the years '68, '70 and '71, 49 Institutes have availed themselves of the grants now allowed by Legislature, and have thus received amounts for each year respectively, of \$3307, \$2947 and \$5833; making a total amount granted in the three years of 12092 dollars.

Regret is expressed that so few Institutes have established evening classes for the instruction of the young.

The Association shows a satisfactory balance sheet; \$154.22 on hand at the expiration of last year.

We find also a very able and exhaustive report of the Fruit Growers' Association of Ontario, by the Secretary D. W. Beadle, Esq., of St. Catharines.

This report is also published separately and is well worthy of the perusal of any and all of our readers.

We find an actual balance to the credit of the Association of about 300 dollars.

In this report the discussion upon the following subjects as occurring at different meetings that have been held, are given in full.

On the best time for transplanting trees.

On Manures.

On Strawberries, Raspberries, Currants, Goosberries, Caerries; the different kinds and their cultivation.

On the effect of ashes upon barn yard manure.

On the best varieties of Pears for profit.

On Apples, Pears, Quinces, Plums, Peaches, and nearly all kinds of fruit.

On Flowering Shrubs

With an abundance of other information invaluable to Fruit Growers.

We then come to the report of the Entomological Society of Ontario, prepared on their behalf by the Rev. C. J. S. Pethune, M. A.

This able report treats of nearly all the most noxious insects now committing depredations on our crops, fruits, &c, in Ontario.

We have, accompanied by very clear illustrations, brief histories of the parasites of the grape the plum, the currant and gooseberry, the wheat crops, including, the Midge, the Hessian fly, the joint worm, wire worm, &c, &c; also of those which feed on the potato bulb and foliage; including the "potato bug," so erroneously called or Colorado potato beetle, not forgetting our little friend the pretty lady-bird; also insects injurious to cabbages, cucumbers, &c.; and giving also means of prevention for each and all of these pests.

The report also classifies and illustrates many of our friends, and particularly the natural parasites of the potato beetle.

Every farmer, and any one who owns a garden plot, should obtain this report; the information contained is most useful to all and the histories, and preventatives are so clearly defined and truly illustrated, that the most entomologically unread may learn much to his own advantage.

The report concludes with a table shewing the average returns of grain per acre, made up from returns of Electoral Division Societies for the years from 1868 to 1871, inclusive,

NOTICE.—We should be obliged if the Secretaries of Agricultural Societies, would communicate to us the days upon which will be held their respective Fall Exhibitions, as we purpose publishing a list of such immediately.

Hired Men on the Farm.

No part of farming operations is more perplexing than the treatment of hired men. In this country the difficulty arises in some measure from the social equality between the hired and the hirers. When an ordinary Canadian farmer wants to hire a man, he as often hires one of his neighbors sons, as any one else from a distance.

It is moreover too often assumed, that directly a man, (no matter what his degree may be), goes out for hire, he at once sinks into something worse than he was before. This is a mistake. There is really no difference whatever in the man, who may have come to your house on a familiar footing of a visitor one day, and the next, engages to work at so much a day, or a month. The feelings of these young men are precisely the same, with the single exception, that they expect to be paid for what they now do; whereas, if they ever did any such work formerly, it was either as accommodation or exchange of work, expecting similar help in return.

When any one hires another, (and especially at a very high price paid as wages for such labor in Canada), he naturally expects to get full value for his money, and that a full day's work should be done in return, and any spare time the man may have, devoted to increasing the value of the farm, or arranging its belongings, or doing something in some way that will pay. In fact, anything rather than waste time, or be idle. This certainly is only reasonable; the time of a hired man is money. Hired men should on their part, realize their position, and when young men, sons of friends, hire out to work for others, they must make up their minds that for the time being at least, they have sold their independence for so much a day, or month, and must do as they are desired, and would be done to by others. This lesson is hard, but it is nevertheless a very necessary one to learn.

At the same time, those who hire such men, should bear in mind the circumstances under which such help is obtained, and not all at once, lose sight of the friend and equal in the servant.

And the servant on his part should recollect that every hour not necessary for rest, food, or sleep, belongs to his employer, and if he is not prepared to render good willing service for good wages, he is absolutely defrauding his employer, and not acting according to implied contract.

The great difficulty with all farm help, is in the "chores." The hired man always objects more or less to do "chores." He considers that if he works well and faithfully during working hours, he ought not to be asked to do chores, evenings, mornings and Sundays.

Now all unnecessary trouble of this kind is readily avoided, by making a clear agreement when hiring—embracing all that is re-

quire of the man to do, and if he does not like to hire under these circumstances, he can leave it alone. There is no compulsion to accept any employer's service, when such terms as are before hand stated, are disagreeable to the man.

Many years since when engaged in some engineering jobs, I had the hiring and control of great bodies of men, some of them the roughest characters. But I always managed to agree with them, and always avoided disputes, my aim being to be strictly just, and above all things to have a perfectly clear agreement in the first instance, and consequently no one ever grumbled, or complained. One agreement I always made, with every one—that if he got drunk, or misbehaved, and thereby required some punishment, I was at liberty to say to him that he should knock off work for a day or two, and if he was boarded, be charged for his board. All agreed to this readily, and it acted as a salutary check on drunkenness, fighting and quarrelling. Many a man has said, when a quarrel was imminent, "I will not fight, as you know very well, the boss will knock me off work for two days, and I cannot afford to lose two dollars for the pleasure of a fight" or getting drunk, as the case may be.

In all my farm labor, I have found it most advantageous to pay good, and rather high wages, and to have a clear agreement that their wages were to be earned. Men are always better satisfied under this treatment. They have the harmless boast amongst their friends that they get somewhat more than others. And you thus command the best men, and are able to get along with comfort and pleasure with them. A poor shiftless man is; not worth half the wages an active, good, driving, careful man is, especially when we consider, that he may have a very valuable team under his care and control, and that one little omission of care, or forethought, may cause a runaway or injury worth half a year's wages to the farmer who hires him, and it is of no use looking to law to right the employer, when such accidents occur. "Prevention is by far better than cure."

C.

How a Farmer should Work.

Why is it that so few men can be persuaded to leave the city and enter upon the enjoyment and independence of a farmers life?

There are many answers to such a question, and we have so often heard of one in particular that we propose to see upon what ground that one is placed.

How often have we been told that "farming is awful hard work?"

We believe that the man who commences without capital must upon his small farm work very hard. He cannot afford to pay hands, not because such money paid out

would not be returned, but simply because he has not the means.

But to such the farmer's life is no drudgery, for it is work, hard manual work to which he has always been accustomed. We would more particularly speak of that class, who fresh from school, never having taken a spade in their hands come to Canada with a moderate capital, and determine to throw their lot in with the tillers of the soil.

Such men must work hard. No one who has not an independent income sufficient to meet all wants can live without work, and the man who schemes, even when well off, to pass through life, without, by some work or another, benefiting the world and employing his own talents is to our mind but a useless member of society and one who little understands the obligations that were at his birth laid upon his shoulders by the Almighty.

The man in the office works. Talk about drudgery, morning, noon and night finds him at his desk, poring over heavy legal technicalities, fighting an almost insurmountable array of figures, ever endeavoring to account for apparent discrepancies, one weary round of never changing work, breathing the close foul air of the office upon which the sun in the heavens shines so seldom.

How can a man dare to call the life of a farmer drudgery? he works in the open fields under the full sun, breathing the perfumes of every flower, and independent of all but the God of nature.

We also contend that the farmer who has a fair sized property has no right to work like a laborer.

His position is one in which the brains should be used.

It is a common country saying that a good set of brains is worth two pairs of hands.

Not to enter further into a general dissertation upon this subject we would quote from an old friend, with whom we have recently had a long conversation.

He said: "I used to work morning, noon and afternoon, I ploughed more acres in the spring than any of my men. I called them in the morning; I hurried them out to the field from their meals; I led them with the scythe, and few binders could follow any cradle, and what was the result, I was never ahead with any work, and was never ready for anything. The odd chores about the house I was never on hand to do nor could I trust them to hired men. I never knew the state of the markets, and was never able to buy at the right time.

I knew not what a man did upon the opposite side of the farm to that in which I was myself working, and my men considered me no more than themselves, a workman who sweated himself to death for his own especial interest.

I thought that no man could work a farm in Canada without he led his men in every

manual job, from cradling in the field to turning manure in the yard.

I met with a severe accident which quite disabled me for time while my old strength has and probably will never return. I had per force to give up manual labor and I then began to manage the farm. The result was that in 12 months I became fully convinced of the folly of my former plans.

I had not only set out to do the work of my men, but I had added to it the cares, anxieties and troubles of arrangement.

This double work of the body and the brain is beyond the capabilities of any man and when I gave up the one and devoted myself entirely to management, I found my farm improving, my work all laid out before hand, my tools all kept in order, and from that day I have never been behind and have made double the profits off my farm."

When asked if he would advise a young man never to take hold in the field operation, he answer most decisively in the negative, but still, he said, never lay out to work like a hired man.

When it comes to the busy days of haying and harvest, obtain, if possible, full help exclusive of yourself, be on hand, and you can put in your own weight in the weakest part of a chain of work. For instance two teams are drawing hay to a barn. You notice the second waggon come home and wait at the door for the first has not unloaded. The weak spot has shown itself in unloading. Put in your assistance there, help to unload, so that the waggons do not wait upon one another. Or if the waggon goes out empty before the other is loaded in the field, the men in the barn will be idle whilst the waggon is coming from the field, it may be ten minutes. Go to the field and help the pitchers. If one waggon gets behind another, it is astonishing how difficult it is to "catch up" in the whole morning.

By being on hand to push along what has fallen behind, you will in the work done easily save an extra hand's wages over and over again.

The same applies throughout the year. While we advocate more supervision and management with less manual labor on the part of "bosses" in Canada, we would yet impress the absolute necessity of close and constant attention upon the farm.

When the general public lose the impression that the farmer is little above the working man in social position they will begin to turn their attention to the advantages that may be gained for their sons by embarking them in the high and independent profession of Agriculture, but until that now almost universal opinion is by the farmers themselves dispelled; public belief will still hold to the servile drudgery of a farmer's life.

C. E. W.

We have also received the Report of the U. S. Commissioner of Agriculture for 1871 on Diseases of Cattle in the United States, a most useful report very carefully illustrated.

The Laborer and the Shopman.

Few men, even in our own country, can be found possessed of such a combination of perspicacity, shrewdness, scientific acquirements, ability, industry and thorough experience in both laborious and literary occupations as Hugh Miller the eminent Scotch geologist and essayist. In his "Story of my Education," p. 491, he tells of his experience as an accountant, after having been for the previous fifteen years an industrious stone cutter, occupying most of his leisure hours in studies of nature, and especially in reading the fossils in the different geologic strata exhibited in Northern Scotland, and he compares the opportunities of the out-door labouring man—the farmer for example—with that of the in-door clerk or shopman.

"For the first six months of my new employment I found myself *unable* to make my old use of the leisure hours which I found I could still command. There was nothing very intellectual, in the higher sense of the term, in recording the bank's transactions, or in summing up columns of figures, or in doing business over the counter; and yet the fatigue induced was a fatigue, not of sinew and muscle, but of nerve and brain," which if it did not quite disqualify me for my former intellectual amusements, at least greatly disinclined me towards them, and rendered me a considerably more indolent sort of person than either before or since. I used to be struck during this transition period by the relaxed and idle expression that had, on the sudden been assumed by my *hands*. And the slackened hands represented, I too surely felt, slackened mind. The unintellectual toils of the laboring man have been occasionally represented as less favorable to mental cultivation than the semi-intellectual employments of that class immediately above him, to which our clerks, shopmen and humbler accountants, belong; but it will be found that exactly the reverse is the case, and that, though a certain conventional gentility of manner and appearance on the side of the somewhat higher class may serve to conceal the fact; it is on the part of the laboring man that the real advantage lies. The mercantile accountant or the law clerk bent over his desk, his faculties concentrated on his columns of figures, or on the pages which he has been carefully engrossing, and unable to proceed one step in his work without devoting to it all his attention, is in greatly less favorable circumstances than the plowman or operative mechanic, whose mind is free, though his body labors, and who thus finds, in the very rudeness of his employments, a compensation for their humble and laborious character. And it will be found that the humbler of the two classes is much more largely represented in our literature than the class by one degree less humble. Ranged against the poor clerk of Nottingham, *Henry Kirke White*, and the still more hapless Edinburgh engrossing clerk, *Robert*

Ferguson, with a very few others, we find in our literature a numerous and vigorous phalanx, composed of men such as the Ayrshire Plowman, the Ettrick Shepherd, the Fifeshire Foresters, the sailors Dumpier and Faloner, Bunyan, Bloomfield, Bamsay, Tannahill, Alexander Wilson, John Clare, Allen Cunningham and Ebenezer Elliott."

The reader who knows Hugh Miller will add his name mentally in this splendid list.

Life on the Farm.

SUCCESS & FAILURE.

There must be a great difference in the ability of the various men who compose the class of "Farmers,"—and who follow farming as a business,—or how is it that some men can pay rent, a heavy rent, for the same farm, on which, the owner previously occupying it, hardly made a living? We all know what a very happy and healthful life it is in some cases; and a hard up-hill toilsome life in others.

Yesterday I was walking and talking with a Scarborough Farmer, known as an exceedingly well-to-do Scotchman; now, however, very old, and fast approaching that "bourne from whence no traveller returns." His farm has been rented for about fifteen years, and during that time he has had two tenants, each of whom has paid annually \$600 a year, with stringent fencing, and good husbandry covenants, in their lease,—rigidly adhered to by their landlord. And this heavy rent, has been paid off about 120 acres of cleared land, without any outside advantages in any way to assist in doing so. No wood, even is allowed to be sold, and only enough cut for the family use; and I am credibly informed, that the present tenant, in addition to paying such a heavy rent, will be able at the expiration of his lease to purchase the farm, should he desire so to do; and yet he began life with little or no capital.

In how many instances does such prosperity attend the farmer? and yet the land in question is by no means above the average fertility; it is manifest then that there must be a great difference in farmers, and this must be due to the carrying out of system in the management of a farm, and not alone to the system of farming. The tenant in question has in addition, excellent furniture and splendid stock, not however thorough-bred, and always pays his rent without grumbling; in fact the man is getting "rich" for one of his class. Of my own knowledge, I know numbers of farmers doing equally well, similarly circumstanced, and situated,—and I also know of many who with the same farm, could hardly keep the "wolf from the door." What then causes such a difference? It cannot be the seasons, for they are alike to all. The quality of the farm does not cause these successes as there are many failures on good land; whilst there are on the other hand, many instances of prosperity on indifferent

farms. It must therefore be the man himself, who is in fault, "and here is the square man in the round hole," he does not fit it, and never will do so. He has not the brains, neither has he the energy or the knowledge of his business to make the farm pay; and farming in Canada requires brains, and business knowledge, as much as in any other enterprise. Such people cannot make a farm, or any thing else pay—there is a constant want about them. They are never up to "the mark," and as the old adage says, "a stern chase is a long chase," so they rarely reach the front row of well-doing men, or rank amongst those who are able to make farming a paying business in Canada.

What truths then do such instances of prosperity and the opposite impress on our minds, with such startling force?—Why, that as the fault lies with ourselves in nine cases out of ten. The only remedy to be applied is clear enough—"spur up," put on more mental and bodily steam, watch other people; see how they improve, and the process they follow; see how promptly they transact their business; how they do it, and the apparent rules under which they work; never rest satisfied with being always behind, but determine to attain the front rank, and depend on it if such a course be faithfully persevered in, by those who are now behind-hand, there will soon be an amendment in deficient circumstances.

C.

How to Commence Business.

There are many young men who are in the habit of excusing their idleness and inefficiency with the plea that they can do nothing without capital. The lack of means is the ready reply they make to every appeal to action. They imagine that they possess in themselves all the prerequisites to success except capital. If they only had capital, in addition to their other *imagined virtues*, they would do great things in the world; they would astonish the natives with the boldness and brilliancy of their enterprise. They would become immensely rich, and lay the world under perpetual obligations to them by the magnificence of their benefactions. This is the way they think and talk, and they roll the vain-glorious idea over in their minds until they come to imagine that the world is an immense loser by their poverty.

