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THE

Canadian Agriculturist,

OR

JOURNAL AND TRANSACTIONS OF THE BOARD OF AGRICULTURE

OF UPPER CANADA.

VOL. XIV. TORONTO, JANUARY 16, 1861. No. 2.

Land Drainage.

It is now a universally admitted truth by l who understand the subject, that in the mperate zone of Europe and America the nder drainage of land is the foundation of l agricultural improvement. Hence laws ve been passed for enabling the owners and cupiers of land to facilitate this essential eration; and the British Government have aned large sums of money, to be repaid by an nual rent charge extending through a long ries of years, for the purpose of extending improved system of land-drainage. Some d of this nature would no doubt be of im- ense benefit to Canada, provided sufficient ecks could be brought to bear to prevent buses. At best the draining of a young and tensive country like this must necessarily a slow and progressive work, since the pital required for such operations, on an tensive scale, is very great, and at pre- nt wholly beyond the reach of the proprie- rs of the soil. Notwithstanding all that s been done in the old country in this way ring the present century, it is astonishing find this essential means of agricultural melioration, can only be said to have made commencement. Imperfect, superficial drain- e is, as yet, comparatively limited. From elaborate paper recently read before the ntral Farmers' Club in London, by that inent draining engineer, Mr. Bailey Denton, condense the following information:

It appears that the total extent of wet lands drained or capable of improvement by draining in Great Britain alone is estimated at 22,890,000 acres, out of the total area of 56,352,000. The extent of land already permanently drained will not reach 1½ millions up to the present time, so that there remains undrained more than 21 millions of acres. The remaining 33½ millions of acres consist, for the most part, of free soils, naturally dry, which absorb and infiltrate to various depths, beyond the reach of evaporation, from one-tenth to half of the rain that falls on the surface, the rest of the rainfall being taken up by vegetation or evaporation, or passing off the surface without entering it in times of heavy and sudden rainfalls. The other portion of the 33½ millions consists of mountainous lands of rock formations, the surfaces of which having rapid slopes, throw off the rainfall in very large proportions, namely, from one third to four fifths of the rainfall. Within the bounds of these steep lands there are bogs and moors, which catch a large quantity of the water thrown from the mountain slopes, and give off by evaporation much more moisture than the rain which falls directly upon them. The extent of the surcharged free soils drained or requiring draining is about 12 millions out of 23 millions of wet lands, leaving of clays about 11 millions. These figures are set forth to draw attention to the magnitude of the field to which under-drainage is gradually extending itself, and for which provision must

be made sooner or later in the main arteries and outfalls. The depth of drains required by the commissioners, before a rent charge on the land is allowed must not be less than four feet.

From the above facts it appears that in Britain there is enormous scope for the improvement of wet lands for many years to come; drainage companies and agricultural engineers will all have abundant work on their hands; and it is equally plain that their labor will be facilitated and made successful on all clay lands by the agency of the steam plough.

Growth of Red Clover with Different Manures.

In the valuable paper on the culture of this valuable plant by the application of special manures, in a recent number of the *Journal of the Royal Agricultural Society of England*, by that scientific and extensive experimenter, Mr. J. B. Lawes, some very interesting and suggestive facts are stated; some of the more important of which we will state in a much abridged form.

The experiments on Mr. Lawes' farm satisfactorily show that some of the crops that are generally grown in rotation will yield a larger amount of produce year after year on the same land, on the application of certain constituents as manure. Thus, a part of the same field, in which the experiments on clover now in question were made, has grown barley for ten years in succession, and on some plots large crops have always been obtained. In like manner, in an adjoining field, wheat has been successfully grown for sixteen years consecutively. Nor is there at present anything in the results to lead to the supposition that these crops might not be so grown continuously for a century.

The results, however, of similar experiments with clover are very different. The practical conclusions derived from a careful comparison of the experiments may be thus very briefly stated:—When land is not what is called "clover sick," that is from exhaustion not capable of producing a healthy crop at all, the produce of clover may frequently be increased by top-dressings of manure containing potash, gypsum, and super-phosphate of lime; but the high price of salts of potash, and the uncertainty of the action of manures upon the crop, render the application of artificial manures for clover a practice of doubtful economy. On land termed "clover sick," some of the ordinary manures, whether "artificial" or natural, can be much relied upon to secure a crop. So far as our present knowledge goes, *the only means of ensuring a good* crop of red clover is to allow some years to elapse before repeating the crop upon the same land.

In works on agriculture the failure of clover is accounted for in a great number of ways, among which the following assumed causes may be mentioned:—Exhaustion of the soil by over-cropping and non-manuring; the growth of parasitic plants, which strike their roots into the clover and exhaust its juices; destruction by insects; the injurious influence arising from the matter excreted by the roots of the former crop, or from the decay of the roots themselves; the growth of the young plant under the shade of a grain crop. Although the clover crop may be found to suffer from more than one of the above-mentioned causes, the phenomena which present themselves are nevertheless by no means satisfactorily explained; and so far as prevention is concerned, our knowledge is pretty nearly limited to that of the fact, that the only chance of growing the crop with success is to allow a certain number of years to elapse before repeating it on the same land.

Although clover is generally a more certain crop on this side of the Atlantic than in the old countries of Europe, still even here of late years it has become somewhat precarious on land that has been long under tillage in the ordinary way; and either special manures, or rest,—that is, repeating the crop at longer intervals,—must be given, in order to bring about the former state of productiveness. Much injury is often done the cultivated grasses as well as grains, by the foul state in which the former are often sown. *Clean seed*

is a matter of the utmost importance. Farmers in general are quite unaware of the extent of the mischief which they thus suffer. In a single pint of red clover as many as 1,600 seeds of plantain have been found; and in a pint of white clover have been detected by careful observation by means of the microscope, 11,200 small seeds of various kinds of weeds! It thus becomes easy to account for the dirty state into which much of our pasture as well as arable land has fallen.

