

Technical and Bibliographic Notes / Notes techniques et bibliographiques

The Institute has attempted to obtain the best original copy available for filming. Features of this copy which may be bibliographically unique, which may alter any of the images in the reproduction, or which may significantly change the usual method of filming, are checked below.

L'Institut a microfilmé le meilleur exemplaire qu'il lui a été possible de se procurer. Les détails de cet exemplaire qui sont peut-être uniques du point de vue bibliographique, qui peuvent modifier une image reproduite, ou qui peuvent exiger une modification dans la méthode normale de filmage sont indiqués ci-dessous.

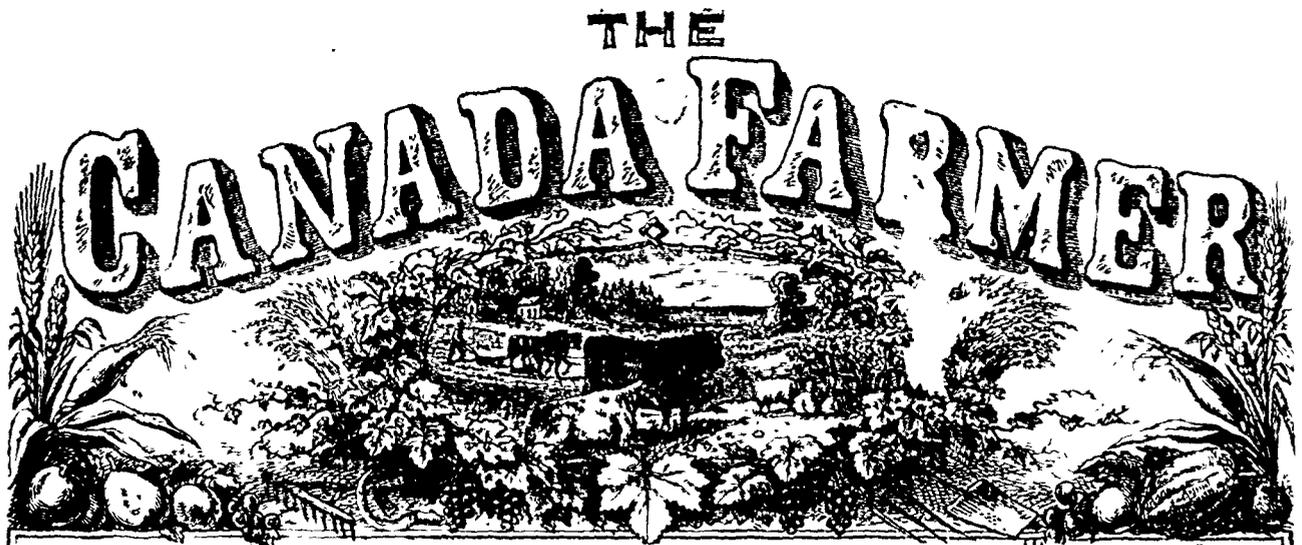
- Coloured covers/
Couverture de couleur
- Covers damaged/
Couverture endommagée
- Covers restored and/or laminated/
Couverture restaurée et/ou pelliculée
- Cover title missing/
Le titre de couverture manque
- Coloured maps/
Cartes géographiques en couleur
- Coloured ink (i.e. other than blue or black)/
Encre de couleur (i.e. autre que bleue ou noire)
- Coloured plates and/or illustrations/
Planches et/ou illustrations en couleur
- Bound with other material/
Relié avec d'autres documents
- Tight binding may cause shadows or distortion along interior margin/
La reliure serrée peut causer de l'ombre ou de la distorsion le long de la marge intérieure
- Blank leaves added during restoration may appear within the text. Whenever possible, these have been omitted from filming/
Il se peut que certaines pages blanches ajoutées lors d'une restauration apparaissent dans le texte, mais, lorsque cela était possible, ces pages n'ont pas été filmées.

- Coloured pages/
Pages de couleur
 - Pages damaged/
Pages endommagées
 - Pages restored and/or laminated/
Pages restaurées et/ou pelliculées
 - Pages discoloured, stained or foxed/
Pages décolorées, tachetées ou piquées
 - Pages detached/
Pages détachées
 - Showthrough/
Transparence
 - Quality of print varies/
Qualité inégale de l'impression
 - Continuous pagination/
Pagination continue
 - Includes index(es)/
Comprend un (des) index
- Title on header taken from:/
Le titre de l'en-tête provient:
- Title page of issue/
Page de titre de la livraison
 - Caption of issue/
Titre de départ de la livraison
 - Masthead/
Générique (périodiques) de la livraison

Additional comments:/
Commentaires supplémentaires:

This item is filmed at the reduction ratio checked below/
Ce document est filmé au taux de réduction indiqué ci-dessous.

10X	14X	18X	22X	26X	30X
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
12X	16X	20X	24X	28X	32X



VOL. IV. No. 3.

TORONTO, CANADA, MARCH 15, 1872.

NEW SERIES.

The Field.

On the Treatment of Soils.

Fall ploughing, especially on stiff land, is a practice strongly to be recommended, not merely to facilitate the work of spring, but also as a valuable means of bringing the soil into improved conditions, chemical as well as mechanical. Deep ploughing in the fall exposes a larger surface in a rough, uneven state, to the action of air and frost, renders the soil free and porous, and consequently better able to absorb and retain heat and moisture during the subsequent season of vegetable growth.

The time and kind of manuring, too, has considerable influence on the texture and properties of soils. On heavy land the ploughing in of rough dung, experience shows to be generally advantageous. The manure tends to keep open the pores of the soil, and as spring advances fermentation proceeds, bringing by degrees the manure into a condition to be freely taken in by the growing crop, and investing the soil with larger capabilities not only of absorbing and retaining heat and moisture, but also of effecting the decomposition of various substances yielding a copious supply of plant food.

Land naturally dry, or made so artificially, thoroughly cleaned and manured with long dung in the fall, can often be cropped advantageously in the spring without further ploughing; the grubber effecting all that is requisite with economy and speed. In this way, followed by the necessary surface harrowings, a fine seed tilth for turnips, mangels, &c., may be much easier and better obtained than by the use of the plough in spring. On many of the stiff clays of England, where the preparation for wheat was formerly a naked summer fallow, since thorough draining and a deeper culture have been introduced, the naked fallow has generally been abandoned, and the grubber has superseded the plough, after beans, peas, or

some other drill crop, in preparing the land for winter wheat. Mr. Mechi informed us that he never ploughs land in spring for turnips or mangels; and this, we believe, since the wider extension of efficient drainage, is the general practice of the most advanced agriculturists. Given similar conditions in Canada, such a system of management could be carried into practice here with similar results, making, of course, such modifications to meet local and varying conditions as circumstances might require.

Soils naturally light and porous require different management from such as have already been mentioned; they use up manure so rapidly that it is not advisable to apply it long before the growing crop is enabled to assimilate it; and from the extreme porosity of many such soils, the application of some mechanical pressure is found necessary in order to retain moisture and to secure a firm seed bed in which the growing plant can securely fix its roots. The application of lime or marl to such soils is generally attended by beneficial results. Indeed, a large portion of the old arable land of Canada would be greatly benefited by liming. This substance enters more or less into the composition of all our cultivated crops, and while, particularly in a caustic state, it facilitates the decomposition of organic compounds, and neutralizes acids injurious to vegetation, it tends to consolidate the texture of light soils, and, what is so much needed, to increase their capacity for absorbing and retaining moisture. For the latter object the application of plaster (sulphate of lime) is well known to be highly beneficial on many soils.

The term "marl" is popularly used to denote a combination of lime and clay, including a class of substances very variable in their composition. The clay, of which most marls largely consist, acts on the soil mechanically, changing its texture, so that it will retain more moisture, and the lime constitutes an essential ingredient in the food of crops. Calcareous marls, exposed to the action of air and frost, readily crumble when wetted; but marls greatly deficient in lime

are with difficulty incorporated freely with the soil, and their manurial value is very small. It is only such marls as freely effervesce, on the application of muriatic acid, that are worth the trouble and expense of procuring and applying. The "shell marl," which is not unfrequently found in strata of varying thicknesses in the river banks of many places in Canada, often contains sufficient carbonate and sulphate of lime to justify the incurring of a moderate expense in applying it to a certain class of soils. As such marls, however, are generally distinguished for an almost total absence of the phosphate of lime, they must occupy a low degree of manurial power in the scale of farm fertilizers, and will not repay a heavy amount of labour and expense in procuring and transporting them to long distances.

The condition in which farm-yard manure is applied, as well as the particular mode of cultivation pursued, exerts a considerable influence on the soil generally, and especially as regards its capacity for retaining moisture. A dressing of green or rough dung in spring for turnips, or other root crops, is not to be commended, especially in climates in which the weather during the earlier periods of growth, (as is often the case in Canada) is dry, and sometimes even parching. The incorporating of half decomposed substances with the soil in spring has a tendency to render it too loose and porous, and by exposing large surfaces to the action of drying winds to cause such powerful evaporation, both as to lower its temperature and rapidly diminish its moisture. For root crops, particularly, it is desirable to apply manures that will readily decompose and become solvent, so as to be freely taken up by the plant during the early stages of growth. The grand point of success in turnip growing, known to every practical man, is to push forward growth after germination as fast as possible; hence the importance of having the manure in a state at once available for the exigencies of the crop at this critical period. The horse-hoeing of crops in rows during dry weather is well known to be highly benefi-

cial, and the chief benefit of the practice arises from the fact that a well stirred soil has a much greater capacity in dry weather to absorb and retain moisture than one in an opposite condition. It is a sound practical maxim, univorsally sustained by experience, not to touch land when wet, but stir it about freely when dry.

With regard to the density of soils, a quality on which their capacity for heat and moisture greatly depends, some popular fallacies obtain. Clays are considered proverbially heavy, and sands light. This, however, can only be true as regards the animal strength necessary to cultivation. A cubic foot of sand weighs nearly twice as much as a cubic foot of water; but the stiffest pipe-clay, absolutely incultivable, only weighs about one-and-a-half that of water. Again, it is well known that strong clays in a wet state contract amazingly when heated, and that sandy soils are but slightly affected in that respect. Some of our strong agricultural clays will contract under the influence of a summer sun as much as one-tenth part of their bulk, while the sandy soils undergo scarcely any change whatever. Again, dry clay will retain from 30 to 50 per cent. of water, and hold it most pertinaciously; whereas pure sand can only retain four or five per cent., and will readily part with that by exposure to the warm currents of the atmosphere. Dried peat will absorb more than one-half of its own weight of water; and such a soil is agriculturally worthless until it is thoroughly drained, clayed and limed; or, in other words, supplied with a very heavy dressing, or series of dressings, of a rich calcareous marl.

From the foregoing remarks it will be apparent that for the farmer to bring his land into the best state for the profitable production of crops, he must pay strict regard to the mechanical and chemical properties of his soil, and seek to improve them by draining—where necessary—thorough cultivation and judicious manuring; varied, of course, to meet existing exigencies of climate, markets, and the physical conditions of his farm.

Depth of Ploughing.

The great object of ploughing is the pulverization and preparation of the soil for the purpose of receiving the crop that is to be cultivated. And as to the manner that this should be done, there is great diversity of opinion, some insisting that it should not be to a depth of more than four or five inches, and others as stoutly insisting that it should be ten or twelve inches; and like the parties who disputed as to the colour of the chameleon, they both are right and both are wrong.

There are important considerations that enter into both the investigation and practice of this subject, and which in a greater or less degree influence the results. In the first place, very much depends upon the

availability of the soil for plant food. If it is in that peculiar condition in which it can not be immediately used by the plant, in consequence of some element that is deleterious to plant growth, then the thought of ploughing to a great depth, in the hope of favourable results, is obviously erroneous, and the practice will be labour lost, so far as immediate results are concerned.

There are very many soils that, in consequence of repeated and continuous shallow culture, have attained to such a state that deeper culture must be very gradual. This applies with peculiar force to many of our fields that are composed of a very firm and compact sub-soil, but which, when once reduced, furnish a soil not wanting in fertility. Now, it is very plain to be seen that this transformation must be gradual; an inch or so at a time must be exposed to the action of the atmosphere, the winds and rain, and the frosts of winter, whereby thorough disintegration is effected; and although several years will be necessary in order to effect a reduction to a considerable depth, it will be found that the labour will not have been in vain, since it requires no great amount of argument to prove the benefits; for it is admitted that a good proportion of the inorganic elements that enter into the composition of plants are obtained from the available soil; it is very clear that if the quantity of available material is increased, then as a consequence the crops must either be increased or else the period of fertility of the soil greatly lengthened, in either of which cases there must be a material benefit.

Not only that, but if the soil be of that peculiar character and composition capable of receiving and absorbing the organic elements of plants, that may be furnished either by natural or artificial means, then if the extent of this capacity be increased, there will be also a much larger accumulation of all of the elements necessary to a healthy and vigorous plant; therefore it is that this practice is sometimes likened to doubling the number of cultivable acres. At all events, so far as efforts have been put forth in this direction, they have never remained unrewarded. Of course it is always to be understood that the soil should not contain an excess of humidity, for in that case the ill effects of any excess of moisture would balance the benefits of deep culture.

It would seem, then, that the answer to the question of the expediency of deep or shallow ploughing hangs upon certain conditions, and if these are properly fulfilled, the results are favourable to deep ploughing.

Now, what are some of the results that follow this course, where all the conditions are favourable? In the first place, it cannot be denied that a good portion of the food of plants is taken up by the roots, and if there is a limit to the extent to which these can be put forth, then to that degree there is a limit to the inorganic sustenance of the plants; so,

therefore, if the soil is deeply pulverized, the extent to which the roots can spread is greatly increased, and hence, as a consequence, the plant can assimilate a much greater quantity of food, and therefore store away an increased quantity of grain for the husbandman.

Again, as all properly constituted soils possess such hygrometric qualities as enable them to absorb and hold for future use a proper amount of moisture, if the extent is increased, as stated above, and there is also a permeability for the passage of the roots of the plants, then it follows that such soil is vastly better prepared to withstand the blasting effects of droughts, and this fact has been amply demonstrated in practice. Nor is this all. Some years since, Hon. J. S. Gould, of Hudson, N. Y., under the auspices of the Agricultural Society of that State, made a tour of the Western States for the purpose of obtaining agricultural information. This occurred in the fall, after the first frosts; and as he passed through the States he noticed whole fields of corn that had been cut down by the frost. There were many of these, which was considered nothing remarkable; but what attracted the attention particularly was, that occasionally a whole field would be found, in which, although the corn of fields surrounding was entirely killed, in this it would be perfectly green, bearing no appearance of having felt a frost in the least. This peculiar condition of things, which was not confined to a solitary field, was made the subject of enquiry, and, singularly enough, in every case the result of the investigation was contained in the answer, that the field was ploughed with a Michigan subsoil plough. What peculiar thermometric change was thus effected, whereby the injurious effects of cold were neutralized, remains a subject of enquiry, but if such an effect is produced, and thus in a measure the growing season lengthened out, it is a matter of no inconsiderable importance to the farmer, especially if he dwell in a high latitude, where the summer is but short. There can be little doubt that, other things being equal, the proper mode of ploughing is to do it deeply, pulverizing the soil to the greatest degree, since successful cultivation depends to a considerable degree upon the disintegration of the soil; and even though the result upon only one acre would be considered to be perhaps a moderate increase, yet, taking into account the acres upon acres under cultivation, when reckoned as an aggregate, how vast must be the result, and what an addition to the material prosperity of the whole country.

WILLIAM H. YEOMANS.

Columbia, Conn., Jan. 29, 1872.

Talk with Farmers.

LIGHT AND HEAVY LAND.

"How did the Deihl wheat do in Haldimand last year?"

"It gave us a capital crop. I got over forty bushels an acre of the finest sample I ever saw. I sowed two kinds of fall wheat last year—the Deihl and the California; both did well, but the Deihl was far the best, in quality as well as quantity."

"Are you still satisfied with that light land in dry weather?"

"Yes, I think I like it better every year, as I understand more how to treat it. I like it better than clay. If we are only smart enough in the spring and get the crops in

early, we are sure of a fair yield, let the rest of the season be what it may. The light land requires good farming, and not too much cropping without intervening grass or pasture and fallow; but then our returns are certain. You know when I went on that place I occupy, about two years since, there was no manure on the farm, and nothing to make it of. The buildings were all gone to smash, so that they had to be repaired and almost rebuilt. The man who was on the place before I went there could not get a living, so he moved off to heavier land. Judging by his failure, I thought I should have great difficulty in doing any good with the farm; but I was so early with my spring crop and the preceding fall wheat, that the dry weather last year did not do much injury to my crops, although others suffered a good deal. I am so convinced of the advantages of this land, in comparison with heavy clay, that I would not exchange it for any other of that kind. I now believe I know what this land is, and I think I see my way clear to manage it to good advantage, and I certainly shall stick to it."

"How did the man prosper who was on your farm before you, after he got on the heavier land?"

"He did very badly. His crops did not pay his expenses. He is now quite out of heart, much more than he was when he occupied my place. The great fault about his farming was, he never was active enough in early spring; and if you do not get your crops in early on light land, the sun dries up the surface so much that they might as well be planted in a bed of ashes at midsummer. Where he now is the land is a very stiff clay, and bakes so hard in the summer that nothing can be done with it unless it is taken just at the right moment, and of course that depends greatly on the weather, and we all know how unreliable that is. Now, on light land you can work early and late; heavy rains do not hinder you, and very dry weather does not altogether stop you either, as it does if you have heavy clay land to work when it is baked hard."

"Do you find clover do better on light land than on heavy clay?"

"I certainly do. I always use plaster, and my crops of hay are very good, and I think the pasture afterwards much better."

"Do you find turnips do as well on your soil as on heavier?"

"Yes; I think a great deal better. There is more natural growth for young plants in light soils. Their tender roots must naturally have less to contend with than when forcing themselves into hard clay, and then all hoeing is so much easier done. It certainly is true that more weeds grow on light soils; but if that goes to prove anything, it proves also that young plants of any kind find it more congenial to their growth, and also that seeds are more likely to germinate in light than in heavy clay soils. Then as to teams—why, my light horses could do nothing with clay land, especially in dry weather. Then all hauling in late autumn

weather is so much more easily done. On heavy clay soils it is nearly impossible to haul off a root crop in November, especially if the autumn has been wet. Then again for pasture. On heavy, wet soils, cattle poach the land terribly; whereas, on my farm, I never see such injury done. I have no doubt that in some years wheat will be a much heavier crop on clay than on light soils; but take the average of ten years, and I question if it would beat it much. And for barley—why, we all know light soils do much better for it under all average seasons. So, take it altogether, I feel confident the light soil is more profitable, and I am sure it is much cleaner and more agreeable to live on than the clay.

VECTIS.

Cost of Exposure of Farm Implements.

A neighbour of mine was telling me, a few days since, about having just erected a shed to contain his farm implements, and, amongst other topics of conversation, we were calculating the loss he had sustained by not doing so some years sooner. It seems he had dispensed with such shelter for somewhat over eleven years, during the time he had been erecting his barns and clearing up his farm. He could not do all at once, he said, and hence was obliged to leave the driving-shed unbuild, and hoped to be able to do it next year, and so from time to time it had gone on. The shed was not built until the last autumn, and cost, without reckoning his own work or teams, somewhere about one hundred dollars. For this amount he had a large comfortable shed, partly open on one side, and so arranged that a waggon could be driven into it, or rather under it, the contents to be unloaded through a trap door in the floor above, which opened into a granary fitted up with bins for oats, barley, bran, shorts, chicken feed, flour, &c., with boxes with tight covers, to contain dried meal and protect it from flies in summer. Unloading was facilitated by the use of a "pulley block" and tackle attached to the rafters overhead, by means of which all such goods or household stores that came under it in a waggon, could readily be hoisted up to the next floor above through the trap door, which closed in two leaves, and fell of itself, the weight so lifted resting on the upper side of the fallen trap. This arrangement was found to work exceedingly well, and saved much labour in carrying bags of grain, flour, &c., up the stairs, in the corner of the shed. All family stores were thus put away quite safe from inroads of rats and destruction by damp, besides removing from the house a most objectionable mess and litter.

The comfort of this shed, and the economy connected with its use, was never appreciated until it was built and in use; and then the wonder was how on earth did we do without it so many years. Underneath were packed in waggons, ploughs, harness, thrashing machine, horse-power cultivator, cradles, rakes, forks, and, in fact, all the farm implements about the farm, were here gathered together

and arranged separately. The heavy portions, such as thrashing machine, horse-power and sawing machine, were arranged with rollers under them, so that they could be handled without difficulty, and loaded up when required, some help being obtained by the block and tackle above mentioned. My friend was so pleased with this convenient addition to his farm, (which was about 200 acres in extent), that amongst other things we determined to reckon the advantages and cost as compared with the losses hitherto sustained from not having such shelter, and all the implements being exposed so many years to the weather. We therefore commenced a regular inventory, charging each implement with its cost, and judging of its depreciation by weather and exposure alone, without including wear and tear, which really was nothing in comparison with the apparent loss and miserable appearance that every article presented. Numbers were partly rotten, all were badly sun-cracked, none were painted, and had an auction been called, and these tools and implements offered for sale, they would not have realized 15 per cent. on their cost. It really made such a formidable account of loss and depreciation in value as compared with the cost of the shed, that we made a tabular account of the cost, present value and loss by weather alone. All iron-work was of course but little hurt, but the wood-work and general appearance were "seury" in the extreme. We omitted all fair wear as useless or unnecessary for our purpose.

ARTICLES.	COST.	LOSS BY EXPOSURE
2 Waggons	\$ 40	\$50
3 Ploughs \$20, \$17, \$15	82	18
4 Harrows	42	20
2 Cultivators, \$30 and \$20	50	15
1 Buggy Waggon	60	20
1 Thrashing Machine	320	100
1 Wood Sawing Machine	55	15
1 Cutting Box	24	9
Small Articles—Cradles, Rakes, Forks, Spare Harness, &c.	75	15
Lot of Small things, tools, &c.	10	15
50 Bags	25	15
Beaping Machines	84	20
	\$947	\$305

The above table shows nearly 30 per cent. absolute loss by exposure, and in reality the loss was much more, as the articles had not been hired out, and were not at all worn to injure them; they were simply utterly destroyed by exposure, and had they been offered for sale a much worse statement would have been shown.

In addition, we reckoned a loss by rats and fowl, and want of storage, at least to the extent of \$30 annually, or \$330 for eleven years, so that the total loss was estimated at \$635 from the want of a shed that cost out of pocket cash about \$100. Of course the building would have cost twice that money, but so much was done at home and by themselves as reduced the amount greatly.

Into this amount we did not add a cow killed by breaking into the barn and eating too much wheat; nor a horse badly injured from the same cause, both of which accidents would have been avoided had there been a granary in which to store the surplus grain.

In conclusion, the amount seems so large that my friend had suffered, due altogether

to the absence of a proper driving shed and shelter, that we were really surprised ourselves. The losses are in reality not always felt at the time; the wretched weather-worn tools will still do their work "after a sort," until, like the minister's gig, they all go to pieces at once, and have to be replaced by new ones; whereas, under proper protection, the wood-work will not rot, and the iron-work will last for a very long time.

I am myself using a buggy waggon purchased for \$50 on the 1st of September, 1847, or nearly twenty-five years since. My child's waggon is now in existence, bought 29 years since; some grain shovels (steel), forks, hoes, and other articles, are now good, and all were bought 16 years since, when I first required them. Many have been bought since, and destroyed from carelessness; but some are in existence to this day, and are quite useable all owing to having been taken care of and protected from the weather

Fences.

To the Editor.

Sir,—I feel that I shall be doing an act of justice to the public in making known my experience in reference to A. Weir's portable fence.

At the Provincial Exhibition, held at Toronto in 1870, I bought a right to make the above fence. We proceeded to make 300 lengths, and in the spring put them in position, and a more elegant or stronger-looking fence need not be sought for. We were fortunate in meeting with a carpenter out of employment, who made all the legs for supports, and cut all the notches in the boards exactly according to the plan furnished to us. But the first half gale of wind that blew after putting it up, over went our fences from one end to the other, and probably it would not take more than five seconds to cross a ten-acre field. To our surprise, we found three or four hands could put the whole up again in a few minutes, by beginning at the end where it left off, which again brought it in right position. But we were very much discouraged, because to a certainty it must be staked. But in what form was the question. The outside fence we decided to stake inside every alternate panel and in the centre, driving the stake low that it should not be seen, and nailing it to the middle batten. This we did to save the credit of our fence. But for the inner fences, we drove longer stakes down alternately on either side without nailing them. This done, we felt perfectly satisfied such a mishap would not occur again. This refixing, staking and nailing, caused us much loss of time, and at the very busiest season. But the next gale that came, over went our fences again, with some damage to that which was nailed, but not to the other. We now proceeded to stake them more securely, and nailed them. We got a large number of stakes four feet long, and let them deep in the ground by punching a hole with an iron crow-bar, and driving them in with a heavy beetle, and thus flattered ourselves that we had put an end to this trouble, loss of time, and vexation; but no, the next

gale was yet stronger, and over went the fence again, the third and last time. The legs (or supports) seemed to form a lever; the motion caused by the wind loosened the stakes, and they were lifted out of the ground as by a lever. At this time we had got only about half of our fence in position, and if we could not find out a scheme to keep it up we concluded we should have to wait and get posts. We were now thoroughly disheartened. I, however, studied the matter out, and ascertained by experiment that if insignificant stakes were driven in the ground in a line with the slanting legs, with one small nail fastening it to the leg, it was equivalent to letting the leg into the ground in a slanting direction, and a strong man could not push it over. With this arrangement, our fence has bravely stood the trying ordeal of that memorable hurricane that passed over this Province on the 24th Dec.; whereas miles of our neighbours' rail fences were blown down and scattered like bits of sticks. We now like our fence as well as ever, and when I want more I shall resort to the same.

In addition to the instructions given by Mr. Weir for making this fence, we found the following simple plan carried us through with less trouble: Notice, first, the ends of the panels lap over each other, and there is commonly a difference of two or three inches in the length of boards; there is no need to waste the boards by cutting them shorter, but the notched boards may always have the same lap, as it will not affect their resting on the supports, be they long or short lengths. Secondly, putting up a few lengths as we first made them, we discovered it was far the better plan *not* to nail the bottom notched boards until they were put in position, because by this arrangement the bearing of the two notched boards may be made just equal by first hanging the weight on the top notched board, then dropping the bottom notched board in the notch of the brace of the legs, and nailing it to the three perpendicular battens; then both notched boards will carry an equal weight.

In making the legs, we found it necessary to drive two cut nails in the cut parts where they were halved together.

After the legs are made (all from one pattern), and the boards notched and kept carefully in pairs, one man, with the sawn lumber at hand, could nail together fifty lengths in a day.

We made a frame of three pieces of scantling, nailing brackets on so as to make the top and bottom spaces absolutely correct both in space and distance, and all the inequalities caused by the varying width of the boards were worked in elsewhere. We also put two nails in the bottom board, and always saved the best pieces for the top rail. Several people have called on me for advice about the fence, and I have carefully explained the necessity of staking as above, and these stakes should be got ready before putting up the fence. On account of the lap of each panel, a twelve foot board is reduced to eleven feet, and ours cost 31 cents a length, including nails.

Mimico.

W. BURGESS.

Fences.

To the Editor.

Sir,—Fencing has now become an important item in the expence of Canadian farming. In the township where we live, the rails split from the timber which grew on the land when cleared up, are now done. A few exceptions exist, where black ash and oak formed part of the original forest. Valuable pine, white oak, and rock elm, purchased from the farmer for a mere trifle, has many years ago been carried away by the lumberman. Cedar cannot be obtained but at an exorbitant price and great labour. Pine lumber, for building purposes, is dear, and has now to be drawn long distances, rendering it impossible to fence with boards and cedar posts. Black ash, the only available timber now for rails, is scarce, the swamps being pretty well culled. The expence of the rails, the labour of getting them out of the swamp, the distance they have to be drawn, make not only a heavy drain on the farmer's purse, but a bugbear to his mind.

We have bought rights to make patent fences, and, after practically testing them, have no hesitation in pronouncing them a kind of *humbug*. Many attempts have been made to improve on the old worm fence, and notwithstanding that your correspondent "Sarawak" designates it the "lazy man's fence," I must confess that I have not seen much improvement, if cheapness, quickness in building, being easily repaired, adaptability to all places, be any consideration in fencing. In the township of North Dorchester there is a fence made by boring three inch holes in tamarac posts by horse power. The holes being placed at suitable distances for six rails, makes the fence about five feet high. The rails are cut eleven feet long, and the ends trimmed to loosely fit the holes. The posts stand on the surface of the ground, and are held upright by stakes driven into the ground on each side of the posts, being securely nailed thereto by spikes. This kind of fence has obtained a good deal of notoriety in the township. Who was the originator I never heard. Thomas Sadlier was the first farmer (and perhaps the inventor) who built it extensively, about six years ago. Since that time it has been built more or less on a number of farms; it is considered a strong fence when properly built. Those who have tested its utility and counted its cost, state that, could they obtain the rails at a reasonable price, they would prefer the old worm fence. Still, where rails cannot be laid on the ground under \$30 or \$35 per thousand, and as long as tamarac posts can be obtained for five cents apiece independent of boring, it becomes an important object to the farmer, when half the rails are only required to make the fence sufficiently high for ordinary purposes.

A very important desideratum in the construction of a fence should be the practicability of easy repair when it has been blow

down or broken by any cause. In the fence I have mentioned above, if the end of a rail should rot before its fellows, or get broken, another cannot be replaced without taking down one post, and adjusting rails, stakes, and post over again; this is inconvenient. The picket and rail fence described by "Sarawak" recently, appears to have several practical advantages over any other rail fence that has been brought before our notice. He says the stakes are not apt to be drawn by the action of frost. His soil must be different from ours, for I have not yet seen either stake or post thoroughly secured from being raised to a more or less extent.

Allow me to suggest what I imagine would be an improvement on the plan of "Sarawak." With a square pointed crowbar punch a hole in the required place, drive the stoutest stake first, lay the bottom rail, close by the side of it punch the hole for the weaker stake, drive it to the required depth, then lay in all the rails except the top one. It would be necessary to keep behind one panel with tightening the stakes. This could be done to perfection with a strong screw, and instead of the pin and withes saw a notch on each side of the stakes, and tie together with a strong tough wire. This would leave each stake free, to be driven again if drawn by frost.

As we intend building a number of new fences next spring and summer, and are likewise very anxious to get the cheapest, strongest, and most expeditious plan of erecting a straight rail fence, we would feel very thankful to "Sarawak," or any other of your correspondents who are connoisseurs in fence building, to state whether our suggestions are of any utility.

FARMER.

Dorchester, Feb. 17, 1872.

Swamp Lands.

A correspondent from the Muskoka district writes for advice respecting the best treatment of a tract of swamp land that is sufficiently dry to have cattle feed on it from the end of May to October. Fire has run over the land several times. The swamp muck forming the surface soil is of considerable thickness, and perceptibly sour. Surface draining by open ditches, the application of lime or ashes, and seeding to grass, would be our course. A friend, who has had considerable experience with such land, describes the treatment he has successfully pursued as follows:—

I first dig surface drains through the centre of the swale, beginning at the outfall, and sometimes many rods on to my neighbour's land. I always aim to have the drain about eighteen inches deep, where it leaves my line; thence upwards dig as nearly straight as may be a drain about thirty-six inches wide at top and twelve at bottom, and about eighteen inches deep. The swamp timber roots are easily cut with a sharp spade ground to a cutting edge. We always ground our spades once or twice a week, sometimes every day; but, as a rule, there is so little of any stony or gravelly material in such swamps that the edge of the spade is seldom blunted more than a file will sharpen, and we always provided one for each man

while digging these drains. I paid 25 cents a rod, and boarded the man who dug, and he always made from one to two dollars a day. The water flowed into the drain as fast as it was dug. The spade was readily driven through the soft spongy roots; and where some were too large to be so cut, each man was provided with a mattock or grubbing axe, and a chopping axe as well. Large trees were always avoided if possible, but small ones of six inches were readily grubbed out and cast aside. When the land was dry enough to bear cattle, the timber was all chopped and laid in heaps to dry. I always aimed to throw the small brush down first, and the larger trees on it, carefully cutting down all projecting branches, so as to cause the windrows to lie as close as possible, and not hollow, or the burn will be bad. No necessity exists to do other chopping at first than get all the brush to lie in close compact windrows. It is necessary to be most careful, to prevent fire getting into this mess of brush and timber, before it is all thoroughly dry. When everything is perfectly dry—land and all—as the water will have drained entirely away by this time, choose a hot day and strong wind, and set fire to all at once, beginning at the lee side, not the windward, else there will never be half fires enough before you are obliged to run on account of the smoke, and the burn will be bad. If all be done right there will be a tremendous blazing burn. But this swamp timber must be dry, or it will not half burn, and consequently the job will be wholly spoiled, as it will be many a year before fire will run again in it.

When all brush is burnt, log up the remainder, and burn if possible; but this can hardly ever be done. This swamp timber will not burn until logged some time. Now begin and sow a heavy seeding of Dutch Clover, Timothy, Alsike, Blue Grass, and especially Cocksfoot or Orchard grass. This last is most important and excellent in its effects. It forms bunches and mats together, and affords excellent food for stock, and support for their feet, thereby preventing poaching the land when feeding on it. No harrowing need be done, but a bunch of bushes dragged each way by one horse or ox, will serve to cover the seed sufficiently. For one year no pasturage should be taken from land so seeded down. It will yield a heavy crop of hay, and thereby a tough sod will form. If possible, not a hoof ought to be allowed on the aftergrass for the first year or two, but a heavy crop of hay may be taken to great advantage. Meadows so treated will be the most valuable on the farm, and, acre for acre, will pay better than the best high land. But great care must be taken not to burn off the log heaps until the grass is quite green, so green as totally to preclude the possibility of fire running, and it will run if fire is put in it at any other time; and if the fire once gets into the sod, good-bye to your beautiful meadow, for it will burn it completely up,

and will keep fire in it for weeks, gradually but surely working its way along, until channels are burnt in all directions. Two to three tons an acre of hay is not at all an unusual crop to harvest. If possible, get some lime, and when it is entirely air-slacked, sprinkle some water on it, so as to avoid dust, and sow about ten to twenty bushels per acre over the field, at any convenient time, and it will pay you one hundred per cent. the first year. There is some difficulty about the season in seeding, not to lose a whole year, as you must have dry, hot weather when burning brush, and if this burning does not go on in May or June, it is late before the grass seed can be sown; but the best meadow I have on my farm was subjected to exactly this treatment, and was seeded down some time about the latter end of June, and produced grass upwards of a foot high the same year. It is amazing how fast and rank grass seed will come on if there is no crop sown with it to retard its growth. This meadow was seeded down just ten years since next June, and it is now excellent Alsike clover—at that time not fully appreciated as at present—formed one portion of seed sown; and now, after ten years, there is more than ever before. The Broad clover, however, has pretty much all died out. But the Alsike re-seeds itself every year, and still holds good.