These persons forget one important fact—that all capital is the product of labor. That nearly all rich men in this country were once poor. That nearly every personal fortune they can enumerate is either the produce of its owner's toil and skill, or the representative of his father's toil and skill.

How did the makers of these fortunes get along without capital? Had they spent the vigor of their youth in idle and foolish lamentations over their poverty, they would have lived and died poor, and left nothing

but an inheritance of honest, steady hands. Capital allied to labor and skill can work wonders in the war of material enterprise. But money is not the only indispensable thing to young men. There are other kinds of capital besides accumulated money, brains, muscle, industry, honesty, diligence, truth, fidelity, skill, tact, education—*all these are capital*, and all of them have a commercial value, which the owner will be able, sooner or later, to command in the market. Provided with these, any young man in this country may make more than he needs to spend every year, and thus have something at the end of each year to invest as money capital. If he needs money let him go to work and make it, and thus give proof of his ability to use it profitably and judiciously. If we go into any great city, or into any prosperous agricultural district, we find the capitalists are those who have made their fortunes without any outside aid. They did not waste their time in repining at their poverty, and in silly dreams of what they could do if they had the money to do it with. They went boldly and resolutely to work; they toiled and thought and planned, and kept toiling and thinking and planning, patiently, until at last they grasped the fortunate moment, and succeeded.

Keeping Roads in Repair.

The best system of mending the highway is that which mends soonest. The old method of working the roads annually by the tax-payers in person is gone out of use in many places. The work was not well done, although the tax-payers had to use the roads they mended. The highways need constant supervision by one man in each town who understands the business, and who can remedy a defect as soon as it makes its appearance. A deep rut is made deeper by every loaded team that passes over the road, and where the system of annual repairs prevails the highways are almost impassable in the early spring. We want the same thorough system of supervision that prevails on our railroads transferred to the highway. This has been adopted in some towns in Massachusetts, and is found to be much better economy, and to give them much better roads. A load of gravel in season applied to the ruts and gullies saves the necessity of two loads applied at the end of the year. Travel on a well-made road does far less injury than the rains and frosts. If the inequalities are immediately remedied, travel rather helps than hinders road-making. Every one prefers the well-beaten track to a new-made road. It is quite possible to distribute the repairs so evenly through the year that the road-bed may be always in good condition. The loss to the farming community from bad roads is enormous. It is one of the heaviest taxes we have to pay. It is laid on every article that goes from the

farm to market, and in many cases the tax is so heavy that it swallows all the profits. Good roads lessen the cost of production; they would cheapen the grocer's bill, the miller's bill, and especially the cost of fertilizers, which are the secret of economical farming in the older States. Work the roads to day, and save money.

Weather Report.

The past month may be justly characterized as one of the hottest months ever recorded in Canada, not only with regard to the immediate district surrounding Toronto, but over the whole dominion. The "oldest inhabitant was often appealed to, to add the result of long continued observation," to the less mature recollection of the present race, that July, 1872, was during its early and middle portion unequalled for excessive heat and aridity; it is well known that upon heat and moisture depend the fertility of the soil, and especially upon the amount of moisture deposited in a certain area, during a given time, in both the temperature and the crepitation the past month offers to the observer such a contrast that the effect will be watched with interest by every one who cares to look at the agricultural interest of the country as of paramount importance to its future prosperity. Taking the observations at the Observatory of Toronto we learn that up to the 21st day the temperature has been above the average, and although the past ten days considerably modifies the excess, the average of the month is 74°, being 3° above the usual July temperature, and 4° lower than the warmest July, (1858,) ever recorded in Toronto. The highest temperature recorded during the month was 96° on the first, and a comparison may afford the best standard. It may be stated that this has only been exceeded twice, 1854—99°, and 1856—95°, the temperature reached its lowest on the 23rd, when 52° is recorded, a range of 44°;—the warmest day was the 1st, average 80° 8', the coldest, the 31st, 62° 0'. The highest recorded in the sun was 151° 0', on the 1st, 2nd and 3rd.

Rain fell on twelve days and amounted to 2.28, being one-third less than the average quantity, but one-third greater than July, 1871.

The amount of cloud is less than the average, and may be classed as 8 clouded, 20 partially so, and 3 clear.

The prevailing winds have been from the S. E. and W., with a velocity considerably under the average; the most windy day being the 26th—10 miles per hour from the S. W.; the least windy the 25th—0.69— from the S.

Thunder or lightning occurred on 1, 2, 3, 9, 10, 16, 21, 28 and 29.

Lightly slight, only mentioned as large on 11, 20 and 23rd.

Horticulture.

EDITOR—D. W. BEADLE,

CORRESPONDING MEMBER OF THE ROYAL HORTICULTURAL SOCIETY, ENGLAND.

The Summer Meeting of the Fruit Growers' Association.

The Meeting was held in the Town Hall, Guelph, on Thursday, July 4th, 1872. There was a very good attendance of members from the vicinity, besides representatives from Kingston, Toronto, Oshawa, Berlin, Ayr, Elora, Galt, London, Hamilton, Dundas, St. Catharines, Brantford, Woodstock, &c.

The first subject discussed was the

CODLIN MOTH.

Mr. Allen of Kingston, said that much damage had been done to the apples in his vicinity by this insect, but that something had killed them off, so that they were not troubled with them now.

Mr. Morden, of Dundas, stated that in some parts of the county of Hastings there was no codlin moth. That he had noticed that the Golden Russets were not apt to be much troubled with them, not so much as the Snow apple and other more tender fleshed varieties.

Mr. Chisholm, of Halton, said that these insects were becoming more numerous and injurious in his neighborhood.

Mr. Bennett, Brantford, thought they were not near as troublesome this year as formerly. He believed the birds helped to destroy them, for he had found the codlin-worms in the crop of the cat bird. With him the Esopus Spitzenburg and Tart Bough had been least affected.

Mr. Denton, London, believed they were worse in old than in young orchards.

Mr. Caldwell, Galt, thought that in his neighborhood these insects had had their day and that they were now on the decline, yet that it was very important to use every known means of lessening their numbers, such as gathering up the fallen apples, trapping and killing the insects, &c.

Mr. Anderson, of Puslinch, had a young orchard that had not yet been much troubled with these worms. With him the Snow apple had been most subject to their depredations, while he had not found any in the Duchess of Oldenburgh or the Red Astrachan.

Dr. Cross, St. Catharines, remarked that though his orchard was young, yet out of some twenty-five varieties growing in it, not one had escaped the codlin moth. Last year not one apple in ten escaped. He always picked up the fallen fruit, had used straw-ropes and killed a great many of these insects, yet there was enough that escaped to injure nearly all of his apples. This pest

was doing more harm than all the other insects put together.

Mr. Saunders, London, stated that a full account of the habits of this insect will be found in the Report of this Association for 1869, together with an excellent illustration showing its appearance in all its several stages of life, and the manner in which it injured our apples. He had no remedies to suggest beyond those already recommended in that report. He had found it also in the plum, thus establishing the fact that it was also on this fruit, which was not generally known.

Mr. Roy, Berlin, had found it in all varieties of apple, except the Swayzie Pomme Grise. Two years ago he had not a codlin moth on his premises,—but last year nearly every apple was badly injured, excepting the Swayzie. Thus far he has seen nothing of them and thinks the fruit will not be injured by them this season. Does not believe in the efficacy of the means recommended for destroying them, but thought the only effectual way to get rid of them was to encourage and protect the birds.

Mr. Saunders replied that he could not see how the birds could be very effectual in destroying these worms, as they spent so large a part of their life within the apple, where they were out of the sight and reach of most of our insectivorous birds. He thought it unwise to promulgate the idea that man's attempts to lessen their numbers were useless, that we ought to use the intelligence God has given us, and do all we can to prevent the undue increase of injurious insects.

Mr. Elliott, Guelph, had been a great sufferer from their depredations, not one fourth of his apples escaping. He had been very successful in trapping them by tying pieces of old carpeting around the trunks of his trees. In these he had frequently found fifty and sixty of the larvæ at a time. He examined them as often as once in ten days. Thought he had noticed that they were more destructive in dry than wet seasons. Had noticed but very little difference in the sorts. Pomme Grise had been very bad with them, the Wagner the most exempt.

Mr. Murton, Guelph, finds the Russets and the Greenings very badly affected.

Mr. Allen, Kingston, did not agree with Mr. Roy in the opinion that birds should be protected because of their usefulness in destroying insects, for he believed they destroyed as many useful as injurious insects. At all events he urged that the present law should be so altered as to allow gentlemen to protect their own orchards from the depredations of the birds, whom he had found to be quite sufficiently discriminating in their tastes to prefer a dish of ripe fruit to the most tempting morsel in the way of a hairy caterpillar.

Mr. Benham, Guelph, remarked that he knew a gentleman who had shot as many as

a hundred and fifty birds in order to save a pint of cherries.

On motion of Mr. Saunders, seconded by Mr. Morden, it was Resolved, that in the opinion of this Association it is highly necessary that some united effort be made by Fruit Growers in districts where the codlin moth prevails, and would urge upon its members the use, at the proper time, of the remedies that have been suggested to lessen their numbers.

THE PEAR.

Mr. Allen, Kingston, cultivated Louise Bonne, Flemish Beauty, Belle Lucrative, Seckel, and Bartlett, found the Bartlett a little tender. The Oswego Beurre did well for a time and then died from the effects of a severe winter.

Mr. Caldwell, Galt, believed the cultivation of the pear to be as easy as that of the apple, and that a timely amputation of blighting or diseased limbs would restore the tree to its usual health and vigor. The following varieties he had found to be hardy, the Bartlett, Rostiozer, Flemish Beauty, Louise Bonne, Easter Beurre, White Doyenne, Sheldon, Seckel. The Seckel was very hardy in Garafraxa. Sometimes the pear tree seems to become bark-bound, and he advised the making of longitudinal incisions the entire length of the trunk of the tree just through the bark, this will relieve the stricture and afford room for the body of the tree to expand. Highly stimulating manures he thought injurious and recommended the use of wood ashes and an annual washing of the body of the tree and the larger branches with soft soap.

Mr. Chisholm, Halton, grew the Bartlett, Duchess, d'Angouleme, and Easter Beurre. The past winter had killed his Bartletts.

Mr. Morden, Dundas, prefers stand to Dwarf pear.

Mr. Denton, London, had carted clay upon the ground where his pear trees stood—the soil was sandy—and found that the trees did not do well where the clay was put on too thick.

Mr. Lee, Guelph, found the Flemish Beauty the best variety of them all.

Mr. Fairley, Guelph, many trees suffered because they were badly planted, the soil not sufficiently broken up and pulverised; did not approve of manure for pear trees.

Mr. Phin, had a light soil and did not succeed well with pear trees.

Mr. Benham, Guelph, had been trying to grow pear trees for the last quarter of a century, lost his first trees; but for the last fifteen years had succeeded very well with Dwarf trees—the reason why cultivators have not succeeded with Dwarf trees is that they have not planted them deep enough so as to have the Quince stock upon which they are worked wholly buried below the surface of the ground. The severe cold of winter frequently injures the quince stock when exposed, and hence the loss of the pear trees. The Bartlett is tender with him,

Louise Bonne yields good fruit in great abundance. Howell succeeds, also Dearborn's Seedling, Seckel, Stevens Gruessee, Vicar of Winkfield, Beurre and Anjou. Has finished the Chaumontel.

Dr. Cross, St. Catharines, would have a poor crop of pears this year, the Duchess d'Angouleme had failed to set its fruit very frequently. Marie Louise had not failed in this way. The Duchess was the only kind that had not blighted in his grounds. His soil is clay, and he keeps it well cultivated.

Mr. Murton, Guelph, thought the soil around Guelph well adapted to the growth of the pear, although for himself he had only some half dozen varieties, and none of these had ever blossomed. Here the Bartlett, Flemish Beauty, Louise Bonne and Beurre Diel are quite hardy, and some most excellent specimens of the fruit had been shown at their exhibitions. His Beurre d'Anjou tree had blighted, though there was not as much pear blight lately as they had experienced. Large quantities of raw barnyard manure were very injurious.

Mr. Elliott, Guelph, has a clay soil, which he prepared by deep cultivation, breaking it up thoroughly. As his pear trees were Dwarfs, he planted them deep enough to place all the stocks beneath the surface of the soil, and since planting mulches them thoroughly both winter and summer, using for the winter mulch suitable manure. This protects the roots from severe winter freezing, and in the summer keeps them moist and shields them from the intense heat of the sun. He prunes his pear trees in the end of summer, when the leaves begin to change, cutting the branch at some distance from the bud. This gives time for the wood to harden at the cut before the severe frosts of winter, so that the bud nearest the cut is never winter killed. He cultivates some fifteen sorts, the Bartlett, Beurre d'Anjou, Flemish Beauty, Louise Bonne, Soldat, d'Esperin, which he finds to be a very fine pear, hanging well after it is set, ripening in November and December, of firm flesh and good flavour. Belle Lucrative of fine quality but requires to be used as soon as it is ripe. Dearborn's Seedling which is quite small, ripening early, and Duchoss d'Angouleme. He uses wood ashes liberally, preferring not to force the trees into a too luxuriant growth by the use of highly stimulating manures. He finds the Buffam a pear of excellent quality, and the White Doyenne is very fine, does not scab or crack, and the samples compare well with those grown elsewhere. Does not think that the winter sorts are generally worth cultivating, they have no flavor.

Mr. Roy, Berlin, found but five sorts that were reliable in his section. The Flemish Beauty was the most hardy, then the Louise Bonne, Seckel, Rostiozer, and Beurre Diel. The Beurre Diel was very hardy, and so was Elliott's Early, a variety of very good quality,

about the size of Osband's Summer and ripening before the Doyenne d'Ete, which he obtained from Mr. James Dougall, of Windsor. The Supreme de Jumper, he feared was a little tender. The Ananas d'Ete was a very hardy tree, but a poor cropper. Has lost several trees of the Beurre d'Anjou during the past winter. His Easter Beurre died. The Glout Moreau is very hardy and has never blighted with him. Cannot do anything with the Duchesse d'Angouleme. The Graslin is very good and a very hardy tree; the Kingessing is tender. He advises mulching the trees, when heavily loaded with fruit, giving them a little liquid manure. Cannot succeed with the Bartlett except it be double worked, he works it on the Grey Doyenne. The Beurre Gifford is tolerably hardy. Has worked the Beurre Rose on a variety known as Summer Rose. The Baldwin apple when worked on the Summer Pippin does well. The Summer Pippin was brought from Pennsylvania by the Germans.

Mr. Stevenson, Guelph, has but few sorts in cultivation. Of these he places the Flemish Beauty first, for size and quality of fruit and hardiness and productiveness of tree. Next to this he ranks the Seckel, then the Louise Bonne and the Glout Moreau. Is pleased with the Kirtland. He prunes his trees in the Spring, forming a low dense head. He has the Osband's Summer and Rostiezer, the latter a straggling grower, is on the quince stock. He prefers the pear stock. The Danlam he had fruited for three years and found it hardy, the fruit did not crack. The Belle Lucrative did very well, but was not quite as fine in flavor as he had expected, the fruit had been very uneven in size, some being of good size and other specimens very small. Does not get any fine fruit from the Duchesse d'Angouleme or the Vicar of Winkfield. The Napoleon does very well, so also does the White Doyenne, though this in some seasons cracks badly. His specimens of the Beurre Diez had not been as fine as he thought they should be, nor did he consider the tree perfectly hardy.

Mr. Alex. Glass, Guelph.—The Bartlett was tender with him, the White Doyenne did well and did not crack, the Grey Doyenne also did well. He had fruited these for five years. Osband's summer fruits sparingly, but the quality is very fair. He finds the Bergamotte Cadette to be his heaviest cropper and hardiest tree. Stevens Genessee yields fair crops, but is badly infested with the codlin moth. The Van Beuren does not crop heavily, but the sample is good. The Vicar of Winkfield is good, the Doyenne d'Ete has fruited twice; Clopp's favorite looks healthy, and so does the Glout Moreau, but these have not yet borne fruit with me.