Care and Food of Live Stock.

At this inclement season of the year, the farmer's best attention should be devoted to the management of his live stock. Not only should shelter and warmth be provided, but special care must be bestowed on all matters relating to cleanliness, feeding, and ventilation. In this country, animals suffer more from want of systematic feeding and cleanliness than from cold, a low degree of which they can tolerably well endure, if unaccompanied with dampness. It is fortunate that in our severest weather, the atmosphere is generally still and dry. With buildings properly constructed, so as to prevent cold currants of air, and yet admit a sufficiency of that essential element, stock, with due attention to cleanliness and feeding, may be carried through our long and severe winters without any extraordinary difficulty, or risk of their health.

The use of straw as food to cattle forms a portion of a very valuable prize essay of Mr. Evershed, which appeared in a recent number of the *Journal of the Royal Agricultural Society of England.* The writer is of opinion that, although it is a common plan in many of the grazing districts of England, where roots are comparatively scarce, to feed store cattle on about 20lbs. of straw and 3lbs. of bean meal, yet that they do better on straw with *roots instead of meal*, even when the supply of roots did not exceed ½ cwt. per head, a day. Cattle wintered on straw and meal only became "hide-bound," with staring coats. It is calculated that the average production of straw per acre is 2½ tons; that not more than four cwt. of straw enters into the composition of a ton of farm yard manure; the remainder being, excrements 6 cwt. and rain water 10 cwt. The consumption of straw-chaff by a cart horse is put down at one ton per annum, at least; cattle at 21 cwt. per annum; and for the sheep on a farm of 400 acres, 8 tons of straw-chaff yearly. On an arable farm of 400 acres, therefore, Mr. Evershed calculates that there is required for the fodder of 50 head of large stock, whether horses or beasts, at least 50 tons; for sheep 8 tons; for storing roots, when wheat is reaped, waste from thatching, making foundation of stacks, &c., say 5 tons; total 63 tons of straw. This article of straw, when finely reduced by the chaff-cutter, is more readily eaten by animals generally.

We also find in the same number of the Society's Journal, an interesting report by Professor Voelcker, on the results of his experiments, which appear to have been conducted with great care and originality, on the feeding properties of several substances. The following results of his analysis of two varieties of Kohl-rabi, of cabbage, and of mangel wurzel, and of the repose pulp after its distillation, will be interesting to our readers:—

	Green top.	Purple top.
Water	86.020	89.002
Oil	.227	.177
*Soluble compounds	2.056	2.006
Sugar, gum and pectin	6.007	4.486
Salts soluble in water	.970	.919
†Insoluble protein compound	.360	.269
Digestible fibre and insoluble pectinous compounds	2.933	1.896
Wo dy fibre (cellulose)	1.230	1.106
Insoluble mineral matters	.197	.139
	100.000	100.000
*Containing nitrogen	.329	.321
†Containing nitrogen	.048	.043
Total Nitrogen	.377	.364
Per centage of ash	1.167	1.058

A comparison of the preceeding results, with the analysis of swedes, mangels, and turnips, shows that theoretically kohl-rabi is much more nutritious than white turnips, and fully equal, if not superior, to swedes and mangels.

The composition of the heart and inner

leaves of the cabbage was proved to be as follows:—

Water	89.42
Oil	.08
*Soluble protein compounds	1.19
Sugar, digestible fibre, &c	7.01
Soluble mineral matter	.73
†Insoluble protein compounds	.31
Woody fibre	1.14
Insoluble mineral matter	.12
	100.00
*Containing nitrogen	.19
†Containing nitrogen	.05

Cabbages contain about the same proportions of water, sugar, and protein compound as are found in good swedes. It appears that cabbages and swedes, weight for weight, possess nearly the same nutritive value.

There is nearly 3½ per cent. more water in the pulp than in the mangel. The decomposition of one specimen of each dried at 212° was found by Dr. Voelcker to be as follows:—

	Mangels.	Pulp.
Sugar, gum, and soluble protein compounds	58.98	23.22
Solumble mineral matter	10.79	6.17
*Soluble albuminous compounds	7.62	6.67
†Insoluble albuminous compounds	1.14	8.25
Celluiar fibre and insoluble pectinous compounds (crude fibre)	20.57	49.22
Insoluble mineral matters	.90	5.71
	100.00	100.00
*Containing nitrogen	1.22	1.07
†Containing nitrogen	.18	1.32
	1.40	2.39
Equal to protein compounds	8 76	14.92

The Professor adds:—"A careful consideration of the differences just pointed out in the composition of pulp and roots will enable us to decide with no great difficulty—1st. That weight for weight, pulp similar to that analyzed by me cannot possibly have the same feeding value as good mangel-wurzels. 2nd. That such pulp, however, is a refuse material which possesses high-feeding properties."

Adulteration of Seeds.

It would appear, at first sight, an unnecessary thing to remind farmers and gardeners of one of the most important and self evident truths connected with the practice of their art, viz., the importance of exercising the greatest care in selecting *pure and sound seed*; but observation and experience too plainly show that in numerous instances, such precautions are in a great measure practically disregarded. Hence it is that both our farm and garden crops are not only inferior both as regards quantity and quality, but the soil is filled with pernicious weeds, most difficult and expensive to eradicate.

In a recent number of the English Agricultural Society's Journal, there is a valuable paper on this subject, by the Messrs. Raynbird, of Essex, who are among the most extensive and respectable seed-growers in Britain. The following facts, chiefly taken from that article, cannot fail to interest our readers on this side of the Atlantic, where it is to be feared a great many old and impure seeds, partly, perhaps, because they are sold cheap, are extensively purchased, to the great loss and annoyance of our farmers and gardeners.