I have seeded down land after harvest, but do not recommend it. The young plants are too weak to stand the winter; but if you notice the seeding about a hay-stack after haying, it is usually good, and rarely dies out the following winter.

Varieties of Potato.

To the Editor.

SIR,—I wrote to you last year about this time, giving my opinion as to the good and bad qualities of the various new potatoes, hoping that some other persons would give their opinion also. I then mentioned Climax, Bresser's Prolific, Early Rose, Willard's Seedling, King of the Earlies, Excelsior, and Early Prince. All these are greatly superior in table qualities and productiveness to any of the old varieties now in general cultivation in Ontario. I am of the same opinion now as I was then in regard to Climax, viz. that this is the best of all potatoes, old or new. In table qualities it has no equal. It cannot be said to be an early potato, but it is from three to four weeks earlier than Peach-blow. It is very productive, and I have never yet seen a diseased tuber amongst them, or a Colorado bug upon their vines. I would not like to predict that my favourite Climax will entirely resist this Colorado pest, but feel confident it will not suffer so much from them as many other varieties. Excelsior and Early Prince I shall in future reject—the one for unproductiveness, the other for want of good table qualities as compared with Climax. Of the Early Rose, Willard's Seedling, Bresser's Prolific, King of the Earlies, and Peerless, I shall still cultivate a few. The Peerless is a great cropper, but it grows too large for a first-class table potato, and will, in my opinion, in a year or two be placed with Cusco and Harrison, and raised for cattle only. There is one other

potato, called Granite State, that I have no hesitation in saying is very promising, and if yourself or any of your readers have had any experience with this variety, I hope the public will get the benefit through the columns of the FARMER. My experience of this variety is as follows:—In the spring of 1870, a gentleman in the State of Maine, writing to me, spoke of it in the highest terms, and urged me to try it. He sent me through the Post Office a small potato weighing less than four ounces. This I cut up into single eyes and planted; in the fall I dug from this four ounces of seed thirty-one pounds of potatoes, of very fine table quality. I planted it again last year, and still think very highly of it.

I do not know of the Granite State ever being cultivated in this section; but I have observed that the Climax has been pronounced in England the best American potato ever raised.

CHARLES ARNOLD.

Paris, Feb., 1872.

Growth and Development of Cereals.

At a meeting of the British Association, Mr. F. G. Hallett read a paper on the "Law of Development in Cereals." He had been convinced several years ago, that grain, and especially wheat, was injured by being planted too closely. He had found that a wheat plant would increase above ground in proportion as its roots had room to develop beneath, and that the roots might be hindered by being in contact with the roots of another plant. Mr. Hallett sums up the results of his extended experiments thus:

1. Every fully developed plant, whether of wheat, oats, or barley, presents one ear superior in productive power to any of the rest on that plant.
2. Every such plant contains one grain, which, upon trial, proves more productive than any other.
3. The best grain in a given plant is in its best ear.
4. The superior vigour of this grain is transmissible in different degrees to its progeny.
5. By repeated careful selection the superiority is accumulated.
6. The improvement, which is first raised gradually, after a series of years is diminished in amount, and eventually so far arrested, that, practically speaking, a limit to improvement in the desired quality is reached.
7. By still continuing to select, the improvement is maintained, and practically a fixed type is the result.

The subject is one of great importance, and also one that is pretty generally appreciated by the farmer, and the conclusions arrived at by Mr. Hallett will carry weight, from the previous attention which this distinguished and practical man has given to practical experiment.

Lime.

For the Farmer.

SIR,—Having considerable experience in the application of lime, both to light, sandy, and heavy clay soils, I beg to state that it fully agrees with that of "Rusticus," of West Seymour.

I have invariably found the grain crop improved both in regard to quantity and quality, by the application of lime even to the lightest lands. Of course judgment and experience must determine the quantity to be applied to the soil in any case. A quantity that would benefit an aluminous or clay soil, would in many cases injure a gravelly or sandy one. But a light dose of lime is quite an essential even for the poorest soils. The science of agriculture or chemistry teaches some very interesting facts with regard to the application of lime to light soils. All sandy soils are largely composed of silica or insoluble combinations of silica. And to make the silica, potash and soda, locked up in the soil, available as plant food, and so essential to the building up both of the frame work of the plant, and also to the development of the grain, they must be brought into a soluble state, so that the spongioles or mouths of the little rootlets can suck them up. Lime, when applied to the soil, is found to be one of the best agents in liberating the silicates of potassa and soda. The earth is a great chemical workshop, in which its particles under the influence of the sun, air and rain, are constantly undergoing change, and being prepared as food for those plants committed to its bosom. Nature is just doing on a large scale what the chemist is doing in the laboratory on a small one, dissolving existing combinations into their elements, and forming new sets of combinations, and the farmer's study ought to be how to assist Nature in this work going on in the soil from day to day, by adding that re-agent most required in the process, or in which his land is most deficient. The mode of applying the re-agent has much to do with the result. That lime may the more effectually liberate the silica and potassa, the presence of heat is requisite, and this is generated by covering up the quick-lime in damp earth, or watering the newly burned lime and covering it up with earth; heat is evolved, and the particles of earth undergo the chemical change under more favourable circumstances than they would otherwise do.

I have found, by many years' experience in the application of lime to light soils in Ireland, that the best results always attended the using it as a compost or mixture with earth. I covered up the lime with earth, then watered the heap well, and allowed it to remain for two or three days, until all the lime has fallen to powder, then mixed the lime and soil thoroughly, and applied the mixture to the land either as a top dressing, or ploughed it in with grain seed.

A. G.

Rain Water Preserved for Farm Use.

The recent drought ought not to be without good results in one respect. From past experience we may be brought to see the absolute necessity of providing for a supply of water for the future in seasons of comparative drought. Where no springs exist, or where the wells are occasionally dry during the heat of summer, every roof about the homestead ought to be made to yield its quota of water towards a general supply. Every barn and stable should be carefully furnished with spouts, and cisterns provided to receive any surplus rain-fall. A very large quantity of water can thus be obtained and kept for use. It rarely happens that severe want of water for cattle is felt for a longer term than three weeks at a time without some rain. It has certainly sometimes happened that an interval of six weeks freedom from rain of any kind, less or more, has occurred; but these cases are quite exceptional and very rare. Where the supply is derived from buildings, one heavy thunder shower may fill the tanks, often to overflow, if all the roof spread about the farm is utilized; whereas, the same shower will only moisten the parched earth a few inches, and do absolutely nothing towards filling the wells. It is thus quite apparent that the rain-fall is much more available for an instant supply than water derived from any other source in dry weather, always provided there is sufficient capacity in cistern room to retain the result of two or more heavy rains.

Let us now consider the questions of demand, immediate supply, capacity of reservoir, and probable quantity to be depended on as an average supply. The average stock of a farm of one hundred acres is usually about six cows, six yearlings and two-year olds, five calves, two oxen (or their equivalent in other horned cattle)—say twenty head; horses and colts, eight pigs, and twenty sheep. These latter can do well enough without water on emergency. Say there are twenty-four head of cattle requiring five gallons a day each, 120 gallons; eight hogs, requiring one gallon a day each, 8 gallons; total demand, 128 gallons.

We have assumed the scarcity of supply from ordinary sources to extend to four weeks without any rain; it therefore follows that the cistern must be of sufficient capacity to contain four weeks' supply, or 28 days at 128 gallons a day; total, 3,584 gallons. A cistern twelve feet wide and eight feet deep, will contain 5,760 gallons, or forty-five days' supply for everything on the farm except sheep, and without any assistance whatever from rain in the interval. It rarely happens in the driest time that there is not one heavy shower, and often more. As before stated, if the supply were drawn from wells, the rain would assist nothing perceptibly; but as all that falls on the roof is saved except just enough to wet the shingles, an ordinary heavy shower would probably raise the water

in the cistern two feet, or afford an increased supply equal to about fifteen days' further demand, showing a grand total of about sixty days full supply for all the farm stock from this source alone.

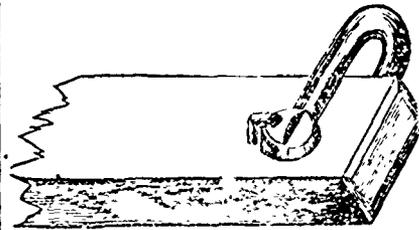
Let us suppose that if simple wooden triangular spouts are tacked to the ends of the rafters, and before being put up melted pitch is run into the corner. The cost will be very little. One man would make the whole required in a week. If galvanized iron is used, the cost is about 12½c. to 15c. a running foot, complete. We should require 200 to 300 feet of such cavetroughs to be put up, and the expense in this latter case is quite an item, amounting to forty or fifty dollars; whereas the wooden angular spouts can be attached for one-fourth the amount. The cost of a cistern of the above size would be about thirty dollars, and it would last for twenty years if put down in clay soil. If, on the other hand, the soil was sandy, the upper portion of the wooden cistern would soon decay, unless it was thoroughly tarred or so arranged as to be always full of water, except when the dry time sets in, when of course it would be occasionally empty. Under any peculiarities of soil in which it was sunk, the cistern would not decay if kept full during the remainder of the year. Some cisterns are made of water lime and one thickness of brick, the lime being carefully spread over the inner surface of the brick wall, which may be built 4½ inches thick in the ordinary way, but at the same time forming a circle. It sometimes happens that cisterns are required in a tenacious clay soil, in which case, when building them, the hole is first dug out perfectly round and true, and a coating of water lime, Oswego or Quebec cement, plastered one inch thick on the clay wall without any bricks; this sets at once, like stone, and the bottom being also plastered, the whole form a durable and excellent cistern: all the art required to do the job well being great speed, to plaster on the mortar as fast as mixed, and to have coarse, sharp, perfectly clean sand, absolutely free from earthy matter of any sort. Of course no frost must be able to touch the walls when so built. On the other hand, frost will not injure a wooden tank. There are some difficulties to be guarded against should the soil in which the cistern is sunk be ever water soaked, in which case, where wooden cisterns are sunk, there must be two heavy pieces of timber crossing the lengthway planks inside of the bottom, and two other corresponding pieces placed as beams across the top, so fastened that the weight of at least eighteen inches of earth bears on them. Then place upright pieces of scantling firmly fastened and driven heavily in between the under and upper beams. These pieces are like joists, to keep the bottom of the tank from bursting in when the water rises outside during a wet time. This is sure to happen, and cisterns are often spoiled by this being neglected; the hole in which the cistern is placed being the lowest part, becomes filled with soakage water, and although there is only a trifle of water to be seen, the pressure to burst up

the bottom is quite as great as if there was a space of one or more feet all around the cistern. This is the hydrostatic paradox familiar to all; so on no account must this precaution be neglected. There is one other remedy for such an accident, but it requires constant attention—that is to bore a hole through the bottom, and have a plug to come up through covering, so arranged in guides that it can be pulled up at any time that there is any danger of water being higher outside than inside the cistern. In this case, removing the plug will allow the outside water to burst in and fill the cistern to its natural level. Then, when a dry time comes, and there is danger of the water caught in the cistern running away through the hole, the plug can be put in its place, and the leak then stopped.

C.

Safety Clevis.

A correspondent sends us a sketch of a simple and ingenious contrivance for preventing the slipping or drawing out of the clevis bolt, an occurrence which is frequently the cause of serious accidents with horses attached to a vehicle. The bolt, which is prevented from turning in its socket, is kept in place while the clevis is in position for drawing, by a bent iron pin or spike. By reversing the position the bolt can be withdrawn. Our correspondent's sketch and brief description will make this clear. He says:



The upper hole in the clevis and the neck of the bolt are square, to prevent the bolt from turning round. To remove the bolt, it is necessary to swing the clevis to the back of the whipple-tree, to allow the blank side to pass the bent spike which is driven into the whipple-tree.

Manuring Turnip Land in Mid-Winter.

To those who have not been able to manure during the fall, the land intended for turnips next spring, or have not had their attention directed to winter manuring, a few hints may not be unseasonable, and may prove useful.

It has been demonstrated many times that manure, carried out and spread on the surface of the land, and not ploughed in, is generally quite as efficacious as that ordinarily applied and ploughed under.

The winter season is far the best for hauling out all manure that can be conveniently handled. It can be then done at about two-thirds the cost of that hauled out during spring and summer; and certainly there is little or no doubt the application of manure in winter is more truly efficacious than if applied during the fervid summer heat. In the former case the land will receive all the

soluble portions of the manure during the thaws of March and April. Some people think there must be a great waste from the melted snow carrying away all these soluble portions; but with some exceptions, where the land is hilly, there is not much run of snow water from ploughed land, especially if it lies at all rough, unless provided with water furrows. The snow gradually melts, and although some of it may run away, the greater portion penetrates the earth where it melted, and ultimately finds its way off by underground channels. Directly, however, the soluble salts touch or come in contact with the earth, its chemical affinity comes into play, although water in considerable quantities may pass through. The earth absorbs these soluble portions, and retains them as in a reservoir, for the future demand by the plant.

Liebig and others say that in a series of experiments made by watering poor hungry clay soils with liquid manure, in about the same proportion as ordinarily used, all the soluble salts and many of the other constituents, were retained by the superstratum until the surface soil was fully charged. After super-saturation of the upper portion, the salts and organic matter passed through and entered the sub-soil; previous to this being done, water was added freely, but it passed as put on, without again leaching out the salts. This was not, however, the case when the soil had obtained an excess of these substances, as all excess was readily yielded to filtration.

No doubt this principle is a bountiful provision of Nature to catch, as it were, these substances, and retain them by chemical affinity until the demand by the plant for food took it gradually up.

There is little question but that a very large proportion of manure as ordinarily applied is wasted, so far as feeding the plant at that time is concerned, as in rain storms an immense quantity of ammonia and nitrogen is beaten down from the air and washed into the earth, but far more than the plant can take up at once; consequently these substances are again in their turn raised by evaporation, to be again deposited somewhere else.

In winter manuring, therefore, it is highly probable that the thaws in March and April admit these portions of manure at once into the soil, instead of being evaporated by heat, as would be the case to some extent in summer.

There is a most intelligent farmer in the county of Wellington, who tells me he always hauls out a large portion of manure during winter, and finds it answer extremely well. His cattle stables are provided with a cavity underneath them, to hold the manure, but too small to last all winter, and he consequently first tried winter manuring from necessity. Now, however, he regularly clears out this manure cellar as it accumulates, and he tells me the result is perfectly satisfactory. No doubt, hill sides would lose something by this course; but the instance above quoted is applied to almost level land, and always on land ploughed in the fall.

VECTIS.

Stock Department.

Sheep.

We propose to bring these articles upon sheep, to a close by a review of the most common diseases to which they are liable.

TICKS.—We all know how to manipulate these, and we have strong confidence in Miller's tick destroyer.

FLIES.—One of the most disagreeable of the disorders of the sheep is that caused by maggots. In any putrid animal matter are rapidly generated the large flesh maggot flies or blue-bottles. These flies, attracted by the strong smell of the sheep, arising from their sweat, quickly deposit their eggs in any spot upon the animal which is likely to afford shelter that may nourish them into life. Around the anus, or at the root of the tail, especially if there be any deposit of excrement hanging about these parts, is the favourite haunt of this fly; and very rapidly, when eggs have once been deposited, will the maggots be hatched, creating, where they feed, loathsome sores, and rapidly spreading over the whole body. In very close weather the eggs are speedily hatched. The parent lays several sets of eggs, and in a few days the maggots appear in thousands. These eat into the skin, and if the affected sheep be entirely neglected, in little more than a week he may die covered by thousands of these loathsome vermin. By tagging or cutting away any wool about the anus which may have collected excrement, particularly in the spring of the year, prevention is generally effected. Sometimes, however, an apparently healthy animal will be affected.

A sheep, when first struck by the fly, will appear restless, hang down his head, jerk about his tail suddenly, run a short distance, and then, suddenly stopping, will attempt to bite the affected part. When these symptoms are manifested, let the sheep be examined. If only nits are formed, crush them, and wash the parts with soap-suds and salt water. But if maggots have actually perforated the skin, they must be removed by lifting the part bored with a sharp pen-knife. The parts affected should be shorn close, and the wounds may be healed with the above wash. When the maggots have, however, become very bad, the following preparation may be used:—Half a pound of pure quicksilver, quarter of a pound of Venice turpentine, half an ounce of arsenic, half a pint of Neat's foot oil, and a pound of hogs' lard, rubbed well together in a mortar.

STAGGERS.—Some consider this as dropsy on the brain, but it is truly the formation of a bladder containing water, or, more strictly speaking, a parasite termed a hydatid, which effects a lodgment just within the membranes of the brain. The best treatment is the use of the butcher's knife, for a cure is

seldom effected, and then only by a doubtful and painful operation.

GRUB IN THE HEAD.—What is commonly known as "the grub," is the larvæ of a fly called the *ostrus ovis*. These larvæ, hatched from eggs deposited in the nostrils of the sheep, crawl up the nose to the cavities called the sinuses, where, being attached by their tentacula or feelers, they feed on the secreted mucus, causing the sheep such agony that he rushes about the field as if mad. The parasite having wintered in these warm quarters, he crawls down again, creating much irritation in his descent. This can hardly be called specially a disease, for at the proper season they are found in the head of every sheep.

It is well, however, to prevent as far as possible the attack, which may be accomplished in July or August, by occasionally smearing the noses of the sheep with tar; or, when the larvæ have got to their place, and have caused very considerable annoyance, it has been thought that they can be ejected by squirting up the nostril a decoction made by distilling half a pound of good Scotch snuff, or a decoction of tobacco in half a gallon of boiling water, stirring and allowing the mixture to cool.

HOOVE, OR BLOATED PAUNCH.—Is not very common among sheep, but sometimes takes place when they are turned on clover upon empty stomachs. If not attended to early, this distension, caused by formation of gas from the fermenting of vegetable food, prevents the blood from circulating in the rumen, and by the consequent rush of blood to the head will cause death. Gentle and steady driving will often relieve the subject; sometimes the paunch must be opened. To perform this operation, at the greatest point of swelling on the left side, just below the hip bone, plunge a knife, sharp at the point, but not on the edge, into the stomach. The gas will be let off, and with it some of the contents, liquid and solid, of the stomach. If there be a regular practitioner near, let him perform the operation. If the inexperienced person has to use this remedy, let him endeavour to fat the sheep, if it survives, as soon as possible, and kill it. It very often happens that when proper instruments have not been used, part of the contents of the paunch fall into the cavities of the abdomen, and produce serious irritation and often fatal inflammation.

Breaking Colts.

I have trained and broken several colts of late years, and have been very successful in the first effort in subduing the animal's determined spirit of resistance. The best plan is to "throw" the colt the moment you have him haltered, so as to enable you to hold him. Choose a soft place, and by passing a rope not less than an inch in diameter round his hind pastern, attached to his neck at the other end, the colt can be thrown without injury. This is the ordinary plan, and one familiar to all, but by far the best course to pursue, and one not at all likely to injure the animal, after you have the halter on him, is to raise up his fore leg and slip a strap over the knee, thus firmly fastening the foot

to the forearm. Don't hurry him, but let him stand and consider what he will do next. If he stands for half an hour on one leg, so much the better. He will try to get out his foot and hop about, and struggle a good deal. Let him do so, and the more he exerts himself the better. By-and-by he will be tired, and the ears will hang down and the fire have left his eye. Now distract his attention, and give him a sharp push on the inside of his one leg. The knee will instantly give way, and down he goes. Place another strap round that fore leg the same as the former, and gently push him over on his side. He will struggle and try hard to rise, and probably will get up on his knees. Let him do so. The ground being well protected by litter or manure from injuring the horse in any part, there is no danger of his doing himself any harm. Sometimes a horse will kneel thus for several minutes, trying now and then to raise himself up, but of course that is impossible. Very soon he will be quite tired out, and lie down or fall down. Let him lie; he is gradually but surely exhausting himself, and proving to his own satisfaction the folly of resistance. He will probably be in a profuse sweat; so much the better. He will never give fully up until he is sufficiently distressed to be covered with sweat, and quite tired out. When you see by his eye and ears that he has lost the spirit as well as the power of resistance, remove the straps, and he will instantly rise. Now "ring" him with a rope or rein, and whip him well until he goes round freely. The one great object is to tire him quite out. Nothing will break a colt like absolute painful fatigue. When thoroughly done out, and stiffened, put on the harness, and let the straps hang about his legs; the more the better. Even now you must not stop, but put a sack with some potatoes, or grain, or sand in it, on his back. About 50 to 75 lbs. will be enough for a small colt. If a large heavy horse, twice that will not be too much. He will now be past resistance, and will be thoroughly cured, and in fact broken; make him carry the weight until he will allow you to handle him. But above all things, do not let him go until you have done everything thoroughly. Half measures will not do. A horse has many times more power than a man, and unless that power is altogether subdued before you attempt to govern him, all your labour will be lost, and your work must be done over again; whereas, if entirely broken in spirit as well as muscular power in the first lesson, you will have little trouble with him afterwards. Next day, while he is stiff and sore, ring him again, and when tired put him into harness at once, choosing an old quiet slow horse to yoke him with at first. He will go, and probably never resist afterwards; but he must again be well done up before you put him into harness; or if he once takes fright at the wheels following after him, he will most likely be a kicker or runaway ever afterwards. But tire him out, do not spare him, before you place him in any such position as allows his strength to be equal to your will. Afterwards you may break his mouth in any way you please. Never, however, leave him untied, or allow of his once

getting away. If he does, he will be months before he forgets that one lesson of "might over right;" he will feel his power, and always want to exercise it.

C.

NOTE BY ED.—The system above recommended may be efficacious and suitable in the case of vicious or very intractable animals; but young horses of ordinary good disposition are managed most satisfactorily by kind and gentle means.

Breaking Colts.

I think "C's" plan of breaking colts, as lately detailed by him in your columns, is unnecessarily severe, and in the majority of cases will tend rather to "break down" the animal than to "train" him. My plan has always been as follows, and I think there are few animals in Canada so vicious as to require any rougher treatment.

Handle him early and constantly, and make him love you; halter-break him the first year that he is weaned, and thus accustom him to the discipline of the stable and the constant harnessing of his stable companions. First, supply him in the stall or in the field with a light bit to play with and champ. Ring him if you like; but I consider it an unnecessary trouble, as a horse will learn the use of the bit alongside a companion. Put the harness on him first in the stable; if he has been handled as a colt constantly and kindly, and dangling straps should make him timid, a kind pat of the hand and a word of encouragement will allay his fears. Put him, when first hitched up, along with a steady horse, but not of a "slow old plug." Let him learn from his companion that, whether he walks or trots, he must use a fast gait. When first put in as one of a team, take little or no notice of him; let him dance or plunge, he will steady ere long, and then encourage him with kind words and soft handling. It is as useless to use rough measures with a young horse for gambolling as with a boy for showing off his natural buoyancy of spirit.

Use no whip at first; there will be plenty of occasions for chastisements when he comes to "know better." As a tyro in the team, he does not know what he is whipped for, and consequently, if there be any sulkiness at all in his disposition, the use of the lash at this period of his life will bring such out.

When he stops and seems to object to the strain on his shoulder, call "whoa," and he will think after a time that stop and "whoa" are synonymous terms. He will soon learn to do as his companion does.

To teach a horse to back is the most difficult part. First back him with nothing behind him, and gradually increase the weight for him to back; but watch closely, and never let his mouth get sore.

When the animal has thus so far been broken, perfect obedience may be taught, but not before. Even now let no severity be

used. It may be now necessary to use the whip. Let it be applied very seldom, and only to convince him that obedience is necessary. When once the horse has obeyed the lash, in starting especially, let it be not used again unless he again refuses.

Many drivers cannot start a team without the use of the whip upon every occasion.

Gentleness, good temper, and firmness, are the three requisite qualities of a colt breaker; the whip and loud voice are only auxiliary aids to be used rarely.

Three years ago I broke a pair of four year old colts, one of which was very timid, and the other naturally stubborn. From the day I first put them in harness to the day that I sold them, thoroughly trained and fit for a strong-wristed lady to drive, a whip was never drawn across their backs.

C. E. W.

Swine Breeders' Maxims.

The Illinois Swine Breeders' Association, at a recent discussion, adopted in substance the following propositions, as condensed in the columns of the *Prairie Farmer*:

1. The lower the price of pork the greater the need for raising those breeds from which the product can be most cheaply made. Depreciation in prices should be met by greater effort to improve the stock.

2. To avoid possible deterioration it is best to preserve the distinct breeds pure.

3. Before farrowing, give sows such food as will incite the secretion of milk. After farrowing, feed lightly at first, increasing the quantity carefully up to full supply. Teach the pigs to eat as soon as possible.

4. After weaning, the pigs should have the best care. Milk, with oats and corn ground together, is excellent food in proper quantity. Plenty of exercise is indispensable to health.

5. Market at nine to fourteen months old for profit.

6. "It was thought not best to encourage the breeding of pure-bred animals for general pork making—that is, it is not necessary to confine it to any one pure breed to insure success, but that the mixing of pure breeds for this purpose has in the main given very satisfactory results."

7. Ground or cooked food will, per pound, make more pork than unground or uncooked; but it does not follow that, under all circumstances, it is most profitable to grind or cook it. This will depend on the price of grain, the expense of grinding and cooking, and the cost of feeding. Each farmer must decide the question for himself and by his own surroundings. It is better to shell and soak corn than to feed it in the ear.

8. Most diseases among animals are attributable to want of judgment and care in their management. The style of architecture, although to be regarded, is not the most important feature of a piggery. A pen, well covered with coarse, wild hay, and kept clean, where the pigs are regularly fed and watered, is all that is indispensable to success.

Treatment of Breeding Sows.

We copy the following from the *London Field* :—

The mode of management of pigs depends, of course, upon the stage at which they are, and the purposes for which they are kept; our greatest care being naturally demanded in the case of the farrowing sow. The sow should not be over-fed while in pig; great loss is often sustained through having great bulky, over-fed sows; the litter is rarely a successful one; the pigs are not strong, and it will be odd, indeed, if the heavy, lumbering animal does not overlie more than one of her young ones, in addition to herself running the risk of having sundry complaints, one of which may carry her off. Neither should the sow be kept lean, but in what is called good middling condition. A short time before she is expected to farrow, nourishing food should must be given her, to ensure her having a good supply of milk for her litter; but this will require to be done judiciously. It is scarcely necessary to say that the sow, while she goes with pig, should not be worried nor knocked about; exercise is quite a different thing, and should not be denied her. A very important point in the management of breeding sows is the condition of the bowels just before she is expected to farrow; these should be kept open by giving her food of a slightly laxative tendency, and she will be none the worse, but much the better, if she has a slight dose of sulphur, nitre, and ginger. A little trouble on this point will be well repaid. We have known many a sow sacrificed from want of attention to her bowels at or before the period of her farrowing. After she has farrowed, if she shows symptoms of uneasiness, or any indications of inflammation about her teats, a dose of the above medicine will give her ease.

We have seen this simple medicine administered with great success even in what might be called critical cases. After the sow has farrowed, attention will have to be paid to her feeding. Strong food should not be given; light mashes, chiefly of milk and meal, will be the best for her, and they should be given milk warm. But as milk has a binding tendency, care should be taken to see that her bowels are in good condition. Comparatively little food will be required by the sow for the first seven or eight days, and this, as just said, should be of a light character. Many valuable sows are lost through want of attention to feeding after the sow has farrowed. Her ordinary food, when it is returned to, should be given moderately at first, gradually increasing the quantity. The straw supplied to the sow for bedding when she is farrowing, and after the litter is out, should not be long, as the young pigs are apt to get under the straw, and get smothered or overlaid by the sow. Chaff is recommended by some, but we prefer straw cut by the straw-cutter into three-quarter inch lengths. The young pigs are apt to eat the

chaff, and this again to act prejudicially on their health. We had an instance lately of the caution necessary to be taken in all details. Our man used a quantity of flax or hemp refuse. Of more than one fine litter of pigs several died through severe constipation, brought on without any apparent cause, till it occurred to us that it might arise from the pigs eating their bedding. We had two or three opened, when the stuff was found in them quite concreted into hard lumps.

Salt and Ashes for Horses and Cows.

Some years since I was engaged in work that required the use of a great number of horses. I was always treating one or another for colic. My men said the horses had the bots, but I greatly doubted this alleged cause of the trouble. However, I used all the usual bott remedies, such as treacle and milk, and physic afterwards; but the evil still continued. One of our men always had his team in a useful state of health, and we all thought it proceeded more from the non-liability of his horses to the disorder than from any specific he used. He had, however, his remedy, which he had been constantly using, and this consisted simply in salt and ashes; a handful every few days was all that was necessary. When the treatment became known, I caused a triangular division to be made in each horse's manger, and this was kept supplied with rock or Liverpool salt mixed with ashes, about one-fourth ashes to three-fourths salt, and sometimes a little sulphur and rosin. I do not imagine any particular specific existed in the Liverpool salt; but I found it better, on account of its being more coarse in its crystals, and consequently less liable to dissolve with the horse's saliva. However, I have no doubt any salt is equally good in effect, but the mechanical action of the coarse salt is certainly best.

From that time all colic ceased, and I had no more trouble with it. The horses were worked very hard, and had very little time to feed, especially at noon, and from some cause I felt convinced that there was too much acidity in the stomach, and that the food consequently passed in an offending state into the bowels, and hence caused the disorder.

Where this ailment only occasionally attacks horses, I have found the use of salt and water, given from a black bottle, and carefully administered to avoid choking, very efficacious. In giving a drench, never pull out the tongue, as the horse may choke; hold up his head, and pour down about half a tumblerful at a time. One old team of mine were always subject to it in summer time when on a journey, rarely otherwise; and the disease always yielded to about half a pound of salt, and as much water as would make it palatable to drench, so as to avoid choking. Sometimes I found the use of the enema, or clyster of thin water gruel, thrown up in quantities of a pailful at a time, very useful. The dung passed freely, and no bad effect could arise from its use. I frequently used it in obstinate cases. Horses unused to travelling long journeys are very subject to

this disorder, though as long as they are kept on the farm at slow work, you would never observe any symptoms of it. The same remedy is excellent for hoven or blown cattle.

I had a most excellent cow, that would "blow" at any time whenever she ate too much clover or grass, especially when taken into the stomach wet, as well as when young and succulent; and this remedy was always at hand and always successful.

I generally followed the treatment with a pint of melted lard, a remedy that never hurts horned stock, and is often most excellent in its effects. Cows must never be bled if it is possible to avoid it. In former years cows were often bled by ignorant amateur farmers, but it is hardly ever necessary in ordinary cases; and to bleed a milking cow is to destroy her dairy properties for some time at least. Strong stimulants generally answer much better, especially after calving and in milk fever.

C. L.

Messrs. Birrell and Johnston, of Maple Hall, Pickering, Ontario, have sold their prize-winning bull calf "Bell Duke 2nd," to the Messrs. Jeffrey, of Whitby, Ont., for \$245. "Bell Duke 2nd" was got by "Bell Duke of Oxford" [830], out of "Mara" by "The Priest," [743.]

Col. Taylor, of London, has recently purchased from Messrs. Walcott & Campbell, New York Mills, the very high-bred bull 7th Earl of Oxford 9985, got by the 5th Duke of Geneva 7932 (now owned by E. G. Bedford), dam 10th Lady of Oxford by 10th Duke of Thorndale, &c., for \$2,000. His dam, 10th Lady of Oxford, was exported to Mr. Cheney, England, last fall, at a very high price; she is the purest bred Oxford now breeding.

CARE OF HORSES' LEGS.—The *North British Agriculturist* says:—"Few men who handle horses give proper attention to the feet and legs. Especially is this the case on farms. Much time is spent of a morning in rubbing, brushing, and smoothing the hair on the sides and hips, but at no time are the feet examined and properly cared for. Now, be it known that the feet of a horse require more care than the body. They need ten times as much, for in one respect they are almost the entire horse. All the grooming that can be done won't avail anything if the horse is forced to stand where his feet will be filthy. In this case the feet will become disordered, and then the legs will get badly out of fix; and with bad feet and bad legs, there is not much else of the horse for anything. Stable prisons generally are terribly severe on the feet and legs of horses; and unless these buildings can afford a dry room, where a horse can walk around, lie down, or roll over, they are not half so healthy and comfortable to the horse as the pasture, and should be avoided by all good hostlers in the country."

Fattening swine need a dry bed, entirely sheltered from cold winds. Their apartment should be well ventilated, sweet and clean, and if their food is slightly soured they will fatten faster upon it, and their flesh will be whiter and more delicate. In fattening sheep their food should be so prepared as to require as little labour from the animal as possible in eating it.

Veterinary Department.

Consequences of "Drenching" a Horse

About twenty years since my brother had a most excellent riding horse. He was certainly as near perfection in this respect as possible, but he had nevertheless a most decided dislike to harness. Whether he considered one great excellence enough for one horse, and hence declined to cultivate other virtues, I do not know; but the fact certainly was that he disliked harness exceedingly. He would work in a light buggy, but when he came to a hill he would invariably stop, and, without any sign of vice, look around and petition—as much as the look of any horse could do—to be relieved from such degrading employment.

This horse had been ailing, and the farrier prescribed some physic, and sent a ball. I gave the ball, but it was rejected more than once by the horse, who spit it out, and consequently it became quite softened in the process of attempting to give it in that form. I determined to dissolve it, and drench the horse with the liquid. I did so, and followed the usual course of an ignoramus, and after putting the liquid contents into a bottle, I held up the horse's head, pulled out his tongue, and poured the contents of the bottle, as I thought, down the throat, but it turned out the greater portion went down the windpipe and into the lungs. The result was a tremendous fit of coughing, which lasted two hours, and threatened to kill the poor brute outright, and afterwards the symptoms settled into a dreadful chronic cough that prevented the animal moving faster than a slow walk. This debility and cough lasted for months, and at last I offered to give away the horse as incurable. Feed was dreadfully dear, and as the horse could not work, of course he cost more than he was worth. Winter passed, and summer came again; the horse mended but little. I, however, wanted change of air for one of my children, who had been ill, and as it was necessary to move her very slowly, I thought old "Toby" could possibly walk at a foot pace, on a good stone road; and draw a light buggy. I never thought him equal to more than eight miles a day, and in fact even this distance answered my purpose quite as well at that time. I intended simply to keep quietly moving a short distance each day, stopping where most comfortable or convenient quarters could be found.

The first day we did but poorly; the horse was "done out" at night, and the cough was much aggravated. The next day he did much better, and the third he had greatly improved in health. On the morning of the fourth day he was quite well, and never coughed afterwards. The cure was complete; change of air had done its work, and I afterwards drove the horse for three months before returning home.

Injuries and Diseases of the Gullet.