Sheriff Davidson, Berlin.—The Duchesse d'Angouleme fruits sometimes, but not as regularly as the Flemish Beauty. His

Flemish Beauty has but few specimens of fruit this year, but last year it bore a heavy crop. On the pear stock it is a very hardy tree. Osband's Summer is a fine pear and succeeds well about Berlin. The Doyenne d'Ete ripens about the middle of August, is a pretty fruit, and the tree an abundant bearer; prefers it to any other summer pear. Dearborn's Seedling bears abundantly. The Winter Velis bears large crops every year, the tree is hardy, the fruit is not equal in flavor to the fall pears, but it is very good. The Seckel bears well, and the tree is hardy and not subject to disease. He mulches his pear trees every autumn, putting it on from six to ten inches deep. Prunes in the spring.

Mr. J. A. Wood, Guelph, prefers the Bartlett. He seldom gets any good samples of the Winter Nelis, the fruit often becoming withered on the tree. The Jaminette is a nice pear, his tree was injured some the past winter. He has also the Flemish Beauty, Swan's Orange, and Beurre Hardy; the latter he finds to be a very hardy tree.

Mr. Jackson, Berlin, cultivates a few varieties, but is ignorant of the true name of many, or those he has purchased do not turn out to be what the label indicated. He has the Ananas d'Ete, which is a first rate fruit, better to his taste than the Bartlett, the Flemish Beauty lacks flavor; has also the Osband's Summer and Beurre Giffard, the latter bears well. The Clopp's favorite does well. The Bartlett is very generally grown about Berlin and does well. Doyenne d'Hiver seems to do well, but has not yet fruited. Steven's Genessee rots at the core, but is otherwise good. The Seckel has not been a success in his hands, while the Vicar of Winkfield is bearing well.

Mr. Saunders, London, has suffered the loss of some of his trees of the Louise Bonne by reason of their breaking off at the point of union with the stock; and his Duchesse d'Anjouleme trees had some of them been injured by frozen sap blight.

Mr. Roy, had suffered in a like manner with the Louise Beurre, and had found the Duchesse d'Anjouleme very tender.

Mr. Stevenson, Guelph, had found the Bartlett very tender.

PEAR BLIGHT.

Mr. Caldwell, Galt, thinks this blight is caused by the severity of the winter.

The Secretary asked how the winter could effect seedling pear trees that had never yet seen a winter, but were nevertheless affected with this blight?

Mr. Allen inquired if the blight was bad where the land was richly manured.

Mr. Saunders replied that he thought the blight was due to certain atmospheric influences.

Mr. Stevenson had also known the young seedlings attacked by the blight before they had passed through a winter.

Col. Magill, Oshawa, remarked that the blight affected trees growing on light or heavy soils alike, that very old trees died with it and thought that the summer had much to do with it.

The President stated that he had been informed by Mr. Bennett, of Brantford, that latterly he had been in the habit of using in dry weather a hydrant with a very fine nose which threw the water up so that it fell upon his pear trees during the evening like a fine gentle rain, and that ever since he had adopted this plan of showering his trees they had not suffered from blight.

Mr. Hamilton, Toronto, has had those trees blight which were on light soil, but not those on heavy soil.

EVENING SESSION.

THE PLUM.

Mr. Lee, had given up the cultivation of the plum and dug up his trees in despair of ever growing any more fruit on account of the curculio.

Sheriff Davidson, Berlin, used to be troubled in the same way so that he had no plums at all; now he has plenty; he succeeded in growing plums by jarring the trees, after placing sheets under the trees, and in this way catching the curculio. He thought the Green Gage, Bleecker's Gage and the Columbia least subject to the attacks of this insect.

Mr. Allen, Kingston, adopted the same plan. He grows Coe's Golden Drop, Green Gage, Washington, Egg plum and Damson.

Mr. Jackson, finds the Lombard a desirable sort, it bore the third year after planting and is not very subject to the curculio. Prince's Yellow Gage also bears well. Common Blue plum is very subject to black knot.

Mr. Glass, also jars the trees and catches the curculio on sheets. He has the Eingham, the curculio is very attentive to this sort, in quality he esteems it his best; grows also the Early Orleans, Ponds Seedling, Victoria, thinks the Victoria tender and very subject to the curculio; Magnum Bonum is a heavy cropper, and the fruit liable to rot in wet seasons, the tree very healthy; the Lombard is a great cropper and the best market plum; Imperial Gage is of second quality.

Mr. Roy Berlin, finds the Victoria a tender tree, and the fruit fails to set, would not advise the cultivation of this sort, except in a specially favorable situation, when with careful cultivation the fruit will be truly magnificent. The Lombard is one of the very best croppers, yet he does not think it the most profitable variety; the Imperial Gage is more profitable. Ponds Seedling is tolerably hardy, bears good crops, and the fruit sells well. Prince's Yellow Gage does well about Berlin; Eingham is a little tender, but a showy and well flavored fruit. The Reine Claude de Bayar ripened with him, which the President remarked was a singular

lar circumstance, it rarely ripening at Hamilton. Was testing Oull's Golden Grape, a new sort; thus far the tree had been perfectly hardy, but not yet fruited. The McLaughlin was a little tender. The Imperial Gage he considers the very best market plum, and well worthy of general cultivation. Lawrence's Favorite he had found to be a very bearer and tender tree.

Mr. Jardine, Galt, cultivates the Yellow Egg and the Lombard, and believes that the curculio does not attack the Yellow Egg.

Mr. Leslie, Toronto, finds three great difficulties in the cultivation of the plum, viz: the black knot on the tree, the curculio and the rot in the fruit. The black knot may be kept in subjection by careful examination of the trees during the second week in July and cutting off all the affected parts, the curculio may be subdued by diligent use of the means generally recommended, but for the rot he knew of no practical remedy. He thought the cause of the rot was of an atmospheric nature. The Lombard and Yellow Gage he placed in about equal rank. The Peach plum does well. The Yellow Egg, Imperial Gage, Coc's Golden Drop and Reine Claude de Bayay are all good bearers.

Mr. Murton, Guelph, is successful with nearly all sorts, notwithstanding the black knot and the rot. The Bradshaw is particularly subject to the rot, yet it bears well and the tree is hardy. The Lombard is the most profitable, is a great bearer and escapes the curculio. The Washington bears well. The black knot can be cut out in July and the wound will heal over. His favorite eating plums are the Bradshaw, Washington, and Coc's Golden Drop. The Damsons are not much affected with the curculio here, nor the Smith's Orleans,

Col Magill, Oshawa, esteems the old English Green Gage the finest flavored of all plums, but it never becomes a tree, and though some of his Green Gages are thirty years old they are nothing more than mere shrubs. The Monroe Gage ripens late, and the tree is very hardy and one of the finest of all, and when young is a very heavy cropper. The Lombard is probably the best for market. Regards the Washington next in quality to the Green Gage. The late spring frosts probably have destroyed the plum crop in the neighborhood of Oshawa this season.

Mr. Sorley, Guelph, thinks the Lawrence's favorite the best sort he has.

Mr. Anderson, stated that the Lombard, Washington and Victoria were killed by the past winter, but Prince's Yellow Gage was hardy and doing well.

Mr. Caldwell says that the Lombard and Imperial Gage are great favorites about Galt. The Duan's Purple does well there. The McLaughlin is the finest plum I have grown, but the tree is tender when young, the fruit is of fine size. The black knot is easily kept in subjection by cutting it out in the month of July. The curculio is the most destruc-

tive enemy. The rot gives us no trouble. Am sure that taking a series of years together, plum growing is a profitable business.

Mr. Hamilton, Toronto, - The Black knot has destroyed nearly all the Plum trees about the City of Toronto. It is worse in trees bearing blue plums than in those of the yellow or green varieties. The Rot is worse when the weather is warm and moist.

Mr. Glass being asked to describe his new seedling plum, stated that the leaf is very thick and heavy, of a rich dark green, with a glossy shining surface. The tree a very vigorous, upright grower. Never has known a tree killed by the winter, not even the yearling buds, though these are some times cut back an inch or two by the winter, the fruit is sometimes very large, weighing two and a half ounces, of a dark purple color, with very heavy bloom. Two years ago, the parent tree bore from four to five bushels and there was not then, nor ever, any appearance of rot. It is a seedling from either Smith's Orleans, or Duane's purple. It is most like the Duane's purple. Ripens from the 5th to the 10th of October. He asked that a Committee of the Association might be appointed to examine the plum.

Mr. Jav. Goldie, stated that Mr. Glass' seedling plum was of a very fine, showy appearance, perhaps not "best" in flavor, but promised to be a very valuable market sort.

Mr. Murton thought its showy appearance and large size would cause it to take well in market. In point of flavor he ranked it as a good second class plum.

The President, and Messrs. Leslie, S. Roy, and the Secretary were appointed a Committee to examine, and report upon Mr. Glass' seedling plum.

Mr. Stevenson, Guelph, had tried a great many varieties, but had now cut them down to a very few, in truth he felt a good deal discouraged in the matter of plum growing. What with the Curculio, Black Knot, and hard winters he had not been as successful as he would like to be. Had tried Chloride of lime for the black knot, but it killed the trees. The Victoria was a splendid plum, the ends of the shoots, winter kill, but it does pretty well, bearing heavily for a few years, and then giving out altogether, McLaughlin does very well. The Imperial Gage is a fine plum. The Columbia is very subject to the Black Knot. The Lombard, Yellow Egg, and Smith's Orleans are the most profitable with him. Goliath bears a great crop, and is hardy. The Curculio is not quite as bad this year as formerly. The rot seems to be infectious. Car's golden Drop ripens very late.

Mr. Wood cultivates the Imperial Gage Lombard and Car's Golden Drop, with good success.

Mr. Fairley, Guelph, thinks the Lombard to be the least subject to the Curculio, and Black Knot, and at the same time the most prolific.

Mr. Peterson thought that the Black Knot made its appearance in trees growing in a poor soil, but not when the soil was in good heart. He did not think the rot to be infectious.

There not being time to discuss the subject of Strawberry culture, it was postponed to a future occasion.

The President for himself and the members from abroad, heartily thanked the Citizens of Guelph for the very kind attentions received from them, and assured them that the meeting had been very instructive and pleasant.

Mr. Peterson seconded by Mr. Wood, tendered to the association the thanks of the Fruit growers of Wellington and neighboring Counties, for holding their summer meeting in Guelph, and for the many valuable suggestions and the important information disseminated through it at this meeting.

New Cerothera.

As is their custom at the opening of the new year, our contemporaries of the horticultural press have in recent issues placed before their readers elaborate notices of our grains in the way of new plants, fruit, and vegetables during the past year—all very exhaustive, no doubt; but yet we looked in vain among their notes for any allusion to a charming novelty whose acquaintance we made last year, and which, we submit, has strong claims to be regarded as *Al* among the cream of hardy flowering plants. We allude to a new dwarf Cerothera, from Utah, which we saw in flower at Glasnevin last year, and for the introduction of which, as of so many other choice plants, we are indebted to Dr. Moore. Calling at the gardens one evening last summer, while walking round with Dr. Moore, he asked, Had we seen the new Cerothera? Being answered in the negative, he led the way to the lock-up garden or sanctum, where one is sure at all times to meet something new, very rare, or of much botanical interest. On this occasion, however, all else was forgotten in admiration of the lovely hule transatlantic gem to which Dr. Moore introduced us. Looked at in the quiet stillness and shadings of a summer evening's close, with its circlet of large pure white flowers, raised vertically above the foliage, on long, slender tubes, and expanding their broad fair bosom to the cooling moonbeams, this lovely plant presented an appearance altogether unique and striking.

This plant is altogether unique amongst its congeners as regards habit and appearance. The best of the latter, as, for instance, *C. missouriensis*, *C. Lamarckiana*, &c., though showy as regards flowers, are of a gawky, straggling habit, which detracts much from their value. The plant to which we now direct attention is just the opposite, being single-stemmed, compact, and dwarf, flowering when not more than 6 inches high, and at the end of the season rarely doubling the

height. But to come to particulars. The stem is short, stout, some 8 or 10 inches high; the leaves reniform, having long foot stalks, which, together with the midrib, in the lower caves, are white, in the upper red or pinkish. Commencing at the base, the flowers issue in long succession from the axils of the leaves, and are elevated vertically over remarkably slender tubes, fully a span in length, in a way to produce a beautiful effect. The flowers, as compared with the plant, are of great size, pure white, the limb of the corolla consisting of four very large-obcordate petals, at the base of which the anthers are placed, round the mouth of the tube, which here expands considerably, and is of a greenish yellow colour. The stigma is cruciform and considerably exerted. The above description, we are quite aware, is very imperfect, and conveys a still more imperfect idea of this fine flower. As yet, as far as we are aware, this *Oenothera* is without a specific name. It comes from the state of Utah, North America, and was communicated to Dr. Moore by his friend M. Roehl, of Zurich. When we saw the plant at Glasnevin it promised to seed freely, and we hope ere long to see it widely distributed, and taking a prominent position in the choice herbaceous border, or cutting a figure in some phase of subtropical gardening, for which its dwarf habit and exotic appearance seem to render it eminently suitable. — (*Irish Farmers' Gazette*.)

Among the Roses.

To the Editor.

SIR,—I am passionately fond of Roses. To me the rose is the most beautiful flower of the garden, and the hours passed in taking care of my rose trees are only surpassed in enjoyment by that of the hours spent in admiring their varied beauties and inhaling their sweet perfume. The hot weather and scorching sun-shine of the past fortnight have been very trying to the beauty of individual blooms, and many a flower that opened in beauty and freshness with the morning, has been scorched and faded by the noontide heat. In such a time of fierce sun-shine it is necessary both for personal comfort and in order to see the roses in perfection, to take an early morning stroll, and visit the rose borders before the sun is up. Go as early as you may, the Queen of flowers will have made her toilet, and be ready to greet you with blushing smiles. And never will any true admirer of the rose have occasion to regret that he left his drowsy bed and went out into the fresh morning air to enjoy its sweetness with the Queen of the flowers. Spangled with dew drops, every varying tint glowing in the freshness of its first unfolding, each rose appears in its virgin beauty. The air too has been cooled through the night, and is filled with the fragrance of flowers, so that you breathe the perfumed breath of the roses, as you stoop to feast your

eyes on the lovely tints of coloring laid on by the pencil of the great Master.

In this varying climate of ours, a climate of such great extremes, where the winter's frost penetrates the uncovered earth to such scorching depths, and the scorching July sun pours down upon the soil with such intense power, the lover of roses will have resort to constant mulching. A mulch of six inches in depth, winter and summer, will prove of lasting benefit. It should be formed of well decomposed manure brought chiefly from the cow-stable, and spread on the surface of the soil, over the entire bed or flat devoted to the roses, to the depth of four inches, and over this may be spread in fall, a covering of coarse strawy-litter to the depth of two or three inches more, or in the month of June covered with grass freshly cut from the lawn or meadow. Such a mulch will prevent the frost from penetrating the soil to any great depth in winter, and will enable the roses to resist the destructive power of the drying frosty winter winds, and come forth in the spring time in full freshness and vigor. And in summer such a mulch will keep the roots cool and full of sap, when the sun is pouring in his mid-day fervor upon the parched ground, and the rapid evaporation that is going on at every leaf pore will be constantly and abundantly supplied.

I have been most abundantly rewarded this season watching the opening flowers of a number of new roses which I obtained from one of our enterprising Canadian Nursery firms. What a delight it is to watch these new roses. Long ago you have noticed the difference in the foliage of the new sorts from the old ones, and from each other, until you can name the most of them by the shade of green they wear, the form and thickness of the leaves and the serrature of the edges. But now the flower buds are bursting and anyhow you may hope to catch a sight of the unfolding rose. Expectation is on tip-toe, and when at last you find the petals unrolled and you look down into the, to you, nectar filled cup, what a thrill of delight fills your soul as you drink in its glowing beauty. Well rewarded for all your care and by your very care fitted to enjoy your reward.