Seeds are adulterated with old seed and with dead seed, and with other seed. Thus clovers of the last year's growth are mixed with the remainders of old stocks, either dead or with vitality impaired—red clover is mixed with the cheaper article trefoil—white clover with red suckling, when that happens to be the cheaper of the two, and it is moreover sometimes colored to make it resemble alsike clover.

Turnip seeds, too, are mixed with dead and refuse samples and with rape seed, sometimes killed to save detection in the crop.

Rye grass seed is mixed with seed of the worthless Holcus lanatus—soft meadow grass: and the high-priced Italian rye grass is especially liable to adulteration of this kind, though its awn should make any admixture with it easy of detection. Let us here quote from Mr. Raynbird a passage indicating the general prevalence of dishonesty of this kind:—"Although with the farmer and country dealer some of the London trade get the credit of these tricks, they sometimes extend to the country; as shown by the following transaction, in which I was personally concerned. Some five or six years since, towards the end of the seed season, I bought of a well to-do country dealer, who has a high reputation for respectability, and who has (it is said) amassed a large fortune by his dealings, some 50 or 60 quarters of what appeared to be a fine parcel of Italian rye grass, the want of the usually characteristic awn on a part of the seed being attributed to over-ripening, or some such cause. This sample was immediately re sold to Mr. William Skirving, the well-known seedsman of Liverpool, one of the most straightforward and honorable men in the trade, who made

request for immediate despatch. Accordingly, dependence being placed upon the honesty and reputation of the country merchant, the 50 or 60 quarters were forwarded on from London without the usual examination there. When the seed was inspected in Liverpool it was found to contain a large percentage of light Scotch rye grass so carelessly mixed that when shot out of the bags the seed showed a streaky appearance, giving plain evidence of the impostor's practices. Accordingly the seed was returned; but, as it was sold for delivery in London, its removal thence without examination prevented me, by the custom of the trade, from enforcing the claim to compensation; although it is very doubtful, I believe, whether the law would not have given me redress, and a sound legal decision on this point would be of great service to the trade."—It is, however, more, perhaps, from the carelessness than the dishonesty of dealers that the farmer suffers, and under this head the injury inflicted is in point of fact inflicted by himself. Seeds of crops are mixed with seeds of weeds, owing to the carelessness of the grower; and this is an injury to the buyer of greater magnitude than any which is suffered by the intentional admixture of dead or worthless seeds with a genuine sample.

Weeds are no necessary growth amidst our crops. The plant appears because the seed is in the soil; and it continues to appear, notwithstanding cultivation, because the cultivator sows its seed. In grass fields many weeds continue to arise because mown after the seeds are ripe; and in arable lands the hoe sows often a myriad in the act of destroying one. The scythe and the sickle scatter broadcast what ought never to be allowed to ripen; and the drill and hand in depositing our wheat and other grain, our turnip seed, sainfoin, clovers, grasses, &c., *sow* and *carefully deposit*, and harrow in as many seeds of weeds as seeds of cultivated crops. And not only does the hoe, and the scythe, and the wind, and the sowing machine, scatter weeds broadcast over our fields, but the dung cart also is full of them. So long ago as the meeting of the Agricultural Society at Southampton we remember seeing plots of grasses which had been manured with farm yard dung compared with other plots on which (broadcast) guano, nitrate of soda, &c., had been used. The artificial manures contained no seeds of weeds; but it was plain that the dung cart had been full of them. When pure seed shall be sown, and no opportunity given in any way for the return to the land of any other than the seed of our cultivated crops, then we may hope that the hoe will ultimately clear the land of weeds; but as long as the farmer sows their seeds he must expect to reap their produce.

We take the following illustration of our subject from a recent number of Morton's Farmers' Almanac:

The impurity of farm seeds, owing to the presence of weed seeds, has been fully investigated by professor Buckman, of Cirencester College, who has published his results in the *Agricultural Gazette*. The following table describes the character of one series of samples of seeds, to which his attention had been drawn by a correspondent:—

Name.	Weed Seeds to the pint imperial	Weight of 2 oz. by measure.	Remarks on Principal Weeds, &c.
1. White Clover	128,000	.....	Caryophyllere, Polygonaceæ Compositæ,
2. Red Clover	16,960	.. ..	Myosotis, Scrophularineæ, &c.
3. Cow-grass Clover	12,160	.....	Plantain, Myosotis, Caryophylleæ. Of
4. Rib-grass Plantago lanceolate	1920	....	these 960 seeds were those of Plantain.
5. Italian Rye-grass	2200	172 grains.	
6. Cocksfoot	3440	124 "	Polygonaceæ—Dirt and stones.
7. Smooth-stalked Meadow Grass	12,000	160 "	Ranunculus repens, Holcus lanatus, Bromis
8. Crested Dogtail Grass..	6400	360 "	mollis Bromus, Holcus, Triticum repens,
9. Meadow Foxtail Grass..	19,200	52 "	Arrhenatherum avenaceum, &c.
10. Meadow Freene Grass ..	3200	200 "	Holcus, Rye-grass, &c., very dirty.
11. Sweet-scented Vernal Grass	1600	100 "	Bromus mollis, &c. Nearly half Holcus lanatus. Holcus lanatus.
			Caryophylleæ and small weeds.

The first example in this list may well astonish our readers. *One hundred and twenty thousand weeds* to a pint of clover seed! This, allowing 12 lbs. to an acre, should give to a square yard of ground a quantity more than sufficient to crop the soil; and if we consider that clovers are at best a slow and shy growing plant, and that the weeds detected in this particular sample come to perfection so rapidly as not unfrequently to produce two crops of seed in a year, we need scarcely wonder that the land should so often be pronounced as "clover sick;" for while there is no denying the condition to which this designation has been given, yet recent observations have led to the conclusion that in cases

of well-prepared land in good condition for a clover crop, sown weeds—to say nothing of those previously in the soil from seeding on the land as the result of dirty farming—have been the cause of failure. Our limited space hinders any enlargement on this subject; but we commend the above table to the attention of our readers, as describing the most important fact in agriculture to which this little book this year refers.