The œsophagus or gullet is a long membranous canal extending from the mouth to the stomach, and it is liable to become obstructed, producing choking. A common cause is a piece of apple, potato, or turnip, or a quantity of chopped hay or straw becoming lodged in the canal. When the obstruction is great, the symptoms produced are of a very alarming nature. There is a peculiar spasmodic action of the muscles of the neck and larynx, the breathing is increased, and a discharge of saliva flows from the mouth. If the horse attempts to drink, the liquid will pass down to the obstruction, and then regurgitate and pass out through the nostrils. If no relief can be given the symptoms increase, and the animal dies from asphyxia, or suffocation.

In cases of choking, if the symptoms are at all urgent, it is desirable to endeavour to dislodge the offending agent as quickly as possible, and in so doing great caution is required, as injury is sometimes done from the severe remedies resorted to by the inexperienced. By giving small quantities of oil, the patient, in his efforts to swallow, will often succeed in dislodging the obstruction. If these means fail, recourse must be had to the probang, which is a flexible instrument, that can be passed down the œsophagus. In introducing the probang, no undue force should be used, and when it comes in contact with the obstruction apply very gentle pressure. If roughly done, the walls of the gullet might be ruptured.

As a result of choking, a dilatation or pouch sometimes forms, and produces symptoms very similar to those above mentioned. The food in passing down becomes lodged in the dilatation, and may accumulate to such an extent as to completely close the passage, or the dilatation may continue to enlarge to an enormous extent.

Mr. Caser, Veterinary Surgeon, of Port Hope, has very kindly sent us a specimen of dilatation of the œsophagus. The pouch measured seven inches in length and fifteen inches in circumference, and was situated near to the commencement of the thoracic portion of the œsophagus. The whole of the gullet, from the pharynx to the dilatation, was increased in size, but the remainder of the thoracic portion presented a natural condition.

The animal from which this specimen was taken had shown occasional symptoms of choking for the past five or six years, and for the last two or three years could not be fed with hay or other dry food. In winter his food consisted of cut hay or straw mixed with bran or meal, and rendered soft with water, which could be easily swallowed; but if the horse attempted to swallow any dry hay, the feed became lodged and produced violent symptoms of choking for several days at a time. The same state was produced when the animal was put to pasture for the first three or four weeks. The symptoms continued to increase to such an extent that it was deemed advisable to destroy the sufferer, and the *post mortem* examination revealed the condition of the œsophagus as above mentioned.

The Dairy.

Dairymen's Association.

FIFTH ANNUAL MEETING.

The fifth annual meeting of the Canadian Dairymen's Association was held at Ingersoll on Wednesday and Thursday, Feb. 7th and 8th. The President, Mr. Jas. Noxor, having called the meeting to order, the usual committees were appointed.

The meeting then adjourned for noon.

The committee's report on the order of business was received and adopted.

PRESIDENT'S ADDRESS.

Owing to the large staff that had promised to address the meeting, the PRESIDENT did not think it necessary to bring a manuscript address. He congratulated the dairymen present on the success of the Association, and on the enlargement of their interests. There was a depression in the business during the last season. About the month of June dairies were crowded with cheese and there were no sales; yet this was only preparatory to a far brighter prospect. Notwithstanding this depression, the prices for first-class goods have been very remunerative since the summer months. It was said, when the factory system was first instituted, that the market for cheese would be glutted, but we find that it has not been so. With the history of the Canadian Dairymen's Association, most of you are well acquainted. While we claim that this organization has kept pace with the wants of dairymen, its financial state is also very good. He paid a tribute of praise to the able Secretary, Mr. R. A. Jones. We realized the sum of \$250 from sale of 500 copies of the report of Association to the late Government, in which we advertised for them for emigration purposes. The Cheese Fair last year was a great success. He concluded by saying that, while the Association has heretofore answered all the purposes of the dairy interest, its influence has now become so great that he thought it would promote the dairy interest throughout the country if it became incorporated, and thus assumed in the eyes of the Province a more legal aspect. He observed a vast improvement in the meeting. Men of prominent position and great experience and ability are now numbered amongst the members of the Association.

Unfortunately Prof. Buckland, owing to illness, is unable to attend.

It was proposed by Mr. E. V. BODWELL that the replies made to certain questions to the successful competitors at the cheese fair be read, instead of hearing the address of Prof. Buckland. These questions and replies were accordingly read by the Secretary, and listened to with marked attention.

TAINTED MILK.

The first question for discussion was: Tainted milk; and has there been any improvement in the condition of the milk delivered at the factories, as compared with the previous years, and what means should be used to secure further improvement?

Mr. JAMES HARRIS, of Ingersoll, opened the discussion upon this question. He thought that the question of tainted milk was a most excellent one. Pure milk was the basis of the whole manufacture of cheese. There were many causes for taint in milk, in

the hot months. He believed that after long driving, the milk would be tainted, also by bad milking; and by particles of mud falling from the udder. Much milk came to the factories unstrained; and this, when shut up close in cans and carried in the heat, becomes tainted. Another cause undoubtedly was bad water. This he illustrated by a fact that had come under his own observation, by which it was clearly shown that in those districts where pasture-land was high and rolling, and the water good, the cheese made was very superior; and in those lands where these conditions were not fulfilled the cheese was bad, and in the vats was found floating curd. The way in which milk is sent to the factories has a great influence upon the manufacture. Unfortunately it is hard to control the patrons and to force them to send good milk. Milk should have the animal heat taken out of it as soon as possible after it is taken from the cow. The subject of cleanliness has been thoroughly ventilated, and yet we cannot say too much of so important a thing. Want of cleanliness among a few patrons will destroy a whole batch of milk. There was great loss by sour milk, which would not make as much cheese as the same amount of sweet milk by at least ten per cent.

Mr. FARRINGTON, manufacturer, of Norwich, said that he could see improvements, at least judging by the attendance of the ladies to-day. In regard to the delivery of milk, he could not see any very marked improvement. Coolness of milk is undoubtedly the preventive of taint. We had no floating curds in the cool season, and yet doubtless we had as much filth. We must get our milk cool. We must not keep it at its normal temperature 98°. Let us get the milk down to 60°, or even 70°, and no perceptible change will take place in its composition. Nitrogenous matter, liquid and heat are the three important elements in milk. We cannot control the first two elements, but we may and must the third, that is heat.

J. M. RAYMER, of Markham, believed that the sun shining on milk often taints it. In his factory at first he had his vat in such a place that the sun shone upon it in the morning; and he had much bad milk. Patrons should be urged to keep their milk in the shade, when waiting for the waggon, and it should be if possible where the breeze may strike it.

Mr. THOS. BALLANTYNE, of Sebringville, heartily endorsed the words of the other speakers upon the question of heat affecting the milk. He could only reiterate expressions often made by him upon similar occasions, that uncleanness was the cause of floating curds, and consequently of bad cheese. He did not think that exposure to the sun affects the milk injuriously. The cheese with which he (Mr. Ballantyne) took the first prize at the London Cheese Fair, was not manufactured in any unusual way, but was the product of perfect cleanliness.

This question was then laid upon the table.

DETERIORATION OF CHEESE.

The second question was: "Deterioration of cheese. How long can early cheese be held with safety before losing flavour, and what does the experience of the year suggest as to early sales?"

Mr. JOHN CRAIG, of Woodstock, said that all experience shows that May, June and July cheeses soon deteriorate. All his letters from England read: "Don't send me rank cheese. The English taste requires a mellow-flavoured article." There was much loss in keeping cheese. He favoured

selling the June, July and August cheeses as soon as they are fit for market. The English cheese does not come into the market with the American until late in the season. Our early-made cheese going to the market before the English cheese has come in, has this year created a demand for American cheese, and the taste of the English is gradually turning to our cheese.

Mr. E. CASSWELL, Ingersoll, has, in all his letters from England, heard that our cheese had been over-kept. Our climate is very different to that of England, and there are few cheeses that will keep in Canada without going off their flavour. He thought that these cheeses should be shipped from 20 to 30 days old.

Mr. FARRINGTON thought that there were points on this subject that previous speakers had not touched. They had told us that the English want a mild cheese, but how were we to keep our cheese on the flavour? Although the fact remains that our cheeses do not keep in flavour over many months, yet he would not admit it as an unavoidable evil. Messrs. Anderson & Co., a London house, in a circular prepared for the American Dairy-men's Convention, stated that nearly all the cheese arriving in England was off flavour; and what was this the effect of? Why, too much moisture in the curds. Get out the water from the cheese and it will keep. The May cheese should go off to market. Our June cheese we make in the largest quantity; it comes into market when it is bad to keep. Buyers won't touch it except at low prices. Let us make our June cheese so that it will keep over, and we can make the profit on it ourselves, instead of throwing the profit into the hands of the dealers.

Mr. CASSWELL spoke highly of Mr. Farrington's factory; if everyone made cheese to keep as Mr. Farrington does we should not have so much going off in flavour.

Mr. WM. NORTHWAITE took exception to the statement that Mr. Farrington was the only man who could make good cheese to keep.

Mr. BALLANTYNE also advocated rapid and early sales of cheese.

BUTTER-MAKING IN CONNECTION WITH CHEESE.

The third question then came: "Butter in connection with cheese-making. Can the two be manufactured together with profit, and to what extent, if any, can the cream be taken from the milk without injury to the quality of the cheese?"

Mr. FARRINGTON, jr., from New York State, advocated the removal from the milk of a portion of the cream. At the factory where he skimmed it it took to make 1 lb. of cheese 10 27-100th of milk; while at that where he used whole milk, it took 10 17-100. In the State of New York they have now a system of creameries where they make part skimmed-milk cheese and part butter. No doubt much of the cream ordinarily used goes over into the whey vat. He believed that it would be profitable to take off the cream that rises overnight and make it into butter. He believed that the rennet not only acts upon the milk in the vat, but all through the process of cheese curing.

Mr. FARRINGTON, sen., thought that about October there was always found too much cream to work down the cheese. On being asked whether the cream should be taken off at the factory or at the patrons' houses, he replied that he thought that the factory was best, as there they would take off just enough.

Mr. B. HOPKINS, Derham, thought that it was a dangerous subject, and the difficulty would arise as to how far we should proceed

in this matter. He thought that the great difficulty was to keep the patrons straight. He dwelt upon the importance of delivering the milk twice a day, and thought that the entry of the thin end of the wedge in skimming might lead to very bad results.

Mr. S. H. LOSEE saw some difficulty in a superabundance of cream late in the fall; but believed that extra heat would make it all right. He tried the experiment of allowing the patrons to skim their milk, but found that he had more difficulty in making cheese that week than in all the rest of the year.

W. S. YATES, Belleville, and W. WILKINSON, Ingersoll, also spoke.

The question was laid upon the table, and the Convention adjourned until 7 o'clock in the evening.

EVENING SESSION.

The committee on orders presented their report, which was adopted. The report of the committee on nomination of officers was received and adopted.

OFFICERS.

The officers are as follows:—President: Mr. Thomas Ballantine, of Downie; Secretary: Mr. J. H. Bell, of Ingersoll; Treasurer: Mr. C. E. Chadwick, of Ingersoll; Vice-Presidents: Messrs. J. W. Scott, Lobo; Robert Webber, West Zorra; W. S. Yates, Belleville; H. S. Losce, Norwich; J. Long, Muskoka; O. S. Phillips, Newmarket; E. V. Bodwell, M.P., Mount Elgin; W. F. Clarke, Guelph; Wm. Pierce, Tyrconnell; Jas. Harris, Ingersoll; Luke Hagle, Arkona; Hon. O. Blake, Waterford; Dr. Cline, Belmont; Jos. Elliott, Peterboro; N. A. Willard, Little Falls, N.Y.; W. Fowler, Clinton; Jos. Hunt, Morpeth; L. B. Arnold, Ithaca, N.Y.; J. P. Dunn, North Dorchester; John Adams, Nissouri. Executive Committee; Jas. Nixon, C. E. Chadwick, H. Farrington, Geo. Hamilton, H. B. Hopkins, E. Caswell, and R. A. Jans.

INCORPORATION OF THE ASSOCIATION.

Mr. THOS. BALLANTYNE spoke of the necessity of having the Association incorporated. He then moved that the Executive Committee take the necessary steps to secure the incorporation of the Association. Being seconded by Mr. C. E. CHADWICK, in an able speech, in which he urged the adoption and execution of the motion, it was unanimously carried.

The PRESIDENT then introduced Mr. X. A. Willard, who proceeded to deliver a lengthy and able address upon the milk, cheese, and butter interests of the United States, conveying much valuable information to the Association.

MR. X. A. WILLARD'S ADDRESS.

The annual milk interest of the United States may be expressed by the following formula:—
1,800 quarts of milk, at 2½ cents per quart = \$42, multiplied by 10,000,000 cows = \$420,000,000.

The 1,800 quarts represent the average annual yield of a cow during the year. If we put the milking season at 300 days, the average yield would be at the rate of 6 quarts per day.

The 1,800 quarts would make about 360 pounds of cheese, or say 150 pounds of butter. We have statistics showing pretty nearly the value of the milk crop of the United States, in items as follows.

Milk consumed as food at 2½ cents per quart.....	213,000,000
Condensed milk	1,000,000
Butter product.....	175,000,000
Cheese product	29,000,000
Value of whey and sour milk from cheese and butter manufacture, converted into pork and calves	10,000,000
Total.....	\$428,000,000

A value very nearly that expressed in our formula.

Commissioner Wells, in his report on the commerce and industry of the United States in 1869, estimates the annual value of the products of the dairy, after deducting the value of products consumed on the farm, at \$400,000,000. He believes that his estimates fall considerably within the mark, and in proof of this assumption he instances the dietary of factory boarding houses, in which the operatives were in a large part French Canadians, notoriously frugal and simple in their habits, and in which they were furnished to their own satisfaction, showing an average consumption of butter amounting to about \$16.51 per year. An average consumption for the entire population taken at one-half this sum, or \$8.25 per head, would result in the expenditure on this account of \$321,100,000.

A consumption of milk to the value of one cent per day for each person, would give an additional sum of \$143,350,000, making a total of these two items of \$464,000,000. Any one who is acquainted with the manner in which milk, and more especially butter, are consumed in the families of American working men, as well as in the houses of the wealthy and well-to-do classes, will acknowledge that these estimates are low. Their enormous values in the aggregate are to be disposed of annually, and it is a matter of interest to dairymen to know where they are placed.

Nearly the whole bulk of our dairy produce is consumed at home; for if we refer to official statistics, we find that about 60,000,000 pounds of cheese, and about 7,000,000 pounds of low grade butter, much of it known under the name of *grease*, go abroad. The value of our entire surplus in dairy products may be put at the following figures:

60,000,000 lbs. of cheese, at 12c. per lb.....	\$7,200,000
7,000,000 lbs. of butter, at 25c. per lb.....	1,750,000
Condensed milk.....	500,000
Total	\$9,450,000

An additional expenditure of 23 cents per year for each person, or two cents per

month, in any form of dairy product, would wipe out our surplus, and leave nothing to go abroad. Our cheese product the past year has been sold exceedingly low, and the best informed commercial men tell us that it is likely to be low in price for a series of years.

It is a matter, then, of some account, to devise means by which the dairyman may relieve himself from the very serious trouble which threatens him. It is believed by many that the cheese product of the United States at the present time is no more than is annually needed for home consumption, provided such consumption be distributed properly over the year.

It is estimated that we have 30,000,000 of people who would consume cheese were it of unexceptional quality and conveniently supplied. Say that each consumed 8 pounds a year, at a cost of 15 cents per pound, or \$1 20, and our whole product would be consumed. At this rate, one cheese of 64 pounds weight, would supply a family of eight persons for the year. Eight pounds a year would be at the rate of about 2½ ounces a week—a small item surely, considering that some men not unfrequently make away with a half pound or more at a single meal. I am more and more convinced that it is upon home markets that we must rely in obtaining a fair compensation for our products.

There are hundreds of villages in the States in which it is impossible to get a pound of good cheese from one end of the year to the other. We need to introduce among us the English system, under which every village has its cheese store, where customers can be supplied with variety of style and quality, both small and large cheeses. People cannot be expected to buy cheese unless it can be conveniently had, and in such form and quality as will suit special wants and tastes. The American system of dependence upon a foreign market, and the forcing forward of immense stocks in hot weather, is a vicious one, and must always prove more or less disastrous.

Let us reason upon this matter without any absurd theories or speculations. I shall appeal only to your common sense for a practical solution of the question. I affirm that the factory system of curing cheese and marketing it in hot weather, is a shameful waste of the hard earnings of dairymen.

What are the facts? The greater bulk of the factories in the United States and in Canada have no conveniences for curing cheese properly, and have no provision for accumulating stock.

The cheese curing process is one requiring skill and attention to details, second only to the manipulation of the milk. The fundamental principles in this department are almost entirely ignored by the cheese-makers on this continent. From the time that the cheese goes from the press to the market, it is left to take its chances with the weather, and its quality when produced from good milk varies precisely as the weather happens

to approximate to a certain uniform temperature. We now know that the whole art of cheese-making consists in the proper development of a peculiar species of fungi, and that the trouble in cheese-making also arises from another class of fungi more or less vicious in character, which gets possession of the milk and curds, or the cheese upon the shelf, over-mastering the first named organisms, which are the cheese-maker's real friends. The action of the one class of fungi is altogether harmful, and according as they have been allowed to develop and take possession of the cheese, so is the product inferior, poor, bad, or worthless.

Now, the useful class of fungi must have a temperature favourable to their growth. The cheese-maker's art is to mould them to his will, to induce them to perform a specific office—to attack the caseine or nitrogenous elements of the cheese, and to break it down to a mellow, plastic state, without doing injury to the flavour—in fine, to prepare it in the best form both as to healthfulness and taste, for the human stomach. This, under certain conditions, it will perform with mathematical precision and with certainty.

You know how plants and animals are moulded to do the bidding of human intelligence—how Bakewell produced his sheep—how Colling, and Bates, and Booth, have made their Shorthorns—how the pomologist has changed the sour and bitter crab into the large and luscious apple—you see how even inanimate nature has been made to do our bidding—how water in the steam engine has become the great propelling power of the world—how lightning chained to the telegraph has been made to talk. God has given us unbounded power over animate and inanimate nature, providing we employ the immutable laws by which they are governed. So this minute microscopic fungus, under the hands of human intelligence, will perform our bidding in the cheese vat and upon the shelves, if we but understand and apply the law which the all-wise Creator has laid down for the government of its being.

Now, to obtain the best results, the growth and development of these fungi (or, in other words, the fermentation of the cheese), must be uniform and continuous. You cannot induce excessive activity one day, followed by a cessation or checking of the process the next day, and so on, and obtain a high standard product. Cheese made from good milk, and with only ordinary skill in manufacture, when placed upon the shelf in a well ventilated cheese-curing house, and kept in a uniform temperature of 70°, will almost invariably cure down fine in flavour and in quality.

The action of these fungi (call it fermentation if you choose), is peculiar, and is not fully understood. Certain it is, however, that they have the power of converting the caseine into fat, or a substance similar to fat, and hence, by attention in curing, a cheese made from milk partially skimmed

may have as mellow and meaty an appearance and taste as whole milk cheese cured in variable temperatures. This is a fact abundantly proved by science, and it has been fully demonstrated by the analyses of Voelcker.

This peculiarity in the manufacture and curing of cheese was brought before my notice in 1866, during my examination of English dairies. Mr. Harding, the distinguished exponent of Cheddar cheese-making in England, always insisted that the goodness and delicate flavour of the cheese depended more upon the temperature and manner of curing than upon any extra manipulation in making. He affirmed that by keeping the temperature of his curing room at 70°, without variation, he could remove a considerable portion of cream from the milk, and yet be able to make a cheese that would sell in the London market for the highest price. It was his usual custom to take the cream from the night's milk, and I have never seen nor tasted cheese more perfect in flavour, or with more of the characteristics of what we term "fine cheese" than that which I ate at his table. His curing room is surrounded with a nest of iron pipes, which are supplied with hot water from the boiler below whenever the temperature of the room falls below 70°. In the low even temperature of England, his curing room, built in with heavy walls of hollow brick, and with ample provision for ventilation, seldom varied in temperature from 70°.

I have experimented sufficiently in my own dairy to know that with good milk, and with a good curing room kept at 70°, there is no necessity for bad flavour, and that cheese can be kept from one year's end to the other, and yet retain that mild, rich, nutty taste which the English so justly characterize as the best manufacture.

I feel earnest about this matter of curing cheese, because I am convinced that its neglect is the great fault of American factories. The complaint is quite common that American cheese *will not keep*. The secret of long keeping cheese is not so much in its manufacture as in the milk from which it is made and its curing.

Our dairymen complain that prices are low, and are seeking a remedy. The remedy lies in better milk and in larger and better curing houses.

In New York there is not a single factory within my knowledge that can hold cheese over in hot weather and retain its flavour. Even under our system of weekly sales, immense quantities of July and August cheeses are over-heated and tainted in flavour when they leave the factory. In New York there is not one factory in a hundred that can hold more than six or eight weeks' make of cheese. You hear of immense shipments of cheese in hot weather, and at low prices. Well, the factories are forced to sell. They say: "We dare not keep it, for it is beginning to turn in flavour; besides, our rooms are full, and it must be sold."

Now, is it any wonder that dealers buy low, and that dairymen are placed at disadvantage? Why, my friends, you and I, and every one else, will buy as cheaply as we can. Has it not become a proverb that "you cannot realize full value upon forced sales?" This is the condition of the Ameri-

can cheese market during a large portion of the year, and England knows it. But the dealers, after purchasing, are anxious to get rid of the goods, especially in hot weather. They have an article upon their hands which they know is constantly depreciating, and is liable to be lost altogether, and so they shift the responsibility as soon as may be, making what margin they can. It is just so in England. It is known that much of our cheese will not keep, and shippers are on nettles until they clear their warehouses of stock as fast as it comes in.

It is this over-anxiety, this hot haste to have our product change hands for fear of loss, that brings prices down. You will observe that English Cheddar holds its own at 76s. to 86s. the cwt., year after year, and why? Because it can be kept a long time without depreciating.

HOW TO IMPROVE CURING ROOMS.

But you will ask—In what way can curing rooms be improved, and in what way can buildings already erected be utilized?

In the first place, wherever possible, I would have a cellar under the dry house. I would have it six or eight inches below the surface, the walls rising above the ground two or three feet, or of a height sufficient to give an abundance of sunlight throughout the whole basement. I would have this room ten or twelve feet high in the clear, and the bottom should be thoroughly underdrained. Then the floor should be grouted and covered with cement or flagging, so that no leakage or accumulation of slops is possible. Ventilators with wickets should be arranged, leading to the rooms above or to the roof. Such a basement would add very much to the capacity of a dry-house, and by attention to drainage and ventilation, may be kept at a low temperature during hot weather. It may be provided with hot water for heating if necessary, the pipes connecting with the boiler so arranged that heat may be supplied at any time with little expense. Here I would place at least a part of the cheese made in hot weather, and all such cheese as could not be readily marketed at a good price.

Supposing every factory had a cool place for storing but 200 cheeses in hot weather, the quantity in the aggregate would be very considerable.

There are over a 1,000 factories in the State of New York alone—say that there are 1,500 in all—that can store 300 cheese each above present capacity, the gross amount would be 27,000,000 pounds. This amount kept from the markets in hot weather, safely kept without fear of deterioration, but retaining flavour and growing better in quality, would so relieve the trade that good prices would probably result on those shipped.

I would not advise the keeping of cheese at any time when fair prices can be obtained.

Then I would adopt the Crosier plan of leading the cold air from the ice-house. In this plan two conductors go down from the upper part of the ice-house. They are made of boards 8 inches wide and an inch thick, with holes bored in them. These holes allow the cold air to enter from the ice, and it pours in a stream from the mouths of the tubes into the room. The temperature of the air as it comes from these tubes is about 35°; with thick walls and high windows he is able to lower the mercury to 62°, and even lower in the hottest weather of July. Sometimes he closes one tube, the draft is strongest in the hottest weather. By this arrangement and the hot water pipes, the desired temperature may be secured throughout the season.

I do not pretend to give the best plan for securing a uniform temperature. I give that which is comparatively inexpensive and which has been found to be practical, to show you that such an arrangement is within the reach of every factory, and that this matter of controlling the temperature is not so difficult as dairymen have been led to imagine. By this simple arrangement, probably the room immediately over the basement (if the outer walls are properly constructed), could also be made cool enough in hot weather.

I would have every factory have store room sufficient to hold all the hot weather cheese, so that at no time to be forced to sell for want of room.

Now, I have tried to show you some of the advantages that would result from the proper curing of cheese, and from having enough store room to hold a certain amount of hot weather cheese during hot weather.

Let me illustrate how this course would likely affect the markets. In the first place, the quality and flavour of the cheese would be improved. In the second place, by withholding a portion of your stocks, and by not crowding the market at a time when it is a fearful risk for dealers to handle large quantities, you will be able to maintain a decent price for what you do sell. This natural consequence is a law of trade.

GOOD MILK.

I have said that our great fault in American cheese making to-day is in the curing of the cheese. I have said that with proper attention to curing, and with only ordinary skill in manipulating good milk, a first-class product can be made. I wish to call attention to that part of the affirmation expressed in two words—good milk.

We have a great deal of talk in New York about fancy cheese and high skill in cheese making. Some factories have a great name in this respect. When an experienced cheese maker, who is attentive to his business, "gets off the track," his trouble generally arises from imperfect milk, unsuspected at the time of its delivery. I do not mean imperfect milk resulting from want of cleanliness in dairy utensils and the general care of milk after it is drawn from the cow; that matter has been discussed from time to time at our dairy conventions, and farmers ought to be pretty well informed upon the evil effects of such filthy practices. Dairymen, it is true, are not generally up to the mark in this respect, for there are vast quantities of cheese every year injured by these means. But you will understand that among the gut-edged factories this matter of cleanliness is becoming more and more rigidly enforced among patrons.

Outside this, perhaps the most prolific cause of bad milk results from the cows drinking the water of stagnant pools, tramping through swales of mud which are alive with filthy organisms of decomposing vegetable and animal matter.

I need only refer you to a few facts by which milk may be spoiled, while the dairyman suspects nothing wrong.

INHALING BAD ODOURS.

Experience and scientific investigation have established the fact that milk taints in the cow's bag simply on account of the cow inhaling bad odours while at pasture. This taint may not be perceptible the moment it is drawn any more than the physician can detect small-pox in a person recently exposed to that disease, but the seeds or germs of putrefaction may be there, and in the case of the milk begin to show themselves and to give trouble to the cheese maker before even his cards are ready for the press, or if he

succeeds in getting the curds into press without difficulty, the cheese not unfrequently shows an early taint, decays quickly, and turns out bad.

MILK TAINTED BY DUST AND BY BAD WATER.

I have seen numerous cases in which the milk has received a taint from particles of dust falling from the cows into the pail while milking. (The speaker here referred to two notable instances of this cause of bad milk that had come under his personal observation.)

I alluded in my report upon English dairies, made before the American Dairymen's Convention in 1866, to the character of English milk as cleaner than ours, and I attributed the fine flavoured cheese of England in great measure to this one cause.

Nothing struck me with more force than the care taken by the Cheddar dairymen of Somersetshire to get good cheese. The pastures are well drained and provided with an abundance of good, clear running water; there are no filthy pools or mud holes; the milking sheds are open on one side, and paved with stone and cement. There is sufficient incline back of the cows to carry off all filth, and after milking all droppings are removed, and the floors and gutters flushed with water, so that everything is clean and sweet for the next milking.

I am convinced that unless the dairymen of America commence at once to pay attention to cleanliness in pastures, not only in regard to slough holes, but the eradication of weeds, providing stock with an abundance of fresh clean water, together with attention to curing cheese, European manufacturers will soon outstrip us in the race for making fine goods.

The factory system is now being established in Europe; all our inventions and appliances are eagerly sought after, and every good thing discovered by us is adopted in England, Sweden, Germany, Russia, Holland, and Switzerland.

Now, understanding the cause and its effects, we can apply the remedy. I have no doubt that the terrible disease known under the name of "milk sickness", so prevalent in Indiana and other parts of the West during the hot weather, will be traced to certain species of fungi in the milk derived from bad water or from some vegetable decomposition. These enter the circulation of the animal and poison the milk, and it is not the result of any poisonous plant that the cows eat.

Mr. Willard then went on to urge the necessity of impressing the patrons with the importance of following these rules of cleanliness, of keeping a daily record of the condition of all milk delivered, of imposing a fine and lowering the per centage of profit, to a person who persisted in delivering milk from over-heated cows, or from cows kept upon pastures subject to the abuses already mentioned. The longer this decided course is delayed, the more money is thrown away in wanton, useless waste. He then proceeded to show the electrical influences of a thunder storm upon milk, recounting some of the experiments on electricity by one of the earliest experimenters, Andrew Cross, a native of Somersetshire. After describing many of the results of Mr Cross's researches, he went on to say:

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 made aware of the fact by

its depressing influences. At such times it is important to take more than ordinary care in the handling of milk—that it be kept out of harmful odours—that attention be directed to its aeration, and such treatment be given it as shall be inimical to the growth or development of fungi.

And again, the fact that milk may be kept sweet a long time in hot water by electrical action, will offer a very important suggestion to inventors in the preservation of milk, and perhaps in the improvement of cheese at factories.

I have dwelt upon this matter of milk and the curing of cheese because they are the living vital questions of the day. Dairymen everywhere upon this continent have reason to be alarmed at the introduction of the system into England, with its cheap labour and immense fields of good dairy lands, for the day may come when their goods may be placed in competition with ours in our own market.

After passing a glowing eulogium upon those already engaged in the work of the factory system in America, Mr. Willard traced the chief reason of so much failure in the production of a first-class article to the dead weight of farmers who will not think, farmers who will not act, who hang back and settle themselves down in the old rut, farmers who do not believe in progress, who do not attend these conventions, who whine at low prices, who dump their rotten milk at the factory doors, and grumble because it is not made into gilt-edged cheese.

It is this dead weight—this living corpse—that is this day paralysing our efforts for progress and improvement. I see these men everywhere in my travels, they have rhinoceros hides, they are wrapped up in their own conceit and will not believe, they have no eyes to see, and their ears are too long to hear. Oh! my friends, it is this class which the progressive dairymen of the age are obliged to lift and carry along by main strength. If we could only reach these men—if we could only induce farmers to improve—to make that progress which the age and the cheese-making art now demands—our progress would be almost boundless, and the prosperity of the dairy interest would be beyond peradventure.

The speaker instanced the market price obtained for his butter by Col. George E. Waring, as detailed in the "Ogden Farm Papers" in the *American Agriculturist*, as a convincing proof that a good article must and ever will command a high price.

The imports of dairy produce into Great Britain for 11 months ending Nov. 30, 1871, by official returns, amounted to nearly \$48,000,000. On the 1st of January, 1872, Normandy butter sold in London at wholesale for 160s. sterling per cwt., while Canadian only fetched from 70s. to 116s., a difference of over a shilling per pound in gold.

Mr. Willard then gave a sketch of the milk condensing system, showing the profits resulting from this business to be as high as an average of a dollar per day upon each cow.

He had been informed that the condensing factories of Massachusetts and New York had recently received an order from China for 11,000,000 pounds of condensed milk.

VOTE OF THANKS.

Mr. BODWELL, in moving a vote of thanks for the able address just read by Mr. A. Willard, spoke of the amount of intelligence within the last four years which had prevailed among our dairymen; and said that a very great part of our advancement was due to the meetings of this Association; and this

increased intelligence, he claimed, had been aided in a great degree by the views which have been from time to time enunciated by the gentlemen who had so ably addressed them to-night. He asked the meeting to look particularly to that one suggestion thrown out about the keeping of our store-houses at an equable temperature. He showed the immense profits arising from every small item of improvement in the manufacture of cheese. He said that he felt sincere sympathy with those who have been so foolish as not to be present here to-night.

This motion was seconded by Mr. O. E. CHADWICK, in a concise and practical speech, in which he traced the rapid development of our dairy interests, and considered such to be in no small degree due to the influence of this association.

The motion was passed, and the chairman presented a unanimous vote of thanks to Mr. X. A. Willard.

THURSDAY MORNING SESSION.

Mr. L. B. ARNOLD, of Ithica, New York, delivered an address on

POISONOUS CHEESE,

of which the following is a synopsis.

With the great expansion of the cheese interest in the United States and Canada, there has been a corresponding improvement in the quality produced, but there have sprung up also some things not so desirable, amongst which is the occasional development of Poisonous Cheese—of which I am invited to speak to-day.

The first case of poison-cheese I can recollect which attracted the attention of the public, or the notice of the press, occurred some fifteen or sixteen years ago. It appeared first in Philadelphia and afterwards in New York city, and I believe in some other places. The symptoms produced were very distressing, and indicated mineral poison, which it finally proved to be. It was easily distinguished from cheese not poisoned by its containing black spots, which were traced to the white lead with which the cheese tubs and milk pails of the dairy were painted. This painting rubbed off into the milk or whey and mingled with the curd, and by the agency of the lactic acid developed in the curing of the cheese was converted into lactate of lead. The cause becoming known, it was at once removed by painting dairy utensils with zinc instead of lead. Since that time cases of poisoned cheese have occasionally made much excitement in the public mind. Lately, since the introduction of the factory system, they have become more frequent. That they should now and then occur is not strange—cheese in its best state is poisonous to some people. Persons to whom cheese is so distasteful and poisonous that they cannot eat it at all are often met with.—Mr. Arnold went on to describe many cases of poison by cheese—it showed that the cheese may be poisonous while the milk and curds are perfectly sweet; the curd was agreeable and harmless, but the moment it became cheese it was distasteful and poisonous. It was, then, not in the milk, nor in the rennet—it was evidently due to the cheese fermentation in connection with a constitutional peculiarity of the individual. But the cases of poison-cheese that are happening now a-days occur to people who have been in the habit of eating cheese without any bad effect. Cases like this are not peculiar to the present day, they have occurred at intervals for the last 50 years or more—both in this country and in Europe; but they seem to have been of more common occurrence lately; they are all alike in having no connection with any

mineral poison. The most rigid analyses have failed to find in them any trace of mineral poison—the characteristics of these cheeses are all similar and uniform, no matter how widely scattered. It appears ripener and richer than usual for its age, has a salty and fatty appearance, and a strong flavour that is rather acid. The symptoms of attack are equally unanimous,—pain in the stomach, nausea and vomiting in moderate cases, extreme distress and cramping in severe ones, followed by diarrhoea; death rarely.

Symptoms generally appear within three hours, and are usually very intense.