Something like this has been my own experience this summer, for the roses my nurserymen selected for me have been of rich and varied beauty. Some of them I will

THE BRAIN.—In one respect the brain is like land—if you want a good crop from it, you must let it lie fallow for a time. There are harvest times for it, which ought to be noted. After a good night's rest, and a cup of coffee or tea, it will yield its best of a certain kind: use it then in matters which require grasp, strong reasoning, and force of expression. Use it as little as possible from two P. M. to seven or half-past; then, until ten o'clock, begin to reap what it will yield in poetic idea and thought; this is the special time for spirit thought, when imagination hangs out her lamps, and the ghosts in

the char-hya-d begin to stir. Better to let it—never later than eleven, if possible—without a glass of whiskey; if you cannot sleep, take a pint of porter. And remember, this advice, as regards sleeping and every thing else, put in included, that it is much better to do a little well than to do a great deal badly.

and name in my own way attempt to describe, in the hope that some other lover of the rose may procure them, and have as rich a treat as I have enjoyed.

A perfect little gem is MADAME ALFRED DE ROUGEMONT, my first experience in blooming this rose was with it in a pot, and it was a most charming sight. I planted it however in the open ground where it passed the last trying winter safely, without any protection; and has been and still is covered with its delicate and lovely roses. The wood and foliage are of a light green, the growth moderately stout, and with a free and graceful habit. The roses are small in size, quite double and full; when newly opened they are most handsomely capped, white with a delicate tint of flesh color, deeper towards the centre. It is a most abundant bloomer, and though by no means showy, is yet exceedingly attractive in its modest loveliness. For bouquets in which light colors predominate, for wreathing the hair or set singly as a loop to gather flowing tresses it is perfect.

Among the brilliant, dazzling ones I place in the foremost rank the DUC DE ROHAN. Free and vigorous in habit, its leaves thick and massive, yet glossy in their dark green, the entire tree puts on the air of one of noble blood, the roses are large, double and full, and when newly opened are of a dark rich red brilliantly shaded with vermilion. The petals are of good substance and have that rich velvet like appearance, which gives such fullness and depth to the glowing color. Apparently perfectly hardy and an abundant bloomer, it will take a commanding position in all our choicest collections.

Another of these dashing showy fellows is LORD MACAULEY. One would hardly expect the staid old historian's name to have been handed on to coming time linked with such scarlet and crimson robes. But it is a lordly rose nevertheless, and seems likely to thrive well in this inaristocratic land of ours, never losing a bud through all the trying weather of the past winter. It pushed forth its stout, dark green shoots when tardy summer came at last, and clothed them with thick, leathery, shining leaves, which tell of blood. And then came the roses, large, full and showy; noble blooms, opening with a brilliant scarlet crimson which changes at length to a deep glowing crimson of rare richness and beauty.

But for queenly stateliness of habit and queenlike beauty, MADAME LA BARONNE DE ROTHSCHILD is peerless among the roses. Others may blush with a more coy and maidenly grace, others may put on more

gorgeous apparel and dazzle the eye with purple and scarlet, but she robes herself in glossiest sabin and draws around her the drapery of ample folds dyed with richest, yet most delicate peach-blow tints. The stout shoots, armed with ivory-like spines, have an air of matronly dignity, and the large, very large handsome cupped, stout petaled roses, borne singly on the extremity of each shoot, of such a clear light satin rose, crown it with royal beauty. I do not wonder if rose growers in England were wild with excitement over the advent of this Queen among Queens, and that the Royal Horticultural Society awarded to her the highest certificate of merit. One thing I have noticed that is worth remembering, it bears the fierce heat of our July sun uncommonly well.

And what a charming rose, in its stainless purity, is that *BOULE DE NEIGE*. The blooms are small, and in the esteem of some that may be counted a defect, but to me its comparatively miniature size is one of its highest charms. Set off with a single spray of its bright green leaves, how charmingly does its snowy whiteness contrast with those raven locks. And whatever may be wanting in size it more than compensates in the abundance of roses, while the petals are rolled back so neatly one upon the other, that it well deserves the name of *Ball of Snow*. And last fall, I remember, what an abundance of white roses we gathered from this best of the white autumnals.

And writing of autumn bloomers, reminds me of that Prince of dark roses *XAVIER OLIVO*. Last fall this was one of the most attractive in the bed, and now the tree is covered with roses and rose buds as though its life work was to cover itself with blooms. And such blooms they are too magnificent in size and beautifully full, of a deep, yet brilliant velvety scarlet when first open, and gradually changing to darkest crimson. It is an exceedingly showy rose, that cannot fail to be admired in the choicest selection, beautiful when only its thick, deep green, glossy leaves are to be seen, but gorgeous when mingling with its shining foliage, the darkly glowing roses are seen in the height of their beauty.

But I must stop. Yet I cannot stop until I have shown you the lovely *COUNTESS DE CHABRILLANT*. Did you ever see such shell-like petals, so beautifully set in cup-like form, and so sweetly tinted with shaded pinks? Is it not a most lovely flower? and each rose is so perfect, not crowded in cluster so close that none can get room to unfold in perfection, but singly, borne on the point of each strong shoot.

There, now I will stop. Not that I have exhausted my list of favorite roses. Oh, no, I have a dozen more. Perhaps, if you are fond of roses, I will sometime tell you about them.

The present prospect of the peach crop in the Niagara district is excellent. It is thought that it will be the largest gathered for many years.

Attempts at Fruit raising in the Backwoods.

Having some time ago promised the Secretary of the F. G. Association to write something about my failures, and successes as a backwoods farmer, at fruit growing. I do so with a very great degree of diffidence, and more with the desire to fulfil that promise, than supposing that I can write anything to interest, far less to instruct others, inasmuch as my experience in that line, only extends over a period of eight or nine years.

Allow me premise my remarks by stating that Bear Creek, on the banks of which I am settled in the township of Moore, like the stream described in the cottages of Glenburne, has a trick of running out of the straight line, and delights in forming oxbow angles and corners, in its tortuous course through the townships of Warwick, Enniskillin, Moore and Sombra. Before the discovery and development of the oil business in Enniskillin, the fertility of its flats was such that 20 and 30 successive crops have been raised without the assistance of any other manure than the alluvial deposits left each spring by floods. Its waters have now become so much impregnated with the refuse from the oil refineries at Petrolia, and other deleterious matters, that anything of a vegetable or animal nature cannot live, and thrive well that is much in contact with them, which almost renders the flats useless for cultivation. Doubts being entertained whether any real remedy can be devised for this much felt grievance, it may be a question worthy of consideration whether settlers could not in some measure compensate for this drawback by taking advantage of its cultivatable slopes and banks for fruit growing. These banks generally follow the zig-zag course of the stream and furnish almost any exposure that may be desired for fruit trees.

The luxuriance with which vegetation flourishes in its vicinity, and the success that has attended the efforts of some settlers who devoted a little attention to Horticulture, afford good grounds for supposing that fruit may be profitably raised at Bear Creek, notwithstanding the blossoms being sometimes blighted by spring and summer frosts.

Improvements in any branch of industry being usually brought about by experiments, often accompanied by failures; I beg to give a few facts respecting my attempts at fruit growing in this section.

In the fall of 1863 I settled on a bush lot. The soil a stiff clay. A small tributary of Bear Creek runs through the centre, affording excellent facilities for draining. A space was chopped and cleared for a house on the banks. The next undertaking after the creation of the log house was to plant some fruit trees.

The declivity of the banks was sufficient to prevent the retention of much stagnant water in the soil, but to prevent the possi-

bility of any remaining about the trees, large holes were dug and some oak stave hearts put in the bottoms with an eye at the lowest side for the escape of water should any accumulate.

The idea of planting fruit tree amongst roots, stumps, logs and log piles was laughed at as utopian by some of my neighbors. It, however, required no great knowledge of Agricultural Chemistry, and vegetable physiology to perceive that the ingredients essential for plant food were in abundance. The large quantities of leaves decaying and decayed, showed a sufficiency of organic matter for some years to come; whilst the piles of ashes, from the trunks of the giant elm, beech and maple trees that occupied the ground for centuries as a previous crop, were enough to satisfy the desires of the most fastidious arboriculturist in favor of alkaline manures.

Apple and plum trees were carefully planted, and grew beautifully. The apple trees will now compare favorably with any in the neighborhood, planted at the same time. Taking into account our short springs and the large amount of work to be performed, possibly the fall is the more convenient season for farmers to plant trees. The trees are established and ready to start into growth as soon as the two great agents of vegetation, heat and moisture, are sufficient in the soil.

The Red Astrachans, Golden Russets and Baldwins bore well in 1870; and the Fall Pippins and Duchess of Oldenburg or a tree resembling the latter last year. Fruit both in size and flavor all that could be desired.

The Northern Spy's and Winter Greenings are thrifty, but the former throw out such a profusion of top growth every year as to require the constant use of the pruning knife to keep the centres open.

Although one tree bore a few last year, I am inclined to believe that the new settler that plants an orchard of Spy's must console himself with the poet's advice and "learn to labor, and to wait" for fruit.

If it be true that vigilance is the price of liberty, not less true is it that crops of good fruit can only be secured by constant watchfulness on the part of the fruit grower.

Two years ago the borers got into the Red Astrachans. Not willing to disfigure the trees by cutting the invaders out, I resolved to try other remedies. A writer on the subject recommended the stopping up of the holes by which they entered, with sulphur. To make security doubly secure, I mixed the sulphur with lard and phosphorous, and closed the holes behind them.

To all appearance the depredators were now as securely shut in as Bazine was in Metz by the Prussians. Alas for the best laid schemes. Sulphur and phosphorous had no more effect on chrysothrips femorata than Port wine and water on an opium eater. As soon as they finished their engineering operations by boring and tunnelling

ing in the heart of the trees they made their exit by more direct routes than they entered, as if they used the phœphorus to light their way.

The trees kept growing and are recovering, but had to be propped for fear of high winds. Last year the the Russets were attacked. Instead of trusting to nostrums, the borers were unceremoniously dug out with a sharp pointed knife.

As working and waiting are man's duty, and thrifty toil the one condition of true thriving, a little well directed labor, if it will not prevent the attacks of these pests, will in some measure make them less frequent. The lye from a few barrels of wood ashes mixed with some soft soap will be sufficient to wash a good many trees two or three times in a season.

Plum trees were planted in the same manner as the apples in the face of a bank with an eastern exposure. They grew from two to four feet each year. After three or four years, symptoms of decay appeared in one after the other until all died. Some died on one side, others all round, whilst the bark on others died in spiral stripes, like the thread of an angur. It appeared as if the sap in early spring were started by the warm sun shining full upon them in the forenoon, and sharp frosts succeeding at night, froze the sap at or near the surface of the ground. The trees when broken, were black in the heart. Some of the plants were suckers taken from the roots of other trees, others were not, and whether this had anything to do with their early decay I know not.

In backward seasons, I have noticed in exposed situations in the elevated districts of Aberdeenshire, Scotland, where alone the hardy Scotch fur and the birch can brave the height and the cold, sap frozen as described. In the case of the pines small protuberances were formed round the trees at the parts frozen, and the sap exuded through the bark adhering to the outside in the shape of resin. These trees appeared stunted in growth afterwards, but they had stamina enough to struggle for life whereas the plums forced it may be too much in summer, succumbed to the sudden changes of temperature.

A yellow Siberian crab tree which was planted in the same bank four years ago, and probably stimulated too much by the droppings of fowls applied once or twice, grew admirably, and bore fruit the last two years. Early last harvest the leaves began to fade and fall off. On examination the bark was found dead under the surface of the ground. It was scraped off and the part rolled in a mixture of cow manure and clay. Should it die this year, which is very likely, it is another lesson that trees may be killed by kindness as well as by neglect.

Peaches were at one time grown in great quantities in this settlement, but of late years few can be raised, and little attention paid to the cultivation of them in conse-

quence. There is no evidence to show that the failure is occasioned by the change of the seasons, and must be accounted for in some other way.

A NEW SETTLER.

[To be continued.]

The Striped Bug.

Every gardener knows that this is a most destructive insect among melon, cucumber and other young vines, sometimes damaging the crop seriously. Many remedies have been suggested, some of them, no doubt, good in their way, but troublesome. Now, we have tried for several years another which has proved with us a complete success. Instead of aiming to drive away the insects by soot, ashes, &c, we pet it, or rather furnish it with food better than the young melon and cucumber plants. We sow around each hill at the time of each planting a few radish seed, and coming up about the same time, the tops supply pasture for the bug, which it much prefers to the vines. Lettuce will also answer, but the radish is rather liked the best. While our vines are untroubled by making this little provision for it, the young radish tops are completely perforated.

Should this fail, which is seldom the case, and has never been with us - sprinkle the vines with a solution of whale oil soap. - N. Y. Sun.

Gooseberries Without Mildew.

I have received the report of the Fruit Growers' Association, and I find some very useful information in it. I notice a report from Ottawa on the gooseberry, and rather unfavorable to the English varieties. Now Sir, as I have grown the English varieties for about thirty years in Sarria with the best of success, they were the admiration of all that saw them, and free from mildew, except one tree, the Ocean Green, and it was subject to mildew—and this year I have one hundred and forty bearing trees, and well loaded with fine bright berries, except six trees, four of the Ocean green and two Seedlings are affected after this season I shall destroy them. I have a number of fine Seedlings, the seed sent direct from England, and some of them are excellent fruit, and some are only common fruit. I have a Seedling from the Red Lion that is excellent, I raised it twenty years ago—have also some two years old seedlings from England. Two years ago I visited some of the Detroit gardens, there I saw some of the English sort, very fine and clear of mildew. The price of the English per doz. was two dollars, and the price of the Houghton Seedlings and Mountain was one dollar per doz. I think that if the correspondent from Ottawa could see the fine English gooseberries that we grow on the banks of the River St. Clair, he would withdraw the piece of advice given. I would not

plant the Houghton Seedling in my garden for we have some wild gooseberries in the bush just as good as them. I have some Seedling plants; they have some fruit on this year if I can keep the bug off them. When I lived in Sarria I had a fine assortment of plums and the plan I had to keep them down was the best that I ever tried. I took a long handle frying-pan and some charcoal and stone brimstone and put a fire in the pan, and held it under the branches, not to scorch them, and that fixed them the best of anything that I ever tried, I had plums when my neighbors had not any.

WILLIAM STOKES

Moretown, Ont., July 1, 1872.

A Fruit Growers' Visit to Guelph,

MR. EDITOR,

I have just returned from the meeting of the Fruit Growers' Association at Guelph, and feel constrained to give you some account of my visit, and what I saw. It is not necessary to say anything about the comfort of travelling on the Great Western Railway, nor to tell you that every train was on time, that the connection was made at Harrisburgh to the minute and that we reached Guelph according to card, that there were no smash ups, no broken flanges nor misplaced rails, for if there had been the *Globe* would have known it, and through the *Globe* all the world would have as surely known it likewise. The readers of the *Globe* know that the Great Western does not indulge in such pastime, and that under its present able management such affairs are left entirely to the Grand Trunk, at least we see no mention of them.

I found Guelph enveloped in a cloud of dust. Weeks of hot weather without a drop of rain, had dried up the soil, and feared that the Horticultural Exhibition would be sadly shorn of its usual attractions. Yet skill and energy will accomplish wonders, and the afternoon was very pleasantly spent among the trophies of the gardeners and amateurs of Guelph. It is not necessary to say anything concerning the Exhibition. The abler pen of the Horticultural Editor has already described it.

But it was my privilege to enjoy a visit to some of the pleasant residences about Guelph, and to be the recipient of such genial courtesies from their proprietors, that the remembrance of this visit will ever remain among the treasures of memory.

In the morning, Mr. Sharpe invited a number of the Fruit Growers to ride with him to his residence, in the suburbs of the town. We found it just such a rural retreat as one would expect in the home of the tasteful Vice President of the Guelph Horticultural Society. The noble beech trees have been left unharmed, and while the charms of the place have been increased by judicious planting, and the laying out of convenient walks and carriage drive, yet these noble

trees give their own character to the place, so that one scarce needed the voice of the scholarly Allen whispering in your ears the familiar words, "sub tegmine fagi," to awaken in your soul memories of the old Roman Poet, and cause you to fancy that you heard the melodious rithigou of his noble carmen flowing through the tops of his favorite beeches.