The following is Mr. Raynbird's advice to buyers of seeds, in order to the detection and punishment of roguery:—

1st. To select a responsible and respectable seedsman, and not to seek goodsat the lowest price and of the lowest value; if he does this, a seedsman can no doubt supply a cheap article, but can he recommend it? 2nd. To purchase seed with a warranty that a certain per centage of the seed will vegetate; the warranty to cover the value of the seed, or more, if necessary. 3rd. To try a certain number of seeds, both in a hot-bed and in the open ground, and see what proportion vegetates: the first plan speedily showing the actual number of living seeds—the second what number would probably grow under open air culture. 4th. to examine seeds him with a microscope, that he may detect the per centage of weed adulterations; the microscope, carefully used, would probably detect not only this but the new or old, doctored or mixed nature of seeds—a single glass is sometimes used now, but a microscope of tolerably high power would be far more efficacious. 5th. To note that the adulteration of rye-grass by admixture, however carefully done, may be detected easily when one seed is lighter than the other; the winnowing machine will separate each according to their respective gravities 6th. To get good genuine samples of similar seed, with a view to a comparison with that purchased both by the eye and by floating the two in water as a test of comparative gravity. 7th. Since, however simple these modes are, many persons will be too much engaged to try them, and will buy seed just before sowing and put it in the ground with merely a cursory examination; why should we not adopt the practice of taking a sample for examination by a scientific botanical examiner, that he may determine the per centage of weeds and of live seeds, just as we have chemical analysis to examine artificial manures? A few shillings thus laid out might save pounds.

To conclude, the adulteration of seeds is a practice of trade, or rather a system of fraud similar to that of falsely labelling goods for sale: as when a hundred yards of cotton thread are labelled as 200; or a tin of coffee stated to weigh 2 oz. or 3 oz. more than its true weight. But there is this difference in these latter instances, that the buyer of the cotton or the coffee suffers an immediate and direct loss, the amount of which can be at once estimated; but the loss to the buyer of doctored seeds is far greater, affecting all the expected increase of the fruits of the earth, if not permanently tainting the soil on which they grow. In honorable trade things should be called by their proper names, and if it is necessary to have mixed and doctored seeds they should be sold as such.

Adulteration plainly owes its origin to the desire to amass wealth and, so long as the demand for cheap goods continues, I fear it will be pandered to by the unscrupulous trader. Dr. Buckman's words in the "Journal," vol xvii., p. 376, may prove a fitting conclusion: "Pure or clean seed is ever worth paying a greater price for, as the reverse may entail trouble and expense for years. Any mechanical processes, therefore, which can be made available for cleaning seed are well worthy of patronage. A seedsman who will be careful in the preparation and collection of seed deserves the best support. In order also to assist in this matter, farmers should be particular not to allow a dirty patch to stand for seed, although it may be 'the most profitable thing they can do with it.'"

Mean Temperature of the Year 1861.

We have been obligingly furnished with the following table, showing the mean temperature of each month of the past year, with the difference from the average, by Mr. Sergeant Walker, of the Toronto Meteorological Observatory:

MONTH.	MEAN TEMPERATURE.	DIFFERENCE FROM THE AVERAGE	REMARKS.
January.....	19.86	—3.67	Alternately Warm & Cold.
February.....	26.06	×3.08	
March.....	26.92	—3.21	
April.....	42.02	×1.04	
May.....	47.50	—3.89	Cold.
June.....	61.29	—0.07	
July.....	65.37	—1.48	
August.....	65.43	—0.54	
September.....	59.07	×1.16	Warm.
October.....	48.74	×3.22	
November.....	37.14	×0.45	
December.....	31.13	×5.02	
Mean....	44.21	⋈0.09	Mild.

Leached Ashes as Manure.

EDITORS "AGRICUTURIST,"—Would you be good enough in your next issue to give a little information as to the value of *Leached Ashes* as a manure for general purposes. Their value *unleached* is well known, but after coming from the soapers their value must be greatly diminished. Alone, would they be sufficient for turnips, or wheat, or corn—say 20 tons per acre? or must they be combined with other composts?

Last year I applied *coal* ashes, with the cinders, over land on which a week after I planted corn, and sowed a patch of turnips. Both corn and turnips were greatly injured. The corn on which stable manure was used was green, and gave good ear, while that on the ashes was yel-

lowish and very poor. And as for the turnips, (and they were well worked,) not one grew bigger than a good sized potato. Can they not be used advantageously?

Is bone dust equally good for carrots and turnips and mangels? Kindly say where the *dust* can be had, and at what price?

Your kind attention will oblige,

Yours respectfully,

ROBT. MACAULAY.

HAMILTON, January 1862.

REMARKS.

The ashes of plants differ materially in their composition, not only as regards the various species, but also the same variety of plants will yield ingredients, in different proportions, according to the nature of the soil, the mode of culture, and the character of the season. The manuring power of ashes, therefore, cannot be estimated by any fixed standard. Wood ashes always contain a considerable amount of carbonate of potash, lime, &c., and are consequently very beneficial to such plants as require large quantities of these alkalies, such as Indian corn, turnips, beets, and potatoes *Leached ashes* have lost much of the principal alkaline salts, and have been deprived of the greatest part of their most important soluble ingredients; still they must not be regarded as an unimportant fertilizer, as the lime and other mineral matter which they contain is always more or less beneficial to the soil. Unless the land is well worked and contains sufficient *organic* matter, we should not consider ashes, whether leached or unleached, as *alone* adequate to the production of a good crop of wheat, turnips, or corn.