It is peculiar that though the poison is so very virulent to some stomachs, others will eat of the same cheese without any deleterious effects. Cases of cheese poisoning are becoming quite common, much more so than is generally supposed. Interested parties have preferred to hush them up rather than publish them, for fear of effect on consumption and price of cheese. He then referred to several cases well authenticated. Dr. Voelcker has analysed several of these poison-cheeses, and has arrived at no better result than have the American analytical chemists. Every one present, it may be presumed, has a general idea of the nature of fermentation; but I may remark in passing that the changes it occasions are always accompanied with the growth and development of myriads of living microscopic fungus plants, and that their growth and multiplication are regarded as the cause of the changes produced, and that these microscopic plants, or rather the germs or spores from which they originate, take the general name of ferment; so that when the terms ferment and fermentation are used you will refer them back in your mind's eye to the germs as the moving cause. He then showed the susceptibility of these fungi to various changes of temperature or to the different composition of substances in which they may grow. It is the same kind of fungus under different circumstances that raises our bread, makes alcohol, beer, vinegar, wine and cheese. This fact has some significance in looking for the cause of poison-cheese. If the same germs by a change of circumstances can be made to produce wholesome cheese in one case and alcohol in another, it will require no great stretch of the imagination to suppose that they might be so varied as to produce some other poison, and it is possible at least that the poison in cheese may be thus originated. The variations in cheese from temperature alone are very great. I must now turn to the examination of milk as the more probable cause of contamination, and from the crucible of the chemist I appeal to the microscope to aid in the investigation. The speaker then showed and explained several illustrations showing how milk appears both in its natural and diseased states. Milk always contains more or less organic germs that act as ferments. He then showed by illustrations those peculiar to healthy milk and those peculiar to unhealthy milk—explaining them as he proceeded. He said that he had shown these magnified views of a drop of milk because they confirmed his own observations in regard to the cohesion of the cream globules of tainted milk, and secondly because they showed the termination of disease in milk, the incipient stages of which are very common, and thirdly because they corroborated what he had before believed to be true: viz, that the germs of fungus plants, which in their growth become ferments, may be and often are taken into a cow's stomach in her food or drink, or even in her breath, and pass into her blood and thence into her milk, where they

grow and multiply and inoculate with disease if they are of a malleous character. There can hardly be a doubt that the germs of the plants shown were derived from the distillery. He spoke of being satisfied of the transfer of ferments from the water of pools, mud holes and swamps into the milk of cows drinking such water—having noticed that when cows drank from such places the peculiar smell of the water reappeared in the curd and whey in the advanced stages of the curdling process; it did not often appear in the milk when it first came to the factory, but when it came to be warmed up, and especially when it approached blood heat, the exact odour of the stagnant water increased with great rapidity. He went on to show the development of these spores in blood, and how the full-grown fungus plants developed themselves. The results which have appeared from the facts illustrated have a direct bearing in relation to poison-cheese. That cheese is made poison by unusual fermentation hardly admits of a doubt. You have seen how the seeds of fungus plants, which act as ferments, reach the milk and infect it. You have seen that cows drinking or eating food that contains spores carry them into the milk, and how quickly they spring into vigorous growth and change the characteristics of the milk. He went on to show how the cows drinking or eating from swamps or stagnant ponds, which always abound in the seeds of miasma, are sure to produce new or modified fermentation in the milk or resulting cheese. There is little difference in a person drinking from the pool itself and drinking the milk of the cow who has been to the pool. He went on to say that instead of destroying them in the milk on its way to the factory we take the most effectual means to cultivate them. We cover our milk can tightly to protect our enemies from the air, and nourish a serpent in our bosoms. If we would all follow the example that Nature has set us, and expose our milk to the air instead of shutting it away unexposed, it would be improved for the purposes of cheese-making by an hour's ride to the factory, and such a thing as tainted milk or poison cheese could hardly exist.

Several questions were asked of Mr. Arnold during the delivery of his address.

When asked whether cows should be fed on high or low ground, he said undoubtedly upon high ground at all times.

To the question as to how long the poison might be supposed to act upon the milk, he said that in all probability it would affect the milk for at least two milkings.

How is it that where there are in July sometime 10 cheeses made in the same vat, one or two will stink while the others are good? He answered, Perhaps they are spoiled by salt.

Mr. Arnold's address was listened to with marked attention.

Mr. CHADWICK spoke in high terms of Mr. Arnold—of the pleasure with which he listened to the eloquent and elaborate disquisition of the lecturer, and of the fraternal feelings which the lecturer had stated to exist between the dairymen of the United States and of Canada. He hoped that the minds of the audience would be filled by those fungi of which Mr. Arnold had spoken. In a healthy manner, in doing thought and observation upon these diseases of milk; and moved a vote of thanks to the able lecturer, Mr. Arnold, of Ithica, N. Y.

The motion, seconded by Mr. Geo. Hamilton, was put to the meeting, which passed a unanimous vote of thanks.

FOOD OF DAIRY STOCK.

Fourth question—To what extent has soiling been practised, and the best system of winter feeding?

Mr. FARRINGTON read a prepared paper upon this subject, in which he remarked that the first thing to be looked to in successful cheese-making is the provision supplied to the cow to make up into milk. In very dry weather we must look for some outside kind of food. Amongst the crops for soiling none equals that of green corn. It is broad in the leaf; absorbs its food largely from the atmosphere; admits of stirring of the soil; can be sown very early; will grow where grass will not. If we cut this corn at the time when it is about to set its ear we cut it with all its juices. Probably from 1½ to 2½ bushels per acre is about the right quantity sown from 18th May to 25th June at intervals of about ten days. Kind of corn not very important. Probably not best to sow large Western on strong land or small on weak land. Cut when blossom first appears; stow it away in large stocks.

A member suggested the plan he adopted last season, sowing corn and roots in alternate drills.

Mr. BALLANTYNE said that in his section they suffered much from want of soiling, owing to frosts. Last year their corn was almost entirely destroyed by frosts, and the patrons in his part suffered fearfully. We can hardly over-estimate the importance of this crop coming in just when the pastures are apt to fail. It does best on sod, where it should be sown broadcast.

The meeting adjourned till 1 o'clock p. m.

AFTERNOON SESSION.

CHEESE FOR FOREIGN MARKETS.

Fifth question—Has the quality of our cheese during the past year met the requirements of the foreign market? If not, in what has it been deficient, and what steps are necessary to take to remedy these deficiencies?

Mr. CRAIG, Nerwich—Thought that Mr. Willard answered this question very fully last night when referring to the relative prices of Cheddar cheese and that made in Canada and the United States. His experience of cheese is extended over very many years, both here and in one of the largest cities in Great Britain. The May cheese shipped by him has, without a single exception, given great dissatisfaction in London, in Liverpool, and in Glasgow. A great deal of our early-made cheese is fodder-made cheese, and such cannot compete with grass-made cheese. Cheese sent by him after the month of May gave universal satisfaction; but it must be remembered that he (Mr. Craig) was careful to send nothing but most perfectly sweet cheese, which he, with care, selected for exportation. The curing of cheese is a most important matter, and it is not every improvised abattoir upon the farm that is capable of curing cheese. Cheese is a very sensitive subject, and easily susceptible of deleterious effect from extraneous objects. Strong, pungent cheese may be required for the taste of those who only use it as a delicacy; but the cheese for the working-classes, as an article of diet, must be of mild flavour. As soon as we can produce a good sweet, mild flavoured cheese, there will be no end to the English market for American cheese. It was not every man who could "holler" "Ha, Beer, and gee-jane," that could make a farmer. The discussions and lectures heard at this Convention will show the amount of science required upon only

one branch of Canadian agriculture. Canadian cheese-making is but in its infancy. By an improved education of our dairymen we shall produce an article that will sell readily in England.

Mr. E. CASWELL, of Ingersoll, another large buyer of cheese, was permitted, owing to his unavoidable absence when questions 1 and 2 were being discussed, to address the meeting on the subject of curing houses and early sales.

Mr. PHELAN thought that it would be a good plan for the Association to engage some first-class person who should go round and instruct the factorymen, and deliver lectures to them on the manufacture of cheese.

Mr. ARNOLD, of Ithica, endorsed these sentiments, and spoke of the benefits which had arisen from a voluntary movement on the part of Mr. Farrington in this way, amongst the dairymen of the first association formed in the State of New York.

It was then moved and carried that Mr. Phelan's suggestion be referred to the Executive Committee for consideration.

A question raised by a member, as to the right length of time that milk should stand before being made into cheese, was answered by Mr. Arnold, who said that the time varied from three days to four weeks.

Sixth question—How does the experience of the past few years warrant making dairying a speciality, to the exclusion of grain raising?

Mr. FARRINGTON, JR., opened the discussion, and paid a tribute to the remarkable success and rapid development of the dairying interest in Ontario. There was great danger of the farmer confining himself to any agricultural speciality. He drew statistical comparisons between a purely grain-raising farm, a part grain and part dairy farm, and a pure dairy farm.

The subject was laid on the table.

Mr. W. WELD wanted some information as to the use of orchard grass.

Mr. BALLANTYNE was asked in what condition should the morning's milk be when put into the evening's milk, and as to the proper mode of curing rennets. In his factory they constantly test milk. The morning's milk, brought into the factory about 9 o'clock, is agitated and thoroughly neredated until about 11 o'clock. When we consider that there is sufficient acidity we put to the press.

The Finance Committee of the Association laid the following report before the Convention:—

Balance from 1870.....	\$ 128 85
Receipts for 1871.....	771 33
Expenditures.....	738 20

Balance on hand.....	\$161 98
----------------------	----------

The committee would recommend that in the future the Executive Committee appoint two auditors.

The committee also recommend the payment of \$50 each to Mr. X. A. Willard, and Mr. L. B. Arnold, as a token of appreciation of their excellent addresses, in the preparation of which and in travelling a distance to deliver them here they must have incurred considerable expenses. Also, they recommended the payment of \$100 to the secretary for his services during the past year.

The report was adopted.

The proceedings terminated by a vote of thanks to the retiring President, Mr. James Nixen.

Butter, Dairies, &c.

The Secretary of the Vermont Dairymen's Association, Mr. O. S. Bliss, writes as follows to the *Country Gentleman* :

Many very considerable improvements in the methods of treating milk have been effected in a few years, and the rooms which but lately were deemed best adapted to that purpose are not now approved by the more progressive and intelligent dairymen. Formerly every facility for cooling the room was husbanded, and the location and construction were chiefly with reference to that end. But it has been found that the new method of cooling the milk by the use of water is more economical and every way preferable, and that a more elevated temperature of the room is desirable; and, as a consequence, other principles govern in locating and constructing them.

It is not worth while to enter upon an extended discussion of that subject in this connection, but it may be pertinent to remark that another season's experience of many individual dairymen confirms the position assumed by us and advocated at the meetings of the several dairymen's associations and elsewhere, last winter; that the cooling principle, whatever it may be, should be applied to the milk and not to the room, and that the milk having been once cooled should be kept in a warm room for the production of the most and best butter. Very satisfactory results have attended the use of the broad, shallow, milk pans, with water underneath; but better results, so far as we have been able to make comparisons between the two systems at different establishments, seem to have attended the use of the deeper and narrower pans with water well up the sides; and this latter system possesses another advantage, in that it is much more economical of space.

We return to the discussion of our main subject with the remark that we no longer, as formerly, advocate the erection of separate dairy houses for butter dairies, nor indeed for cheese, if there is plenty of room in the house. We would, then, if building a new farm house, or re-arranging an old one, place our dairy room just in that part of the house where it would be most convenient to the water supply and to the kitchen, for we would do our dairy work in the kitchen, or anywhere else but in the room where our milk is kept. If just as convenient, we would put it on the shady side of the house, but not otherwise. We would not put ourselves out at all to secure ventilation, other than by lowering or raising a window on special occasions, as currents of air are not ordinarily desirable. We would keep a small box stove in the room, and light a little fire in it in damp weather, even in midsummer, and that would answer every purpose of the most elaborate and expensive system of ventilation. One very decided advantage af-

forded by the stove ventilation is that the air taken up by it from near the bottom of the room, is damper and cooler than the more elevated strata, and the odour-charged gases which many dairymen believe are expelled from the milk by the cooling process, are mixed with these lower strata of air, as are the exhalations of any occupants of the room.

In regard to the amount of room required, we remark that the best equipped 40-cow dairy with which we are acquainted, occupies for setting purposes a room containing only about 120 square feet, though we confess we should prefer to have a little more elbow room. The pans used in this establishment are six feet long and one foot wide, and the same deep, set in wooden tanks about four inches wider. They are arranged in pairs, the water supplied by rubber hose from a pensketo in one corner of the room, and both water and skimmed milk are drawn off through hose and tubing. The pans are lifted out and carried into the kitchen adjoining for cleansing and scalding, and no work is done in the room other than straining the milk and dipping off the cream. The churning is done in an adjacent shed, in a revolving box-churn, by horse-power.

Very great economy of construction and operation will result from the adoption of the new method, which we unhesitatingly commend to any who are seeking the best results.

Kicking Cows.

A few years ago I had considerable experience with kicking cows, and by far the best remedy out of quite a number that I tried, was a strap or surcingle drawn tightly around the cow just in front of the hips and close to the bag. Tighten it up till she does not attempt to kick. I never knew it to fail; you can gradually loosen it until it will be sufficient simply to lay it on her back. But be cautious and do not loosen or leave it off until she makes no effort to kick with it tight or on. Kick she *cannot* with the strap tight. The first cow I ever tried it on was the worst I ever saw. With both hind legs tied together she would kick backwards like a horse; then, in addition, one fore-leg was tied up, and she would stand on the other and kick with both hind ones, as soon as an attempt was made to milk her, till she tumbled down; then would get up and kick again until tired out; so the milk was generally left on the stable floor, and it was decided to dry her up and beef her as soon as possible, though an extra cow. Seeing the surcingle remedy in the *Country Gentleman*, I tried it, and effected a cure.—*Cor. Country Gentleman.*

M. Gaudin estimated that half a million litres per day of artificial milk could be prepared in Paris at a trifling cost, which should have all the nutritious qualities of good milk. An emulsion prepared at a very high temperature from bones, fat, and gelatine, tastes, when cold, like stale milk of cheesy flavour; the components of ordinary milk are all present; the gelatine representing the casein, and the fat the butter. The French seem bound to continue their exertions to produce milk from chemical cows. The milk is probably as good as the butter recently mad from the residuum of the Thames ceer, England.

Entomology.

The Mosquito

Happy is the man who has never tossed and tumbled impatiently within the folds of a mosquito curtain on a sultry night with a pack of ravenous insects within and without sucking the blood of the Englishman—who has never been bitten by one of these annoying pests which begin to blow their horns just when, wearied with the heat of the day, peaceful slumber is anticipated! "Where do they come from?" asks the impatient man suffering from their attacks. Calm yourself, friend, and listen to what an American writer on entomology says on the subject:—"The mosquito proceeds from the animalcule commonly termed the 'wiggie-tail.' I took a bowl of clean water and set it in the sun. In a few days some half-dozen wiggie-tails were visible. These continued to increase in size till they were about 3-16ths of an inch in length. As they approached their maturity, they remained longer at the surface, seeming to live in the two mediums—air and water; finally, they assumed a chrysalis form, and by an increased specific gravity sank to the bottom of the bowl. Here, in a few hours, I perceived short black furze or hair growing on all sides, until it assumed the appearance of a minute caterpillar; and thus, its specific gravity being counteracted or lightened, it readily floated to the surface, and the slightest breath of air wafted it against the side of the bowl. In a very brief space of time afterwards the warm atmosphere hatched out the fly, and it escaped, leaving its tiny house upon the water. How beautiful, yet how simple! After the water had gone through this process I found it perfectly free from animalcule. I therefore came to the conclusion that this wiggie-tail is a species of shark, who, having devoured whole tribes of animalcule, takes to himself wings and escapes into a different medium to torture mankind and deposit eggs upon the water to produce other wiggie-tails, who in turn produce other mosquitoes. Any man who has kept house with a cistern in the back-yard, has doubtless observed the same effect every summer. Open your cistern cover any morning in the mosquito season, and millions of them will fly out in your face. Close the windows of your room at night, at the risk of being smothered for want of air, being careful at the same time to exclude every mosquito, and go to bed with a pitcher of that same cistern water in the room, and enough will breed from it during the night to give you a satisfactory amount of trouble. In fact, standing by a shallow, half stagnant pool, on a midsummer's day, you may see the wiggie-tails become perfectly developed mosquitoes, and they will rise from the surface of the water and fly into your face and sting you." The mosquito is said to have been introduced into the Hawaiian Islands

by vessels from Mazatlan. Dr. Vickering, in his "Voyage," states that they found the larva of the mosquito on ship board for many days after leaving Honolulu. Dr. Richardson, in his "Journey through the Arctic Regions," mentions that masses of mosquitoes which were frozen, were soon thawed by heat, and became as venomous in their attacks as ever. In Cuba they boast of half a dozen species of the mosquito, as the coraci, the zancudo, the rodador, the jaguey, the lancetero, &c. The proboscis of many of them is so powerful that it will draw blood through a thick leather glove, and the scars will sometimes not disappear entirely for many months. Mr. Edwards, in his "Voyage up the Amazon River," speaks of the swarms of carapanas or mosquitoes which they encountered, that put all sleep at defiance. Nets were of no avail, even if the oppressive heat would have allowed them, for those which could not creep through the meshes would in some other way find entrance, in spite of every precaution. Thick breeches they laughed at, and the cabin seemed the interior of a bee-hive. Dr. Turnbull tells us that at St. Domingo he saw a gentleman who was seriously lamed by the festering bite of one of these galley-nippers, inasmuch that he was obliged to be carried in a litter on board the ship by which he left the island. Many in various districts, no doubt, desire to know whether there has yet been discovered any positive exterminator of this pest and disturber of night's slumbers. For ourselves, in years gone by, we used to be content with building up a good fire on the earthen floor of our bed-room with green boughs, and the smoke from this failing to discomfit the enemy, we were fain to resort to tobacco fumigation from the combined assaults of pipes and cigars. The world has grown wiser in its mechanical and chemical knowledge, and the instructions, recipes, and contrivances for banishing mosquitoes are more numerous. The following is said to work like a charm: A piece of camphor placed on a tin vessel, and held over a candle or lamp, will by its fumes expel the mosquitoes. A mixture of benzoic acid and sugar heated on a hot shovel, or in a frying pan, will, it is said, drive mosquitoes out of an apartment.

The Chinese burn jossticks, or large pastiles about half a yard long. They are formed of shavings of juniper or pine wood, artemisia leaves (reduced to powder), tobacco leaves, a small portion of arsenic, and a mineral called mawang. The fumes are found effectual in keeping off the insects. In the Amazon district, and other parts of Brazil, cow dung is burnt for the purpose. In the evening every house and cottage has its pan of burning dung, which gives rather an agreeable odour, and as there are usually plenty of cattle about, this necessary article is always to be procured.

When millions of people in all quarters of the globe are tortured both by day and by

night by those pests—the midge, mosquito, and sand fly, and when every known means of prevention have hitherto failed in ensuring a respite from their attacks, the following remedy may be useful, which has been successfully adopted by an angler, who had been driven from the stream by the swarms of midges that infested the locality. Having with him a small bottle of benzine collas to clean his fingers from wax in fly-making, as an experiment he put a small quantity of it on his face, neck, and wrists, and passed through myriads of his tormentors, not only unscathed, but untouched. As he advanced they made a way, and cleared from his path in every direction. This simple antidote will in Wales prove a god-send to the poor husbandman and quarryman who, in many instances, cannot carry on their daily avocations without the very inferior protection of gauze netting. To the artist, the tourist, the naturalist, and the fisherman, it will be a boon of great price. Whether it will be as effectual in keeping off mosquitoes and other pests of tropical climates, remains to be seen, but a few drops about the ears of a horse serve to keep away flies; and if it be effectual in preventing the attack of the formidable Tsetse fly in Africa, there is a respite to the doom of many domestic animals. Benzine, or benzole, is the product by distillation from coal tar naphtha, therefore naphtha will answer the purposes equally well, and at one-fourth of the cost. Certainly benzine is a much neater preparation, and is less offensive to the sense; yet both of them are innocuous to the skin, and can be thus used with impunity.

In the West India Islands the coasts swarm with mosquitoes, and in calm weather they come a mile off shore, and are succeeded in the morning by as great a pest, namely, large dung flies, usually called "doctors," from the quantity of blood they extract by means of a piercing sharp probe, which gives a smart pain. Captain Mayne Reid, in the "Hunters' Feast," describes the safety from mosquitoes which results from the application of pennyroyal. He says, "Whether it is the highly aromatic odour of the pennyroyal that keeps off these insects, or whether the juice, when touched by them, burns the delicate nerves of their feet, I am unable to say. Certain it is they will not alight upon the skin which has been plentifully anointed with it. I have tried the same experiment often since that time with a similar result, and, in fact, have never since travelled through a mosquito country without a provision of the 'essence of pennyroyal.' This is better than the herb itself, and can be obtained from any apothecary. A single drop or two spilled in the palm of the hand is sufficient to rub over all the parts exposed, and will often ensure sleep where otherwise such a thing would be impossible. I have often lain with my face so smeared, and listened to the sharp hum of the mosquito as it approached, fancying that the next moment I should feel its tiny touch, as it settled down upon my cheek or brow. As soon, however, as it came within the influence of the pennyroyal, I could hear it suddenly tack round and wing its way off again, until its disagreeable 'music' was no longer heard.

The only drawback to the use of the pennyroyal lies in the burning sensation which the fluid produces upon the skin; and this in a climate where the thermometer is pointing to 90°, is no slight disqualification of the remedy. The use of it is, sometimes, little better than 'Hobson's choice.'

Dr. Durkin, at a meeting of the Boston Natural History Society, stated that he had satisfied himself from repeated examinations that the male mosquito has no sting, and cannot draw blood, the female alone being endowed with that organ. A correspondent at Mauritius notices a strange thing. After residing at Port Louis for say three years, the night mosquitoes ceased to annoy him, at least he never felt their presence, but upon removing to an outpost called Black River, about twenty miles distant, there the mosquitoes, which were very large, attacked him worse than ever. After about a fortnight these latter ceased to annoy him, but when he returned to Port Louis his old friends renewed their attacks, and this also occurred at other out stations. Compared with mosquitoes, sand flies are perhaps still even more troublesome pests. Minute in the extreme, they almost defy detection, and pass exultingly through the finest gauze, yet confiding in their number, which is legion, they prove a most pitiless and unwearied foe.

In travelling the rivers and portages of the Hudson's Bay territories, in spring and summer, the *voyageurs*, hunters, surveyors, and others, suffer dreadfully from myriads of sand flies and mosquitoes, and become so disfigured by their attacks that their features can scarcely be recognised. It is not possible to give an idea of the torment endured from the sand flies. As you dive into the confined and suffocating chasms, or wade through the close swamps, they rise in clouds, actually darkening the air. To see or to speak is equally difficult, for they rush at every undefended part, and fix their poisonous fangs in an instant. The face streams with blood, as if leeches had been applied, and there is a burning and irritating pain, followed by immediate inflammation, producing giddiness, which almost drives one mad, and causes the sufferer to moan with pain and agony.

American inventions are usually to the purpose, and they have not lost sight of the mosquitoes. A patent bedstead contains machinery which, when wound up, sets in operation fans suspended above the sleeper, which continue in motion from seven to twelve hours, with rapidity regulated at pleasure by the occupant of the bed, creating a brisk or stirring breeze, or gentle, soothing zephyr. There is another American insect trap in which the mechanism is simple. Mosquitoes and flies are attracted to alight on a drum (covered with a singared cloth) which, by means of clockwork, is slowly worked into a trap, from whence they can be taken when dead.

Akin to the intolerable itching sensation produced by "prickly heat," is the terrible annoyance produced in Texas and other quarters by the "red bug," a microscopic insect which abounds in the grass, and enters the skin of the legs and ankles when exposed. It must not be supposed that the red bug bears any resemblance to the noisome insect commonly known under that name here. Insects of almost any description pass under the general name of "bug" in America.

The vigorous and unremitting assaults of these tormenting pests, convey the moral lesson of man's helplessness, since with all our boasted strength we are unable to repel these feeble atoms of creation.—*Journal of Applied Science*.

Stories About Insects.

At this dull season of the year, when the insect world especially is hushed and silent in its icy tomb, it may interest some of your readers to be told a few stories about insects that we have culled from various sources. We shall repeat them without any reference to scientific order, and without regard to subject. No story-teller, we fancy, would like to be bound down by any restrictions as to system or order.

FLEA.—It is related by Geoffrey, in his *Histoire des Insectes*, published in the time of the former French Republic, that a certain Mark, an Englishman, had succeeded, by dint of patience and art, in making a gold chain the length of a finger, with a padlock and a key to fasten it, not exceeding a single grain in its weight. A flea attached to the chain pulled easily. Another English workman, the same author relates, constructed a carriage and six horses of ivory; the coachman was on the box, with a dog between his legs; there were also a postillion, four persons in the carriage, and two servants behind, and the whole of this was drawn by one flea! We leave it to our readers to decide whether we should express our admiration at the herculean strength of the fleas, or at the cleverness of the English workmen.

About fifteen years ago, Baron Walckenaer relates, the whole population of Paris was amazed and charmed at the following sight: Thirty fleas went through military exercises, and stood upon their hind legs, armed with pikes formed of very small splinters of wood. Two fleas were harnessed to and drew golden carriage with four wheels and a postillion. A third flea was seated on the coach box, and held a splinter of wood for a whip. Two other fleas drew a cannon on its carriage; this little triquet was admirably finished, not a screw or a nut was wanting. These and other wonders were performed on polished glass. The flea-horses were fastened by a gold chain attached to the thighs of their hind legs; they had lived thus for two years and a-half, not one having died during that period. To be fed, they were placed on a man's arm, from which they sucked the blood.

SUPERSTITIONS.—In Europe there is an insect called the "Churchyard-beetle," (*Blaps mortisaga*), which has been known on several occasions to be discharged from the human stomach. About the year 1823, it is recorded that a woman in Ireland discharged about two thousand larvæ of this insect at various times, as well as a pupa and a perfect specimen, which she had evidently taken in by her adherence to an absurd and superstitious practice of drinking daily a quantity of water mixed with clay taken from the graves of two Roman Catholic priests, and eating large pieces of chalk. One of these beetles was kept alive for three years, after having been repeatedly immersed in spirits of wine, and even kept in some during a whole night.

A small species of Snout-beetle (*Curculio*) was in old times regarded in England as a certain cure for the tooth-ache; it was even named by Illiger *Anti-odontalgicus*—the anti-tooth-ache weevil. Gerbi, who wrote a long dissertation upon this creature, stated that a finger once imbued with its juice would retain the power of curing the disease for a twelvemonth. What a fortunate thing it is for modern dentists that such remedies are no longer believed in!

Kirby and Spence relate—as another ancient remedy—that nine larvæ of the moth of the wild teasel, enclosed in a reed or a goose quill, were considered a certain cure for ague.

Matthioli, the same authors tell us, gravely affirms that every oak-gall contains either a fly, a spider, or a worm, and that the first foretells war, the second pestilence, and the third famine. A pleasant choice of evils, certainly!

GOOD FOR EVIL.—Entomologists are generally considered to be a very cruel and heartless race of beings, because they capture and kill so many specimens for their cabinets. This is by no means a true charge, as they spare the lives of myriads of useful insects that the thoughtless multitude tread upon without mercy; but however this may be, here is a story of a beetle that saved the life of a great French entomologist, who had no doubt put to death thousands of its class. About the year 1792, during the great French Revolution, M. Latreille, at that time a parish priest, was arrested with other curés for not taking the oath to the new Government. He and his companions in misery were taken to Bordeaux in the month of June, and there kept in prison till a ship should be ready to carry them off to the convict establishments at Guiana. Meanwhile events occurred which caused a temporary suspension of the sentence of transportation, and Latreille remained detained in the prison at Bordeaux. In the same chamber which he occupied there was an old sick bishop, whose wounds a surgeon came each morning to dress. One day, while the surgeon was present, an insect came out of a crack in the boards. Latreille seized it immediately, examined it, stuck it on a cork with a pin, and seemed enchanted at what he had found. "Is it a rare insect, then?" said the surgeon. "Yes," replied the captor. "In that case you should give it to me." "Why?" "Because I have a friend who has a fine collection of insects, who would be pleased with it." "Very well; take him this insect; tell him how you came by it, and beg him to tell me its name." The surgeon went quickly to his friend's house. This friend was M. Bory de Saint Vincent, a naturalist, who became celebrated afterwards, but who was very young at that time. On receiving the insect he endeavoured to determine its name and family, but, in spite of all his researches, without success. Next day, the surgeon met Latreille again in the prison, and told him

that in his friend's opinion the beetle had never been described. Latreille knew by this answer that M. de Saint Vincent was no mean entomologist. He therefore said to the surgeon: "I see plainly that your friend must know my name. You will please tell him that I am the Abbé Latreille, and that I am going to die at Guiana, before having published my 'Examen des Genres de Fabricius.'" Bory, on receiving this piece of news, took active steps, and obtained leave for Latreille to come out of prison, his uncle and father being bail for his re-appearance whenever summoned. The vessel in which Latreille was to have sailed to exile, or rather to death, set out soon afterwards (without him, and foundered in sight of Cordova, with the loss of all on board except the crew. By the exertion of his friends his name was shortly afterwards erased from the list of the condemned, and thus did a little beetle—the *Necrobia* or "Life in Death"—save from a wretched fate one of the greatest of French entomologists.

The Striped Bug—How to Get Rid of it

The best way to deal with the striped bug is to sit down by the hills and patiently watch for him. If you are spry, you can annoy him. This, however, takes time. It takes all day and part of the night. If you get up before the dew is off your plants—it goes off very early—you can sprinkle soot on the plant, and soot is unpleasant to the bug. But the best thing to do is to set a toad to catch the bugs. The toad at once establishes the most intimate relations with the bug. It is a pleasure to see such unity among the lower animals. The difficulty is to make the toad stay and watch the hill. If you know your toad, it is all right. If you do not, you must build a tight fence round the plants, which the toad cannot jump over.—*My Summer in a Garden.*

The silk manufacturing interest in the United States is assuming immense proportions, and bids fair to rival the cotton interest in extent. There are numerous manufactories in New York; New Jersey has 16 factories and 75,000 spindles; 1,500 operatives find employment in the silk manufactories of Philadelphia, while \$5,000,000 are invested in this business in Connecticut. The Cheney Brothers in Hartford alone are turning out daily 1,500 yards of dress silk, and 4,000 yards of other dress goods into the manufacture of which silk enters, besides large quantities of ribbons and sewing silks. The quantity of silk imported to meet the wants of this constantly increasing industry must amount to many millions yearly, and if it can be successfully cultivated in North America, incredible sums will be saved.

ENTOMOLOGICAL SPECIMENS may be sent for identification and information respecting history and habits, to the office of the CANADA FARMER. The specimens should be sent in a pasteboard or other box, not loose, but packed with cotton wool, or some similar material. The name and address of the sender should always accompany the package. The postage should be prepaid.

Correspondence.

Hay and Straw Cutters, and Chopped Barley.

To the Editor.

In a recent number of the CANADA FARMER "Old Countryman" mentions the value of a first-class hay and straw cutter. I shall feel obliged if, for the information of those who, like myself, do not know what constitutes a first-class machine, he will explain. I got one many years since, worked by hand, but did not perceive any advantage from its use; it cut too long. I am informed by a Prussian practically acquainted with the use of cut feed, that straw cannot be well cut unless carefully threshed for the purpose, that the rollers of the cutter should thoroughly bruise the straw.

Will a good straw cutter cut corn fodder, or must another machine be used for the purpose?

What is "chopped barley," and how is it prepared?

For want of a suitable machine, will coarse grinding at a grist mill answer?

ANOTHER OLD COUNTRY MAN,

Carleton, Ontario, February, 1872.

In reply to the above enquiries, we would say that many of the cheaper straw cutters, ranging from \$15 and upwards, will do the work of a private gentleman, who perhaps only cuts for a team of horses or a milch cow. For the farmer, cutting for a great number of cattle, we consider these cheap, light made hand machines dear at the price, for they soon get out of order—in fact, are not of sufficient strength and capacity to do the work.

The constitution of a first-class machine we consider to be summed up in the greatest rapidity of cut to the smallest relative amount of labour.

As to cutting too long, a good machine is regulated to cut from a fraction (we do not know exactly the shortest length) of an inch upwards, by an adjustment of the gearing.

As to its being impossible to cut any straw but that carefully threshed for the purpose, we can only say that doubtless straw which has not been cut up very much by the thrashing machine will pass more easily through, and be cut more evenly by the straw cutter; but our own experience has been that, with a feeder who knows his business and sharp knives, we can cut any kind of straw, though it stands to reason that a stiff straw, as wheat; will cut more easily than such soft straw as that of barley, even as linen will cut more readily than wool. The line taken by our correspondent's informer (the Prussian) that straw should be specially thrashed to cut, is no doubt correct in theory, but not at all a necessity in practice.

The rollers of a good machine do thoroughly bruise the straw, but much of their power for this purpose depends upon the manipulation of the feeder.

We have spoken throughout of a good machine, and we would recommend those made upon the principle of knives in a fly-wheel, which wheel is turned by one or two men, or by horse power. We cannot just now place our hand upon the name of the patent, but an application to Messrs. Maxwell & Whitelaw, of Paris, to Mr. Watson, of Ayr, and doubtless to almost any of our large agricultural implement manufacturers, would elicit all the necessary information for our correspondent.

In answer to query No. 2: "Chopped barley," or "chop," is the name commonly given by our farmers to grain coarsely ground at the grist mill. A suitable machine for doing this grinding at home may be also obtained from the above named manufacturers.

Improved Stock versus Shows.

To the Editor.

SIR,—The numerous Township Agricultural Societies throughout the Province have held their annual meetings, and the all-important questions are—How can we manage our Society this year to make it beneficial to the township? and also—What plans can we devise that will induce a large number of farmers to take an interest in the Society?

It is evident to all observers that a great number of these societies are declining year after year—not on account of their inutility, nor from the fact that their day is past, which to a certain extent is true as regards some older and wealthier townships—but simply from the fact that after all the Fairs and County Shows have been held within the reach of everyone, a number will still persist in holding their Township Shows, and foolishly waste the few dollars they can secure, despite the protestations and better sense of a large number of the farmers of the township. I will mention the case of a neighbouring township, which a few years ago counted a large number of members on its list, and was in a very prosperous condition. Shows were held year after year, and the Society gradually failed, until last year the prize list barely reached \$50, and the amount received by exhibitors did not exceed \$25. I might give other instances similar to this, but it is unnecessary. Some townships have adopted a different course, and think the rest would do well to follow their example—that is, turn their attention and means to the purchase of stock.

Some townships have purchased thoroughbred animals, members pay their annual fee, and these have been allowed the indiscriminate use of the animals, and the result has been a failure; advocates of the Show system pointing to it as an evidence of the superiority of their system.