After we had strolled through the grounds enjoying the cool shade of the lovely retreat, we were invited within the hospitable home to partake of a little refreshments, when our host took occasion in a neat little speech to give a most cordial welcome to the Fruit Growers, and to express his sympathy with them in their endeavours to stimulate and encourage the cultivation of fruit. His sentiment was very briefly responded to by the Secretary of the Association, thanking him for his kind attentions, and expressive of the gratification enjoyed by the officers in finding their efforts to promote fruit culture so enthusiastically seconded by gentlemen of culture all over the Province.

The afternoon and evening were spent in listening to the discussions of the Fruit Growers' Association, which were eminently practical and useful. Mr. Allen of Kingston made most serious charges against the fruit eating birds, and felt that the law against shooting small birds should be so modified that a man might be allowed to destroy them off his own premises, if he choose. I am very sorry that Mr. Allen should loose all his nice cherries and strawberries by the birds, and suggest to him to try the "cat remedy" which is now going the rounds of the papers. For myself I had much rather the birds should have all the cherries than to do without the birds. I love the birds almost as much as the flowers, and though I do sometimes wish they were more considerate of the fruit-eating propensities of the proprietor, yet I cannot bring myself to shooting them because their facilities for gathering cherries are greater than mine.

Speaking of cats, it is said that the stuffed skin of a cat put upon a support just over the top of the cherry tree, will be as efficient in driving the birds away, as a living feline.

The next morning Mr. Goldies, the energetic and enthusiastic President of the Guelph Horticultural Society, very kindly took me in charge, and introduced me to the grounds of several of their Fruit Growers, and to their gentlemanly proprietors. We first visited the grounds of Mr. Allen, which we found kept in very fine order, and planted with many choice fruits and fine ornamental trees. Here an opportunity was given of examining the tree of the new seedling plum raised by his gardener, Mr. Glass. It was evidently different in foliage from either of the varieties from which it is supposed to have sprung. The leaves are

very large, thick, dark green in color and with a very glossy upper surface. The tree is evidently a very vigorous grower, and of a healthy habit. There is but little fruit on it this sea on; yet enough to enable the committee appointed to examine it, to form a good opinion of its qualities.

Mr. Allen, with a considerate love for the relics of earlier days, still preserves the first house ever built in Guelph, which is pleasantly located near the bank of the Speed, and so nicely ensconced within the borders of clustering trees, of native and foreign origin, valued some for their luscious fruit, and others for their graceful form and grateful shade, that it is one of the chief attractions of this enterprising place.

Parting with reluctance from our kindly attentive host, and his skilful gardener, we were taken to the hospitable home of our estimable friend who had given up his own valuable time this day that he might contribute to the enjoyment of strangers. These grounds are but newly and partially planted, yet what had been done was marked with eminent good taste, and everything seemed to thrive under the Presidents care. Attention was kindly drawn to a variety of the Kentish which had been introduced we believe from New Jersey by Mr. Goldie, which is of a more dwarf habit of growth than the ordinary variety, and yet bearing very bountifully. Such a variety can not fail to be valuable in our golden cherry growing regions, and in all small grounds where economy of space is important. After being refreshed with most kindly hospitality, we started out again and proceeded towards the grounds of Mr. Stevenson, but on approaching the place learned from Mr. Elliott that he was from home. This gentleman on learning that we had called at his place had taken the pains to walk over to Mr. Stevenson's, a distance of nearly two miles, in order that he might meet with us and accompany us to his own garden. Such are the kindly attentions the fruit growers from abroad received from their brethren in Guelph, and thanks, more than can be expressed, are due to them all for their exceedingly cordial hospitality.

I returned with Mr. Elliott, and had the pleasure of a most delightful stroll through his grounds, which are most scrupulously neat and clean, and the trees all in good vigor and health. A tree of the weeping Nut Ash, most tastefully trained over and around a summer house, is one of the interesting features of the place. There is also a weeping Elm grafted some twelve feet from the ground, which is a noble object, and when it has acquired a little more age will be exceedingly attractive.

In the garden of Mr. John A. Wood is also a fine collection of fruit trees, most of which were well filled. The experiment of inducing the curculio to leave the plums alone, by treating them to some sweetened

water, or molasses and water, placed on corn-cobs fastened in the trees was here being tried, but it cannot succeed, for however fond of sweets the curculio may be, they injure the plum in the effort to perpetuate the species not to gratify their appetites. In these grounds we saw plenty of the Colorado potato bug, and most earnestly advise every one who is troubled with these pests to apply to Prof. Buckland at Toronto for a copy of Saunder's and Read's Report, in which is a full account of the bug, and instructions how to get rid of them.

But time would not wait, and as I was obliged to leave Guelph by the noon train, several other fine grounds that it would have been a pleasure to have seen were left unvisited. Yet what was seen served to show that with attention to shelter, and low training, good fruit can be grown in Guelph, and the trees preserved in vigorous health.

Rose Rendatler Geranium

It may not be generally known what a very useful plant this is for winter flowering; its bright pink flowers are brighter now and of a better shape than they are in summer, and they are also produced very abundantly. I have a house half full of it, that has been a mass of flowers for the last three months. The cuttings were struck late in spring, and grown in the open air in six and eight inch pots; not plunged, but placed on bricks, and in September were removed to a light airy house, where the temperature is not allowed to fall below 4°. The plants are now many of them perfect little specimens, fit for a dinner table, with five or six fully developed trusses on each. I have given many other kinds a trial for winter flowering, but never found another half so good as Rose Rendatler. This I have grown and watched five or six winters, and it has never failed — *The Field*.

The Directors of the Ontario Fruit Growers Association offer the following prizes for the year 1872:

1st. An Honorary medal to the originator of any new fruit which, having been thoroughly tested, is found to be worthy of being placed among the fruits of its class for cultivation in Ontario

2nd. The sum of fifty dollars for the best new Canadian seedling late winter apple.

Thirty dollars for the best Canadian seedling harvest apple.

Twenty dollars for the best Canadian seedling autumn apple.

All these to be at least equal to the old popular varieties now in cultivation. Not less than two dozen specimens of the fruit must be sent, when in condition for examination, to the President of the Association, Rev. R. Burnet, Hamilton, accompanied by a letter setting forth what, in the opinion of the sender, are the excellencies of the fruit sent, whether for croking, or for the dessert,

&c., &c.; also stating the origin of the tree, if known, its vigour, hardihood, productiveness, and the like.

3rd The sum of twenty-five dollars for the best essay on the cultivation of the plum, including a short description of the varieties which the writer has grown, and his opinion on the merits of each.

Fifteen dollars for the second best essay thereon.

4th. The sum of twenty five dollars for the best essay on mildew of the gooseberry and the grape, with drawings of the appearances of the mildew in several stages of development as seen under the microscope by the writer.

Fifteen dollars for the second best essay thereon. Each essay must be forwarded to the Secretary, D. W. Beale, St. Catharines, on or before, the fifteenth day of September, 1872, and bear a motto, and be accompanied with a sealed note having the same motto indorsed on the outside and containing within the name of the author of the essay.

5th. To any person sending to Wm. Saunders, Esq., London, transportation prepaid, five thousand of the plum Curculio, (*Conotrachelus Nemophar*) in the beetle state, the sum of twenty dollars; or sending three thousand, the sum of ten dollars; or sending two thousand, the sum of five dollars. The Treasurer will pay these sums to any person furnishing him with a certificate from Mr. Saunders, stating that he is entitled thereto.

LIBONIA FLORIBUNDA.—Where dwarf, bushy, freeflowering plants are in demand in winter, a dozen or two of this Libonia ought to be grown. It has a very neat habit, with small pea green foliage, producing freely about the new year its peculiar but showy tube-shaped yellow and red flowers. It may be classed as a soft-wooded greenhouse plant, and any one commencing with small plants in February, may, by liberal treatment, obtain dense little bushes by autumn. The great secret in doing this plant well is to grow it rapidly in spring and early summer, occasionally pinching in the strongest shoots that seem inclined to break away, and about the end of July to place them in a cold frame to mature the growth keeping the lights on for two or three weeks at first, and then afterwards to give abundance of air approaching to almost total exposure. In the beginning of October place them in a warm greenhouse near the glass. The following compost will grow it well:—Two-thirds turfy loam, one-sixth peat, one-sixth two years old cow dung, thoroughly mellow, with a sprinkling of charcoal, broken small, and silver sand. The thing to aim at is to induce a free growth in spring, with a cooling and ripening period out of doors afterwards, with a good supply of water at all times. I should state it is easily propagated. Young shoots strike freely in a hotbed in spring. — *Gardener's Chronicle*

Entomology.

Ants to blame for the Aphides!

(To the Editor.)

Sir,—Some people's ideas upon things of which they know nothing, are often sufficiently ridiculous. And generally he who knows least of a subject is the most conceited concerning the correctness of his notions about it.

Talking the other day with one of our workmen, who professes to have been a gardener in England, he began as usual to tell of his various experiments in the way of ridding of noxious insects his little plantation at home. Among the most formidable of his enemies he mentioned the ant. It would keep climbing up and down his cherry trees in spite of all he could do to the contrary. He had tried a rag saturated with coal oil, wound about the tree, but still it would climb up.

"But what harm does it do?" I inquired. "Why," said he, "Mr. Pettit told me it done no harm, but I know better'n that. It carries up the lice and puts them on the leaves. Pretty soon them leaves curls up, and then the fruit gets spoiled."

"I have read that the ant seeks out the plant lice, attracted by the sweet juice which they secrete."

"Well I know they put 'em there, for I took partiklar notice of the beans as my woman planted in the garden, where the hens picked off the pisuirs, that there was no lice, and she had a good crop, wale them as I planted in the field and did not put no chickens near, were 'nt worth gatherin'."

To explain or argue was completely out of the question; he was of the same opinion still. So I left him revealing some new design, which he had formed for the extinction of that very troublesome and destructive insect, the ant.

L. WOOLVERTON.

Emigration.

Still They Come.

As to the condition of things in this relation in the South of Ireland, we clip a paragraph from the communication of a correspondent of "THE FARMER," of April 29th, 1872, (an agricultural paper published in London and Edinburgh) as follows:

Agricultural laborers are now receiving from 2s to 2s. 6d. per day with diet. This is considered very good hire; "still the cry is Westward, Ho!" It is not by the hundred they are to be reckoned any longer, but by the thousand. The week before last 2,500 left Cork; last week there was as many, and still every train brings its contingent." All the lines—Irish, Channel, and National

have put on additional steamers, yet you constantly see in the Cork papers; "the White Star steamer Atlantic arrived yesterday (April 19) from Liverpool; she took 200 passengers, leaving 200 behind. The Cunard steamship Hecla also arrived, and took 300 passengers, leaving 150 behind "for want of room," &c. I sincerely hope my poor countrymen are "improving their position," in going to the "Far West," but if emigration on this scale continues a little longer, I think Ireland will become a large pasture farm. Already several large farmers in my locality have sold off their milch cows and turned to feeding dry stock, in consequence of the scarcity of female servants.

Emigration.

In the matter of placing the advantages and holding out inducements to intending emigrants from the old countries, we are decidedly behind the United States. In a small weekly newspaper published in one of the rural districts in England we notice an advertisement of the Burlington and Missouri River Railroad, inviting emigrants to settlements in the hands of that Company in Iowa and Nebraska. Now, although we should be very averse to see that unjust puffing so often exhibited in reference to American Emigrational notices, yet we think that our fault has heretofore particularly been in the neglect of the old country rural districts. It is from such parts that the most promising and deeply needed class of emigrant will come. In this vast agricultural country it is to the small farmer and the farm labourer that we may with all justice hold out grand inducements of progress in Canada.

Book Notices.

Ville's Chemical Manures.—A work of special interest, and in which much information might be found for the farmer.

Published by HENRY CAREY BAIRD, 406 Walnut Street, Philadelphia.

The following are the titles of some of the books which were in circulation in the time of Cromwell. The authors of those days, like the Burmese Embassy of ours, must have thought there was "something in a name": "A most Delectable, Sweet-Perfumed Nougay, for God's Saints to Smell at;" "A wair Bellows, to Blow off the Dust Cast upon John Fry;" "The Snuffers of Divine Love;" "Hooks and Eyes for Believers Breeches;" "High-heeled Shoes for Dwarfs in Holmess;" "Crumbs of Comfort for the Chickens of the Covenant;" "A Sigh of Sorrow for the Sinners [of Zone, Breathed out of a Hole in the Wall of an Earthen Vessel, known among Men by the Name of Samuel Fish;" "The Spiritual Mustard Pot to make the Soul Sneeze with Devotion;" "Salvation's Vantage-Ground; or, a Louping Stand for Heavy Believers;" "A Shot Aimed at the Devil's Head-Quarters, through the Tube of the Cannon of the Government."

Agricultural Intelligence.

Farming in Vancouver's Island.

We so often receive enquiries as to the inducements for settlement in British Columbia, that the following extract from the report of Mr. James Richardson, the geologist, is sure to be read with interest:—

The vegetable soil which has been mentioned seems to be of a very productive character, and whether in the forest, the field, or the garden, appears, combined with the favourable climate, to yield large returns. In the Comox district, about 140 miles from Victoria, as already stated, the soil is spread over a very considerable area of prairie country, commonly designated an opening, extending from the coast up the different branches of the Courtenay river for seven or eight miles. The surface of this district, which is naturally free from timber, with the exception of single trees and stumps, chiefly of oaks (*Quercus Garryana*) and strips of alders (*Ainus Oregona*) in the bottoms, may be some twelve square miles, the scenery of which is picturesque and parklike. Its margin is very irregular in shape, and it is surrounded by a growth of very heavy timber, among which are the Douglas pine (*Abies Douglasi*) often attaining ten feet in diameter and 200 feet in height, half of which is free from branches and the cedar (*Thuja gigantea*) often equally large. The open country in its natural state is mostly covered with a growth of ferns, which sometimes attain a height of ten feet, with stems three-quarters of an inch in diameter and roots descending to a depth of three feet. These roots the native Indians prepare in some peculiar way for winter food, and excavate deep trenches to obtain them. The farmers are under the necessity of grubbing up the fern roots before the ground is ready for use, and they are often voluntarily assisted by their pigs in this operation, these animals, it is said, relishing the fern root as food. I was informed by Mr. John Robb and Mr. John McFarlan, two partnership settlers of the district, that the average yield of land after it is cleared and thoroughly under cultivation is of wheat, from 30 to 35 bushels per acre; barley, 40 to 45 bushels; oats, 50 to 60; peas, 40 to 45; potatoes, 150 to 200; turnips, 20 to 25 tons. Some of the turnips exhibited by Mr. Robb at the agricultural show are said to have been remarkably heavy, but those of the Swedish and yellow varieties, seen by me, I consider rather small. The season, however, was said to be an unusually dry one. The yield of Timothy hay is said to be about 2 tons per acre. Clover thrives well and rye grass is valued for its after crop.

The yield of butter per cow after calf feeding is about 150 lbs. annually, the ordinary selling price being 30 cents per pound. Cattle generally require to be home fed from the beginning of December to the middle of April. Snow seldom lies long. Heavy falls sometimes occur, but generally disappear in a few days. Once or twice snow has remained on the ground for two months. Apples, pears, plums, cherries, white and red raspberries, red, white and black currants, and most kinds of fruit thrive remarkably well. Some apples, of which I obtained samples, measured thirteen inches in circumference and weighed nineteen ounces. They were high flavoured and well adapted for eating

and cooking. Of the pears many measured eleven inches in circumference and were high flavoured and juicy.

At Gabriola, prairie land or openings such as those already described at Comox occur. More of them are met with on Saltspring Island, but in neither place of the same extent as at Comox. Mr. Griffith, one of the settlers at Saltspring, informed me that the fall wheat thrives well there, and yields from 35 to 40 bushels per acre. Of other grains the yield seems to be about the same as at Comox. In Mr. Griffith's garden there was a large plot of common winter cabbage, the solid heads of most of which measured from three to four feet in circumference. Red cabbage and cauliflowers were equally large and sound. Carrots and parsnips were large, as well as onions, and there was abundance of tomatoes and of several varieties of gooseberries, which did not seem to thrive so well at Comox. Mr. Griffith informs me that at Saltspring the bushes give in quantity and quality a crop equal with the best English. The crops of all the varieties of currants and raspberries in quantity and quality vied with those of Comox.