Leached ashes we should recommend, as a general rule, to be used as a compost, or with other materials abounding in the organic elements; that is, containing vegetable and animal matter.

Coal ashes rank much lower in the scale of fertilizers than those derived from wood. Their chief value as a manure consists in the quantity of earthy salts they contain. Especially sulphate of lime, and more or less of the phosphate of magnesia. After all, their mechanical action on certain soils is, perhaps, more beneficial than their chemical, particularly on very heavy, adhesive soils, destitute of lime. In such soils coarse coal-ashes, when applied in considerable quantity, and thoroughly incorporated with the soil, by deep ploughing or digging, tend very much to lighten it, by permanently opening up its pores, and thereby affording free admission of air, heat, and moisture. On very light soils, which are naturally too loose and porous, the action of coal ashes may prove positively injurious, by giving greater intensity to these qualities. This may have been the case with our correspondent, who does not state whether his soil is stiff or light, nor its condition in relation to organic matter. We should certainly not recommend the application of coal ashes to light, hungry soils, except, perhaps, as a top dressing for grass or clover.

Bone dust may be relied on as an excellent manure for turnips, carrots, mangels, &c., and it possesses great value as a dressing for most of the cereal crops, particularly old pastures. The most reliable and economical way, perhaps, of using it, is in a compost with other things,—such as farm-yard dung, ashes, rotten leaves, scouring of ditches, &c. It would be well if a bone mill was erected in the vicinity of all our principal towns and cities, as the quantity of manuring matter lost from this neglected source alone is beyond all calculation. Mr. Lamb, of Toronto, has had a bone-mill in operation for several years, and many of his customers, we happen to know, have been well satisfied with the result of their trials. Mr. Lamb's prices are 50 cents per bushel, crushed coarsely; and 60 cents for half inch and dust. He allows 15 per cent discount on all orders of not less than $100. We will shortly take up the consideration of the matters involved in our correspondent's communication more in detail.

The Agriculturist.—Correspondents Wanted.

EDITOR OF THE CANADIAN AGRICULTURIST.—*Dear Sir,*—I have just received the last number of the *Canadian Agriculturist* for 1861, and I must say that I am highly gratified with its improvement, especially for the last year, therefore I do not hesitate to say that it stands not No. 2 to any of the American Agricultural papers that we get from our neighbours. But there is one feature lacking, namely, a greater amount of correspondence, which I frequently hear you complain of. If this could be obtained it would add much to the popularity of your valuable paper. I think the cause of this must be the high postage. Men do not like to give

information and then have to pay for it. But I will come to a conclusion, with the remark that your paper is like a winter apple, ripening better and better.

R. B. WERDEN.

Picton, Prince Edward, Jan. 20, 1862.

Patents of Invention.

We extract from the official Gazette the following list of patents issued for agricultural implements and machines:

BUREAU OF AGRICULTURE AND STATISTICS,
Quebec, 15th Jan., 1862.

His Excellency the Governor General has been pleased to grant Letters Patent of Invention for a period of Fourteen Years, from the dates thereof, to the following persons, viz:—

Heman Hazleton, of the Township of Townsend, in the County of Norfolk, Carpenter, "An Improved Self Propelling Gate"—(dated 21st May, 1861.)

Silas Welte, of the village of Princeton, in the County of Oxford, Cabinet Maker, "An improved Churn, termed the 'Blenheim Churn.'"—(Dated 22nd May, 1861.)

Robert Kerr, of the township and county of Waterloo, Yeoman, "A Grain and Seed Broadcast Sower."—(Dated 24th May, 1861.)

George A. Carman, or the village of Morrisburgh, in the county of Dundas, Carriage Maker, "A Vegetable Root Cutter."—(Dated 28th May, 1861.)

Michael Clair, of the township of Sophiasburg, in the county of Prince Edward, "The Excelsior Washer."—(Dated 4th June, 1861.)

James McKelvey, of the town of St. Catherines, in the County of Lincoln, Tinsmith, "A Refrigerator termed the 'Prince of Wales' Cupboard Refrigerator."—(Dated 25th June, 1861.)

Elias Vanderwater, of the township of Sidney, in the county of Hastings, Machinist, "An improved Reaping and Mowing Machine,"—(Dated 17th July, 1861.)

Henry Fryatt, of Aurora, in the County of York, Carpenter, "Rotary Tooth for Harrows." (Dated 17th July, 1861.)

George Deans, of the town of Port Dover, in the county of Norfolk, Mechanic, "A Challenge Washing Machine."—(Dated 18th July, 1861.)

Almas A. Knowlton, of the township of Brome, in the county of Brome, "A Washing Machine."—(Dated 18th July, 1861.)

John Pike, of Prescott, in the County of Grenville, as assignee of John G. Frazer, of the aforesaid place, Barber, "An improved Churn."—Dated 30th July, 1861.)

Charles R. Parkes, of the City of Toronto, in the County of York, Turner, "An improved Churn."—(Dated 30th July, 1861.)

Peter McEwen, of Russell, in the county of Russell, Farmer, "An improved Plow."—(Dated 30th July, 1861.)

Abiel O'Dell, of the Town of Bowmanville, in the county of Durham, Machinist and Builder, "A Self-regulating Spiral Spring Mangle and Washing Machine."—(Dated 3rd August, 1861.)

John Powers, of the town of Stratford, in the county of Perth, Builder, "The Victoria Washing Machine."—Dated 3rd August, 1861.)

Richard H. Oates, of the city of Toronto, in the county of York, Manufacturer, "A Self-revolving Wind-Mill House with circular foundations."—(Dated 9th August, 1861.)