I will give the method as practised in the township in which I live, believing that it will be found efficient in a majority of town-

ships. The Society determine on getting a number of thoroughbred bulls; each section desirous of securing the services of one come forward with a list containing the members' names and the number of cows requiring to be served. For these they are to pay, besides the member's fee, 50 cents per cow—for services beyond the number stipulated, the charge is \$1 per cow. All the money should be paid in time to secure the grant, and the consequence is a large amount is raised, which soon returns increased a hundred fold in the improvement of the stock. The grant last year on the amount returned was within a trifle of \$100, nearly enough to purchase one good animal. Another method, and one I believe fully equal to the above, would be to give a bonus to every one bringing an animal into the township, and agreeing to keep him a certain length of time—say a bonus of \$50 be given the purchaser on the above condition. This would be a great inducement to some who are desirous of improving their stock, but are barely able to purchase one themselves. Inducements must be held out to members in this case in order to maintain the Society. Societies managed somewhat after the above would prove to be of inestimable value to those engaged in them.

AGRICOLA.

Do Fences Pay?

To the Editor.

SIR,—In the older districts of Ontario the outlay on fencing has become a very serious item of farm expenses. Fences are now so costly that the benefit derived from them should be carefully calculated. I cannot see that there is any good reason for having so many as are commonly used. It seems to me a false economy to fence off a farm into small fields for the sake of all the grain or pasture saved. The gleanings of the grain crops are in great part available even after the main crop is taken off, and the portion not fit for use is not lost, but remains as a rich manure, producing perhaps nearly its original value in the succeeding crop. I think that fences enclosing the grass land are all the field fences required on ordinary farms. Now that we have good portable fences, those enclosing the meadow land could be moved whenever necessary at a small cost; and even if rail fences were used, the cost of moving them once in from four to six years would not be great. By doing away with the fences, the farm operations would be greatly facilitated. Ploughing especially could be done with less labour by having fewer headlands and longer ridges. A considerable quantity of land now occupied by fencing, and worse than useless, would also be brought under cultivation.

A. M.

NOTE.—Our correspondent has furnished some calculations to show the cost of fencing compared with their supposed saving, and thereby strengthens his position—that to a considerable extent the amount of fencing generally adopted on our farms involves a serious loss. We think his argument sound, but his figures not very clear or conclusive. The publication of his letter is a sufficient answer to a private enquiry which he appends.

Natural History Queries.

A correspondent from Fitzroy wishes to know what is the best work on the North American Flora, also if there is any work on the Fauna of the country. He asks if there are any Botanic Gardens in Ontario, and where the best establishments of the kind are located in the United States.

The best work at present published on the Flora of North America, and it includes a large proportion of the plants found in Canada, is Gray's Manual of Botany, price \$3 25; can be procured of any Canadian bookseller.

There is no book of the same class on the Fauna of this continent. Perhaps the most complete work on the subject is the large and rather expensive publication of Richardson, entitled *Fauna Boreali-Americana*.

There is no Botanic Garden in Ontario. In the United States, one of the oldest is in Philadelphia. Another of more recent establishment is connected with the Department of Agriculture in Washington.

Prizes for Dogs.

To the Editor.

SIR,—Our Provincial Show is generally very creditable to the Province. Almost every article of useful manufacture is represented, and the display of cattle and farm stock is generally very good, and coming down to poultry, pigeons, &c. There is generally a good turn-out. There is one department, however, which I think has never been represented—dogs. I think small prizes for dogs might be added to the prize list without injury to any, but to sportsmen in particular with much benefit. The department could be made almost self-sustaining from the first, and I think after a few years would prove a success.

In England the purity of breeds is kept up by competition at shows. Here we have no shows; hence the difficulty all sportsmen have in procuring well-bred dogs. I hope there is enough sporting element among the gentlemen who have the management of our Provincial shows to take this matter into their consideration, and offer this year small prizes for sporting and other dogs.

SPORTSMAN.

Strathroy, Jan. 8, 1872.

CHINESE YAM.—Some years ago we received a communication from a correspondent speaking in favour of the Chinese yam. Though we published the letter, we appended an editorial note disclaiming any endorsement of the writer's recommendations. We are sorry to learn that an American publication, entitled "How to Make the Farm Pay," has copied the article *without the note or the writer's signature*, and crediting the whole to the CANADA FARMER. This is very unfair, and we have reason to fear has led some parties astray. We have before given this explanation, but a letter of enquiry from

a correspondent in Nova Scotia leads us to repeat the statement. We would caution anyone against experimenting with the Chinese yam, for even where it will grow, we believe the cost of digging up the roots, which are thickest at the base, makes it a very unprofitable crop to raise. We must also add that the unfairness which in this instance is manifest in the book referred to—"How to Make the Farm Pay"—stamps the work in our estimation as altogether unreliable.

BERKSHIRES.—A correspondent wishes to know where he can procure thorough-bred Berkshire pigs or pure-bred Brahma fowls. Our reply is "See advertisements," and our advice to stock breeders is "Advertise."

THE HOUSEHOLD.—We thank our correspondent H. M. for his letter, and shall endeavour to bear in mind his suggestions in reference to the "Household Department" of this journal.

SCALDING HOGS.—In answer to Frank Smith as to the proper temperature at which water should stand to scald hogs, we can only say that to a water barrel full of boiling water it is customary to put about two 2½ gallon pails of cold water, and it is then found that the latter part of the scald is usually the best. We have never come across any farmer that had tested the temperature with a thermometer; neither have we seen it recorded in any agricultural work.

The Canada Farmer.

TORONTO, CANADA, MARCH 15, 1872.

The Drainage of Swamp Lands.

An amendment, or rather an extension of the Act for the Drainage of Swamp Lands, was submitted to the House during the session just past by Mr. McKellar, in a series of resolutions which have been adopted. The resolutions shadow forth, as any one who will read them carefully can at once perceive, a measure of the simplest and most beneficial description. They propose certain changes in an Act which is already in force and is being in many cases acted upon; so as to allow municipalities that may take advantage of that Act to have money advanced out of the public funds instead of by private individuals, on the security of debentures, while the greatest care is taken that every farthing of any money thus advanced shall be paid back, and paid back at the very time it is due.

The fact mentioned by Mr. McKellar, that there are at present in force two Acts for the drainage of waste lands, is perhaps not so well known as it ought to be.

The more closely these are examined, and compared, and contrasted, the more it will be seen that the Premier of the late Government has no reason to boast of that which his Cabinet got passed and acted upon, for in many respects it is very faulty, and in its practical working has been found liable to great abuse. The Acts in question, which are respectively 32 Vic., cap. 43, and 33 Vic., cap. 2, have this characteristic difference, that while the former leaves the work to local effort and local superintendence chiefly, the latter centralizes all in the Provincial Government, and leaves nothing for the parties most concerned but to pay the amount which the authorities may say is due.

So absolute is the power under this Act that neither the consent nor request of any of the owners of the land to be drained is necessary in order to the work being proceeded with at any time the Government may choose. As a matter of prudence the late Government, we believe, never actually proceeded with any drainage work without being requested to do so by a majority of the land-owners interested; but they need not have done so had they acted fully upon the law they themselves framed; and as a matter of fact, after the petition of the proprietors was presented all was managed by Government, down to the award made by its assessors, who, in many cases had no practical knowledge of the land drained, of what it had been, of what it still was at certain seasons, or of how much it had been improved by the works in question, and yet who made a decision from which there was no appeal, however much it might be against propriety and justice.

Whether or not the land were actually benefited by the drainage operations, or to the extent the arbitrators might determine, was of no consequence. The unfortunate owners might grumble, as Mr. Gibson said that some in his locality had good reason for doing; but they had to pay, though the drains might be a mere sham, and their wet land as wet as ever.

Not only so, but the drainage works being given out generally *en bloc*, those who proposed to contract had to undertake for so much, if any, that it put it perfectly out of the power of poor men in the locality to compete at first hand for any share in the undertaking. What was the result? In more than one case exactly what was mentioned in the course of the debate on Thursday. Contractors made on single undertakings as much as from 25 to 30 per cent. of profit, simply by sub-letting to those poor men who

could have as easily taken small portions at first hand, if the extent of each had been within their ability, and certainly would have done so had the work been under local management.

So defective, unsatisfactory and tyrannical has the Act of the Macdonald Ministry been found to be, that in spite of all the advantages arising from the money being by its provisions advanced by Government, and on more advantageous terms than what was possible in connection with a private loan on mere municipal debentures, there has much more money been actually expended under the former than under the latter Act, to which we have already referred.

As that Act, which the resolutions in question propose to amend and improve, now stands, if a majority of the resident or other owners of land to be benefitted petition a Township Council for certain improvements in the way of drainage, &c., and specify the nature of the work desired, that Council may have the locality examined by a competent person and may procure plans and estimates. If, on examining these, the Council is of opinion that the work proposed, or any part of it, is desirable, then it can pass a bye-law for carrying this out: and such bye-law provides for the work being done; for debentures being issued by the municipality to pay for this work; for assessing the property really benefitted, by special rate, so as to meet the interest on the bonds and provide a sinking fund for the re-payment of the principal when it becomes due; for settling the time and manner in which the special assessment is to be paid; and for valuing the amount of improvement made on each lot of land supposed to be benefitted. The award by the valuator, however, in this case, is not made final. An appeal from it lies to the Council, and from the Council to the County Judge.

Every reasonable provision is made for this bye-law being duly published before being acted upon; for other municipalities being compelled to carry the drains through their territory, if this should be necessary to the work being efficient, and at the same time beneficial to the other municipalities. All these provisions, however, are untouched by the resolutions which Mr. Macdonald so unmeasuredly denounced. In all its main features the Act is left as it now stands, the great change being merely in its being permitted to Government to buy these municipal debentures—issued as we have described—but in no case to an extent beyond \$20 000 for any one municipality, and to charge five per cent for what

would otherwise bear eight, in this way giving three per cent of advantage to the borrowers, while drawing one per cent more than could otherwise be secured to the public funds.

The security for repayment is also ample. It is found by experience that not more than a fourth part of a township ever needs draining or is ever sought to be drained. Twenty thousand dollars are all that can in any one case be advanced. The whole property of the municipality is made responsible to the debenture holders for this money, while the parties actually benefitted are made responsible to the township.

It is evident, accordingly, that it is the interest of those not benefitted to force those more immediately concerned to pay to the uttermost farthing; for if in any case the debt should be cancelled without payment, they, as well as the whole country, would be simply enhancing the value of the private property of some of their neighbours, from which they individually derived no benefit. How different all this is from permission to borrow to any extent and for any unspecified purpose in the interest of the whole municipality, as was the case under the Municipal Loan Fund, we need not say.

The scheme, then, as shadowed forth in the resolutions, is an admirable one, providing ample security for the work being done, the debentures being paid, and the burden duly apportioned, while the whole is so arranged that the responsible parties will have every reason to repudiate the idea of Government forgiving one cent of either the principal or the interest of any sums that may thus have been advanced.

Indeed it seems to us that, on something of the same plan, advances might with perfect security be made for the drainage of lands not to be characterized as swamp, yet standing very much in need of such improvement.

A Word to Young Beginners.

Farming is neither drudgery nor is it all play. It is well for those who have amassed a fortune at the desk or in the counting house, to spend their latter days or their leisure hours in the pleasures of amateur farming, in fancy stock and model husbandry. There is, indeed, to our mind, no nobler use to which the rich man can apply his money than to the improvement of the soil, the stock, and the general agricultural status of a country, out to the man who enters upon farming as the business of his life from which he must make his living, and provide for the wants of his old age and the welfare of his family, the

pursuit of farming is attended with like trials and difficulties to those of any other profession. For the benefit of the novice, we propose to lay down a few rules and principles, such as may guide the beginner to a proper and systematic pursuit of farming.

In the first place, it is an egregious mistake to entertain the idea that any man possessed of a robust frame and strong constitution can be a successful farmer. Mere physical attributes are doubtless to be looked upon as great blessings; but without a sound brain, a happy constitution, and good business capacity, success in agricultural pursuits cannot be attained. Indeed, a man to be at the head of our profession must be possessed of profound intelligence, and must be thoroughly and very generally educated.

The perfect knowledge of all the natural laws which govern the circumstances of live stock and of field crops, and the general adaptation of such knowledge to the daily operations of the farm and the constant care of animals, can only be attained by a thorough and general education, well grounded and extended over many years of scientific reading and practical application.

The man who pretends to anything approaching a thorough knowledge of agriculture must be a botanist, a geologist, a chemist, an entomologist, a proficient in veterinary science, in the apary, the dairy, &c. When he has attained a thorough insight into these, and perhaps other sciences beside, and a power of practical adaptation of such knowledge, he may sum himself up and write after his name—agriculturist.

Beginners, let it be your object to know these things, and to illustrate and prove each item of newly acquired knowledge by practical applications. It has been well said by one of the greatest men among the nations of Europe, that the word "impossible" should be erased from every dictionary in the world. Do you mark it out of your language, and strive to attain perfection as farmers.

If your heart is not in the country—if you do not like the quiet rural life far away above the excitement of the city, do not attempt to farm. Examine yourself whether you love to be about animals, to feed them and to pet them, to pass your summer days in the field and your winters about the byres.

We may appear to lay too much stress upon this point; but we have known dozens of young men, who thought they loved the country, but when the first day of difficulty approached, when the reverses came and the smooth sailing was interrupted, their love of the country collapsed, and they left their farms disgusted, and in too many instances ruined.

No man ever won renown as a painter, as a musician, or in any other scientific pursuit, who had not a natural inborn love for his calling. Farming is a science, and failure awaits the man who cannot throw heart and soul into its pursuit.

We have dwelt longer upon this part of our subject than we had at first proposed, because we felt that there was too little of that love of and ambition in the noble profession of the farmer inspired in the minds of our young beginners. The world is quick to point out what it is pleased to call the drudgery of the farm, and it must be in the mind and nature of the individual to feel its pleasures and its glorious independence.

Prize as an Incentive to Good Farming.

We approve heartily of making the prize lists of our Provincial and larger local fairs as high in value and as extended as is consistent with the funds of particular societies; and yet, we think that there is another way in which to award prizes, that would have a more direct effect upon the agricultural progress of the country. An immense amount of prize money goes to bring into our fairs every kind of machinery, practical and useless. Now, the mere fact of a large concourse of farmers being gathered together from all the surrounding country, with the avowed object of subjecting to their most careful scrutiny the many implements brought together for their inspection, should itself be almost enough to bring into the field the best articles that the manufacturer can produce. Of course, prizes are necessary to increase the spirit of emulation amongst the several manufacturers; but still these prizes should only be used as an auxiliary to that other far greater incentive, the use to the maker of agricultural and industrial improvements of our fair grounds as a most powerful advertisement.

The prize list, as it stands now, hardly reaches the ordinary farmer. There are many farmers who possess in their way model farms, and yet have not the means to go largely into the importing of thoroughbred stock, and it is well that it is so; but at the same time it is utterly impossible for these men to compete against our large breeders. The ordinary farmer cannot hold his own at our greater exhibitions in the shape in which the prize list is now adjusted; but there is one way by which every farmer may compete without large capital for a very high post of honour upon the prize list.

In England, for some years, a premium has been awarded by the Royal Society for the best conducted farm. Could we not award a premium in some such manner? The award to the best field of turnips was something, but it was rather one-sided, giving all the advantage to the light land farmer.

The state of our fences is a standing disgrace to the country. We think the award of a premium, either in money or a diploma, or a silver medal, or in some other form, with the notoriety which surely accompanies the possession of such a prize, would be an incentive to some few individuals to surpass their township, county or province, in the matter of a neatly fenced farm.

Again, sub-divide this, so as to give the newer settler a comparative chance; give a prize for the farm surrounded and divided by the best rail fence, and that surrounded and divided by the best improved style of fence.

Again, give a prize to the best wintered lot of stock, to be awarded in the commencement of spring.

If the funds of any society be not sufficiently large to justify them in awarding large money premiums in these ways, let the prize take the shape of a diploma. To the most enterprising and the most noble minded farmers, we feel assured that a prize in the form of a diploma would be equally acceptable as a premium in money.

We do not assume that the best fenced farm or the best wintered stock are the two most advantageous objects to which to apply an award; but we do think that there is no way by which the agricultural status of the country would be more surely improved, or by which a greater impetus would be given to a neater and more thorough management of the farm homestead and contents, than by awarding diplomas in a public manner to those who should justly merit public commendation as examples for good to the agricultural community at large. And in this way only can the ordinary farmer, who is not possessed of large capital, hope to gain that public notice and approval which would follow in the event of his claiming by merit one or more of such diplomas or prizes.

Take Time by the Forelock.

All classes of business are subject to sudden rushes. At certain seasons the clerk in the counting-house or the shop-keeper, is compelled to put in extra hours or to engage more employes. The business of the farmer is also subject to these sudden calls for extra exertion. Throughout the winter season the farmer has comparatively a leisure time, and he is sometimes tempted to give this, his periodical holiday, too long a license.

Over and above the attention to stock, the sale of the products of the farm and the pleasures of sleighing parties and social gatherings, this season should be pre-eminently one of preparation. It is not in the amount of acreage to be sown, or the quantity of grain and hay to be cut and harvested, that the farmer finds himself so sorely pressed when once the spring time and harvest are fully upon him. It is in the want of due preparation for these operations. From the time that the first furrow is turned in the spring the farmer should feel that, barring accidents, he can keep his teams and hands continuously engaged in *bona fide* operations.

Our own experience has been that nearly a month is consumed in winter in full preparation for the coming season, and if this be now neglected, how many precious days are

lost in the growing days of early summer. As an illustration of the work that must be done some time, and may be done before spring work begins, we will note down sundry acts of preparation for the coming spring and summer, and the time already expended on them:

Leaving and putting back in granary 50 bushels barley 70 bushels (at 3) with 10 pens—in all 160 bu-h-ls—2 men, 1½ days, or 3 days per man.....	3	days per man
Sorting 60 bushels potatoes.....	1	“
Drawing home 20 cords pine.....	2½	“
Cutting up same for stove.....	3	“
Repairing mower and reaper to be re- paired.....	1	“
Repairing drill to be repaired.....	1	“
Repairing several implements.....	3	“

These are all essential matters, jobs that must be done now or in summer, and such are very often put off.

Last summer we asked a farmer to give us a day drawing wheat, we being very hard pushed. He had secured his wheat, yet rumbled a good deal, for, said he, I would sooner give you three days' work in winter than one at this season. Computing the value of time upon this standard, and we think it by no means an unjust one, the nineteen days already mentioned would be equivalent in value, as lost time, to nearly two months in the summer; or, say only twenty days, how much can be performed in that space in seeding time or harvest, and what a loss does the farmer suffer who is delayed in *bona fide* field operations so many days. These preparations are absolutely necessary, and if not done now must be performed in summer; how many more are there that might well be made.

We should now do all that we can think will be necessary in the busy months, and, depend upon it, there will be abundant demands, at present unthought of, to fill up every rainy day in summer.

Settling on Free Grant Lands.

A city correspondent enquires whether he can profitably invest \$500 by securing free grant lands, and whether the land is good he also wishes to know what an intending settler should take with him.

There is plenty of good land in the free grant district, and plenty worthless for agricultural purposes. Nothing but an examination of the locality can decide the question of its value. The prospects of success and the wisdom of the venture depend mostly on the emigrant himself. As regards the articles a settler should take with him, it is not well for him to cumber himself with much of anything.

All the necessaries of life can be purchased at the stores, in the villages that are springing up all through that country, and more especially at the principal towns, such as Parry Sound, on the north shore of the Georgian Bay, and the town of Haliburton, in the Peterborough district, township of Dysart. When emigration is contemplated

to Dysart, application should be made to the Canadian Land and Emigration Agent, C. J. Blomfield, Peterborough; or to the office of Messrs. J. & W. Beatty, Parry Sound, when information is wanted connected with that locality. From either of these sources any information can be obtained as to what can be purchased on the spot.

Carpenters' tools, and a few articles of this kind, will no doubt be better and cheaper in the cities, but, freight added, it is probable that there would not be much saved by laying in any stock of extra articles before going on the land. It might, however, be an advisable plan for intending emigrants to open a communication with some merchant in Toronto or elsewhere on the front, who will always supply goods at city prices, and freights will be the same whether to the consumer or retail merchant, who imports goods for public convenience. It is the common custom for a grocer, for example, who deals with any person at a distance, to execute, or cause to be executed, any orders for goods that he does not keep himself. We have known many instances of such business being very satisfactorily conducted, and much time and travelling expense thereby saved to parties who would otherwise have to come to the cities themselves.

Notes on the Weather.

The past month of February has been on the whole a very pleasant one, characterized however, like the preceding months, by excessive dryness, most unusual at this time of the year. In some parts of the country there has been a good covering of snow, but in the neighbourhood of Toronto very little has fallen, and the ground is quite bare. No indications yet disclose the condition of the winter wheat; nor is it possible, from any reliable data, to prognosticate the character of the coming season or the probable lateness or earliness of the spring. Some weather-wise prophets have signally failed in their predictions. An unusually early migration of wild geese was reported by one observer; but we have these signs noted every spring, without bringing us any clearer insight into the future. On the other hand, Mr. Stewart, of the Toronto Observatory, to whom we are indebted for our monthly meteorological reports, has noticed a remarkable scarcity and almost entire absence of birds during the whole winter, very few Buntings having made their appearance, and crows being first seen on the 26th February.

The report from the Toronto Observatory is as follows:—

The mean temperature of the month of February has been 20°.7, being 2°.3 colder than the average of that month, and 3°.6 colder than February, 1871. The highest temperature occurred on the 24th, when the thermometer reached 45°.2, and the lowest point on the 2nd, when the temperature fell

to 3°.6 below zero, a monthly range of 48°.8. The warmest day was the 24th, of which the mean temperature was 39°.3; the coldest the 22nd, mean 10°.2.

Rain fell on 4 days, and again fell far short of the average quantity, the total amount being 0.36 inch, against 0.92 inch. This deficiency has not been compensated by the amount of snow, which fell on 9 days, and amounted to 7.3 inches against 19.2 inches, showing for the winter quarter, in comparison with the similar quarter of the previous year, a deficiency of rain 1.52 inches, and of snow 57.1 inches.

With regard to the amount of cloud, the month may be divided as follows:—12 days cloudy, 9 days partially so. 8 clear.

The prevailing winds have been, during the early part of the month, N. E., and for the latter part W. and S. W.; the average velocity being about equal to the average, i. e., 8.6 miles per hour

Literary Notices.

PRACTICAL DAIRY HUSBANDRY—By X. A. Willard.—We have just received a copy of this long looked-for work, and though we have not yet had time for a careful study of its contents, and have not space for an extended notice, we are glad to give it early and cordial welcome, and to announce to those interested in dairying that this very complete and exhaustive treatise on all that appertains to modern dairy husbandry is now published, and that in its pages they will find practical information on all the details of this important branch of farming. There is no man better qualified to write such a work than Mr. Willard. He has made the subject his special study for years, has been practically familiar with the factory system of cheese and butter making in the best dairy region of New York, and has enlarged his inquiries and observations by extensive travel on this continent and in Europe. The work treats of dairy farms and fixtures; the management of grass land; dairy stock, their selection, care and management; milk; the history of associated dairying; English dairy practice; the composition of cheese; Voelcker's cheese experiments; cheese manufacture and butter manufacture; besides other matters connected with the subject. It is illustrated with plans and drawings of buildings, figures and diagrams of implements and apparatus, and portraits of dairy stock. The work is altogether most carefully prepared, elaborate, and complete, and will be a truly valuable guide to all who conduct dairy operations, on the moderate scale of the farm, or on the factory system. The publishers are D. D. T. Moore, of the *Rural New Yorker*, New York. The price is \$3 American currency.

BUTTER FACTORIES.—A brief but comprehensive treatise on American Butter Fac-

ories, written by Mr. X. A. Willard, which first made its appearance in the *Journal of the Royal Agricultural Society of England*, has since been re-published by the Wisconsin Agricultural Society, both in their annual volume of "Transactions," and subsequently as a separate pamphlet. As might be expected from the reputation of the writer, his treatise contains clear and practical information on the subject of butter-making by the associated system. It traces the history of the movement, describes the most improved system of operation and the best apparatus, and gives an interesting account of several manufactures that have grown out of these creameries or butter factories, such as the manufacture of skim-milk cheese and whey butter. A number of other matters connected with the subject are briefly noticed, and considerable space is devoted to an account of dairying in California, which Mr. Willard thinks well adapted for the successful prosecution of this branch of husbandry. We recommend the work to any one who is seeking for reliable information on the subject of which it treats.

AGRICULTURAL SOCIETIES.—We have not space to publish the names of officers of Agricultural Societies, but as soon as we can obtain from the Department of Agriculture a complete return of the Societies and Secretaries, we hope to publish a list of these, as heretofore.

SIMMERS' CULTIVATORS' GUIDE FOR 1872. The catalogue of garden and field seeds and bulbs, which Mr. Simmers, of Toronto, has once more published, is in advance of those of former years, in being more full, beautifully illustrated, and got up in the best style of typographical skill. The pamphlet contains, besides a very complete list of agricultural and horticultural seeds, useful practical directions for sowing and cultivating, which the novice and amateur will find of great service in directing the work of the garden. Mr. Simmers also makes up good collections of vegetable seeds, or assortments of flower seeds at reduced prices, particulars of which will be found in the catalogue.

FLEMING'S CATALOGUE.—Mr. James Fleming, of Toronto, has issued his catalogue of green house, bedding, and other plants for 1872. The list comprises the standard varieties adapted to this climate, and the most promising novelties. The collection of geraniums is especially full and complete. For the convenience of amateurs, the pamphlet contains the names of several carefully chosen collections, which are supplied at prices varying from \$2 to \$10, according to the number of plants. Mr. Fleming's long experience, established reputation, and facilities for raising the choicest plants both under glass and in the open air, are such as to command the confidence of the yearly increasing patrons of Canadian horticulture.

Horticulture.

EDITOR—D. W. BEADLE,

CORRESPONDING MEMBER OF THE ROYAL HORTICULTURAL SOCIETY, ENGLAND.

Ontario Fruit Growers' Association— Winter Meeting.

The Fruit Growers' Association of Ontario held their usual winter meeting in the City Hall, Hamilton, on the 8th February, 1872. There was a large attendance of members from many parts of the Province, from Kingston and Oshawa in the East, to London in the West, including nearly every intermediate point.

The President, Rev. R. Burnet, called the meeting to order, and after the reading of minutes of previous meeting, the members listened to the reading of an essay by P. E. Back, of Ottawa, on Practical Climatology. W. H. Mills, Esq., read a paper on Radiation and its relation to tree growth. These papers were listened to with marked attention, and referred, with thanks to the writers, to the Committee on Publication.

FRUIT IN MANITOBA.

Mr. Spencer, recently returned from Manitoba, where he had been largely instrumental in organizing an Agricultural Society, being present, the Chairman called the attention of the meeting to the fact, and requested him to take part in the discussions. Mr. Spencer very gracefully acknowledged the compliment, and being requested to give some account of the condition of fruit culture in Manitoba, made some very interesting statements. He said that scarcely any fruit was cultivated there, but there was an abundant supply of some of the small fruits found growing in a wild state.

The apple trees that had been introduced into Manitoba from more southern latitudes had all failed, and he believed the only way to secure trees sufficiently hardy to endure that climate would be to raise them from seed. There is a species of crab apple found growing there, but it is too austere to be of any use. Wild plum trees abound there, apparently of several varieties, and many of these are quite good, much better than the wild plums found growing in Ontario. Raspberries and strawberries are found growing wild in great abundance, and are of good size and excellent flavour. Wild grapes also are found there, and two varieties of cranberry—the Trailing or Marsh Cranberry, and the Highbush Cranberry, the latter in great abundance. There is also a species of hop found in a wild state, which is very fine. The vegetables that are raised there are of excellent quality, and would compare very favourably with those of Ontario. The cattle were also very fine; the grade cattle of the country were not much behind the thoroughbred of our own Province.

Some of the members suggested that a Fruit Growers' Association should be established in Manitoba, to whom this Society might send scions of the most hardy varieties of apple, &c., and expressed the hope that Manitoba might be in this way soon supplied with many valuable fruits.

OVERSTOCKING THE FRUIT MARKET.

Mr. A. M. Smith read a paper on the danger of overstocking the fruit market, for which he received the thanks of the Association, and the meeting proceeded to the discussion of that subject.

Mr. Osborne spoke of the disappointment which many had met with this season in sending fruit to England, in some cases not realizing enough to pay expenses of shipment and sale. This he believed to be owing to improper management, and remarked that good paying prices had been realized by those who put up their fruit in a proper manner, sorting it well, packing it securely, and forwarding it promptly. The fruit of Ontario was not excelled by that of any part of the apple-producing region.

Mr. Durand believed that the production of a large supply of good fruit in any part of the country would turn the attention of dealers to us, and so increase the number of purchasers that there would be a competition among the buyers that would secure to the grower good prices.

Mr. Clemens believed there was so large a part of the country but poorly adapted to the raising of fruit that the demand existing there would consume all the surplus fruit that could be grown in the fruit-raising districts.

Mr. Watson thought that his experience did not indicate any lack of demand, for when he was a boy good snow apples only sold for twelve-and-a-half cents, which now readily brought a dollar-and-a-half; and, reasoning from past experience, believed that the demand would fully keep pace with the supply.

Mr. D. Hammond thought that the quality of the fruit raised was constantly improving, and that this had a tendency to keep up the demand. In his locality there was a good fruit market.

Mr. Spencer, of Manitoba, remarked that fruit can now be sent to Winnipeg, via Duluth, without any land carriage. If gentlemen present thought the price obtained for apples in Glasgow to be remunerative, he would tell them that at Winnipeg, instead of selling for twenty-seven shillings and six pence, ordinary apples found ready sale at twenty dollars per barrel, and one had to be sharp to get them at that.

Sheriff Davidson stated that there was a time when at Berlin there was no sale at all for what little fruit was then raised there, but now the best prices were paid for good fruit. He mentioned also that he had found dry leaves an excellent material in which to pack apples.

Mr. Haskins complained that the Hamilton market was very poorly supplied with good fruit, that in fact the most of it looked as though the best had been taken out and sent to some other market, and expressed the hope that fruit raisers would at least be able to supply Hamilton with what fruit it needed.

Mr. Osborne exhibited to the meeting some fine bunches of Isabella grapes which he had kept, remarking that a considerable quantity of these grapes could be sold at this time, at prices varying from fifteen to twenty-five cents per pound, and said that if fruit-raisers would take the trouble to preserve those fruits that were abundant in the autumn, until this season of the year, they would secure good prices and be well repaid for their trouble. On being asked how he had preserved these grapes in such fine condition, he stated that he allowed the grapes to remain on the vine until they were perfectly ripe, then when they were quite dry he cut them from the vine, handling the clusters carefully by the stem, and laid them in shallow boxes, first placing in the bottom a layer of dry leaves, and upon these a layer of grapes. In this way he filled the box with alternate layers of grapes and leaves, closing with a layer of leaves. The boxes were then nailed up tight, and buried in the ground in a dry spot in the garden, not sinking them very deep, but ridging the earth up over them. This morning he had dug them out with a pick, the ground being frozen, and found the grapes to be all in as perfect a state of preservation as those he now exhibited. He had been led to try this method from finding grapes on the ground in spring, which had been covered during the winter with leaves, in a very fair state of preservation, and thought he would try the method he had just now described, and which in this instance had been so very successful.

Mr. Grey stated that one fruit dealer in Toronto had, last fall, imported over two tons of grapes, which he thought might as well be grown in Canada. For the past thirty years prices had been good in that market, and he believed they would continue so.

Mr. Woolverton thought it might be possible to exceed the demand for summer apples, but in winter fruits there was no danger.

Dr. Cross thought there was danger of growing too many of the small fruits. He had sent strawberries to Toronto for which he realized nothing, and last year was unable to sell his Bartlett pears, the dealer in the city telegraphing to him not to send them.

Mr. Caldwell thought the demand for first-class fruits was continually on the increase; of these the supply would never be too great.

Mr. Graham said that at Fort Erie there was a constant demand for fruit, especially for apples, pears, &c., (the Buffalo market

taking everything they could raise. Cider apples were bought up, at very good prices, for the manufacture of vinegar.

Mr. Allen, of Kingston, would discourage the production of any but the choicest varieties of fruit, and the sending to market of any but choice samples. A gentleman near Poughkeepsie, N. Y., sent annually to Europe several thousand barrels of apples, each apple very nicely wrapped in silver paper, and for these he obtains high prices. The wrapping of each apple secures a careful examination of each, and the rejection of all that are imperfect. He believed that the very production and sending to market of choice fruit of itself created a demand, and that the more abundantly consumers were supplied with good fruit the more they would consume.

DISTANCE OF PLANTING.

The second question was taken up after recess—At what distance apart should apple and pear trees be planted?

There was a very general expression of opinion, the burden of which seemed to be that about thirty feet apart each way was a suitable distance for apple orchards, but twenty feet each way was quite sufficient for standard pear trees.

Some of the members thought that some varieties of apple, those that did not make large spreading heads, such as the Early Harvest, Duchess of Oldenburgh, Northern Spy, &c., might well be planted at twenty feet apart each way.

Mr. Caldwell remarked that it was found to be desirable to plant trees much closer together in the northern districts—say in Minto, Garafraxa, &c.—than in the Niagara district. The trees in the northern sections suffered so much from cold that it was necessary to plant with reference to the peculiarities of that climate. When planted close together, and trained low, the trees protected each other, so that while a distance of forty feet each way would be very suitable in the warmer and more southern parts, in the northward he would advise planting apple trees not more than 25 feet apart each way. From his own observation he could say that long-stemmed trees in that part of the country were not the thing, and that those who had tried the experiment of low training and close planting had been much more successful.

Mr. Grey, of Toronto, fully coincided with Mr. Caldwell. The planters in the northern sections were enquiring for low-headed trees, having become convinced of the superiority of such trees for their locality over the old-fashioned style of long trunks. It might also be well, he thought, to plant the pear trees between the rows of apples.

Mr. Morden advocated planting the trees further apart than the distance recommended by Mr. Caldwell, on the ground that when planted so near together, the roots of the trees would soon interlace and exhaust the

soil of the requisite fertility. On this account he advocated planting trees at considerable distance apart. He spoke of an orchard which he had grown in the county of Hastings, where he had pursued the plan of wide planting and high training, and believed the orchard had been a success, comparing favourably with any.

Mr. Morse was partial to the quincunx form, planting the trees in rows thirty-three or forty feet apart each way, and then planting an intervening row by placing a tree in the centre of each square formed by four trees. He thought that in this way the desired protection was secured, while at the same time the distance was so increased between the individual trees that no evil effects would arise from interlacing of roots or branches.

Some remarks were made upon the correspondence existing between the form of the top and the form of the root, some maintaining that those trees which formed a broad spreading top also threw out wide-spreading roots, while those having a fastigate top sent their roots more perpendicularly into the earth. To this it was replied that as our trees were grafted upon some seedling stock, it was probable that the roots would assume the style of growth natural to the seedling stock, and not that of the inserted grafts. This led to some discussion upon the influence which the scion exerted upon the growth of the stock. Some instances were mentioned where it was manifest that the root growth was affected by the scion, but the instances that are well authenticated did not seem to be sufficiently numerous to admit of any general conclusions on this point.