Mr. Griffith's orchard occupies about two acres, and has been set out only three or four years. I saw different varieties of apple, pear, peach, plum and cherry trees, and the proprietor informed me that all kinds bore fruit last year. The apples are excellent in quality, and the pears, though not large, were equal in flavour and juiciness to any I have ever tasted.

Mr. Griffith has about 300 barn door fowls, which are fed on the grain of the farm, and enable him to supply a great abundance of eggs to the Victoria and Nanaimo markets, where they sell for 25 to 40 cents per dozen.

At Fulford Harbour Mr. Theodore Frago showed me a pumpkin, which measured 32 inches in length, with a diameter of 15 inches at the small end, and 22 inches at the other; and he informed me that larger ones had been used before my arrival. The settlements of North and South Saanich, as well as of other districts near and around Victoria, show a good deal of prairie land, "oak openings," as they are called in that part of the country, from the greater abundance of trees of this species than elsewhere. In these oak openings many beautiful farms are met with; the soil and aspect of them resembling those of Comox. In addition to the grain, fruit and vegetables enumerated elsewhere, the hop vine has been introduced in North Saanich, and in the neighbourhood of Victoria. In the former place Mr. Isaac Cloake and Mr. Henry Wain, with some others, have each a hop orchard, as it is there termed, of several acres in extent. Mr. Cloake, who spent nine years amongst the hop fields of Kent, England, informs me that his hops are quite equal, if not superior, to the English, which, according to him, was tantamount to saying that they were the best on the face of the earth; and Mr. Wain, who likewise had practical experience, stated that in regard to aroma they were equal to the best he knew. They are of the variety known as the grape hop. It was introduced from California, and is said to have greatly improved in British Columbia.

The yield of hops is here from 1000 lbs to 1700 lbs. to the acre and it brings in the Victoria market from 22 to 60 cents per lb. When railway communication is established, the article may become one of trade between the two provinces, for if I am rightly informed, the hops imported from England are superior to any raised in Canada.

Other settlements of a similar character to those described are established between

Saanich and Nanaimo, which I had no opportunity of visiting. Near and around settlements possessing farms such as mentioned, in many places rocky hills rise up to heights of 1000, 2000 or even 3000 feet and more, the surface of which is in some parts craggy, but in others they present patches, with a thin soil, covered with a firm short bunch grass, on which sheep and cattle thrive well, for such of them as I saw there appeared to be in good condition. The temperature is cooler in such places than in the lower and more level country, and during the heat of summer they afford excellent pasturage, which will much assist the industry of agriculturists. Along the coast and in the interior of Vancouver Island as well as on those of the archipelago surrounding it, many localities for farms similar to those which have been here described will be discovered and hereafter become the homes of thousands of a hardy and industrious people.

Management of Hired Help Strikes.

Moor's *Rural New Yorker*, in commenting on this subject and the recent strikes of farm laborers in New England says:

We commend local legislation in this matter. We believe it policy for a community of farmers to meet, fix upon the number of hours that shall be regarded a day's work, the prices they will pay the different classes of laborers, the amount that shall be allowed per hour for extra time, and then operate on the co-operative principle of "helping each other out" on occasions. We have known good results to follow such combinations—results that were not good to the farmers, because their co-operation oppressed the laborers, but because it defined distinctly the relations between employer and employee, and enabled each to understand and appreciate the other. There must be mutual concession. We warn the farmers of this country that unless there is some such distinct and definite relationship established by them, the laborers will combine to establish it. The strikes in the cities, the labor unions, self-protective societies, internationals, etc., are steadily at work seeking to combine labor against capital—seeking to control capital by controlling labor. This matter must be met sooner or later, as it is being met in England, and there will be the same disturbance of relationship and of values, unless a wise discretion induces the taking of steps in advance to recognize the rights and meet the needs of the workingmen.

There are two points that would very greatly affect the status of labor. 1. Yearly engagements. 2. Good wages; but with a proportion held till the completion of the contract. As it is now, the farm laborer has all in his favor and no risk. In view of a busy season, he gets high wages and is regularly paid up; at any time he pleases he can leave, and thus cause the loss of all his former work on the crop, and there is no redress. Holding 25 per cent. of the amount till the contract is finished will go far to remedy this great evil.

Compost Heaps.

It is often recommended that when manure is thrown into heaps in the field, it should be covered with a layer of earth, to prevent the escape of the ammonia. The experiments of Dr. Voelcker, at the Royal Agricultural College at Cirencester, in England, have established the fact that the evaporation of ammonia from large heaps of manure goes on but slightly; for the reason that during the decomposition of the manure certain organic acids are formed at the same time the ammonia is evolved, and then immediately unite with the ammonia, forming nonvolatile compounds. There is an active escape of ammonia from the interior of large heaps, where the heat is too great for the chemical changes above referred to; but as it approaches the exterior part of the heap, where the heat is very much less, the ammonia is completely taken up by the organic acids and retained. There will be but a trifling escape of ammonia while there is sufficient moisture to retain it, for water absorbs and retains many hundred times its bulk of ammonia gas at ordinary temperatures. These non volatile compounds, from being highly soluble in water, are liable to be washed away at every rain storm, giving the well known color to the drainings of manure heaps.

Statistics show that the value of the annual products of milk is nearly equal to the value of imports for the year ending June 30, 1871. Milk consumed as food, at three cents a quart, is worth annually \$275,000,000; butter, \$195,000,000; cheese, \$29,000,000, condensed milk, and whey and buttermilk, used in raising pork, \$10,000,000; making a total of \$509,000,000. The imports of all kinds are worth \$520,000,000. So that from American cows' udders is squeezed every twelve months, an equivalent to one-fifth of the national debt. All the greenbacks and the postal currency in the country could buy only four fifths of it. But when we add to this the quantity of water made into milk for our towns and cities, the greenbacks would be literally nowhere.—*German town Telegraph*.

One hundred tons of new wheat, raised in the San Joaquin Valley, were shipped to Liverpool recently, by J. Frielander. When it is recollected that this is early in the season for grain, this fact becomes of importance. Usually wheat has not made its appearance in the market before the latter part of June, or the beginning of July. Moreover, fifty tons of this wheat were reaped, thrashed, sacked, and shipped on the same day. If this is not lightning work in the agricultural line, it would be hard to find. Six hundred sacks of new barley were also brought down from the same district. Farmers from the San Joaquin Valley say the grain there this season exceeds any before raised, both in quantity and quality.—*From the Pacific Observer, of Jan. 14, 1872.*

Miscellaneous.

Causes of Dew.

If dew fell, it would fall for the same reason that rain falls; but dew does not fall—it is simple a deposit of moisture, always contained in the air to a greater or lesser degree, and which, when there is enough of it, will always form on any cold body exposed to the moist air, in precisely the same way that a cold bottle or stone, taken from a cold cellar and suddenly exposed, in the shade, to the moist, warm Summer air, will become wet; this is not sweating, nor does this moisture come out of the bottle or stone, as many people believe, but from the air. It is for the same reason that moisture will condense against the window-panes when the air is cold outside, and moist inside, the moisture slowly freezing, while its deposits form crystals of ice, which we so often admire in Winter. When the weather is cool enough, the moisture deposited will even freeze on plants and grass, and then we call it hoar frost; if it does not freeze, it is simply dew. The only point left to be explained is, why does the ground become so cool during the night, so much cooler than the air above it, as to cause the latter to deposit its moisture? This was for many years a vexed problem, till Wells first suggested the radiation of obscure heat, which takes place from the surface of the earth through the clear atmosphere into the space above, and so causes the surface to become much cooler than the air itself. He demonstrated this by means of thermometers placed at different heights, and also by the fact that dew is only deposited on cloudless nights. When there are clouds, they reflect the heat, or prevent it from escaping. The surface of the earth thus being kept from cooling, no dew is deposited.—*Manufacturer and Builder.*

Novel Exhibitions at a Spring Fair.

At the Oxford, Chester county spring fair, they are not satisfied with horse-racing, but get up other matches, which have little or nothing to do with farming. One of these was a picking-up match, in which to make it look agricultural, potatoes instead of stones were used. This is the way the match is given: "Four bushels of potatoes were placed along the trotting-course, in four lines of a bushel each, and about a foot apart on the ground. The four contestants each had a wheelbarrow, and at the word "go" commenced picking up the potatoes and depositing them in the wheelbarrows, and the first to get them loaded up and return to the starting point was to be declared the champion potato-picker and rewarded accordingly." The stakes were money. How much was privately bet on the match we are not informed exactly, but no doubt it was considerable.—*German town Telegraph.*

How to Build Brick Chimney-tops.

All the brickwork above the superstructure, whether the building is stone, brick, or wood, should be made with cement mortar, which will absorb much less water than mortar made of caustic lime and sand. The bricks for a chimney-top should be soaked in water for a few minutes, so that they will not extract the water from the mortar. In order to have mortar become very hard it must dry slowly. By laying up wet bricks, the mortar will set slowly, dry slowly and eventually become almost as hard as the bricks. Every brick chimney should be covered at the top with a copestone, with an arched top, or with bricks placed over the flues, like the rafters of a building, for the purpose of turning off the water which would go down the inside, be absorbed by the bricks, and, in some instances soak through and wet the paper or ka'somining on the inside. A chimney-top laid up with good cement mortar, and covered with a copestone or chimney-arch, will stand the influences of the weather for more than a hundred years without any repairs.

To Test Green Paper for Arsenic.

We have been asked for a simple method of doing this. The tests for arsenic, strictly so called, are suited only to laboratory use, but since it is the arsenite of copper that is employed for the poisonous green colors, a test for copper is sufficient for ordinary purposes. Put a drop of aqua ammonia on the suspected paper, and if it changes the color to blue, you may be sure that copper is there, and almost as sure that arsenic is present also. There is not one chance in a hundred that a more critical examination would lead to a different conclusion. At any rate, we advise our readers not to use any paper on the walls of their houses or for any other purpose, if this simple test makes its character suspicious.

Handling Hogs.

A late number of the *German town Telegraph*, says:

A practical breeder gives the following advice, which, in the main, we think sound, for those whose herds are not too large, and who are engaged in mix husbandry. To handle hogs to the best advantage, a pasture is needed of green grasses—clover, blue grass and timothy—and it is best if there is no running water or stock ponds in the lot. Hogs do better where there are no branches or stock ponds to wallow in. In place thereof, have good well-water pumped for them. Having troughs made, and nail strips across, eight inches apart, to keep the hogs from lying down in the water, and let these hogs be put on floors, to keep them from digging up wallowing holes. If any feed be given, it should be soaked in swill barrels for twelve hours before feeding—no longer—and fed to them as drink.

To Keep Hams in Summer.

Some bag them and whitewash the bags which is troublesome and somewhat expensive; some cover them with dry wood ashes and pack them in barrels and cover them thoroughly with pine shavings; but the best plan of all, and certainly the least expensive with all who have a smoke-house, and every farmer should have a good one, is to keep the hams hung up in the smoke-house, which should be kept perfectly dark at all times. Hams so kept two years old, were among the best we ever tasted. Uniform darkness is a complete protection against the attack of insects.—*W. Rural.*

An Extensive Wheat Field.

On the west side of San Joaquin river in this vicinity, there is a grain field which extends for thirty-five miles and is of an average width of eight miles, thus covering an area of 179,200 acres. Persons who have lately travelled through this immense grain field estimate the total average yield at sixteen bushels to the acre, which will give a total yield of 2,867,200 bushels, or 86,015 tons

Banner's ten horses cost him \$145,500.

On Saturday last while Mr. James Hair, of the 7th line St. Vincent, was unloading hay he met with rather a singular accident. In attempting to lift a forkful, the handle broke and he fell back to the ground, the fork falling after him and striking him on the side, one prong entering, and it is supposed, piercing the liver.

In our issue of the 29th ult, Alex. Cowan, sen., of Pittsburg, claimed a very heavy yielding gooseberry tree, from which was gathered twelve pounds of gooseberries at one picking. Mr. Jos. Trotman, of Ancaster, informs us that he picked at one gathering from one tree, fourteen quarts, weighing 1 lb. and 10 oz. per quart, making 22 lbs. 12 oz. This tree is also an English variety, closely resembling "The Plowboy."

Cramp in horses arising from irregular action of the motor nerves. Rubbing the affected parts with a wisp of hay for ten minutes would be beneficial; and should friction alone not remove the tendency to cramp, the parts affected should be rubbed occasionally with a solution of camphor and olive oil, in the proportion of one part of camphor to four of olive oil. Don't take two men with a rail to rub the belly but follow above instructions and give gentle exercise.

AGRICULTURAL PAPERS AS PREMIUMS.—The following resolution was adopted unanimously at the late meeting of the National Agricultural Congress:—

Resolved, That we earnestly commend to the county and district Agricultural and Horticultural Societies throughout the country, that they offer subscriptions to the best Agricultural and Horticultural periodicals for which money or silver ware of equivalent value are usually given, and that they aid by all other legitimate means in their power, as corporate bodies, to extend the circulation of such periodicals.

TRAPPING WOODCHUCKS.—The best and cheapest trap is a snare made of brass wire looped simply with a running knot and concealed over the mouth of the hole when the animal is at home. Try it; it only costs a few cents, and is surer than the steel trap or the rifle.

EXTRAORDINARY YIELD OF BUTTER.—Mr. T. J. Holiday informs us that a cow in his possession, during the month of June, a little more than a week after calving, yielded milk so rich in cream, that from just seven days' milk he churned the extraordinary quantity of 22 lbs. of butter. This is certainly a most exceptionally good yield; and we should be interested in learning whether the cow keeps up her reputation

THE BEST TIME TO HOE.—In Secretary Flint's Massachusetts Report it is stated by a cultivator that the portion of the garden which is hoed or cultivated with the dew upon the ground produces better crops than the part that is hoed in the heat of the day. Will some of our own cultivators make the experiment with different parts of their garden and send us the results for publication

In some seasons bees will get very little honey from the white clover, although all the conditions are apparently favourable. In the same way, Italian bees will in some seasons get little or no honey from the second crop of red clover, while in others they will store largely from this source, while black bees are losing weight.

A little boy was being instructed, in morals by his grandmother. The old lady told him that all such terms as "by golly," "by jingo," "by thunder," &c., were only little oaths and but little better than other profanities. In fact, she said he could tell a profane oath by the prefix "by." All such were oaths. "Well then, grandmother," said the hopeful, "is 'by telegraph' which I see in the newspapers swearing?" "No," said the old lady, "that is only lying."

The following paragraph is from an exchange:

"A piscatorial Virginian recently conceived the idea of catching fish with nitro-glycerine. At the Kanawha Falls he sunk a tin cartridge, containing about half a pound of glycerine and, connecting it with a battery, its explosion threw up a volume of water some thirty feet high. With the water were thrown up eighty-six fish, averaging from one and a half to thirteen pounds each. The fish were not killed, being merely stunned, and were readily picked up by a boat."

Only a brute would attempt to murder fish in the way described. The fellow should be blown up with nitro-glycerine himself. It would be difficult to find a more beautiful spot for artistic angling than at the foot of the Kanawha Falls, and yet in this lovely spot a miserable wretch must put a devilish invention to work to depopulate the stream of fish. Shame upon one who has such a low idea of sport.

FLOWERS FOR A RELISH.—The following good story is told by the *California Farmer* as having actually occurred in that neighborhood:—Mrs. A had a green Irish girl who was very anxious to please. She said one day to her, "You need not prepare any meat for supper, if Mr. A. wishes any relish he will bring something home." About tea-time Mr. A. came in bringing a quantity of the finest flowers from his mother's conservatory. The wife handed them to the girl, telling her to put them in a cool place, and she would arrange them after tea. When she went for them, she saw none, and questioned Biddy, who said, "Sure, mam! I have them already, and indeed it was very hard to get them all fine enough," and handed the lady a dish full of roses, heliotropes, fuschias, etc., all picked into the finest bits imaginable. "What do you mean?" exclaimed Mrs. A., filled with astonishment. "Sure, ma'am, you said the master would bring home a relish, and I thought 'twas a salad ye wanted." The joke was so good that the girl was forgiven, and many a laugh we had over the flower salad.