David Elm Norton, of the town of Bowmanville, in the county of Durham, Machinist, "An improved Churn, termed 'Norton's Horizontal Screw Dash Churn.'"—(Dated 16th August, 1861.)

Robert Webber, of the township of East Zorra, in the county of Oxford, Yeoman, "Webber's Scarifier or Field Cultivator."—(Dated 20th September, 1861.

William and Thomas Walker, both of the township of Chinguacousy, in the county of Peel, Carpenters, "The Ocean Wave Washing Machine."—(Dated 29th Nov., 1861.)

C. S. Shannon, of the city of Hamilton, "An improved Driving Rein."—(Dated 29th Nov., 1861.)

Henry Dodd, of the township of Goderich, in the county of Huron, "Improved Sieves or Screens for Fanning Mills."—(Dated 29th November, 1861.)

Volney O'Brien, of the town of Guelph, in the county of Wellington, "The Excelsior Churn."—Dated 29th Nov., 1861.)

James G. Thompson, of the town of Peterborough, Gentleman, "An Automatic Gate."—(Dated 29th Nov., 1861.)

Asa Jarvis Foote, of the village of Tilsonburg, in the county of Oxford, "A new and useful Washing and Scouring Machine."—(Dated 29th Nov., 1861.)

Hugh McLaren, of Lowville, in the county of Halton, "A combined Seed Drill and Cultivator."—(Dated 29th Nov., 1861.)

N. H. Nutting, of the township of Marysburg, in the county of Prince Edward, "The Ontario Washing Machine."—(Dated 29th Nov., 1861.)

William Depew, of Paris, county of Brant, Tinsmith, "A Balance Gate."—(Dated 29th Nov., 1861.

On Feeding Stock.

The following lecture on Feeding Stock was delivered by Dr. Anderson, chemist to the Highland Agricultural Society of Scotland, at its annual meeting in Edinburgh, December 18th,

1861. It will be found interesting and useful to our readers generally. EDS.]

In an address given at the Edinburgh show, in the year 1859, I took up the subject of the feeding of stock as a branch of farm management, and discussed the general principles on which its prosecution depends, referring more especially to the nature of the food and its use in such a manner and in such quantities as are necessary to secure a proper proportion of the great classes of nutritive compounds required to maintain the vital functions in a state of healthy action, and the particular conditions under which the constant wastes of the tissues may be reduced within the narrowest possible limits, and the quantity of food required to supply the place of the effete matters thus diminished to the greatest extent. These matters, in fact, include the broad principles which must be kept in view in the feeding of all animals, and practice has arrived at conclusions in harmony with them, by studying, in the first instance, the natural instincts of the animals, and observing the kinds of food they prefer, and then by mixing the different substances in different proportions, and otherwise varying the mode in which they are supplied to the animal. It has thus come to be well known that certain foods and mixtures produce a better effect than others, some kinds fattening quickly and giving the animal those qualities which the butcher seeks, and others producing a much less favourable result. Looking at the subject in a practical point of view, it becomes, of course, most important to prosecute it into detail, and to ascertain the most economical method of arriving at the required result, and by a systematic series of trials it is possible to obtain an accurate knowledge of the kinds and quantities of food capable of replacing those in common use, and to make mixtures which fulfil the same end with greater economy. A great part of this knowledge has been attained by experience—that is, by a succession of trials extending over a very long period of time, and many of which have, in one sense, proved failures, inasmuch as they showed that particular mixtures were uneconomical, and a source of loss to those who used them, although in another sense, they were not failures, because they showed what ought to be avoided. If it were possible to go back over the whole range of trials by which our practical knowledge of the best proportions and kinds of food has been acquired, it would, no doubt, be found that, as in most instances, experience has been bought at a very high price. It is only after often-repeated observations that it can arrive at incontestible conclusions, and herein it is that science differs from experience. The results in both are obtained by observation, but science has systematised observation, and has coupled with it the explanation of the facts observed. It starts from the knowledge acquired by experience, seeks to discover the *rationale* of every fact, and endeavours to generalize and classify them.—Thus, if it has discovered, for example, that a particular food known to give unfavourable results is deficient in some particular element, it then proceeds to try whether the addition of that substance will increase its nutritive effects; and if this proves to be the case, it is justified in inferring that every other food in which that element is wanting will also prove disadvantageous in practice. The tendency of science, therefore, is to diminish the number of trials which end in loss, and thus to acquire practical knowledge with greater rapidity and economy. It is obvious, however, that science cannot in all, or even in many instances, predicate with absolute certainty the exact extent to which particular foods are likely to be advantageous in practice; but this is owing in a great measure to our still imperfect knowledge of the complicated mechanism of the animal frame; and no one who knows either this or the various disturbing causes which interfere with the results when vital processes come into play would for a moment venture to indulge in dogmatic assertions, but would rather look upon science as fitted to direct experiment and supply a class of facts which may form the groundwork of further practical observations.