PLANTS FOR DISTRIBUTION.

The meeting having been asked to state what trees or plants the members desired should be sent out for trial, it was suggested by Mr. Ball, of Niagara, that it would be well to give some nut-bearing trees a trial, such as the Filbert, which he believed had done well in some localities.

The President remarked that he had succeeded in raising them at Hamilton.

Mr. C. Arnold, of Paris, stated that he had grown the English walnut (*Juglans Regia*) and that last year they ripened nicely.

Other members remarked that they had succeeded in growing the tree, but not the nuts.

The President then announced that any suggestions with regard to the kind of tree to be distributed hereafter would be acceptable from any member, and that suggestions might be addressed either to the President at Hamilton, or to the Secretary at St. Catharines.

MEETINGS.

The places of holding the succeeding general meetings of the Association for this year were then discussed, and it was decided that the summer meeting should be held in

Guelph, at the call of the Secretary, and the fall meeting in Toronto. The annual meeting for the election of officers, &c., will be held in the city of Hamilton during the week of the Provincial Exhibition.

FORMING HEADS OF ORCHARD TREES.

The third question was taken up—At what distance from the ground should orchard trees be made to branch?

Mr. Martin favoured low heads. He thought these shielded the trunks of the trees from the heat of the sun in summer, and that on such heads the fruit ripened earlier and was more easily gathered.

Mr. R. N. Ball thought that six feet from the ground was a very suitable height, answering well for all purposes. The ground could be cultivated under such trees, the fruit could be conveniently gathered, and when the trees acquired size they sheltered each other sufficiently.

Mr. Caldwell advocated low heads as necessary in the colder sections, and thought that ploughing and deep cultivating in the orchard was very injurious to the roots; also that when the trees branch low the weeds are unable to make any luxuriant growth, being too densely shaded by the tree tops.

Mr. Morden was opposed to low heads believed that in practice it only amounted to growing three or more trunks instead of one. He thought, from his own experience in the county of Hastings, that there was nothing gained by training trees low.

Other gentlemen stated their views, the majority of whom were in favour of forming the head at about six feet from the ground. If the branches came out lower than this, the weight of fruit and leaf soon bent them to the ground, so that great inconvenience was experienced from these pendent branches sweeping the ground. There is a just mean in this matter, which may be varied by the habit of growth of the particular variety, or by the peculiarities of climate and exposure to winds.

The discussion was enlivened at this stage by the reading of a carefully prepared paper by A. Macallum, M. A., on "Some of the meteorological conditions that obtain at Hamilton." His essay was received with thanks, and referred to the Committee on Publication.

CROPPING ORCHARDS.

The fourth question was then considered, namely—Should any crops be grown in the orchard?

Mr. R. N. Ball thought it was well to cultivate the orchard while young with crops which did not exhaust the soil, as peas, beans, &c.; but that after the trees have come fairly into bearing, no crop whatever should be grown in the orchard.

A large number of members expressed their opinions, but the prevalent opinion was strongly in favour of growing only such crops as those mentioned by Mr. Ball, or other

hoed crops, as turnips, &c., while the trees are young; and that in no case should crops of grain, as rye, wheat, &c., be grown in the orchard.

VARIETIES OF APPLE—WHAT PROPORTION?

The fifth subject was—In planting orchards, what should be the proportion of summer, fall, and winter apples, in every hundred trees?

Mr. R. N. Ball would plant all winter fruit, if planting for market. Would plant no more summer and fall fruit than was needed for home use.

Mr. Arnold thought that some summer fruit might be safely planted for market, such as the Benoni and Summer Strawberry. There was but little demand for fall apples. At that time grapes, pears, and sometimes peaches, filled the markets, and when these could be had in abundance the demand for apples would be light.

Mr. Allan thought that by far the larger part should be winter sorts.

Mr. Caldwell advised that two-thirds of the apple orchard be of winter varieties, the other third to be made up of summer and fall sorts. This arrangement was about what each required for family use, and would meet the requirements of the market.

Mr. Watson remarked that for six weeks in the fall, after the early apples were gone, there were no good table apples to be had in the Toronto market at any price, and that good dessert apples would there command a ready sale.

Mr. Smith thought that orchardists had made a great mistake in confining their planting so exclusively to winter varieties; that there was a considerable demand for summer apples, much greater than the present supply.

Mr. McGill would plant one quarter of his orchard with summer apples.

DECAY OF BARK ON APPLE TREES.

Mr. Morden enquired what was the cause of the loosening and decay of the bark on apple trees? He said that this decay of the bark occurred on the trunk and main branches, and generally on the south-west side of them. It sometimes extended for a considerable length on the trunk of the tree, and even below the snow line. After a time the bark becomes discoloured at the affected place, gradually becoming dry, dead and black, quite down to the wood.

Mr. Beadle remarked that he had noticed this disease in his own part of the Province. It was usually in the form of a black spot, of variable size, sometimes on the trunk of the tree, sometimes on the large branches, and always on the south and south-west side, where the surface was exposed to the direct rays of the sun. When the tree inclined to the north east, or the branches extended horizontally to the north or north-east, and were exposed to the full power of the sun, there these injuries to the bark were found. He had never

seen them on those branches which extended southward, or that grew nearly upright, nor on the trunk of a tree that stood perpendicularly, or that leaned towards the south or south-west. When the branch of the tree or the trunk inclined so that the sun's rays fell on them at right angles to their surface, or nearly so, then these black spots appeared. He believed they were due to the action of the sun, perhaps the joint result of frost and sun-heat. It might be that the mischief was done in the later days of winter, when the sun has acquired considerable power, and the nights are very cold with severe freezing, and the air remaining frosty during most or all of the day, while the unclouded sun is shining with full power on the bark of the tree. He had never seen any such injury on any other side of the tree, nor on any trunk of a tree not thus inclined, nor on any where the trunk or limbs were screened from the sun's rays. An examination of the injured spot revealed no cause, but presented an appearance as though the injury had begun in the inner bark, next to the wood of the tree. He suspected that a careful examination of the trees spoken of by Mr. Morden would show that they were thus exposed to the action of the sun, and that the only remedy was protection in some way from the sun's rays. The fact mentioned by Mr. Morden that he had never seen the Northern Spy thus affected, strengthened Mr. Beadle's views, as this tree is remarkable for its perpendicular habit of growth, in both trunk and branches.

Mr. Allen was of the opinion that this affection was due to solar heat. It was well known by woodmen in the neighbourhood of Kingston that forest trees decay chiefly on the south side.

The President had seen this disease, but never where the trunks of the trees were shaded. Apricots and nectarines will thrive well on the shaded side of the house, but fail when planted on the sunny side.

Mr. Bagwell had caused a new wood to form over these injured spots by carefully cutting all the dead parts away, quite down to the wood.

The President had also succeeded in causing such a growth, and believed it had been greatly promoted by covering the wound with a thick plaster of mingled clay and cow-dung, which had shielded the injured part from sun and air.

Considerable discussion ensued as to the action of frost and sun upon the cells when filled with sap. Intense frost, crystallizing the sap, and so causing it to expand, might rupture the cells in which it was contained. And perhaps when not ruptured by the crystallization of the sap, but considerably distended by this cause, the sudden increase of heat from the sun's rays might so expand the air contained in the cell, before it had melted the sap, as to rupture the walls of the cell, and in this way cause the destruction of the tissue.

MR. BEADLE'S WORK ON CANADIAN HORTICULTURE.

Mr. Morden introduced the following resolution, seconded by Mr. Townsend:—“That this meeting is much pleased to learn that the Secretary of this Association has

prepared a work on fruit culture and gardening in Canada.” He supported this motion by stating that a Canadian work of this kind was very much needed, and he believed that Mr. Beadle's forthcoming work would do much to advance the interests of fruit growers in this Province.

Mr. Allen remarked that it was of the greatest importance to have such a work written by a Canadian, as all the American works fail to give the information most needed by Canadians.

Mr. Beadle thanked the meeting for their kind expressions of confidence in a work which they had not seen, and trusted that their expectations would not be wholly disappointed. He requested the members who might take the trouble to look into the book to make a note of any omissions that might present themselves, and kindly favour him with their suggestions; for should such a thing happen as that a second edition should be called for; he desired to make it in all things as complete as possible. It had been written for Canadians from a Canadian standpoint, and he should be most happy to receive from them any suggestions that should enhance its usefulness to his fellow-countrymen.

SUBJECTS FOR DISCUSSION.

The following subjects were suggested for discussion at a future meeting:

What system of drainage should be adopted for orchards?

What is the cause of trees being raised out of the ground during winter?

Is mulching beneficial?

What is the best time for pruning?

Is it profitable to the country to raise grapes for wine?

What is the best method of cultivating indoor grapes?

* DISPLAY OF FRUIT.

There was a very considerable collection of fruit, principally apples, but including some nice pears and well kept grapes, laid upon the table. The Committee on Fruits made a careful examination of them, and reported thereon to the meeting. This report will be published in the annual transactions of the Association.

The meeting broke up at a late hour of the evening. Due notice will be given to members, by circular, of the time of holding the summer meeting at Guelph.

Salt as a Garden Manure.

Salt as a manure has long been applied to garden and farm crops. Its principal use, however, in gardens, has been in the destruction of weeds, for it is well known that in large quantity it is destructive to vegetable life; hence it is employed for scattering over walks, or they are watered with a strong solution of salt, to destroy the weeds and moss appearing on them. On the other hand, in moderate quantities, its application is attended with very satisfactory results.

Although salt, or saline matter, enters into the composition of all plants, it is evident, from the experiments made by Dr. Voelcker, that the application of a quantity of salt which proves beneficial to one kind of plant will be injurious to another. This he demonstrated by watering plants with water holding varied proportions of

salt, and it is a remarkable fact that to most of the crops of the horticulturist even in very strong solutions it did not prove injurious. Even at the rate of twenty-four grains to a pint, it "decidedly benefited radishes, onions, lentils, and cabbages," but "plants of *Andropogon odoratum* (sweet vernal grass) were killed by a solution containing twenty-four grains of salt per pint, after the lapse of one month." "Grasses are affected by salt more readily than any of the plants experimented upon." We may, therefore, conclude that salt in a certain quantity is beneficial to most vegetable crops, for we have radishes or raphanese, crambe (sea-kale), Brassica, including cauliflower, broccoli, borecole, and turnips; Liliacee, including onions, leeks, and asparagus, and, I may add, many of our most beautiful bulbous plants, and those with succulent leaves. Dr. Voelcker remarks, "Bulbous plants and plants with succulent leaves, are especially benefited by the application of salt;" also lentils, peas and beans, and, may we not safely conclude all the order Leguminosae—pod bearers, as the dwarf kidney bean and scarlet runner? Dr. Voelcker mentions the thistle as being benefited by salt, and we may consider the globe artichoke and cardoon to be equally so. Mr. Johnson completes the list on the authority of Saussure—viz., beet root, rhubarb, potatoes, Jerusalem artichoke, carrot, probably also the parsnip and celery, as these two belong to the same natural order; so that salt is beneficial to every kind of vegetable crop.

Of the value of salt there can be no doubt, in fact, from its application this season, I have come to the conclusion that to the gardener it is one of the most valuable of manures. For some fruit trees it seems not to be so desirable as for others—for instance, the apricot, apple, and cherry; but the peach, the pear, and the plum, are benefited by it.

I need say no more respecting its value, but will proceed to its application, of which there are several modes, but I shall only name two—namely, alone and mixed with other substances.

Salt applied alone.—As a top dressing salt may be applied to every kind of kitchen-garden crop at the rate of ten bushels per acre, or half a gallon per rod. It may be given at the time of sowing, putting in, or planting the crop, but I consider it most advantageously applied when crops from seed have arrived at the thinning stage; to "put in" crops, as potatoes and Jerusalem artichokes, it may be applied when they are well above ground, and before the first hoeing, to planted crops as soon as they are again rooted. Ten bushels per acre I think a sufficient quantity for a general dressing. Some crops will bear much more salt than the quantity named; for instance, asparagus is not overdone at 1 lb. per square yard, or 43 cwts. per acre, and the best time to apply it is when the heads are appearing, and again early in May.

Cabbages may have repeated applications

of salt, and so may most of the cabbage tribe. Cabbages planted in September to stand the winter may in October be dressed, and again in March, broccoli and winter greens after planting, and in October or early in November; whilst for most other members of the same family one application will be sufficient.

The value of salt as a manure may be estimated principally from its entering into the composition of plants; but it possesses other values—one being that it is destructive to predatory vermin as the slug, and is found a complete cure for grub in turnips, and club or ambury in the other representatives of the cabbageworts. It has also another most valuable property—that of protecting plants from injury from cold.

Salt mixed with other substances.—This, I believe, is the most satisfactory method, for all soils require to be constituted of several ingredients for the production of healthy plants. Gardens long enriched with stable or farm-yard manure in time become sick or worn out. Lime dressings have been advised, and are indeed very beneficial, often more so than dressings of stable manure.

Lime does good, but it is known that "when salt is mixed with moist earth and lime, a considerable quantity of carbonate of soda and chloride of calcium is produced, owing to the salt being partially decomposed, the chlorine of a part of the salt uniting with the lime, whilst carbonic acid supplies its place, forming carbonate of soda. This having the property of combining with silica and rendering it soluble, may prove beneficial to plants by supplying them with that essential article of their food."—*Gardener's Assistant*, page 121.) Now, if we dress ground for onions, one part with lime, another with salt, and a third with soot, the ground having in autumn been manured in the usual way, we find there is little, if any, difference between that limed and the part sown without the lime dressing—the produce is not materially greater; but that dressed with salt produces more than the limed part, and the parts dressed with soot more still. This would show soot to be the most fertilizing of the three, but in none of these cases is the dressing so good as when the whole are mixed—that is, the lime, salt, and soot, which afford much the better crop of onions. A bushel of lime, soot, and salt mixed, and sown broadcast over the ground intended for onions and carrots prior to putting in the seeds, is good against the maggot or grub which infests these vegetables, and is sufficiently stimulating. It is also an excellent dressing for ground in March intended to be planted with every kind of vegetable crop. It is valuable both as a manure and as a preventive and destroyer of insect pests.

Every one knows the value of guano as a manure. It is considered to contain most, if not all, the constituents, required by vegetables. I am persuaded, however, though it may be highly fertilizing, that it is not so beneficial by itself as when mixed with salt, one of the inorganic elements that in guano is reckoned of very inferior value. In some guanos there is a considerable quantity of lumps, consisting for the most part of common salt (chloride of sodium). In the best samples of guano the chloride of sodium is about 3.00; of a sample consisting of hard lumps the chloride of sodium has been found

as much as 49.70. Ordinary samples of Peruvian guano contain 5.00 of alkaline salts, potash and soda. This quantity may be sufficient for cereals, but there is not evidently enough salt for kitchen garden crops, for I find crops dressed with guano alone do not produce so well as those dressed with one part salt to two parts guano, and at that rate 1 cwt. of salt to 2 cwt. of guano answers for every description of vegetable, but it should not be given in dry weather, for all the leaves upon which it falls it scalds or leaves a white blotch.

I am convinced that guano and salt in the proportions named will prove to be the manure of manures for vines, especially those that have a tendency to mildew; also for peaches, which never do so well as near the sea or within reach of its influence. It will also be good for all plants subject to mildew. Salt and lime are the most destructive of all to fungoid life.

Ferns are speedily destroyed by guano and salt, but it is remarkable that if freestone be sprinkled with it that the stone in a few days becomes quite green from the growth of moss; hence it may be of value in newly formed rock-work.—G. ABBEY, in *Collage Gardener*.

On Practical Climatology.

One of the main objects of climatology to the Farmer, the Gardener, and to the Fruit Grower, is the knowledge of what fruits, grains and vegetables, may be grown with profit in a certain locality without the trouble and loss of planting a large quantity of some valuable tree or plant, and having them destroyed by frost, heat, or wet, or some change of weather or temperature. A knowledge of this nature in the Ottawa valley would be of the greatest utility, as it is the most unfortunate place I know of with regard to its supply of fruits. There had been little or nothing done here in the way of putting out fruit trees—or if there had, they (the trees) had not succeeded—until a few years ago, when an agent came from a Rochester nursery, and a new state of things is now beginning to dawn upon us; but we are still groping in the dark, as we do not know what to plant, having to test almost everything. The agent mentioned made such a good thing of his visit that he now regularly comes to this city two and three times a year, taking orders, supplying, and having sales; but I am informed that he is to have a rival in the shape of some nurserymen brothers named Bailey, from Lyn or Kingston, who are going to establish themselves here in the spring. This is much desired, as plants raised on the spot, or even brought from the frontier, are more hardy than those coming from so far south as New York State. Another American agent met me a few days ago, and asked what fruits would stand this northern climate. I told him plainly I did not know, that it depended much on the care given after planting, and a good many other things. I knew of one gentleman who had a few pears, some green gage plums, and two or three varieties of apples; another who had several trees of Fameuse; that there were also a good many

varieties of grapes grown, but most of the people who had tried the finer sorts of apples and plums had failed, but from what cause I was unable to say, for, although intelligent men, when asked the cause of their failure, they were unable to give a satisfactory answer, but principally laid the fault on the climate and the borers. There are some fruits, however, that no one fails in here who cultivates them well, and this list comprises the red, white and black currant, the American Seedling gooseberry, the strawberry, the black raspberry, the crab of all kinds, and the early varieties of grapes, if the frost does not take them before ripe in the autumn. He told me he had supplied several parties with trees to test, so that he might introduce them at some future day.

I regret to say that a blight has been observed the last two years on the Transcendent crab. It strikes the top bows, and appears to spread downwards. It affects, as far as I have noticed, only the oldest trees; it begins to show itself at the time the fruit is about half grown, when the leaves die and the fruit shrivels. Several of my acquaintances have asked me what it is caused by, and the remedy, but I neither know the one or the other. I have advised sawing off the limbs below the part injured, but do not know if this advice has been followed, or if it has proved a check to the disease. I fancy it must be like the blight on the pears I see so much about in agricultural papers. Perhaps you, Mr. Editor, can tell the cause and the cure? My trees are yet too young for it to show itself. The red and white raspberry do well when bent down, and a weight in the shape of a slab laid on them to keep the tips below the snow. Brinckle's Orange stands remarkably well protected in this way, but the Philadelphia is perhaps the hardiest of the red kinds, although all do well if bent down as before stated. All the varieties of grapes require winter protection, and the best and easiest to apply is earth. This substance and snow is found to equalise climate most effectually if applied properly, and anything that can be thus protected may be grown here if it will only ripen its wood and fruit in our short seasons.

It will be noticed that the effects of climate on plants is chiefly regulated by *temperature* and *moisture*, the amount of degrees of sun heat and rain fall during the *growing* season; if the plants can be kept dormant and sufficiently warm to preserve life, the rest given during winter only gives renewed and active vigour on the outbreak of spring. By actual thermometrical test, we have more sun-heat in Canada than they have in the southern parts of France, hence we ought to be able to raise here all the sub-tropical fruits if safe winter protection could be given—the true test of climatal adaptation being the ability of the plant to ripen its seeds and its young wood. Latitude does not always indicate temperature, and for this reason this arbitrary rule has been modified by lines called

isothermal, these are drawn through points whose temperature gives the same average heat throughout the year. By looking at a chart of the temperature of the earth's surface, it will be observed that the line of perpetual frozen ground stretches across this chart in a very irregular manner, and that the part *nearest the Equator* touches the continent of America at Labrador, north of Belle Isle Straits, and from thence runs parallel to the Equator nearly as far as Quebec; it then bends gradually upwards, and on the Pacific coast it is 20 degrees, or 1,200 miles, further north than it is on the Labrador coast. Temperature is also regulated by hypsometrical or altitudinal height, as in the case of mountainous regions; but with this we have little to do in Canada, as our surface is generally flat. But lest any of your readers should have a boulder of unusual size in his town lot, perhaps it may not be uninteresting to state that a height of from 300 to 400 feet, it is estimated, makes a difference of 1° Fahrenheit. The yearly isotherm of 50° Fahrenheit passes through latitude 42° 30' in the east of America, 51° 30' in England, 47° 30' in Hungary, and 40° in Eastern Asia. It will therefore not be difficult to perceive that places having the same *mean* temperature may have a very cold winter and a very warm summer, as we have in the Ottawa valley, greater extremes being felt here than in any part of this Province; but by warding off the cold of winter by protection, and taking advantage of the great summer heat, fruits may be grown here that are cultivated in a much warmer latitude, because an artificial isotherm is thus formed. By actual experiments made in Scotland, it was found that the frost there seldom or never penetrated further than one foot into the ground, and that the mean temperature, after striking off the decimals at that depth for the succeeding months of one year, beginning with January, was 33°, 33°, 35°, 39°, 44°, 51°, 54°, 50°, 51°, 47°, 40°, and 35°. At the depth of two feet the thermometer stood the same for months at a time, and at eight feet deep the lowest marked during the year was 42°, and the highest 50°.

Some plants require a long winter of repose and a short, hot summer; others require a dry season, followed by a wet one; whilst others again do best in a moderate temperate climate throughout the year; but it is absolutely necessary in determining the limits of the various products of the vegetable kingdom, to know the mean monthly and the mean daily temperature whilst vegetation is active, and to determine this it is necessary to know the number of days required by a plant to produce its leaves, flowers and fruits, and to estimate the mean temperature during that period.

The furthest north that vegetables are grown for food is at Hammerfest, lat. 71°, there potatoes, turnips, carrots and cabbage, succeed.

I notice in the Horticultural Department of THE GLOBE, of the 2nd of February, speaking of the Lawver apple, the statement that "It also blooms late, and thus escapes *spring frosts*; if the tree be sufficiently hardy to endure the winter of our northern localities, this habit of blooming late will be of very decided advantage." I must inform the author of this paragraph that we have no late or "June frosts," as they are termed in the west, in this "northern locality," so that his remarks do not apply.

P. E. BUCKE

Ottawa, February 5, 1872.

The Fruit Growers' Association of Ontario.

We are apprised by circular that another distribution of fruit trees is to be made this spring among the members of this Association, for the purpose of testing their adaptability to the varying conditions to which they will be exposed in the different sections of our Province, and this time members are to have a choice of two out of five carefully selected by the Directors. They are as follows.—Standard apple, *Wagner*; standard pear, *Beurre Clairgeau*, plum, *McLaughlin*, peach, *Hale's Early*; grape, *Arnold's Othello*. We deem this selection an admirable one. The Wagner apple is a handsome winter fruit, with a close-grained, white flesh, and fine flavour; it also bears early and abundantly. The Beurre Clairgeau pear is well known to all lovers of this choice fruit, is one of the largest and handsomest of pears, and of good quality, and is also an early bearer. The McLaughlin plum is a very beautiful dessert fruit, of first quality; and the same may be said of Hale's Early peach, which latter promises to be hardier than most other peaches, and will probably prove itself well adapted to many of the southern portions of Ontario. It is but just that Canadian seedlings of recognized merit should also have an opportunity of being fairly tested, hence the *Othello*, one of the most promising of the seedlings of Mr. Chas. Arnold, of Paris, Ont., has been placed on the list. This grape is a very fine one, large, black, and of good flavour, and is said to ripen with the Concord.

Each member of the Association will be allowed to select any two of these, which will be forwarded free of expense. This method of thus making the whole of Ontario a grand experimental field for the testing of new and untried fruits, is worthy of all praise, and its approval by the public is manifest in the increasing interest taken in the working of the Association, as well as in the large accession of membership. The members now number nearly one thousand, having been trebled within two or three years. The chief object of this Association, besides that already referred to of testing new fruits, is to disseminate all the useful information procurable in reference to fruits especially adapted to our climate, both for amateur as well as for profitable market culture, and also everything relating to their growth and management; and thus to guide in a safe track the efforts of all lovers of fruit in striving to provide for themselves and their families an abundance of these rich gifts of nature.

The annual report of the Association, which is sent free to all members, is exceedingly valuable, containing as it does the opinions and experience of so many professional and amateur fruit growers on topics of interest; this is now in the printer's hands, and will be shortly issued. Doubtless there will be a large addition to the ranks of the Society this year, as soon as the liberal distribution determined on becomes known. The membership fee, which is the only qualification required, is one dollar, which may be remitted direct to the Secretary-Treasurer, D. W. Beadle, of St. Catharines. —*The Free Press*.

Training of the Chinese Wistaria in a New Style.

This is a beautiful runner, popular everywhere. It is made to run on trellises—grows very rapidly—and its long racemes of blue flowers are beautiful. Florists have discovered a process to make this plant grow in tree form so as to support itself. This is the plan:—"A young plant is first trained to a stake six feet high. When it reaches the top it is headed off. The second year, or as soon as it is stiff enough, the stake may be taken away, and the young plant will support itself. It will never make running branches after this, as it expends itself in the effort to overcome gravitation. A beautiful umbrella head is formed, with hundreds of drooping flowers in spring."—*Wilmette Farmer.*

Grapes at Owen Sound.

I had a fine display of grapes last year, especially Rogers' 3, 4, and 13, Concord, Creveling, Clinton, Isabella, and a large white one which I cannot name. Iona, Isabella, and Delaware do not seem to thrive with me. I am sorry to say the greater part of the grapes were cut down by a very early frost on the night between the 17th and 18th of September. Nearly all within eighteen inches of the ground were saved. No doubt the protection of the leaves and the heat from the warm ground were the cause of this.

Of pears, Beurre Clairgeau (magnificent), Grashin, and Seckel, were the best. Beurre Easter was unshapely and gritty. Had a few fine quince. Cherries and peaches do not thrive very well. Plums were superb. Apples all good except the Baldwin; it does not seem to get on in this region. My fine trees have all come to grief. I had a fine display of roses and shrubs last season.

SARAWAK.

The Lesson of the Garden.

The most humiliating thing to me about a garden is the lesson it teaches of the inferiority of man. Nature is prompt, decided, inexhaustible. She thrusts up her plants with a vigour and freedom that I admire; and the more worthless the plant, the more rapid and splendid its growth. She is at it early and late, and all night—never tiring nor showing the least sign of exhaustion.

And the weeds are not all. I awake in the morning, and a thriving garden will wake a person up two hours before he ought to be out of bed, and think of the tomato plants, the leaves like fine lace-work, owing to black bugs that skip around, and can't be caught. Somebody ought to get up before the dew is off (why don't the dew stay on till after a reasonable breakfast?) and sprinkle soot on the leaves. I wonder if it is I. Soot is so much blacker than the bugs, that they are disgusted, and go away. You can't get up too early if you have a garden. You must be early due yourself if you get ahead of the bugs. I think that, on the whole, it would be best to sit up all night, and sleep day times. Things appear to go on in the night in the garden uncommonly. It would be less trouble to stay up than it is to get up so early.—*My Summer in a Garden.*

Depth to Plant Seeds.

The proper depth to plant seeds is a question of considerable importance, and one which, like many other similar questions relating to plant growth, cannot receive a definite answer that would be of general or universal application. In dry sandy soils, situated in dry climates, a deeper covering will be required than would be judicious where both soil and climate indicate the reverse of these conditions. For instance, it has been shown that peas continue longer in bearing condition, on sandy soils, when sown at a depth of 6 inches, than they do when placed nearer the surface; and it is said that the Indians upon the table lands of the Colorado plant corn 10 to 12 inches below the surface, with the best results; but if planted with only 1 or 2 inches of covering, the crop fails. Seeds also vary in their ability to penetrate depths of soil in germinating. Leguminous seeds, and some of the largest seeding gramineae, can be planted deeper than those of a lighter character. It has been given as a general rule that all seeds germinate most speedily when covered with a depth of soil equal to their own thickness, and where the constant presence of sufficient moisture for germination can be maintained; this rule is, perhaps, as nearly correct as any that can be given.

Growing Violets.

The violet, says a correspondent of the *Gardener's Monthly*, has ever been one of my favourite window flowers. In former years, when brought into the house from the cold pits to flower, they were placed at once in the sitting-room window, where we had a regular temperature of about sixty degrees; but the stalks were always slender and the flowers rather small. Thinking it was too hot, I kept them other years in a cooler room, where the heat might perhaps not range over between forty-five and fifty-five, and the result has been much healthier looking plants and finer foliage. Besides this, they were not much behind what I have had in warmer places in other years. I am sure they want very little heat to do well.

Another fact: I have learned that a manure water made of rotten wood is a capital fertilizer for them. Once I thought as shady places were the natural places where violets grow, rotten wood would be a good thing in the soil, but they sometimes get sick in it; but the liquid of steeped wood does not seem to have this effect; on the other hand, a lively green is the result. We never water them except when they show signs of drying; in our room this is about twice a week. This may not be new, but it is true.

The hot-beds should now be set to work without delay.

PREVENTING IRON GARDEN TOOLS FROM RUSTING.—It is said that if iron garden tools are laid for a few minutes into a solution of soda, they will be protected from rusting for a long time, even if exposed continuously to a moist atmosphere.

Horticultural Hints.

1. When fruit trees occupy the ground nothing else should—except very short grass.
2. Fruitfulness and growth of the tree cannot be expected the same year.
3. There is no plum that the curculio will not take, though any kind may sometimes escape for one year in one place.
4. Peach borers will not do much damage when stiff clay is heaped up round the tree a foot high.
5. Pear blight still puzzles the greatest men. The best remedy known is to plant two for every one that dies.
6. If you don't know how to prune, don't hire a man from the other side of the sea who knows less than you do.
7. Don't cut off a big lower limb unless you are a renter, and don't care what becomes of the tree when your time is out.
8. A tree with the limbs coming out near the ground is worth two trees trimmed up five feet, and is worth four trees trimmed up ten feet, and so on until they are not worth anything.
9. Trim down, not up.
10. Shorten in, not lengthen up.
11. When anybody tells you of a gardener that understands all about horticulture and agriculture, and that can be hired, don't believe a word of it, for there are no such to be hired. Such a man can make more than you can afford to give him; and if he has senses enough to understand the business, he will also have enough to know this.—*Selected.*

Notes on Raspberries.

We have fruited ten kinds, and make the following comments:—

Doolittle and Miami, both abundant bearers, and we think leave nothing further to be desired in black caps. Should be planted about equally, for home use, but for market plant mostly Miami, as it is a week later and thus comes less in competition with Southern berries.

Of the red, Kirtland gave us our first berries; an abundant crop of rather small, firm berries, of pleasant but not high flavour; canes perfectly hardy; needs a deep, rich soil to give both cane and berry more size.

Hornet gave us the largest berries; very firm, but of second quality. Franconia and Brinckle's Orange both productive and excellent. Fastolf very fine in quality; runs terribly to suckers, and yet makes but feeble canes. Clark, quite productive; very best in quality; good size; too soft for distant marketing; suckers quite too abundantly except where plants are in demand. The last five named must have winter protection, and are all much improved by heavy summer mulching.

Catavissa will not stand a severe winter, and we have heretofore in the spring cut the canes to the ground (the roots never injure), and only had from it an autumn crop.

Philadelphia is loaded with fruit as usual; medium size; second quality; too soft for distant marketing, but in quantity making up for all other defects. In five years with us it has *never winter killed*, and never failed to be *loaded down* with fruit; does not sucker badly.

Ellisdale after two years trial, and Ohio Everbearing after three years, we have thrown out as too unproductive to pay ground rent — *Western Rural*.

THE LOVE OF RURAL LIFE.—The habit of finding enjoyment in familiar things, that susceptibility to Nature which keeps the nerve gently thrilled in her homeliest nooks and by her commonest sounds, is worth a thousand fortunes of money, or its equivalents. — HENRY WARD BEECHER.

The principal value of a private garden is not understood. It is not to give the possessor vegetables and fruit, that can be better and cheaper done by the market gardeners, but to teach him patience and philosophy, and the higher virtues—hope deferred, and expectations blighted, leading directly to resignation, and sometimes to alienation. The garden thus becomes a moral agent, a test of character, as it was in the beginning. — CHARLES DUDLEY WARNER.

NEW TEA ROSES OF 1871.—Eugene Verdier's list of new Tea Roses, which he most strongly recommends, are nearly all of some shade of yellow. The only exceptions are Belle Maconnaise, large, double, pale rose, and Madam Berard, bright rose. We have already a sufficiency of yellow Tea roses; a tea-scented rose, of some brilliant colour, is what is now wanted.

THE GREAT BANANA OF ABYSSINI *Musa, Eusete*.—This is represented to be a very great acquisition for summer out-door gardening, being sufficiently hardy to grow well in the open air in summer, and requiring to be wintered only in a cool house. The leaves grow to a length of from eight to ten feet, are of a beautiful dark green, with a bright crimson mid-rib, which thus forms a most beautiful contrast. The plant attains an average height of twelve feet.

LIMING FRUIT TREES.—The periodical liming of fruit trees is generally considered as serviceable, especially in keeping down the ravages of the insects which find their home in the fissures of the bark. It is also important that the operation should be likewise extended to the main branches. For the purpose in question, white-wash has generally been used, causing a decided whiteness of the tree, which is objected to by many on the score of the unsightly appearance and the readiness with which the lime becomes detached. It has been shown, however, by experience, that the same beneficial effect results from the use of colourless lime-water, which every one knows how to prepare with unslaked lime, and which, when settled and become clear can be poured off and used as above indicated. In this way repeated applications can be made without affecting the appearance of the tree. — *Utira Herald*.

Apiary.

Experience with Bees.

The following letter from Mr. Maitland, which we give in full, we think will be interesting to every bee-keeper. We hope others will follow his example, and give through this journal a short but faithful account of their experience from time to time. J. H. THOMAS, Esq.,

SIR,—Having received the first number of the CANADA FARMER for 1872, and read the "Review of Bee Culture during the past season," I am induced to make a few general remarks.

The past season has been one of the most unfavourable I ever experienced for the honey bees in this section of the country. Many old stocks will not winter through, and many young ones will fare still worse.

One of my neighbours smothered eleven hives of black bees last fall. He obtained about 50lbs. of honey altogether. The bees were in common box hives. No doubt, you will say as I do, what a waste has taken place, not so much on account of the bees as the combs; for had the frame hives been used, the empty combs could have come into use next season, by being properly cared for, and the loss of last season would thus be redeemed.

I managed to Italianize all my stocks, or nearly so, from the one queen bee I received from you. I had forty-six stocks last fall, which I had weighed; twenty of which not coming up to the required standard to winter through properly, I made ten good heavy stocks from them, by simply putting every two together, first taking away one queen. I use frame hives altogether, as by their use many things can be done with bees which it is impossible to do with any other kind of hive. I have nearly enough empty combs to fill ten hives for next season's operations, saved from those I doubled up, which will enable me to take advantage of the honey season.

The Italian bees still maintain their reputation. I think they make about one-third more honey than the black or common bees.