HOME-NESTS.—I once knew a decent man who was driven to drink by an untidy home. He used to return from his work, sometimes wet and weary, to no fire, to dirty children, and to no end of confusion; and when this happened on a Saturday, which was frequently the case, and there was the mop-bowl here and the chairs piled up there; dust on this hand and dirt on that; a hungry child screaming in the cradle; and a jaded and somewhat testy wife on her knees cleaning the floor—he many a time went straight to the ale-house, where he would sulkily remain, until it was likely that the chaos was reduced to order. I don't say he was right in so doing. He was not. It was his duty to help his wife. I'm merely showing you how a man may be acted upon by his home. He may be made happy or miserable, good or bad, by it. Great is the influence of a wife over her husband here. On her hearth she is truly mighty; a sort of queen, swaying no mystic sceptre, for home ways are the rod of her strength. And, young people, just as some have been driven astray by badly managed homes—so others, I verily believe, have been allured from their wanderings by well-regulated ones. You may believe it or you may not, but I affirm it in all seriousness, that there is, and must be, and to the end of earth's generations there will continue to be inexpressible charms to a working man, on a Saturday especially, about a wife washed and neatly attired, children clean and orderly, a tidied room, a singing kettle on the hob of a bright fire, a corner chair loose coat, and old easy shoes or slippers receiving an airing on a shimmering fender, and a smiling hearty welcome from his partner and their offspring. Oh! a powerful attraction have these charms. They have drawn thousands of husbands home, I don't doubt, and kept them there.—*Kind Words.*

SCIENCE NOTES.

MECHANISM OF FLIGHT.

The mechanism of flight has long been a favourite branch of scientific investigation, and it seems to have at last received its solution in the establishment of the famous "Figure of 8. Wave theory," originally promulgated by Dr. J. Bell Pettigrew, of Edinburgh, and now confirmed by Professor Marey of the College of France, Paris. In 1867, Dr. Pettigrew announced the remarkable discovery that all wings whatever—those of the insect, bat, or bird—were twisted upon themselves structurally, and that they twisted and untwisted during their action. The wing, in fact, during its vibrations twists and untwists, acting as a reversing reciprocating screw, and forming what is technically called a "mobile helix." The result of this is that the wing, during its oscillations, describes a figure of 8 track, similar in many respects to the track described by each ear in sculling. This holds good of the vibrating wing of all flying animals whatsoever, so long as the body of the animal is artificially fixed and rendered stationary. When, however, the animal is liberated and is flying at a high horizontal speed, the figure of 8 is converted into a wave-track, from the wing being carried forward by the body, and from its consequently never being permitted to complete more than a single curve of the 8. This is an entirely new view of the structure and functions of the wing, and one of the deepest possible interest to the aeronautical world. Dr. Pettigrew's discovery has now been completely confirmed by Professor Marey, who has succeeded in causing the wing of the insect and bird to register its own movements, and has established by actual experiment the absolute correctness of Dr. Pettigrew's views. Professor Marey's mode of registering displays much ingenuity, and is briefly as follows—

"A cylinder revolving at a given speed is enveloped by a sheet of thin paper smeared with lamp black, and to the tip of the rapidly vibrating wing of the insect is applied in such a manner as to cause it to brush out its track on the blackened paper, which it readily does. A similar result is obtained in the bird by fixing a registering apparatus to the wing and causing the bird to fly in a chamber. In this case the registering apparatus is connected with the cylinder by means of delicate wires, and the registering is effected by means of electricity. In both cases the figure of 8 and wave movements, originally described and figured by Dr. Pettigrew, are faithfully reproduced. The way of a wing in the air has hitherto been regarded as a physiological puzzle of great magnitude, and well it might be, since some insects (the commonly for example) vibrate their wings at the almost inconceivable speed of 300 strokes per second, that is, 18,000 times in a minute

"It should be added that though Professor Marey endorses Dr. Pettigrew's view as to a figure of 8 movement, and has recently admitted his priority in that observation, he is yet by no means of the same opinion as Pettigrew as to the explanation of the mechanical effect of the movements and the influence of the bird's weight. Pettigrew maintains that the wings act as inclined planes in such a way that the bird actually rises by its own weight. Dr. Marey will not admit this at all, and is at issue with the Scotch anatomist on some other matters of moment. The beautiful and ingenious experiments which Dr. Marey is now carrying on will place these matters beyond conjecture by the light of experiment."

THE PARIS SIEGE BALLOONS.

Some very interesting statistics have recently been collected and published as to the balloons which were despatched from Paris during the great siege; and there can be no doubt but that the lessons learnt at Paris in regard to balloon navigation will be of the utmost value in any future employment of aerial machines, not to say in any future war. According to *Nature*, as many as sixty-four balloons actually left Paris in good order, carrying in all not less than one hundred and sixty-one individuals, and something like three million letters. The first ascent was made on the 23rd of September, 1870, by M. Darnof, and came to a favourable conclusion. The fifth balloon carried in its basket the Minister of War, M. Gambetta, whose course in this was as original as in some other matters. The fearless republican, however, arrived safely at Amiens after a voyage of four hours. Equally remarkable was the journey of M. Janssen, the celebrated astronomer, who left Paris with the purpose of watching the approaching eclipse in the South of Europe. The balloon bore the renowned and auspicious name of "Volla," and deposited M. Janssen, along with the whole of his instruments, in complete safety at Savenay (Loire Inférieure), after a flight of five and a half hours. One of the succeeding balloons left Paris with two cases of the terribly explosive compound "dynamite" on board, to be dropped upon the enemy at some favourable moment. Fortunately for the Prussians, however, no opportunity for carrying out this scheme presented itself. The last balloon was despatched from Paris on the 26th of January, 1871.

"Of these sixty-four balloons, only seven were unsuccessful in fulfilling their purpose, two of the machines being utterly lost at sea; while five were captured by the enemy. As many as sixteen actually fell within the hostile lines; but the aeronauts were in most cases too quick for their pursuers, and managed to escape. In fact, of the five actually taken only three were really captured by the enemy's forces, the other two falling in fact upon German soil, namely, in Prussia and Bavaria. The most interesting voyage was certainly that of M. Rollier, who travelled safely from Paris to Christiania in fourteen hours, after a journey across the North Sea of nearly twelve hours. Of the two lost at sea, one was observed to go down by some sailors at Rochelle, while of the other nothing certain is known.

"The regularity with which the balloon service was conducted during the winter of 1870 under grave disadvantages will be remembered by all who studied the daily newspapers at that period, the news from the French capital never being interrupted for more than three or four days together. Most of the aerial machines contained 2,000 cubic metres of gas, and one of them consisted of twin spheres tethered together; they were usually started for the Orleans or North railway stations at nightfall, so that they might escape the vigilance of the German troops posted round the city. Besides a freight of letters the majority carried baskets of pigeons, and in five cases dogs, destined to return with news to the beleaguered city; how well the pigeon-post itself was organised may be gathered from the fact that fifty thousand messages were sent into Paris by its means alone.

"Some attempts were made by M. Tisandier Freres to return to Paris by means of aerial machines impelled by favourable winds; but two successive essays made from Rouen on the 8th and 9th of November were quite fruitless."

THE AIR FILTER.

Professor Tyndall, as is well-known, some time ago created a considerable excitement by his lectures on "Dust and Disease." In these lectures he demonstrated that the air we breathe is literally charged with fine solid particles, of the most varying nature. This conclusion, though never before demonstrated in such a complete and elegant manner, is nothing new; and there are many authorities who would freely admit the facts brought forward by Tyndall, but who would by no means concur in the deductions which he drew therefrom. Tyndall, in fact, as the result of a long series of experiments with atmospheric air, came to the conclusion that most contagious and infectious maladies, especially those of an epidemic character, were propagated chiefly, if not entirely, by the medium of invisible particles floating in the air. This point cannot at present be regarded as settled; but one result of Tyndall's adoption of this theory has been the invention of a very valuable air-filter or respirator, which cannot fail to prove of great use. It is contended that this respirator will serve at least three purposes. Firstly, medical men and nurses by means of this can enter the most polluted atmosphere with comparative immunity, if not in complete safety. Secondly, the same apparatus will enable firemen to enter buildings filled with dense smoke, with complete impunity, the filter arresting the particles of carbon, and allowing only pure air to pass. Thirdly, miners can safely work by means of this in places where carbonic acid is present in noxious proportions.

"The filter itself consists of a cylinder, four or five inches long and two inches or more in diameter. Its interior contains, at the top, a layer of cotton wool which has been moistened with glycerine, then a layer of dry cotton wool, then a layer of charcoal, then cotton wool, with wire gauze covers at both ends, and at the upper end a mouth piece so shaped as to fit closely over the

mouth of the wearer. By drawing the breath through this instrument, the most dense smoke may be entered with impunity. This filter has been tested by the London Fire Department with such success that the firemen of that city are to be provided with it for regular use. When places are to be entered, such as mines or wells, where carbonic acid gas is present, it is necessary to add another layer of cotton wool, and to place a layer of slacked lime between the two bottom layers of cotton. The object of the lime is to arrest the carbonic acid and oxide gases."

"A recent test consisted in placing the experimenter, who had one of the instruments secured over his mouth, within a small closet, with a rabbit and two birds for companions. Carbonic acid gas and carbonic oxide were then injected until the atmosphere of the closet was rendered highly poisonous. In 23 minutes, the animals were dead, but the experimenter came out at the end of 30 minutes, having suffered no inconvenience from the noxious gases; but the work of breathing through the small instrument for so long a period and the heat of so small an apartment rendered him uncomfortable. Experiments are still in progress to determine the best sizes and forms for the instrument, and ere long we may expect that the air filter will be an instrument of common use."

THE CASPIAN SEA.

An Italian journal, *L'Osservatore Trimestre*, states that the object of the recent visit of the Russian Czar to the Southern part of his empire had particular reference to a project for uniting the Black Sea with the Caspian by means of a canal. There is ample geological evidence that the Caspian Sea, and the Seas of Azof and Aral are merely remnants of a vast inland sea or collection of brackish water, which must have been as large as the Mediterranean, or larger, and which probably at one time opened directly into the Black Sea. The contemplated canal, therefore, would, to some extent, restore a state of things which existed during comparatively recent geological periods. The *Scientific American* gives the following details as to the proposed canal and the advantages which are expected to be gained by its formation:—

"The entire length of the canal would be 630 Russian versts, about 400 miles, though the mountainous chain to be pierced only measures eight versts, or about five miles. It is calculated that 32,000 labourers will have to be employed for fully six years in order to complete the undertaking. Quite apart from the direct commercial advantages which would result from the completion of this canal, it would serve to replenish the Caspian sea with water, a highly important consideration. During the last decade, and even longer, a remarkable reduction of water was noticed, so much so that the final extinction, that is, exsiccation of the sea, was apprehended. The results would not only be malarious in the extreme, but also destructive of a great source of wealth, namely, the sturgeon, sterlet, and seal fisheries. Many thousand persons are at present employed in these fisheries (chiefly at Astrakhan), by whom 800,000 lbs. of caviar alone are annually obtained. An insurance of water supply to those persons would, therefore, give renewed stimulus to their local enterprise, though the same may not be nearly as important as the effect on commerce at large."

COMPARATIVE ANATOMY.

Teacher and student alike will welcome from the pen of Professor Huxley a "Manual of the Comparative Anatomy of Vertebrated Animals," which has been published in England by Messrs. Churchill, and has been reproduced in America by Messrs. Appleton, of New York. No branch of science is of greater interest, and the student of medicine in particular, would always be the better of some knowledge of this subject. Up till this time, however, there has been no good text book on this subject, and its teaching has been hampered by special difficulties. Properly speaking, Comparative Anatomy forms a branch of Natural History, and there is no department of Zoology which is of greater intrinsic interest, or of more practical importance. Few teachers of Natural History, however, make any attempt to impart more than the merest outline of Comparative Anatomy, and the reason of this apparent neglect is not far to seek. Comparative Anatomy is pre-eminently a subject which can not be learned out of books alone, or by the help of illustrations, however numerous or well executed. The student of this subject must himself use the dissecting-knife, and look through the tube of the microscope, and the knowledge acquired in this way will not only be much wider and more extensive than that to be acquired by any amount of reading or listening to any number of lectures, but it will have the advantage of real and permanently abiding knowledge. Every institution therefore in which Natural History is taught, ought to have connected with it a working laboratory, in which the necessary dissections can be carried out by the students, and the use of the microscope can be practically taught. On the continent of Europe such a laboratory is considered an essential appendage of every zoological class room; and this is the case with one or two of the English Universities—Oxford being a notable example. In most of the British colleges, however, as in most of those of America, this necessity has not yet been recognized, and the result has been that Comparative Anatomy has never taken its true place in the study of Natural History. As Comparative Anatomy merely deals with the anatomical structure of the lower animals, it follows that even an acquaintance with the anatomy of any one animal, if acquired by actual dissection, will enable the learner to gain a fair knowledge of his subject by reading alone. Hence, medical students, who are presumably well acquainted with the structure of the human body, are capable of acquiring a considerable knowledge of comparative anatomy merely by reading and attending lectures. Even in this case, however, a much more satisfactory knowledge would be gained, at a much less expense of labour, if the student were enabled to work at his subject practically. In the case of the ordinary arts student, who is presumably wholly ignorant of human anatomy, it becomes simply an impossibility to teach comparative anatomy, in the absence of practical appliances for dissecting, nor would such

a student gain any benefit from reading even such an admirable work as Professor Huxley's new Manual. In fact, Huxley's recently issued work is an excellent case in point. We do not hesitate to say that, as a text-book of comparative anatomy, it is unequalled in accuracy, clearness of expression, and lucidity of explanation. We also do not hesitate to say, that it would be almost wholly useless to any student, however earnest or industrious, if ignorant of human anatomy, or unprovided with any facilities for dissecting animals for himself. We do not say this in disparagement of Professor Huxley's work, for we are very sure that its distinguished author would most cordially agree with the truth of this statement. The work is technical from the first line to the last; it is crowded with the scientific names of muscles, bones, nerves, blood-vessels, and organs, which are in most cases known by the medical student as occurring in the human subject; but of which the arts student is profoundly ignorant; and there is no sort or kind of glossary. Given such a practical laboratory as we have spoken of above, and no better book could possibly be placed in the hands of the student. Without such a laboratory, we greatly fear that the non-medical student would in vain endeavour to gain some idea of this most important branch of Natural History, however anxious he might be to learn, or however willing his teacher might be to impart his knowledge. He might no doubt acquire some literary knowledge of his subject, or he might burden his memory with a more or less extensive series of technical names, but we venture to think that he would not have made himself a comparative anatomist. We further venture to think that little value can be attached to the merely theoretical knowledge of such an eminently practical subject as comparative anatomy; whilst none of those who have tried the experiment will deny the herculean labour involved in the attempt to learn a practical science by purely abstract methods.

ELIMINATION OF ALCOHOL.

An interesting and important investigation has been carried out Dr. Dupré, the lecturer on chemistry at the Westminster Hospital, London, to determine what becomes of alcohol when taken into the system, and the results have recently been laid before the Royal Society. Three views have been held as to what becomes of alcohol when taken into the body. Some have held that all the alcohol which enters the blood is oxidised, and that none of it is excreted from the body in the form in which it was taken in, namely, as alcohol. Others believe that part of the alcohol taken into the body is oxidised, and that part is eliminated in an unchanged form without undergoing any alteration. Others, lastly, who hold that alcohol is merely what is ordinarily understood by the term "poison," believe that alcohol, when taken into the system, is incapable of undergoing any change, but that the whole of it is eliminated in same form as it entered. If the last view be assumed to be the case, it is absolutely certain that if a certain quantity of alcohol be taken every day for any length of time, a

point must soon be reached at which the amount of alcohol eliminated per diem must exactly equal the amount taken in the same time. Otherwise, an accumulation of alcohol must take place within the system, and this accumulation would constantly become greater and greater—a view altogether inconsistent with well established physiological facts. Dr. Dupre's experiments were chiefly directed to the settlement of this point, and they appear to have been well conceived and well executed. The results may be summed up as follows.—When alcohol forms a portion of the ordinary diet on successive days, there is no increase of the alcohol eliminated each day. This shows that all the alcohol which is daily taken into the body is daily disposed of in some way or another; and as it certainly is not eliminated as alcohol, it must be employed, or metamorphosed, or destroyed within the system. After alcohol has been taken into the body, it commences to be excreted, and the process of elimination goes on for a period varying from nine to twenty-four hours, when it ceases altogether. Lastly, the total amount of alcohol eliminated by all the excretory organs is only a minute fraction of the total amount taken into the body. It may, therefore, be regarded as certain that those are in error who hold that alcohol merely passes through the body unchanged. On the contrary, it is thus seen that the larger proportion of the alcohol taken into the system undergoes certain changes, almost certainly of the nature of oxidation, so that it ultimately leaves the body in a form different to that in which it entered it.