The position which science is capable of taking may be best illustrated by a particular example, and for this purpose we may select the facts connected with the use of rape cake as a feeding stuff. Chemistry has shown that, so far as the proportion of nutritive matters contained in that substance is concerned, it is completely on a par with linseed cake, which sells at double the price, but it has also established the fact that it contains a small proportion of a peculiar bitter principle of a resinous character associated with its oil. Now, it is well known that some bitters are not unpalatable to cattle, while others are very offensive; but it is not possible by analysis alone to foretell whether any such substance belongs to the one or the other category, that being a matter which can only be decided by observing the effect it produces on the animal itself. At this point, therefore, the function of science ends, and that of practical observation begins; and it has been found in practice that—owing, no doubt, to the presence of this substance—rape cake cannot be given with the same freedom as linseed cake, because, when consumed in large quantity, its disagreeable taste affects the animal, although when used in smaller proportion and mixed with palatable substances it proves highly nutritious. These facts having been determined, a further progress may be made, and science may proceed to inquire whether it lies within its resources to devise a process by which the objectionable constituent may be removed and the substance thus placed on a level with the most favored food, while practice may study the best method of concealing its taste or otherwise palliating its bad effects. When the study of the principles of feeding is

prosecuted into detail, many subjects of great interest and importance offer themselves for consideration, and of these not the least worthy of notice is the best method of making the food consumed fully available to the animal. It has been clearly established that only a very small proportion of the nutritive matters of the food is stored up within the body in the form of flesh and fat, and that even under the most favorable circumstances by far the larger proportion is practically wasted, or at least reduced to the less valuable form of manure. It is known also that the quantity stored differs greatly in different animals; thus, the pig makes a much better use of its food than the ox, for it will increase in weight nearly twice as much with the same consumption of food. The same is true, though to a more limited extent, with regard to individuals of the same species, and every one knows that some cattle fatten more quickly than others. These differences are, no doubt, often due to constitutional peculiarities which cannot be overcome in practice; but it cannot be questioned that it is a matter of the greatest possible moment to determine the circumstances under which the waste can be reduced to a minimum, and the animal be made to assimilate the largest possible proportion of the food which enters its stomach. It is very obvious that the complete solution of this problem involves many nice physiological questions, and in the present state of our knowledge is scarcely possible: but there are individual departments of the subject which may be considered, and to one of these I propose directing your attention on the present occasion

The particular question I intend to discuss is how far the nutritive value of a food may be increased by adding to it certain accessory substances which are not themselves *foods*, in the proper sense of the term, but which, either by maintaining the general functions in a state of health, or by promoting digestion, facilitate the assimilation of the true food. My attention has recently been directed to the subject in the course of some experiments, to which reference will afterwards be made, but which I shall here discuss only in a general point of view. Substances added to the food in this way are commonly known by the name of "condiments," and are understood to operate by promoting the healthy exercise of the digestive organs. The mode in which they do this, however, is not well defined, and cannot in all cases be identical. We ourselves use a vast variety of those substances, but we do so without any definite object, and most of them have probably no other effect but that of pleasing the palate, and are, therefore, very far from acting favorably, but rather induce the ingestion of a larger quantity of food than the stomach can properly dispose of, and, consequently, check, instead of promote the progress of digestion. On the other hand, if we are to argue from our natural instincts and the universality of their use, there are substances which must be beneficial. Experience has led us to the use of certain mixtures of food, which are often considered to be mere manifestations of popular fancy, but which are really founded on natural laws, thus, for example, we eat beans and bacon, and thus conjoin a very fat feed with the most highly nitrogenous vegetable. In the same way, the Irish laborer who consumes a large quantity of the starchy potato uses along with it a great deal of milk, so as to supply the nitrogenous and fatty substances the system requires. It is reasonable, therefore to assume that the use of condiments is dictated by the necessity for them. If, then, the subject is important in regard to human beings, it is still more so in relation to the feeding of cattle, which, in their artificial state, cannot select for themselves, but must take what the feeder supplies.

The most important of all condiments to animals is unquestionably salt, and if we are to assume that their natural instincts lead them to take what is beneficial, we can have no doubt as to its utility. The desire for it is shown by the avidity with which cattle consume it when lumps of it are placed in their feeding troughs, and that this is not the effect of the artificial state in which they are kept is proved by the fact that any spot where it exists is sure to become the resort of wild cattle. Such spots are not uncommon in the back woods of America, where they are known by the name of "salt licks," and the ground around them is constantly covered with the footprints of innumerable herds of wild cattle. So familiar is the desire of cattle for salt that in our colonies it is well known that the most effectual method of preventing them from straying is to place abundance of salt at their disposal in the neighborhood of the stations at which they are kept. Beyond all question, then, salt must be in some way advantageous to animals. Let us see whether it is possible to find any reason for this. If the different parts of the animal body be examined, the quantity of salt contained in it is found to be far from inconsiderable. Thus—

Human blood contains	0.42	per cent.
Milk	0.02	"
Horses' blood	0.51	"
" chyle	0.53	"
" urine	0.29	"
Ox urine	0.01	"
Pig urine	0.52	"
Sheep urine	0.63	"

It is clear, therefore, that a considerable quantity of salt is indispensable for maintaining the supply required by the system. Thus, a horse excretes daily about 20lbs. of urine, containing nearly 400 grs. of salt. If, now, we look to the food as the source of this supply, we are struck by the small proportion of common salt which many of them contain. This quantity is exceedingly variable, and depends to no small extent on the nature of the soil on which the crop was raised, proximity to the sea, &c.; but the following tables give in grains the average quantity

contained in 100 lbs., of the more important kinds of cattle food:—

	Grains.
Meadow hay	2940
Clover hay	2380
Oat straw	840
Turnips	770
Red clover (fresh)	630
Beans	560
Peas	315
Oats	210
Potatos	158
Rye straw	79
Barley and wheat straw	traces.
Barley and wheat grain	traces.