I, too, have practised artificial impregnation, with a good deal of success. I fully believe in the system; but still, once in a while there is a failure. I will give one proof of the system turning out all right. In 1870 I placed a young Italian queen, newly hatched, into the impregnating box along with some workers, where they remained until the fifth day, when I removed the working bees, putting in their stead six or seven pure drones, which I left thirty-six hours. At the end of that time I took out the young queen, and took her about five miles from here, where no other but black bees are kept, and introduced her into a black stock. Now for the result: In the month of October, 1871, I visited the locality and examined the bees. I found that the hive in question had swarmed naturally, throwing off as beautiful a stock of pure Italian bees as I have among my own; also the young queen in the old hive was producing pure bees likewise.

I am certain the young queen never flew before I took her away. I saw two drones lying dead at the end of thirty six hours on the bottom of the box.

I intend to experiment still further with the queens next year. It may be that we do not allow the queen to be old enough before putting in the drones. If we were to adopt the eighth day of her age instead of the fifth, it might answer better. Time will tell.

I have not known any cases of foul brood in this part. Is the cause and origin of the disease clearly known? I would like to guard against it in every possible shape. A timely hint would confer a favour on bee-keepers in general.

Do you manufacture honey extractors for sale?

Will they extract honey from frames of different sizes?

If you have them for sale, what is the price?

Before closing, I would ask you the best mode to adopt in order to renew an old hive of bees and comb. Two years ago I adopted the plan of putting one hive under another. I succeeded in getting the under hive filled with combs and honey. The top hive I removed, which contained a fine lot of honey, and wintered the bees in the under one; but upon examining the combs this year, I found there was too much drone or store comb, and had I not put in proper brood comb, the hive would not have been of much use to any one.

JAMES MAITLAND.

Kilmarnock.

NOTE.—It seems quite possible that Mr. Maitland has succeeded in artificial impregnation; yet it would be more satisfactory if the queen had never been allowed to fly. There is a bare possibility that she may have met a drone on the wing. If she had been confined to the hive until she had laid the eggs, there could have been no mistake.

There are several theories for the cause of foul brood, but they are contradictory, and no satisfactory explanation has yet been offered. The only precaution that can be taken is to keep good strong stocks, and be careful that no bees are introduced from affected apiaries.

The combs of an old hive of bees may easily be removed when frame hives are used, by taking out a card or two at a time, and putting in other cards or empty frames, and allowing the bees to build new comb; but we do not advise the removing of old combs so long as the bees can use them. Old combs are warmer than new ones, and in many cases remain good for ten years and even longer. Combs are none the worse for being dark coloured. If, however, cards of comb from any cause become worthless, or nearly so, remove such cards to the outside, next to the walls of the hive; the bees will then fill whatever portion of the combs that are good with honey, when they can be removed, and the honey extracted.

I build honey extractors that will extract honey from the frames of the Thomas hive, or from any frames smaller than those, but not from frames larger or longer. They will be advertised in this journal.

J. H. T.

Artificial Swarming.

A correspondent enquires if two artificial swarms can be made from the same stock in one season. Much will depend up the season, and much upon the stock itself. We have made three and four good stocks from one during the season. In the first instance, we divided a good strong stock, afterwards divided the old stock again, and the one we had made from it, making altogether four stocks. If a stock is strong, and the combs well filled with young brood early in the season, and the honey harvest continues good, it may be safely divided more than once.

Our correspondent will understand that when a stock is properly divided, the old stock is deprived of the queen, and a large majority of the bees, much in the same manner as when a natural swarm issues. It will therefore be several days before it has another laying queen and the combs be filled again with young brood, and until such is the case it would not be well to divide. The swarm made from the stock will frequently require to be divided again, as it has the old queen; and if she be prolific and the honey harvest good, the hive will soon be filled with combs, and the combs filled with brood and honey; and if the stock is not divided, or extra room provided, they cast a swarm. No bee-keeper should attempt to make artificial swarms who does not understand the nature and habits of the bees, or has not some reliable work to guide him in the operation.

Frequently, from want of knowledge, or following the directions given by some novice, great blunders are made, and the science of bee culture is pronounced at fault. In a small pamphlet printed in Sarnia, describing a hive patented by George Otts, there is a plan given for making artificial swarms, which, if followed, would surely ruin an apiary. The writer says: "Raise off the honey board, and take out carefully about half of the combs, with the bees attached to them, and put them into the empty hive. The combs should be placed in the middle of each hive; fill out the outside with empty combs or frames." No worse method could well be adopted. No feature of it is in harmony with their habits. The writer appears to be aware that the "division" which happens to be without a queen will build drone comb, which would be ruinous to the stock, and he therefore advises that all such combs be removed and used for storing surplus honey in, seeming to forget that while the bees are building this drone comb the honey harvest and season for breeding is passing away, and in many cases would be past before the bees could rebuild worker combs in the place of those removed. We would warn all bee-keepers against following any such plan. That which approaches closely to natural swarming is by far the nearer to right. The hive also described in this pamphlet has several serious objections, and no feature of it can possibly be covered by a patent which is of any real utility. But more of hives anon.

Poetry.

Strangers Yet.

Strangers yet!
After years of life together,
After fair and stormy weather
After travel in far lands,
After touch of wedded hands,—
Why thus joined? Why ever met.
If they must be strangers yet

Strangers yet!
After childhood's winning ways,
After care, and blame, and praise,
Counsel asked, and wisdom given,
After mutual prayers to heaven,
Child and parent scarce regret
When they part—are strangers yet.

Strangers yet!
Strange and bitter thought to scan
All the loneliness of man!
Nature by magnetic laws
Circle unto circle draws;
Circles only touch when met,
Never mingle—strangers yet.

Strangers yet!
Will it evermore be thus—
Spirit still impetuous?
Shall we ever fairly stand
Equal to soul, as hand to hand.
Are the bounds eternal set
To retain us strangers yet

Strangers yet!
Tell not love it must aspire
Unto something other—higher
God himself were loved the best
Were man's sympathies at rest;
Rest above the strain and fret
Of the world of strangers yet—
Strange s yet!

Eventide.

The stream is calmest when it nears the tide,
And flowers are sweetest at the eventide,
And birds most musical at close of day,
And saluts divinest when they pass away

Morning is lovely, but a bolder charm
Lies folded close in Evening's robe of balm;
And weary man must ever love her best,
For morning calls to toil, but night to rest.

She comes from heaven, and on her wings doth bear
A holy fragrance, like the breath of prayer;
Footsteps of angels follow in her trace,
To shut the weary eyes of Day in peace

All things are hushed before her, as she throws
O'er earth and sky her mantle of repose;
There is a calm, a beauty, and a power
That morning knows not, in the Evening hour.

Until the evening, we must weep and toil,
Plough life's stern furrow, dig the weedy soil,
Thread with sad feet our rough and thorny way,
And bear the heat and burden of the day.

Oh! when our sun is setting, may we glide,
Like Summer Evening, down the golden tide,
And leave behind us, as we pass away,
Sweet, starry twilight round our sleeping clay.

Household.

Impure Water in New Wells.

Many cases of impure water in new wells are caused by dissolving impurities from the stones used to wall them. Wells are often abandoned, the water becoming so fetid that no animal, however thirsty, would drink it. When such is the case, remove all water from the well, and clean the bottom from mud or other impurities. The second filling of water will be much better, and if the process be repeated a number of times, unless the impure water flows directly from the earth, it will become as wholesome to drink as from wells not thus previously infected. Should it be necessary to dig through a stratum of soil containing partly decayed vegetable matter or blue clay, the water of said well will taste offensive for some time; but unless the case is an extraordinary one, the thorough cleaning of the well a number of times will ultimately render it pure and wholesome. In walling a well, reject all stone of a porous nature, such as sandstone, for it is from such that the evil alluded to often has its origin; also, entirely exclude surface water from the well. The water is always of better taste when the bottom of the well is of rock foundation, and to have it thus, the cost of digging a few feet deeper is of minor importance.

Domestic Receipts.

APPLE SOUFFLE.—Stew the apples with a little lemon-peel; sweeten them; then lay them pretty high round the inside of a dish. Make a custard of the yolks of two eggs, a little cinnamon, sugar and milk. Let it thicken over a slow fire, but not boil; when ready, pour it in the inside of the apple. Beat the whites of the eggs to a strong froth, and cover the whole. Throw over it a good deal of pounded sugar, and brown it of a fine brown.

APPLE FLAAT.—Take six large apples, pare, slice, and stew them in as much water as will cover them. When well done, press them through a sieve, and make very sweet with crushed or loaf sugar. While cooling, beat the whites of four eggs to a stiff froth, and stir in the apples; flavour with lemon or vanilla. Serve with sweet cream. Quite as good as peaches and cream.

APPLE CHARLOTTE.—Take any number of apples you may desire to use; peel them, cut them into quarters, and take out the core. Cut the quarters into slices, and let them cook over a brisk fire, with butter, sugar, and powdered cinnamon, until they are *en marmalade*. Cut thin slices of crumb of bread, dip them in butter, and with them line the sides and bottom of a tin shape. Fill the middle of the shape with alternate layers of the apple and any preserve you may choose, and cover it with more thin slices of bread. Then place the shape in an oven, or before the fire until the outside is a fine brown, and turn it out upon a dish, and

serve either hot or cold. For *croquettes de pommes* you cook the apple just as for the *charlotte*; but instead of putting it into the jelly shape you roll into balls, or rather cakes, which you cover with egg and bread crumbs, and fry of a rich brown.

TO BROIL SALMON.—Clean it, well, and cut it into round slices, about an inch and a half thick; dry it thoroughly in a clean cloth; rub it over with sweet oil, or thick melted butter, and sprinkle a little salt over it, especially if the fish has been well freshened; put the gridiron over clear, clean, live coals; when it is hot, wipe it clean, and rub it with butter, oil, or lard; lay the salmon on, and when one side is done, turn over carefully, and broil the other. (They may be cooked nearly as well in an oven, in a buttered pan or dish.) Serve with anchovy, lobster, or shrimp sauce.

TO BOIL SALMON.—Water enough to fully cover the salmon. When the water boils, skim it, (if the salmon needs salt, add it to the water.) Wash the fish well, and put it in, boiling gently if the meat be thick. Salmon requires almost as much boiling as meat. The thickness is more to be considered than the weight. Fifteen minutes boiling to a pound of fish. Ten pounds of full-grown salmon will be done in seventy-five minutes. Serve with lobster, shrimp, or anchovy sauce. The thinnest part of the fish is the fattest.

Another fashionable mode of serving salmon is to divide the large part of the body in three parts; boil; dish them in a line, and pour over them Genevoise sauce. The skin is not removed.

DESTROYING MOULD IN CELLARS.—According to Dr. Wiedehold, fungus growths in cellars may be combated either by burning sulphur, or by pouring two parts of concentrated sulphur acid over one part of common salt. In the first instance, sulphurous acid gas is produced; and in the second hydrochloric acid, by means of which the fungi are destroyed. It is sufficiently evident, however, that during this process all openings must be closed, so as to prevent any escape of the gas, and the greatest care exercised not to enter the cellar after the operation until it has been thoroughly ventilated.

BEE CULTURE AND WOMAN'S WORK.—Adam Grim, of Jefferson, Wisconsin, who is one of the most successful apiarists in the world, commenced the season last spring with 285 swarms of bees, and increased the number by swarming to 646. These swarms produced within a fraction of 21,000 pounds of honey, which sold strained for \$4,100. The Jefferson County *Union* says:—"We often hear women say that there is no remunerative employment for them. As an answer to this we would state that Mr. Grim has two daughters who have each taken separate charge of an important part of the apiary. Miss Kate Grim has by her skill and attention the past summer earned \$1,200 net, and Miss Margaret Grim has earned \$1,400 net.

Poultry Yard.

Cost of Food for Hens.

Repeated experiments by ourselves and others show that one bushel of corn per year is sufficient to keep one fowl which runs at large, in addition to the insects and other things obtained by foraging. Hens that are shut up should be allowed no more grain than those at free range, but they should be given grass in summer, mowed often so as to keep short and tender, and in the winter raw cabbage or boiled potatoes, or fresh vegetables of some kind. Also as an equivalent to the insects they are deprived of by confinement, give a small daily ration of animal food, such as sheep's lights and livers, either raw or cooked, finely minced; or, which are the cheapest and come ready cooked, chandler's scraps crushed. The value of a year's allowance of vegetables and meat per head will be just about equal to one-half a bushel of corn. It will generally be found that at times, or in parts of the country, when or where corn is remarkably cheap or dear, the price of potatoes, &c., and of animal food also, will be correspondingly high or low, so that the above estimate is of wide application.

Therefore the price of one bushel of corn represents the keeping of a fowl running at large, and 50 per cent. added to this is the cost in case of confinement. We are speaking of a breed of average size and appetite. It is not to be expected that a *Cochin* and a *Bantam* will prove equal in feeding capacity. A great yield of eggs is accompanied by a great consumption of food; hence fowls of prolific breeds may, though of small size, eat more than large hens that lay sparingly. Also a breed which, like the *Brahmas*, tend to fatten, will, if given all they will eat, consume more, in proportion to their size, when not laying than a less plump variety like the *Spanish* will under the same circumstances. —*Prairie Farmer*.

New York State Poultry Show.

The fourth annual exhibition of poultry and miscellaneous fancy stock, under the auspices of the New York Poultry Association, was held at Albany during the second week in February, and was very successful. The total number of entries amounted to 615. There was a remarkably good show of Asiatic fowls, and game classes were also well filled and of high merit. Some splendid turkeys and geese were exhibited. Of the former, one pair weighed 56 lbs.; and among the latter a *Sebastopol* gander attracted much attention on account of its peculiar crimped or curled plumage. There was a large and good show of pigeons.

Fish breeding was illustrated by interesting specimens of brook trout and black bass from the establishments of Livingstone Stone, of Charlestown, N. H., and F. Mather.

A very attractive feature of the exhibition was a miniature minkery, which is thus described by the *Country Gentleman*:—

A very interesting object is an ingenious and intricate wire cage, containing 16 minks, of both sexes and of all ages, from the establishment of Henry Ressegue, Verona, Oneida county. It has four stories; the topmost is devoted to wheels for exercise, of which the little animals freely avail themselves; the next is for sleeping, and is kept scrupulously clean by its occupants, who invariably take pains to go down to the floor below for feeding and other purposes which would soil their nests; the cellar, so to speak, holds tanks of water for bathing. Mr. Ressegue keeps now about 45 minks in all. His yard is 60 feet square, enclosed by a 6-foot board fence, from which a cap-board projects 16 inches inward to prevent his stock from climbing out. Water runs through it at all times, giving free opportunity for swimming, and a few old dry goods boxes are provided for shelter. In the winter the males are kept in a pen, but the females have the range of the rest of the yard. During March the males are left free, with all barriers down. About the first of April the males are shut up again, and the females are separated into compartments, only two being left together. From April 20 till May 1, they bring litters of 6, 7, 8, 9, and in rare cases 10 young ones apiece, of which they raise 6, 7, or sometimes 8. At the age of 5 to 7 months, they are worth \$5 to \$8 each for their skins, but Mr. Ressegue sells all he can produce at \$30 a pair for breeding. They are fed waste meat, at an almost nominal cost, and beyond this require hardly any care or attention, having no enemies from which they can not protect themselves, and being entirely free from disease and not liable to accident. The specimens exhibited here were constantly surrounded by spectators, and formed a strong point in the exhibition.

FOWL WITH MATCHLESS LEOS.—A singular fowl has been forwarded to me by the kindness of Mr. Henry Cheffins, who has furnished me with the following account: "A game cock was given me last year, and turned down in my poultry yard, where I had a moderately-bred lot of Dorking hens, to which, by the bye, it was not intended he should have access. The eggs were set as usual, and one of the birds hatched shows such distinctive marks of both breeds, especially in the legs, that I send it to you." Upon examination, I find the bird to be coloured like a black-red game-cock. The legs, however, are both with the additional Dorking toe, and what is exceedingly remarkable is that one leg (tarsus) and foot is perfectly white, the other deep bright blue. The appearance of the bird is very singular; it strongly reminds the spectator of the dress of the old servitors, half blue, half yellow, the legs being of different colours. I think the case sufficiently interesting to put upon record. I may also mention that on two occasions lately I have seen examples of pigeons, red on one side, and blue chequered on the other; this one-sided arrangement of colours produced a very singular effect.—W. B. TEGETMEIER, in *Field*.

QUICK GROWTH OF DUCKS.—The prejudice against ducks, on account of their extreme voracity, is not well founded; for if they eat enormously when half grown, they increase in weight proportionately. Quick growth is one of the things most desired in animals of all kinds that are raised for the table. If the experiment be tried of rearing chickens and ducks that were hatched the same day, in a flock together, and giving them all they will eat, the latter will outstrip the chickens in growth.

Agricultural Intelligence.

Agricultural and Arts Association

MEETING OF THE COUNCIL.

A meeting of the Council of the Agricultural and Arts Association of Ontario was held on Thursday Feb. 22, in the Council-room, Agricultural Hall. The following members were present:—Hon. David Christie, Hon. J. Skead, Messrs. J. C. Rykert, Geo. Graham, Barnett, Nathan Choate, R. Gibbons, M.P.P., S. White, James Young, M.P., Arohibald McNab, Irwin Diamond, L. E. Shipley, A. Wilson, George Murton and Hugh Thomson, Secretary.

ELECTION OF OFFICERS

On motion of Mr. SKEAD, seconded by Mr. YOUNG, Mr. White was elected President.

On motion of Mr. SHIPLEY, seconded by Mr. DIAMOND, Mr. Wilson was elected Vice-President.

On motion of Mr. MURTON, seconded by Mr. GIBBONS, Mr. Graham was elected Treasurer.

Mr. White, the President, then took the chair.

The minutes of the last meeting were read and confirmed.

THE AGRICULTURAL COLLEGE

A communication was read from the Hon. A. McKellar, Commissioner of Agriculture, requesting the Council of the Association to make an examination of the site purchased for the Agricultural College and Experimental Farm, and report thereon as follows:—

1st. As to the nature and adaptability of the soils for the required experimental and illustrative purposes.

2nd. The sources of water supply.

3rd. The advantages or otherwise of the site chosen.

Mr. RYKERT moved, seconded by Mr. GIBBONS, "That as the President and Messrs. Christie, Diamond, Skead, and Murton, have already examined the proposed model farm at Mimico, referred to in the communication of the Commissioner of Agriculture, they be and are hereby appointed a Committee to prepare a reply to the communication received from that gentleman." Carried.

Mr. RYKERT, in a discussion that took place after the motion was carried, contended that as some of the members of the Council had not yet visited the proposed site, a report should not yet be prepared. He had not visited the site, and would like to do so before a report was sent to the Commissioner.

Other gentlemen spoke to the same effect, and it was finally agreed to defer the drawing up of the report until this afternoon, in order that before doing so all the members of the Council might have an opportunity of visiting the farm.

THE NEW COUNCIL.

A communication was read from Professor Buckland, reporting the following gentlemen to have been elected the Council for the current year, as made up from the returns sent to the Department of Agriculture and

Arts by the electoral division societies of the respective districts:—District No. 1, Archibald McNab, Lochiel; No. 2, Hon. J. Skead, Ottawa; No. 3, Andrew Wilson, Maitland; No. 4, Irwin Diamond, Mountain View, Prince Edward; No. 5, Nathan Choate, Port Hope; No. 6, Geo. Graham, Brampton; No. 7, Geo. Murton, Guelph; No. 8, J. C. Rykert, M. P. P., St. Catharines; No. 9, Hon. D. Christie, Parle; No. 10, Robert Gibbons, M. P. P., Goderich; No. 11, L. E. Shipley, Falkirk; No. 12, Stephen White, Charing Cross.

EXHIBITION OF AGRICULTURAL IMPLEMENTS

A communication was read from Messrs. John Watson and John H. Grant, of Ayr, Ont., stating that at a meeting of manufacturers of agricultural implements in the Province of Ontario, it was unanimously agreed that it was desirable that no prizes should be offered for agricultural machinery and implements at Provincial exhibitions, but that they should still be at liberty to enter their articles for exhibition only.

It was agreed to defer the consideration of the communication until the prize lists are taken up for revision.

SECRETARY'S REPORT.

Mr. THOMSON read his annual report, containing a resume of the proceedings of the Association during 1871. The report showed that the total number of prizes given at the last Provincial Exhibition, held at Kingston, was 1,774 and that the amount of money disbursed in the payment of such prizes was \$12,957 50. The number and the amount of the prizes given at the exhibition held in this city in 1870 were respectively 1,926 and \$12,243 50. The report also showed the affairs of the Veterinary College to be in a very satisfactory state.

The report was adopted.

TREASURER'S REPORT.

Mr. GRAHAM, Treasurer, submitted his annual report, from which it appeared that the receipts for the year, including the Legislative Grant of \$10,000 amounted to \$27,357 50, and the disbursements to \$25,370 02, leaving a balance on hand of \$2,257 75.

On motion the report was referred to the Committee on accounts.

EXECUTIVE COMMITTEE

Mr. MURTON moved, seconded by Mr. GRAHAM, That the following gentlemen be the Executive Committee for the current year:—The President, the Hon. D. Christie, Mr. L. Shipley, Hon. J. Skead, Messrs. Wilson & Young, Dr. Burnett, and the mover. Carried.

BRODDIGNAGIAN ROOTS

The Secretary read, amid great laughter, the following communication he had received from a Lindsay druggist and dealer in seeds:—

DEAR SIR.—An English seed house, with whom I deal, have written to me that on a railway journey, one of their firm met with a large farmer from Ontario, named Pearce who informed him that in our virgin soil we often grow long red mangolds, 5 feet in length, and globes 50 to 60 lbs. each. They desire to obtain some specimens, and are sending me out some specially good seed. I think they have been deceived, but should like to carry out their wish, if possible. To this end will you kindly advise me if it is at all probable that mangolds have ever reached that enormous size in Canada? Also, will you kindly furnish me with the name of one of the growers of the largest roots in the Province, so that I may communicate with him, and give the English seed the very best possible chance? I may mention that the seed will

be furnished gratis, the only condition being that, if roots are raised from it large enough to be worth sending to England, I am to get them, and will send them home, free of expense to the grower, for exhibition in the great Smithfield show, with the name of the grower attached.

The Secretary was authorized to reply to the communication.

DOG SHOW

A communication was read from L. H. Smith, Strathroy, asking if a dog show could not be held in connection with the Provincial Exhibition of the Association, and if so what steps it would be necessary for sportsmen and others who take an interest in the matter to take to secure the holding of such a show.

ACCOUNTS.

A number of accounts were referred to the proper committee.

The Council then adjourned.

The Council met again on Friday morning at ten o'clock. The minutes of the last meeting were read and confirmed.

THE EXPERIMENTAL FARM

The Committee to whom was referred the communication of the Commissioner of Agriculture, reported the following draft of a letter which they recommended the Council to send to him:—

TORONTO, Feb 23rd, 1872.

DEAR SIR,—I have the honour to acknowledge the receipt of your letter of the 21st inst, requesting that the Council of the Agricultural and Arts Association would make an examination of the lands purchased by the late Government for the site of an Agricultural College and for an experimental farm, and report to you as to their eligibility. In reply, I beg to state that the Council have examined the lands in question, and they have come to the following conclusions:—

1st. The locality is not such as to render it desirable for an agricultural college. It is just far enough from the city of Toronto to be very inconvenient for access by ordinary conveyance, and for obtaining those supplies which are needed almost daily. The lands are not pleasantly situated, and the whole neighbourhood is repulsive and seems to be malarious. The former occupants of the land do not seem to have been prosperous, and their neighbours are in the same condition. The fair inference from that is that labour and money have been bestowed on soil which did not yield an adequate return.

2nd. The soil is bad: a portion of it is stiff clay, too retentive to allow the superabundant moisture to exude and permit the percolation of water, even in the case of drainage, unless drains should be so numerous as to be but a few feet apart, thus incurring a very large outlay. So far as the Council could judge, the proportion of clay soil as above described may perhaps include from eighty to one hundred acres. A large portion of the soil on the west of the farm, embracing say four hundred acres, is wet and sandy, having a subsoil of hard blue clay. Some of the soil on the north side of the farm is so light that when rot under grass it would be blown with the wind. Holes had been dug in several places, which gave sufficient indications as to the quality of the soil and subsoil. The formation is that of sandstone; the worst possible one for the production of grain, grass, roots or fruits, and most unfavourable for the development of

stock. There is no limestone on the farm, a want which cannot be sufficiently supplied except by the application of lime in large quantities, which would be very expensive. The buildings and fences are nearly valueless, and Canada thistles seem to be everywhere abundant on the farm.

3rd. There is no living water on the farm, so that the necessary supply could only be had at great and continuous cost. The existing wells, some of them over thirty feet deep, are at present dry.

4th. There seems to be little church accommodation for students who would attend the college. This, in the opinion of the Council, is a vital defect. Parents would hesitate to send their sons to an institution where to a great extent they would be removed from the influence and restraint of religion at a period of life when the character is being formed. Besides, the college buildings must needs be large enough to accommodate all of the students with board and lodging, as there is no such accommodation in the neighbourhood. The Council are of opinion that the scheme as at present projected would end in failure, even in the event of a large expenditure of money. They are, however, of opinion that there would be no difficulty in obtaining a proper place for the college and experimental farm, and one which would be creditable to the Province of Ontario.

Prof. BUCKLAND thought the report went too far in condemning the site that had been selected for the experimental farm. Several other localities had been looked at, and he was sure that some grave obstacle had stood in the way of their selection. The farm that had been chosen was of course out of order at present, which was probably the fault of the late tenants. The land that had been selected was intended for an experimental farm, and it would probably do as well as better land for that purpose. One advantage of having the farm at Mimico was that it might be partially at least supplied with professors, who would at the same time be connected with educational institutions in this city, and thus something could be saved on salaries. There were two churches at Mimico, one belonging to the Church of England, and the other to the Presbyterians, besides which there were a number of churches at the western end of the city, which the students at the college might attend.

Rev. Mr. BURNETT thought that the report aimed at the selection of a farm in some other part of the country. He moved that the report be not adopted.

The amendment was not seconded and therefore fell to the ground.

Hon. Mr. CHRISTIE said that the late Government had adopted an unwise policy in limiting the selection of a site for the Agricultural College to the portion of country within a radius of ten miles from the city of Toronto. He did not know where a worse block of 600 acres of land, having any claim to be called farming land, than the one that had been selected by the late Government as a site for an experimental farm could be found in the Province. The formation of the land that had been chosen was sandstone; he had looked in vain for a piece of limestone on it; and would Professor Buckland tell them that grain fruit or roots could be successfully produced on land in which there was no limestone? The idea of choosing such a piece of land simply for the purpose of showing what could be done in the way of rendering bad land productive was an absurdity. Was it to such land as that that they would take

their sons to learn agriculture? He did not think so. Then the prospect from almost all sides of the site chosen was repulsive. The facing was bad, and the fruit trees were dwarfed and apparently struggling for existence, which was all that could be expected of them when the quality of the land on which they grew was taken in consideration. There was only a depth of about eight or nine inches of upper soil, and he was satisfied that, except on the few sandy ridges, the earth must be full of moisture, because the sub soil was so firm and imporous that the superabundant water could not percolate through it. How could they drain such land as that unless at very great expense? Another great objection to the site was the lack of water for the stock. It was true that the lake was so near that all that would be required could be easily procured from it, but they all knew that a farmer would prefer a piece of land with a stream of living water running through it. Referring to Professor Buckland's remark about the possibility of securing the services in the college, provided it was located near to the city of Toronto, of some of the professors in the other educational institutions in the city, and thus saving a portion of the expense of keeping up a separate staff of professors for that institution, Mr. Christie said that it would be ten times better for the Government to bear the expense of a staff of professors for the Agricultural College exclusively, and have it on a good farm, than to build it on the land that had been chosen merely for the sake of the saving in the salaries. Experience had taught us that it was better to have an agricultural college quite separate from other educational institutions. In Cornell the literary studies had been found to overshadow the agricultural. His (Mr. Christie's) opinions as to what an agricultural college should be were that there should be four or five Chairs, not more. There should be a teacher of scientific and practical agriculture, there should be a teacher of botany, chemistry and entomology,—he thought the three last mentioned branches might be taught by one professor. Then there ought to be a veterinary school in connection with the college, not merely for the training of young men for the practice of the veterinary art as a profession, but in order that every student might be enabled to acquire so much veterinary knowledge that he would be qualified to do his own veterinary work under ordinary circumstances. Then he thought it important that the student at this college should have an hour a day with a master from a commercial college. He thought also that church accommodation within a reasonable distance of the college was a desideratum. He maintained that to put up an agricultural college on the land that had been chosen by the late Government would be a disgrace to the country. He was glad that the building operations had not yet proceeded far, and thought that the Government would be justified, even if by doing so they lost a considerable sum of money, in selling the land that had been chosen by the late Government, and selecting somewhere else a site which would be a credit to the Province.

Mr. WILSON said that in all his travels he had never seen any soil of the description he had seen on the proposed experimental farm on the previous day. He endorsed the opinion generally expressed by Mr. Christie with regard to the site. There were three great objections to it. One was the unfruitful nature of the soil; another, the lack of water; and the third, the lack of lime in the soil. Every one of them knew that neither grain nor roots would grow well on land in which there was a lack

of potash or limestone. On a farm of this description there ought to be a running stream or some other source of supply of pure water, and in his (Mr. Wilson's) opinion pure water could not be obtained on this farm. With regard to the locality he said nothing, except that the conveyance of manure to this farm, which would require an enormous quantity of it, would be very expensive.

Mr. GIBBONS, M.P.P., said that from his experience in farming he would judge that to keep this farm in a state fit for cultivation, it would be necessary to have four or five teams drawing manure to it the whole year round. The nature of the soil and the want of water were two great objections to it. In an experimental farm some of almost every kind of soil was required, but he thought that a large proportion of it should be of a light nature—such as the students of the college would be wise in choosing when they purchased a farm for themselves. It was his opinion that the Government should choose their farm in the vicinity of some large town.

Hon. Mr. SKEAD said that the Council should have been consulted before the locality of the experimental farm was chosen. Upon visiting on the previous day the land that had been selected, he had found it much better than he had expected after the accounts that he had heard of it. A large portion of the land in Canada was no better than it. His opinion with respect to an experimental farm was that, if proper land were selected, it would be self-supporting. He thought that the manure, instead of being obtained in the city, should be manufactured on the farm. Of course they all agreed that the site that had been selected was not a good one, but they must remember that about \$45,000 had already been expended upon it. He believed, however, that it would be well even now to abandon the land that had been chosen. By giving time, the Government might sell it, and make some money out of it. He had heard that a deputation had come to the city from Guelph to endeavour to secure the selection by the Government of some land in the vicinity of that town, as the experimental farm.

Mr. MURTON said that he wished it understood that that was the first he had heard about a deputation from Guelph.

Mr. McNAB said that he had expected that in this fine section of the Province he would find only such land as could be cultivated like a garden, and was therefore surprised when he saw the proposed experimental farm, which he had found to be just such a one as had been described by previous speakers. A record of the products of the farm would no doubt be kept, and it would be too bad if this record—the record of the model farm of Ontario,—compared unfavourably with the records of ordinary farms in Europe. If it did, it would not tend to encourage immigration into the country.

Mr. SHIPLEY said that he had seen a great many farms in the western portion of Canada, and if he were selecting one for the site of an agricultural college, he would not choose the one the late Government had accepted. On the experimental farm stock would very likely be raised, and it was well known stock did not thrive well on land in which there was no lime. The report was perhaps a little stronger than he (Mr. Shipley) would have had it had he drawn it up, still he would vote for it.

Mr. DIAMOND said that his political sympathies were with the late Government, but he had not come to the Council to carry

out any political view, and therefore he did not look at this matter in a political light. From his many years' experience as a farmer, he professed to know something about soils, and would therefore say, after visiting the proposed experimental farm two days previously, that he fully concurred in the sentiments, with regard to its soil, that were embodied in the report.

Mr. GRAHAM had some doubt about the land being malarious, but he thought the selection had been an unfortunate one. He considered the land unfit for the purpose for which it had been chosen.

Rev. Mr. BETHUNE said that he was surprised when he heard that the Government had made a choice of this land as the site of the experimental farm. He thought, however, that it would be well to have the farm near the city, because many things that would be required in the College must be purchased in Toronto; as well as because a saving could be effected in the salaries of professors by having the College near the educational institutions of this city. He would have preferred to have the report a little more moderate in tone, but he thought that a better site than the one that was chosen might have been purchased in the neighbourhood of Toronto.

Professor BUCKLAND said that the choice of the site had been limited to a radius of ten miles from the city of Toronto. He had favoured the selection of the land at Mimico on account of its locality. If the farm and college were situated at a distance from a railway they would not likely be visited very often by either the Commissioner of Agriculture or the public.

The report was then put, and was adopted *nem. con.*

Mr. SKEAD, who was out of the room at the time it was put, stated, on returning, that he had intended to vote against its adoption.

LEASE OF AGRICULTURAL HALL

Mr. GRAHAM reported on behalf of the committee that had been appointed to wait on the proprietors of the Agricultural Hall, with respect to leasing it again to the Agricultural and Arts Association, that the proprietors were willing to lease it to the Association for a term of ten years at \$1,000 per annum—\$200 a year more than was paid under the old lease. The committee recommended that the lease be accepted on these terms.

The report was adopted.

THE DENISON ESTATE.

Col. G. T. Denison, Jun., appeared before the Council, and on behalf of Col. R. L. Denison asked permission to sell the property of the last named gentleman on which the Association hold a mortgage, on condition that he pay the proceeds of the sale to the treasurer of the association before March next. The request was granted.

THE PRINCE OF WALES' PRIZE

Mr. YOUNG moved, seconded by Mr. CHOATE, "That the President and Treasurer be appointed a committee to invest the principal of the Prince of Wales' prize, \$800, and that they report their action at the next meeting of the Council." Carried.

MEMBERS' EXPENSES

Mr. YOUNG moved, seconded by Rev. Mr. Burnett,—"That as it is desirable that the sums paid to the members of this Council, as necessary expenses under the 17th section of the Agricultural and Arts Act, should be fixed and uniform, it be and is hereby resolved that the necessary expenses of each member attending the regular meetings of

the Council shall be considered to be \$3 for each day that the member is necessarily absent from home attending to the business of the Council, together with the amount of his railway fares in going and returning, and that the Treasurer shall make up and pay the amount of such expenses to the members at each meeting."

After some discussion the motion was put and lost.

THE EXPERIMENTAL FARM AGAIN.