GIANT TREES.

California has long been believed, in the estimation of its inhabitants at any rate, to be in the proud position of possessing the highest trees in the world. It appears, however, that a formidable rival is to be found in Australia. On this point the Government Director of the Botanic Gardens at Melbourne furnishes some interesting details. Since easier access has been obtained to the back gullies of the mountain system of Victoria the marvellous height of some of the Australian trees has become the subject of closer investigation; and some astounding data, supported by actual measurement, are now upon record. The highest tree previously known was a "Karri" Eucalyptus, measured by Mr Pemberton Walcott in one of the delightful glens of the Warren River in Western Australia, where it rises approximately to a height of four hundred feet. Into the hollow trunk of this "Karri," three riders, with an additional pack-horse could enter and turn without dismounting. This giant tree, however, has been exceeded by other species of Eucalyptus, which rise to a height, in some cases, not less than four hundred and eighty feet. The renowned forest giants of California, in their favourite haunts in the Sierra Nevada, rise to a height of about four hundred and fifty feet. It must be conceded, therefore, that the Victorian trees exceed the Californian in point of actual length, though considerably inferior to them in point of bulk.

The *British Medical Journal* says that the people of Rome are very much interested just now in the fate of a poor fellow, Cipriani, who has swallowed a fork in public, prongs downwards, and who is now suffering, in consequence, agonies which are the subject of daily bulletin. Some comfort may be derived by his friends from the record lately published of Mr. Lund's patient at Manchester, who survived swallowing a dessert knife six inches long; and, from the perusal of a recent article in the *Journal de Medicine et de Chirurgie*, in which instances are cited where the alimentary canal has safely supported the most unexpected foreign bodies—among others, lizards, a file, a tea spoon, a bat; and finally, from the whimsical but melancholy instance of a man who, to amuse himself, swallowed successfully and safely a five-franc piece, a closed pocket-knife, and a coffee-spoon, but killed himself at last in the vain effort to digest a pipe.

An extremely "tall" story comes from Elizabeth, New Jersey, as to the wonderful feats of a carrier pigeon, which performed the journey from Sopus Farm, Warren Co., N. J., to Sandusky, Ohio, a distance of four hundred miles, in exactly an hour. An eyewitness thus describes the condition of this unequalled bird on its arrival at Sandusky—"I found the greatest excitement had followed the arrival of the pigeon. Mr Smythe told me that at precisely two o'clock the bird came like an arrow into his house. His movement was more like a blue streak than a well-defined bird. He seemed but little exhausted, although nearly all the feathers were off his body, except the small patch held on his back by the gutta-percha which fastened the note. A few miles more would have worn every feather from his wings, and then he would have to depend upon the momentum already acquired to carry him on his journey, and to steer by a tailless rump, and perhaps be killed in attempting to alight." No wonder the owner offers to match this pigeon "when he has grown a new suit of feathers" for \$1,000 against any carrier pigeon that has not done this distance in an equal time.

No process in the manufacture of iron is of so arduous and laborious a nature as that of "puddling." It has at last become impossible for the iron masters to obtain a sufficient supply of trained puddlers, and numerous attempts have been made of late years to solve this growing difficulty by the invention of some machine by which puddling can be effected. The problem was at last successfully solved by an American, Mr. Danks, of Cincinnati. The English Iron and Steel Institute sent out a committee to report upon the system employed by Mr. Danks, and they have declared that it is a complete success. There can, therefore, be no doubt but that this branch of the iron manufacture will now be entirely revolutionized; the terribly laborious craft of manual puddling will shortly be a thing of the past; and there will probably be a considerable improvement in the character of the wrought iron produced by this method. Upon the whole, this is one of the most important and beneficial discoveries which have of late years been made in the vastly extended and important industry of the iron manufacture.

Canada Butter Trade.

No. II.

In a former article we drew attention to the demoralized and unsatisfactory state of the foreign trade in Canada butter, and we will now proceed to carry out the promise then made of suggesting remedies which, in our opinion, would do very much to bring about a healthier state of affairs, and secure for our leading dairy product a much higher position abroad than it unfortunately now occupies.

One means by which much good might be accomplished has already been tried to a limited extent with good results. This is for country buyers, storekeepers or others, to furnish the farmers in their vicinity with firkins in which to pack their butter as it is made, so as to obviate the necessity for carrying small consignments to the stores, often in very hot weather and over long distances; and what is of much more importance, to secure straight, oven packages, put up in a clean dairy, instead of in the cellar of the store-keeper, where it is exposed to all sorts of impure and noxious scents by which butter is only too easily tainted. There would also be a very considerable saving in the matter of loss by weight—a very heavy item under the present system—and the trade would become much more satisfactory. If, in addition to this, there should be established in every village or town, where the trade is sufficiently large to warrant it, an open butter market, the storekeeper would find himself much more at liberty to select his stock than he is now, and at the same time run little risk of giving offence to his touchy feminine customers. The truck and barter system is a bad one under any circumstances, and it will always be found to lead to bad results in some shape or another. Everything should be paid for in cash, and then accounts could be kept close up and many bad debts would be avoided. The great object to be gained in connection with the butter question is, it must be remembered, to secure a better made and a better packed article. To do this it is necessary first to furnish the means, where they happen to be wanting, and secondly to create by competition in open market such rivalry as will induce each and every butter maker, whether she have much or little to offer, to do her very utmost to get the highest price going for what she has to sell. That this is perfectly feasible we entertain not the slightest doubt, and we earnestly recommend that a general and fair trial be given to these suggested remedial measures. The matter is one of great gravity to many thousands of people, not merely on account of the actual loss with now accrues by reason of inferior butter, which though paid for at the price of good, has to be sold at a sacrifice, but also from the fact that to raise the standard of butter by whatever means it may be accomplished, is to increase the value of the entire make by causing it to assume

higher rank in foreign markets, rendering it more readily saleable, and at a much more satisfactory range of prices. The means we have suggested are within reach of those most interested, and unless they put their own shoulders to the wheel, they can hardly expect any superhuman assistance to lift them out of the mire in which they are now figuratively stuck.

But, while we wish to impress on the farmers and storekeepers the necessity of exertion, it is in the power of the commission men and butter dealers generally in the large markets to materially help them. This is to be done by compulsory inspection, which, if demanded by the trade, will readily be granted by Government. Every package of butter offered for sale at points of shipment abroad should be subject to inspection, the standard to be rigidly kept up, and every package branded as it may inspect. No butter should class as No. 1 which was not perfectly sweet, well made, of good colour, properly salted and free from milk, and calculated with moderate care to keep well for any reasonable length of time. No. 2 should also be good butter, free from streakiness and well made, but up to No. 1 in other respects. Medium quality should inspect No. 3, and, while requiring to be sweet and free from taint, might be undesirable in appearance, and not marked by good keeping qualities. All strong tainted or slushy butter should class as "Rejected." We do not doubt, if a careful inspection of all butter were once to be made compulsory, and a fair trial given it, that the results would be beyond the hopes and expectations of many who are now in favour of such inspection; and there would be no desire to return to the present state of things. The experience which may be gained elsewhere is all in favour of this official grading of butter according to its merits, and we do not see any good reason, if the system works well in Ireland or elsewhere, why it should not do so in Canada as well. The introduction of the inspection system in grain here in Toronto, though it could not affect the quality, has, by affixing the official stamp of grade, done much to render the trade in its satisfactory to all concerned, except, perhaps, to those who either from poverty of judgment in buying got less than they anticipated from their consignments, or who hoped to get as much for poor goods as could be realized for superior qualities. Foreign buyers will not do as willing to send in orders when they have to trust to the individual judgment or the individual honesty in making purchases, as they would do where they know exactly what they are buying, the grade guaranteed by the sworn opinion of a man qualified to judge, and whose fitness for his position soon becomes tested in the most practical way possible. There may be objections raised to the principle of compulsory inspection, and there may be hardship in individual cases, but no objections we have yet heard adduced, no loss caused by too rigid classifica-

tion, are at all sufficient to alter the opinion we have formed and here expressed, that the greatest possible amount of good would soon result in the butter trade of this country, if once it were known throughout the country that the quality would in every instance determine the price, with no possibility of palming off on inexperienced buyers a good merchantable butter, stuff not fit for shipment, and only serving to bring loss to the shipper and discredit on the whole trade of the country in this very important item of export.

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Table with 2 columns: Item and Price. Items include Single-boarded Hive, Double-boarded Hive, Individual right to make, Single-boarded Hive and right together, Double-boarded Hive and right together, Large Gauge or New Entrance, each, Small or old Gauge, each, Bee Protector, Honey Knife, Honey Extractor—the best in the market, Italian Stocks in the single-boarded hive, Italian Queens, from latest importations, Canadian Bee-keeper's Guide, pre-paid.

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FAMILY SHUTTLE SEWING MACHINE

THE CHEAPEST THE BEST



HAMILTON, ONT.

v4-3 121

Office of the Appleton Knitting Machine Company,

Hamilton, June 1, 1872.

THE APPLETON KNITTING MACHINE COY,

ARE now prepared to exhibit their invention to the public.

They claim for it a superiority over every other Knitting Machine.

It is perfect in its action, working smoothly and accurately, and will not get out of order.

It will knit close or open, plain or ribbed work. Knits in any shape, with single, double or triple thread,

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It will make a long, or short stitch, without stopping, and will knit backwards and forwards without tension on the yarn; in short, it has none of the defects of the other machines, and is an improvement on them all.

The standard of excellence of all knitted goods is that made by hand, therefore, it is required of a first-class Knitting Machine, that it produces Stockings, Socks, Shirts, Drawers, Mitts, Scarfs, and all other knitted goods, as perfect as the hand made article.

The Machine is constructed in the most substantial manner, finished in first-class style, and will last for years. It does perfect work, simple in construction, there is nothing about the machine but what may be understood at sight, and the most inexperienced may in a few hours acquire a knowledge of working it.

The Appleton Knitting Machine Company are prepared to submit their invention to any test or comparison with any other, and they desire no higher recommendation than that they feel assured will be accorded it by the Public.

A Book of Instruction is provided.

AGENTS WANTED

Terms liberal, and made known on application to the Company, Hamilton.

Hamilton, June 1, 1872.

6-1f

Markets.

Toronto Markets.

"CANADA FARMER" Office, Aug. 15, 1872.

The produce and provision trades have been quiet during the past month, closing with light receipts and generally limited demand. The movement in bread stuffs, especially as devoid of activity, under declining quotations from Liverpool and the west, and prices of flour and grain have given way very considerably.

In this city the wholesale prices are as follows.—

FLOUR AND MEAL.

Flour—Superfine, \$6 75 to \$7 00, Family, \$6 10 to \$6 25; Extra, \$6 35 to \$6 50
 Oatmeal—\$4 60 to \$4 70.
 Cornmeal—\$3 25.
 Bran—\$14 to \$14 50.

GRAIN.

Wheat—Soules, \$1 37; Treadwell, \$1 15; Spring, \$1 40.

Barley—No. 1, 58c to 60c, No. 2, 52c to 55c.

Oats—37c to 38c.

Rye—Nominal, none offering.

Peas—62c to 65c f.o.b.

HAY AND STRAW.

Hay, in short supply, at \$27.

Straw—\$14 to \$15.

PROVISIONS.

Beef, by the side, Nominal.

Mutton, by the carcass, 8c.

Potatoes—per hbl., \$2 25 to \$2 50.

Pork—Mess, \$14 75 to \$16 00.

Bacon—Cumberland cut, 7c to 7 1/2c, Canada, 6 1/2c to 7c.

Hams—Salted, 13 1/2c to 14c, Smoked, 15c to 15 1/2c.

Lard—9c to 10c.

Butter—Dairy, choice, 13c to 14c.

Eggs—Packed, 12c to 14c.

Cheese—10 1/2c to 11c; Reesor's Stilton, 18c; Royal, 17c.

Dried Apples—9 1/2c to 10c.

Salt—Goderich, \$1 12 to \$1 15;

HIDES AND SKINS.

Hides—No. 1, cured and inspected, per lb 9 1/2c, No. 1, inspected, green, 9c; No. 2, inspected, green, 8c.

Lambskins—50c.

Catfkins—Green, per lb, 10c.

Wool—Fleeces, 52c.

THE CATTLE MARKET.

Beves (live weight) \$4 to \$5 per cwt.

Sheep—\$3 to \$5 50.

Calfes—\$3 to \$7.

Lambs—\$2 50 to \$2 75.

GALT, Aug. 15—Flour, No. 1 super, \$6 50 to \$7 00; fall wheat, \$1 25 to 1 30; (new) \$1 00 to \$1 20, spring wheat, \$1 20 to \$1 25; barley, 60c to 60c; peas, 60c to 60c; oats, 37c to 40c; cattle (live weight), \$3 50 \$4 00, beef, \$6 00 to \$12 00, mutton, \$6 00 to 10 00, dressed hogs, \$9 00 to \$9 00, hides \$7 00 to \$9 00; sheepskins, \$9 25 to \$9 30; wool, 60c to 60c, butter, 14c to 15c, eggs, 14c to 15c, cheese, 10c to 11c; hay, \$15 00 to 17; potatoes, \$1 00 to \$9 00; corn, 60c to 60c.

GUELPH, Aug. 15—Flour, No 1 Super, \$7 00 to \$7 50, fall wheat, \$1 10 to \$1 25, spring wheat, \$1 20 to \$1 24, barley, 50c to 55c, peas, 60c to 62c, oats, 40c to 42c; cattle, (live weight) \$2 50 to \$4 50, beef, \$6 00 to \$7 00, mutton, \$6 00 to \$7 00, dressed hogs, \$9 00 to \$9 00; hides, \$7 00 to \$9 00, sheepskins, \$1 00 to \$9 00; wool, 48c to 50c; butter, 13c to 15c; eggs, 12c to 13c, cheese, 60c to 60c, hay, \$14 to \$16, potatoes, \$1 25 to \$1 30, corn, 60c to 60c.

HAMILTON, Aug. 15—Flour, No. 1 super, (old ground) \$6 25 to \$6 50, fall wheat \$1 20 to \$1 30, spring wheat, \$1 20 to \$2 00, barley, none, peas, none, oats, 38c to 40c, cattle (live weight) \$3 00 to \$5 50, beef, \$6 00 to \$6 00; mutton, \$6 00 to \$7 00, dressed hogs, \$9 00 to 0 00; hides, \$8 00 to \$ 50 sheepskins, 50c to \$1 05, wool, none, butter, 11c to 16c, eggs, 12c to 15c cheese, 10 to 15c; hay, \$9 00 to \$9 00, potatoes, \$9 00; corn, none.

LONDON, Aug. 15—Flour, No. 1 super \$9 00 to \$9 00; fall wheat, \$1 30 to 1 40, spring wheat, \$1 30 to \$1 40, barley, 50c to 55c; peas, 50 to 51c; oats, 32c to 33c; cattle, (live weight), \$4 50 to \$5 00; beef, \$5 50 to \$6 00, mutton \$8 00 to 9 00, dressed hogs, \$9 00 to \$9 00, hides, \$8 00, to \$9 00, sheepskins, \$9 20 to \$9 30; wool, 50c to 55c, butter, 12 1/2c to 13c; eggs, 11c to 12c; cheese, 8c to 9c; hay, \$12 00 to \$13 00; potatoes, 60c to 75c; corn, 50c to 60c.

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