At this stage of the proceedings,

Hon. A. MCKELLAR, Commissioner of Agriculture, entered the room and having received permission addressed the Council. He said that in asking them to examine the land out at Mimico his object was to ascertain the views, with regard to it as a site for an experimental farm, of those whom he looked upon as best qualified to offer an opinion in such a matter. The farm if it were bad land would prove a failure, and it would be discreditable to the country if what was produced on it were taken as a criterion of what the Province could do in the way of agriculture. He had then come to trespass still further on the kindness of the Council. The Government had no interest in locating the college in any particular part of the country, but wished to choose the best possible site, and the one on which it would be the most likely to succeed. He wished to ask the Council if they would favour the Government by going to Guelph for the purpose of seeing some land in the vicinity of that town that had been offered to them as a site for the Agricultural College and experimental farm. If the Council could find a better site elsewhere he wished they would let the Government know where it was. Perhaps it would be well for the Government to postpone the building of the college until there was no doubt they had no doubt that they had found the best possible site. The Government did not intend to determine themselves where the college would be built, but to submit their choice to the House.

It was agreed that the Council should visit the land in the vicinity of Guelph to-day, in accordance with the request of the Hon. Commissioner of Agriculture.

The Council then adjourned.

Hamilton Township Farmers' Club.

A meeting of the Township of Hamilton Farmers' Club was held at Cobourg on the 17th of February, Peter Sidey, Esq., Cold-springs, President, in the chair.

The subject for discussion, "The advantages of Fairs, and the best method of managing a Spring Fair," was introduced by Mr. Alexander McDonald, who said:—"The plan of holding periodical Fairs for the sale of farm stock, fat cattle, grain, &c., has been for some time past in operation in certain localities of Canada, and I believe with the most satisfactory results. Such fairs have many advantages, and I would like to see them established all over the country. They bring buyers and sellers together, and give each an opportunity of doing business under the fairest possible circumstances. Buyers are saved the time and trouble of picking up cattle here and there, and sellers are subject to no uncertainties as to the ruling market price. Facilities for weighing fat cattle are

at hand, and both the local butcher and distant dealer can at once take care of their purchases. Besides the special business of the fair, a great many other matters can be attended to; nor is it the least advantage of such occasions that farmers, who, as a class, are greatly isolated, can compare notes and talk over matters of common interest. In the old country, fairs are absolutely essential to the system of farming carried on. There they always know where they can buy such stock as they want, and can depend on selling it for what it is worth at any Fair day. As things now are here, the farmer who feeds ten cattle or twenty sheep, is at the mercy of some local butcher. He cannot send them to a distant market with advantage, because he has not got a car-load of them; but if we had a monthly or quarterly Fair, we could sell small lots to dealers who were buying to ship, and there would be competition enough to secure us fair prices. Now, if a farmer has more feed than he wants, he does not know where to look for stock to eat it, and he is just as bad off if he has more stock than he wants; he must sell to some one who knows how he is situated, and who will try to get them for less than their actual value. I have now mentioned a few of the advantages of Fairs, and also a few of what, in my opinion, are the disadvantages we have to encounter for want of them, and in conclusion I trust that neither our farmers nor mechanics will be lacking in their efforts to make our Spring Fair on the 20th of March a great success. The trouble and expense of such efforts, which have for their object not only the good of the individual but the general welfare, is nothing to the satisfaction which every one must experience who contributes to an object so worthy, and I cannot but hope that some of our farmers, who have heretofore been lukewarm and stood aloof from us, will turn over a new leaf, and resolve now to come forward and help us to keep our proper place in the general improvement and progress we see going on all around us. I hope, and sincerely believe, that the day is not far distant when, instead of an annual spring Fair, we shall have quarterly, aye, even monthly Fairs, permanently established in this locality.

The discussion of the subject elicited from various speakers, among whom were Messrs. Pratt, Bourn, Lapp, McEvers, and Burnham, a unanimous opinion in favour of holding periodical Fairs, for the more ready sale and purchase of stock, exchange of seed grain, procuring implements, and other requirements of the farm.

The Chairman, in summing up, observed that these institutions were a great benefit to the farming community, not only for buying and selling stock, and similar objects, but also for the purpose of hiring help to assist in the labour of our farms. Fairs were greatly used for this purpose in many countries. He thought they would also

be a benefit to our mechanics to dispose of their stock of implements. The farmers at this season were always wanting something—a new plough, or roller, or harness, or seed drill, or some other tools for the farm. He thought a quarterly Fair should be tried first. If this was successful, they could then try a monthly one. He did not know if other counties gave as much encouragement to Fairs as Northumberland did; or if other counties had given prizes as they had done. He thought that farmers stood in their own light not to patronize these Fairs. They had to be worked up, just as Farmers' Clubs had to be; but if Fairs were once fairly set going, they would grow of themselves; but they wanted to be pushed at first to give them a start.

Does Farming Pay?

The Western New York Farmers Club lately met and discussed the question "Does it pay to be a farmer?"

We extract from an exchange newspaper some particulars of the discussion:

Mr. Glass felt like Artemus Ward when he said he had been an honest old farmer five years. When the speaker first went into the business he was told by some people that he could not realise over five per cent. on his investment. He said if he did not make ten per cent he would not be a farmer. He found by experience that farming did pay, in spite of all that was said to the contrary. Farmers have a habit of charging the interest against stock, but omitting the cost of living, and by this theory, which is unusual in other business, a farmer figured that he realised seven per cent. on his investment, when in fact it was seventeen per cent. The speaker illustrated his argument by an article published in the *Rural Home* on this subject, in which a farmer calculates that he made eight per cent. on his farm, and forgot to add to it the cost of living, the rental of his homestead, and sundry other items which would have to be counted if he were doing any other business. If fifty young men were to start out and engage in farming, and fifty others were to enter other pursuits, the young men who had become farmers would, doubtless, be nearly all successful, while at least half of the other fifty would be likely to fail.

Another speaker, Mr. Root, said he made a profit of \$240 per acre last year above expenses for family and keeping up buildings. In twenty years he had made an aggregate of \$100,000 by farming.

Mr. Quimby gave his experience in getting on in farmer life. He started with \$1,500 and a wife and three children. He bought 135 acres of land, and it took nearly all the money he had to stock it. His wife was in delicate health, and children all small, and he had to pay a great deal for labour. He persevered, however, raised his family, educated them, gave his two sons \$1,300 when they attained their majority, and after sixteen years' service in farming he sold his land

for considerably more than he paid for it, and walked off with \$20,000 in cash. He attributed his success in farming to planting his crop in rotation. There is no investment like that in real estate.

R. W. Warner said that farming paid in every way, although many young men thought otherwise. It pays in the enjoyment of health, in the leisure time it affords, and in various other ways. He gave an instance of a family of five boys who had entered upon farming some years ago, and now each of them has a large farm, is highly respected, and withal, in the most comfortable circumstances.

Mr. Hooker believed that the lands of farmers ought to be directed to the future usefulness of their farms. He was opposed to the principle of exhausting the land in a few years for the purpose of raising large or profitable crops. This only afforded a temporary advantage, which often proved in the end ruinous. The speaker related something about Canadian farming. He knew a farmer on the other side of the lake who had his farm divided into sections, in each of which a crop was raised. He had it so arranged that he rotated his crops most systematically. Many of our farmers have a fluctuating policy. When there is a prospect of corn being high, they raise corn, and when the market looks well for wheat they sow wheat.

Mr. Hodges said that Early Rose potatoes were commanding a high price; everybody raised Early Rose potatoes.

On the question of the best crops to raise, it was generally conceded that much depended on the locality, and that in general a mixed system of husbandry was most advantageous.

The Agricultural Society of France.

The Society was established in 1868, and consists of between 3,000 and 4,000 members, who are resident in almost every department of France.

It appears that the Council of the Society is arranged into ten sections for the following departments:—First, agriculture proper; second, of breeding and rearing live stock; third, the cultivation of the vine; fourth, woods and waste lands; fifth, horticulture and the cultivation of fruit trees; sixth, climatology, irrigation, and the economy of water generally; also, with sectional railways for the benefit of agriculture; seventh, agricultural industries; eighth, silk culture, and entomology generally; ninth, rural economy, and legislation bearing upon agriculture; and tenth, the creation of superior agricultural schools, &c.

Everyone who has travelled in France must have been impressed with the fact that agriculture in many districts is very much behind, particularly as regards the breeding and general management of live stock; and also that there are large tracts of country which could be profitably reclaimed and brought under cultivation. With such a climate as that of France, and with soils generally so friable and fertile, the aggregate produce might be increased to an extent far exceeding the estimates made by the most sanguine agriculturists.

Council of the Agricultural and Arts Association.

The following are the names and addresses of the elected members of the Council of the Agricultural and Arts Association of Ontario for the ensuing year:

- District No. 1.—Archibald McNab, Loochiel.
 " 2.—Hon. James Skead, Ottawa.
 " 3.—Andrew Wilson, Maitland.
 " 4.—Irving Diamond, Ameliasburg.
 " 5.—Nathan Choate, Port Hope.
 " 6.—Geo. Graham, Brampton.
 " 7.—Geo. Murton, Guelph.
 " 8.—J. C. Rykert, M.P.P., St. Catharines.
 " 9.—Hon. David Christie, Paris.
 " 10.—Robt. Gibbons, Goderich.
 " 11.—L. E. Shipley, Falkirk.
 " 12.—Stephen White, Charing Cross.

PRESENTATION.—Mr. Walter Riddell, of Cobourg, was recently the recipient of a handsome testimonial in the form of a watch and gold chain, presented by members of the West Northumberland Agricultural Society, of which he is Treasurer, in token of their high appreciation of his services to the Society, and his efforts for the advancement of agriculture in the County. Mr. Riddell has been a member of the County Society for thirty years, and during more than half that period has gratuitously filled the office of Treasurer. He has also for many years efficiently performed the duties of Secretary to the Hamilton Township Agricultural Society, and more recently has rendered the same service to the newly organized Farmers' Club in that neighbourhood. He has besides been a careful observer, and furnished some valuable statistics of the time of sowing and reaping, and market prices of farm produce, during a period of more than 25 years, and has contributed in addition a number of excellent practical articles to the columns of the *CANADA FARMER*. These and other claims upon the esteem of his brother agriculturists were cordially recognized in the address which accompanied the presentation. Every one who knows Mr. Riddell will feel that this tribute of respect has been well deserved.

AGRICULTURAL ENTERPRISE IN JAPAN.—The *Prairie Farmer* says that for some weeks past Capt. Capron and an associate have been engaged in purchasing specimens of American farm implements, seeds, &c., together with representative cattle, swine, horses, and sheep, under commission from Gen. Horace Capron, who was recently called to Japan, by the Emperor, for the purpose of introducing American agriculture into this empire. The greater amount of the purchases have been made in the West. All were expected to be in readiness to pass over the Pacific railroad to San Francisco, for ocean shipment, about February 1. The entire shipment would be gathered together at Chicago, including some half dozen practical farmers, who go out to assist the General.

THE PRODUCTION AND EXPORT OF GRAIN IN VARIOUS COUNTRIES.—Some interesting statistics of the production and export of grain throughout the world have recently been published at Berlin by Herr Behm, from which it appears that Prussia produces annually 158,000,000 qr. of grain, and exports 12,000,000 qr. Austria produces from 56,000,000 to 70,000,000 qr., and exports 3,500,000 qr. of grain and 160,000 tons of flour. The production of the Danubian Provinces is from 13,000,000 to 17,000,000 qr., and the exportation from 3,000,000 to 3,500,000 qr. The United States produces annually upwards of 227,000,000 qr., and exports 2,500,000 qr. In Denmark, the production is 10,000,000 qr., and exports 1,750,000 to 2,000,000 qr. The principal countries that import grain are Great Britain and Ireland, the annual production of which is estimated at 45,500,000 qr., and the imports at from 17,000,000 to 20,000,000 qr. Switzerland produces 2,400,000 qr., and imports 1,350,000 qr. In Belgium the production is estimated at 9,200,000 qr., and the imports from 250,000 to 1,000,000 qr. Italy produces 23,750,000 qr., and imports 2,000,000 qr. The Zollverein produces 83,000,000 qr. (chiefly rye.) The production of grain in the Netherlands is estimated at from 3,000,000 to 4,000,000 qr.; the imports vary considerably. In France, both the production and imports of grain are exceedingly variable; in 1867, the imports amounted in value to upwards of £10,000,000 sterling.—*Journal of the Society of Arts.*

The Michigan State Relief Committee have contracted for 400 ploughs, to be ready as soon as spring opens, for use among the destitute farmers.

The Farmers' Club of Colorado, at their meeting lately in Denver, concluded that one per cent. of the cost of fencing will pay for herding. They also state that the fences in Illinois cost about ten times as much as the value of all the cattle in that State

The average production of grain per acre has steadily fallen in the United States, but in England it has increased. In New York, for instance, it has fallen in the last fifty years from twenty to eight bushels per acre, and in California the decrease per acre is somewhat startling. Improved cultivation, and the application of manures as [brought up the standard in England, and he will do it in the United States.

The London *Milk Journal*, in commenting on the adulteration of milk, says, of nearly 300 specimens representing the same number of dealers, only twenty-seven were found without adulteration. In speaking of fever poisoning by the milk pail, he further says, "that there is something horrible in the idea of drinking small-pox in our morning milk or eating it in our daily bread, but that we are not free from fatal contingencies of this sort is proved by many instances of undoubted authority; all of which might be avoided if consumers could be supplied direct from country dairies."

Miscellaneous.

A Comparison.

A WELL WORKED FARM THAT PAYS.			
20 acres	Wheat ..	600 bushels.....	\$750
20 "	Barley	860 bushels.....	480
20 "	Oats ..	1,200 bushels.....	480
20 "	Hay	50 tons ..	500
20 "	Pasture
			\$2,210
A SLOVENLY WORKED FARM THAT DON'T PAY.			
20 acres	Wheat ..	200 bushels....	\$300
20 "	Barley ..	400 bushels.....	240
20 "	Oats ..	600 bushels.....	240
20 "	Hay ..	15 tons.....	150
20 "	Pasture
			\$930

Balance in favour of well worked farm, \$1,280.

We may therefore expend \$1,280 upon the well worked farm, and yet be in as good a pecuniary position as if we spent none. In other words, judicious expenditure of capital for the benefit of nature will yield a full return.

Descent of woman not according to Darwin: In time the mulberry tree becomes a silk gown, and a silk gown becomes a woman.

The *Boston Journal of Chemistry* says:—"The cause of failure in the use of concentrated fertilizers is often due to the manner in which they are applied. It is difficult for those who have been accustomed to use bulky manures to realize that the full fertilizing potency of a bushel of animal excrement may be held in a large table-spoon, and that a handful of one adds to plant structures as decidedly as several shovelfuls of the other." It is only a question of cost in preparation."

Henry Clay once gave expression to the following sentiment:—"No man can be a thorough and intelligent farmer who depends solely upon his own practice, and neglects to avail himself of the knowledge of others, communicated orally or by the press. It is my belief that no farmer of observation and thought can read a good agricultural paper regularly without deriving from it more benefit than many times its cost, and wherever a family is growing up around him, it would be wisdom to subscribe for several."

A gentleman of large experience, and claiming to be as humane as the rest of us, communicates to the *Agriculturist* the fact that he rids his premises of rats by putting potash in their holes and runs. The poor wretches get it over their feet and fur, then they lick it, and don't like the taste of it, it burns them somewhat, and the more they see of it the less they like it; and so they clear out almost as soon as the application is made. To get rid of mice, the same person uses tartar emetic, mingled with any favourite food; they take it, take sick, and take their leave.

INFLUENCE OF FOOD ON THE QUALITY OF PORK.—As the result of experiments in England upon the influence of food upon the quality of pork, it is stated that pigs nourished with milk give the best flavoured meat and the greatest weight; next to which come those fed with gram, maize, barley, oats and peas. Potatoes furnish a loose, light, tasteless flesh, which wastes away very much in cooking; while that of animals fed upon clover is yellow and of a poor flavour. Oil-cakes and oil-seeds produce a loose, fatty flesh, of an unpleasant taste; beans a hard, indigestible, and unsavoury meat; and acorns are but little better.

Mr. Thornton, in the *London Field*, gives a comparison of the strength with which the several leading breeds of cattle turn out at the Shows of the Royal Agricultural Society: "The result of seven years, ending in 1852, was 702 Shorthorns against 211 Herefords and 357 Devons; and for the last ten years the number exhibited have been 1,476 Shorthorns, 574 Herefords, 472 Devons. At the leading markets and fairs, except perhaps in the south-west, they comprise the majority; and it is estimated that there are more Shorthorns bred, fed, and grazed in England, than all the other breeds put together."

FOUR CALVES AT A BIRTH.—A small Ayrshire cow belonging to a Scotch clergyman, Rev. Mr. Myers, of Benholm, about eight years old, lately gave birth to four calves when within a fortnight of her expected time to calve, all perfectly developed and without defect. The first was a bull, the rest heifers; the first, third and fourth were stillborn, and weighed respectively 25, 26 and 30 lbs. The second was lively and vigorous, and promises to live, and the dam was recovering rapidly. She had never before dropped but one calf at a birth. Her present progeny were sired by a Shorthorn bull; and, in common with Mr. Myers' other cows, she had had the range in summer of one of the richest old pasture fields in the county, to which a dressing of bone meal was applied last spring.

LONGEVITY OF THE MULE.—How long can a mule live? A correspondent says that Mr. Daniel Munro, of Elbridge, has a mule reputed to be sixty years old, the evidence of which is considered good: "We interviewed Old Peggy last fall; with her mate, a frisky thing of only twenty or so, she was drawing a steamer weighing 3½ tons. She was getting a little grey about the head. Didn't like going with the steamer at first—brayed against it; but they turned on the steam whistle, and she was silenced. She was claimed to be as strong, hearty and obstinate as ever, and could stand as much sawing on the bit, and pounding over the head, when she didn't wish to back a load. She was also active, as I was assured, with the kind permission to try for myself by tickling her in the flank, and see her 'strike out from the hip' right or left. In fact, her prolonged experience had apparently tended to lessen rather than increase her respect for mankind."

Advertisements.



HAVING been the first to introduce to the public the Hybrid Squash, American Turbin Squash, Marblehead Mammoth Cabbage, Mexican Sweet Corn, Plumbe's Water Melon, Brown's New Dwarf Marrowfat Pea, Boston Curled Lettuce, and other

New and Valuable Vegetables,

with the return of another season I am again prepared to supply the public with Vegetable and Flower Seeds of the purest quality. My Annual Catalogue is now ready, and will be sent free to all. It has not only all novelties, but the standard vegetables of the farm and garden, (over one hundred of which are of my own growing), and a carefully selected list of Flower Seeds. On the cover of my Catalogue will be found copies of letters received from farmers and gardeners residing in over thirty different states and territories, who have used my seed from one to ten years. I warrant, -1st: That all money sent shall reach me 2d: That all seed ordered shall reach the purchaser. 3d: That my seeds shall be fresh, and true to name. Catalogues free to all. v4-1-41] JAMES J. H. GREGORY, Marblehead, Mass.

TREES, FRUIT AND ORNAMENTAL For SPRING OF 1872.

We invite the attention of Planters and Dealers to our large and complete stock of Standard and Dwarf Fruit Trees, Grape Vines, Small Fruits, Ornamental Trees, Shrubs, Roses, New & Rare Fruit and Ornamental Trees Evergreens and New Plants. Prompt attention given to all enquiries. Descriptive and Illustrated priced Catalogues sent prepaid on receipt of stamps, as follows: No. 1—Fruit, 10c. No. 2—Ornamental Trees, 10c. No. 3—Green-house, 10c. No. 4—Wholesale, Free. Address Estab'd 1840 ELLWANGER & BARRY, v4-2-3t Mount Hope Nurseries, ROCHESTER, N. Y.

To Farmers and Gardeners.

I invite all who have been in the habit of buying their garden seed from boxes left at the stores, to give my seed a trial side by side, and mark the difference in their germinating, and in the purity and quality of the vegetables raised from them. I have made it my mission for several years past to drive bad seed from the market, and so save farmers and gardeners the immense loss they annually suffer from the purchase of it. The public have well appreciated my efforts, and I have now fifty thousand customers in the United States and Canada. I sell no seed I do not warrant, and what is the real pith of the matter, I stand by my warranty; to enable me to do this I grow myself a large proportion of the seed I sell. Catalogue sent free to any applicant. JAMES J. H. GREGORY, Marblehead Mass. v3-12-4t.

SMALL FRUIT INSTRUCTOR

SIXTY-FOUR PAGES price 25 cts. postpaid Tells how to plant and grow all kinds of Small Fruit successfully, both for market and home garden. John J. Thomas, Henry Ward Beecher, Judge I. S. Harris, of Ga., and others, say it is one of the most complete and practical works ever printed. Price List of Plants, retail or wholesale, free to all applicants. Address A. M. PURDY, Palmyra, N. Y. Or PURDY & HANCE, South Bend, Ind. P. S.—Specimen copies of the Fruit Recorder and Cottage Gardener, a dollar monthly, (A. M. Purdy, Editor.) Free to all applicants. It speaks for itself. To see a copy is equivalent to subscribing. v4-2-3t

FIRST PRIZE BEE HIVES. BUY THE BEST.

J. H. THOMAS' Moveable Comb or Frame Hives

ARE all that can be desired for a bee-hive. They were awarded the first prize at all the Provincial Fairs for seven years. They possess more advantages than any other hive in the market, yet are more simple in construction and easier to operate with, which we are prepared to demonstrate at any time. In fact, they are the best and cheapest frame hive now before the public. For full particulars send for circular

PRICE LIST FOR 1872.

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, Small or old Gauge, Bee Protector, Honey Knife, Honey Extractor, Italian Stocks, Italian Queens, Canadian Bee-keeper's Guide.

Township and county rights for sale at great bargains. Send for circular. All orders must be accompanied with the cash, and addressed to J. H. THOMAS, Brooklyn, Ont.

IMPROVED STYLE!—REDUCED PRICE!

MOORE'S RURAL NEW-YORKER, THE GREAT NATIONAL ILLUSTRATED Rural, Literary, and Family Weekly.

Has long been the Favorite Farm and Fireside Weekly of America, but its Improved Style and Reduced Price for 1872 render it still more popular.

TERMS.—Only \$2.50 a Year; \$2 in Clubs. Sold by all News-Dealers; price 6 cts. Great Premiums to Agents. Specimens, Premium Lists, &c., free. D. D. T. MOORE, New York City. v4-3-1t

Advertisement for Pulmonary Balsam, featuring an image of a person and text: 'PULMONARY BALSAM USED AND RECOMMENDED BY THE MOST EMINENT PHYSICIANS IN NEW ENGLAND FOR THE LAST 45 YEARS. "NOTHING BETTER." CUTLER BROS. & CO., BOSTON. Sold by the Druggists FOR COUGHS, COLDS & CONSUMPTION. LYMAN, ELLIOTT & CO., Toronto, Agents. 11-6t.

NEW AND RARE VEGETABLES.

I make the seed of New and Rare Vegetables a specialty, besides raising all the common varieties. On the cover of my Catalogue will be found extracts from letters received from farmers and gardeners residing in over thirty different states and territories, who have used my seed from one to ten years. Catalogues sent free to all. I grow over one hundred varieties. Get your seed directly from the grower. v4-1-41] JAMES J. H. GREGORY, Marblehead, Mass.

THE CANADIAN Fruit, Flower, & Kitchen Gardener, By D. W. BEAD

THIS WORK is now in press, and will be issued by JAMES CAMPBELL & Son, Toronto. It makes a very handsome volume of four hundred pages, beautifully illustrated with colored plates and numerous engravings, in three several styles of binding—cloth, green and gold, at two dollars and fifty cents, cloth, with red leather back and corners, at three dollars; half calf at four dollars. Canvasers wanted in every county. References required. Address v4-1-11] GEO. CRAWFORD TORONTO.

CHOICE VEGETABLE SEEDS FOR EARLY SOWING.

Table with 2 columns: Vegetable and Price. Items include CABBAGE (Little Pixie, Early Wyman), CAULIFLOWER (Extra Early Paris, Demi-Bour), CELERY (Prince of Wales, solid and fine, Incomparable Dwarf Crimson), CUCUMBER (Turner's Blue Gown, Rollison's Telegraph), LETTUCE (Bruce's Nonpareil, Improved Silesia), MELON (Cox's Golden Gem), RADISH (French Breakfast), TOMATO (Bruce's extra Early Apple, The Trophy, Key's Early Prolific).

On receipt of Two Dollars we will send Free by mail to any part of the Dominion the above collection of New and Choice Seeds. JNO. A. BRUCE & CO., Seed Merchants, HAMILTON, ONTARIO. v4-3-1t

REID'S New Double Hollyhock Seed!

THESE noble and majestic autumn flowers have only to be seen in flower to gain them a place in every garden, forming as they do gorgeous pyramids of many colors—pure white, yellow, orange, buff, black, rose, pink, crimson, deep maroon, carnation striped, etc. 20 varieties in separate packets, \$1; all the varieties mixed, 60 cts.; 14 beautiful varieties of Snap-dragons, 25 cts. Any of the above sent free by mail on receipt of the amount. JOHN REID, Plant Nursery, SARNA, Ontario. v4-3-1t

CHEESE VATS AND HEATERS

Of a superior quality; also Cans, Hoops, Presses, AND ALL KINDS OF CHEESE FACTORY UTENSILS Manufactured and sold by HATCH & COMPANY, Oshawa, Ontario. REFERENCES: Hon. George Brown, Bay Park, Brantford; Hon. David Reesor, Markham; Gideon Striker, Esq., Picton; Bronk Cheese Factory Company, Belleville; James Elliott, Esq., Peterborough; Messrs. Phillips Bros., Newmarket. Send for Circular and Price List. v4-3-3t

YORKSHIRE CATTLE FEEDER

For fattening and bringing into condition, Horses, Cows, Calves, Sheep and Pigs. It fattens in one-fourth the usual time; fed to horses, saves one-third the grain; mil cows produce more milk and butter. A DOLLAR BOX CONTAINS TWO HUNDRED FEEDS. HUGH MILLER & CO., Agricultural Chemists, 167 King St. East, Toronto. Sold Everywhere. v4-3-3t

WILSON, BOWMAN & CO
MANUFACTURERS OF



THE EASIEST THE SIMPLEST

THE JOCKMAN

FAMILY SHUTTLE

SEWING MACHINE

THE CHEAPEST THE BEST



HAMILTON, ONT.

v4-3-12

THE GREAT WORK FOR DAIRYMEN IS WILLARD'S Practical Dairy Husbandry.

MR. WILLARD is widely known as the *Best Authority* on all matters pertaining to Milk, Butter and Cheese. This *Great Work* contains about 550 large octavo pages, fully illustrated, and handsomely printed and bound. It tells all that is known to date about MILK and its Products, including Butter and Cheese Factories, Dairy Utensils, &c., &c. Price \$3. As this book is sold by Subscription, we want an active and reliable Agent in each County throughout the United States and Canada, to whom a liberal commission will be given. Send for Circular, containing terms, &c. To any person reading where we have no Agent, or who cannot wait for one, the Publisher will send a copy, post paid, on receipt of price, \$3, (or for \$5 the book and *RENTAL NEW-YORKER* one year.) Address

D. D. T. MOORE, Publisher.
5 Beekman St., New York.

THE YORKSHIRE CATTLE FEEDER



FOR fattening and bringing into condition
Horses, Cows, Sheep, Pigs, &c.

It is highly recommended by the Professors of the Veterinary Colleges of Great Britain. It is possessed of purely vegetable extracts in a condensed form. It regulates and keeps the stomach in a healthy condition. It is held in high reputation by first-class breeders of stock throughout Europe and Canada. Stock fed with the Yorkshire Cattle Feeder have in every instance wherever exhibited taken first prizes. It has been awarded congratulatory recommendations from agricultural societies for the great benefit they have derived from its use in the raising of stock. It fattens in one-fourth the usual time. A dollar box contains 200 feeds.

Sold every where.

HUGH MILLER & CO., Proprietors,
167 King Street East, Toronto.

v4-2-21

CABBAGE, ONION, SQUASH

I have published three works, most amply illustrated, on the cultivation of these three vegetables, giving the thousand details so invaluable to the beginner. Price of each, sent post paid to any address, thirty cents.

v4-3-11 JAMES J. H. GREGORY, Marblehead, Mass.

FRUIT TREES

A VERY fine stock of Standard and Dwarf Apples, Pears, Plums, Cherries, Peaches, Grape Vines, Currants, Gooseberries, Blackberries, Raspberries, and other Fruit and Ornamental Trees, &c., for sale low for cash at the

WINDSOR NURSERIES.

Farmers and others desirous of planting in spring will do well to send their orders direct to the Nurseries (instead of purchasing from irresponsible tree peddlers) as early as possible, as they can then be fitted to better advantage. *Catalogues sent free on application.*

THE CANADIAN FRUIT CULTURIST sent free by mail for 25 cents. Every person planting trees, however low, should get a copy. JAMES DOUGALL, Windsor, Ont., 15th March, 1872. [v4-3-11]

Markets.

Toronto Markets.

"CANADA FARMER" Office, March 12, 1872.

A decline in wheat in the Liverpool market has depressed prices here, and the market is dull. In this city the wholesale prices are as follows—

FLOUR AND MEAL.

Flour—Superfine, \$5 25; Spring Wheat, extra, \$5 35 to \$5 40; Fancy, \$5 45 to \$5 50; Extra, \$5 65 to \$5 00; Superior Extra, \$6 00

Oatmeal—\$1 70.

Cornmeal—\$3 50 to \$3 40.

Bran, in car lots, \$17.

GRAIN.

Wheat—Soules \$1 26 to \$1 29; Treadwell, \$1 24 to \$1 26; Spring, \$1 16 to \$1 19; Do Judge Proof, \$1 13 to \$1 15.

Barley—No 1, 66c. to 67c.; No. 2, 60c. to 61c.

Oats—42c.

Peas—65c to 72c.

Rye—70c to 75c.

HAY AND STRAW

Hay, in fair supply, at \$16 to \$22.

Straw, scarce, at \$9 to \$15.

PROVISIONS.

Beef, by the side, 5½c to 6½c.

Mutton, by the carcass, 7c to 8c.

Apples, per brl., \$2 60 to \$3 00.

Potatoes—per bag, 75c to 90c.

Poultry—Turkeys, \$1 to \$1 50; Chickens, per pair, 40c to 60c; Ducks, per pair, 60c to 50c; Geese, 50c to 70c.

Pork—Mess, \$14 50.

Bacon—Cumberland Cut, 61c to 6½c, Canada, 6c to 6½c.

Hams—Salted, 9c to 9½c; Smoked, 10½c to 11c.

Lard—9½c to 10c.

Butter—Dairy, choice, 18c to 19c.

Eggs—Packed, 16c to 18c.

Cheese—11c to 12½c, Reesor's Stilton, 18c; Royal, 17c.

Dried Apples—8½c to 8½c.

Salt—Goderich, \$1 10 to \$1 25; Liverpool, per bag, \$1 20.

Dressed Hogs—\$5 15 to \$5 20.

HIDES AND SKINS.

Hides—No. 1, cured and inspected, per lb. 9½c to 9½c; No. 1, inspected, green, 9c; No. 2, inspected, green, 7½c to 8c.

Sheepskins—1st class green, \$2 50 to \$3 20 Dry, 50c to \$3 00.

Lambskins—\$2 50 to \$3 00.

Calfskins—green, per brl, 12c.

Wool—Fleece, 55c to 65c; Pulled, 52c to 55c.

THE CATTLE MARKET.

Horns (live weight) \$3 00 to \$5 00 per cw

Sheep—\$4 50 to \$5.

Cattle—\$3 to \$3.

Lambs—\$4 00 to \$7 00.

Montreal.—Flour—Market dull and easy, but without quotable change in value, sales of ordinary to choice super at \$5 65 to \$5 85. Grain—Nominal in absence of transactions. Provisions—Generally unchanged. Butter—Still unsaleable. Ashes—Pots dull and lower, closing at \$7 65 to \$7 75; pearls unchanged.

Contents of this Number.

	PAGE.
THE FIELD:	
On the Treatment of Soils.....	81
Depth of Ploughing; talk with Farmers.....	82
Cost of Exposure on Farm Implements.....	83
Fences.....	84
Soil, Land, Varieties of Potato.....	85
Growth and Development of Cereals; Lime;	
Rain Water for the Farm.....	86
Safety Clovis, Manuring in Winter.....	87
STOCK DEPARTMENT:	
Sheep; Breaking Colts.....	88
Breaking Colts, Swine Breeders' Maxims, Treat-	
ment of Breeding Sows.....	89
Salt and Ashes for Stock, Items.....	90
VETERINARY DEPARTMENT:	
Consequences of "Drenching" a Horse.....	90
Injuries and Diseases of the Gullet.....	91
THE DAIRY:	
Canadian Dairyman's Association.....	91
Butter, Parties, &c., Ricking Cows.....	97
ENTOMOLOGY:	
The Mosquito.....	97
Stories about Insects.....	99
CORRESPONDENCE:	
Straw Cutters, Improved Stock versus Shows,	
Do Fences Pay?.....	100
Natural History Queries; Prizes for Dogs; Scald-	
ing Hogs.....	101
EDITORIAL:	
The Drainage of Swamp Lands.....	101
A Word to Young Beginners.....	102
Prizes as an Incentive to Good Farming; Take	
Time by the Forelock; Settling on Free Grant	
Lands.....	103
Notes on the Weather, Literary Notices.....	104
HORTICULTURE:	
Ontario Fruit Growers' Association—Winter	
Meeting.....	105
Salt as a Garden Manure.....	107
On Practical Climatology.....	108
Fruit Growers' Association—Circular.....	109
Training Chinese Wistaria; Grapes at Owen	
Sound; The Lesson of the Garden; Depth to	
Plant Seeds; Growing Violets; Horticultural	
Hints; Notes on Raspberries; Items.....	110
APIARY:	
Experience with Bees.....	111
Artificial Swarming.....	112
POETRY:	
Strangers Yet, Eventide.....	112
HOUSEHOLD:	
Impure Water in New Wells; Receipts.....	112
POULTRY YARD:	
Cost of Food for Fowls; New York Poultry Show;	
Fowl with Matchless Legs.....	113
AGRICULTURAL INTELLIGENCE:	
Agricultural and Arts Association—Meeting of	
the Council.....	113
Hamilton Township Farmers' Club.....	116
Does Farming Pay? Agricultural Society of	
France; Council of the Agricultural and Arts	
Association.....	117
MISCELLANEOUS:	
A Comparison; Items.....	118

THE CANADA FARMER is printed and published on the 15th of every month, by the GLOBE PRINTING COMPANY, at their Printing House, 24 and 25 King Street East, Toronto, Ontario, where all communications for the paper must be addressed.

Subscription Price, \$1 per annum (Postage Extra) payable in advance.

THE CANADA FARMER presents a first-class medium for agricultural advertisements. Terms of advertising, 20 cents per line space. Twelve lines' space equals one inch. No advertisements taken for less than ten lines' space.

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

GEORGE BROWN,
Managing Director