It is at once obvious from the examination of this table, that in only a small number of the common kinds of food is there a considerable quantity of salt, and many of the most important substances are altogether devoid of it. It is particularly worthy of notice also that hay, which may be described as the natural food of cattle, contains it in abundance. and hence, when feeding on it, the animals may obtain all that is absolutely necessary for their health, but when they are placed upon some of the mixtures of food now in common use—such, for example, as turnips and straw—the quantity may be too small for their requirements. If to these considerations we add the necessity for salt to supply the hydrochlaric acid which is found in the gastric juice, and the other uses which it fulfils in the system, we can entertain but little doubts as to the importance of an adequate supply of it for maintaining in a healthy state the functions of the animal, while it is also manifest that the quantity required for this purpose is mainly dependant on the nature of the food. Proceeding further to inquire into the influence which salt exerts in causing the animal to exhaust more completely the food supplied to it, and to store up a larger quantity, the results obtained by different experiments are very conflicting. The subject has been examined very carefully by Boussingault. He took six young cattle, which he divided into lots of three each, so as to secure as perfect uniformity as possible, and to the one he gave no salt, to the other he gave it in the proportion of 525 grains per head daily. After some time both lots were weighed, when it was found that the lot which had got salt had gained 10 5 lbs. for every 100 lbs. of initial live weight, while those which did not get salt had gained 11 lbs. In this respect the animals were restricted to a fixed quantity of food; but another was made, in which they were daily supplied with more than they could consume. and the residual quantity weighed. In this case it was found that the animals which got salt took 38.4 lbs. of food daily; those which got none, 35.9.; or for every 100 lbs. of live weight, the first took 3.2 lbs., the second 3.1 lbs., or rather less. 100 lbs. of food consumed with salt gave an increase of 6.8 lbs. of live weight; and without salt, of 7.2 lbs. Little difference is, therefore observable between the results of the two cases; but, such as it is, it is unfavorable to salt, a somewhat larger quantity of food being necessary to produce a given increase with salt than without it. Boussingault himself remarks that the difference was so trifling that it might be disregarded; but he says also that there was a marked difference in the general appearance of the animals. Those which got salt had a lively appearance, their eyes bright, and their skin smooth, soft, and shining; while those which got no salt were dull and inactive, and their coats rough and staring; and this difference was so great that it could not escape the observation of the most cursory observer, and there could be no doubt that the former would have brought a higher price in the market. A series of experiments made by a German observer (Farthmann) on sheep lead to an opposite conclusion. He took thirty sheep and divided them into three lots. They all got daily 1 lb. hay, 3 lb. straw, and 3 lb. potatos; and during the latter part of the experiment, 1¼ lb. of beans were addded. One lot got no salt, but the other two were supplied with it in different quantities. The result is shown in this able:—

	Average gain in weight per sheep.
No salt,	13.1 lb.
¼ ounce of salt daily	16.9 "
½ " " "	17.7 "

Here the difference is marked, but the effect appears to be very irregular, for some of the sheep which got no salt had actually lost weight to the extent of 1 or 2 lb. Some experiments of Sprengel's also tend to show that salt promotes the production of wool: for of two lots of sheep which got 3 lb. of potatos and 4½ lb. to 5 lb. of rye straw daily, those which got salt yielded 1 lb. 11½ oz. of wool more than the others. It is worthy of notice that in both these experiments the food contained a very small quantity of salt, amounting, in Farthmann's experiment, to about 41 grains, and in Sprengel's to 8½ grains daily, quantities which are probably insufficient to maintain the functions in a state of health.

An interesting series of experiments has recently been made by Lehmann on the quantity of salt consumed by draught horses. The animals on which he experimented were doing their daily work, and fed on the mixture of food, which, by actual analysis, were found to contain daily 290.8 grains of salt. Into the manger of each horse was placed a lump of rock-salt weighing 8 or 10 lb, which it was allowed to lick *ad libitum*. The quantity of salt consumed during the first three days was very large, and amounted in the case of one horse to nearly 10 oz. per day: but it rapidly fell, and at the end of six weeks the consumption did not exceed 200 grains per head, and the animal which began by taking so large a quantity of its own

accord entirely abandoned its use. The salt consumed by different horses varied very much, but was always largest in the case of old animals, so much so, that Lehmann remarks that the quantity eaten might almost serve to give an approximate estimate of the age of the animal. It was observed also that when the horses were worked hard, the quantity of salt used invariably dimnished. The following table gives his results on this point:—

	Average daily consumption. Light work.	Hard work.
Young horses.....	199 grs.	132 grs
Old horses.....	305 "	166 "

If we add to these numbers the quantity of salt contained in the food, we may draw the conclusion, that according to the age and work, the total amount of salt required for maintaining the functions of a horse in a state of health varies from 400 to 600 grains daily, and it may be reaonably inferred that if the food contains this quantity, the addition of salt may generally be dispensed with.

(To be continued in next number.)

Agricultural Intelligence.

Sorghum Sugar.

The Executive Committee of the State Agricultural Society of Illinois, is in session at Springfield. The correspondent of the Chicago *Times* writes that the greatest enthusiasm seems to prevail all over the state in regard to the Sorghum question. There are many growers there, all of whom have met with marked success in its culture the past season, and who will embark more largely in the enterprise another year. The samples of both sugar and syrup there shown would convince the most skeptical of the feasibility of its becoming one of the fixed staples of Illinois.

Among the more prominent of these exhibitors of sugar, I may mention Mr. J. H. Smith, of Quincey, Ill., who presents a sample of a lot of about *one ton*, the largest amount, I am sure, ever made by one man from northern cane. It should be stated that this was made from the African cane and not from the Chinese. Mr. Smith considers this much the best cane for the production of sugar. He states that about seven tenths of the syrup runs to sugar, and that he can make the sugar at five cents per pound and molasses at twenty-five cents per gallon, and realize more profit from an acre of cane than he can from an acre of corn.

A fine (much lighter color and drier) sample of sugar is present from Blymers, Pates & Day, Mansfield, Ohio, I do not know how large a quantity they have produced.

Much interest also attaches to the fine samples of refined syrup from the refinery of Mr. Corbett, of the *Prairie Farmer*. Everybody is delighted with it, none placing it, for flavor and sweetness, below the golden syrup of commerce. The whole question will receive the attention it deserves at the hands of the Executive Board. I have heard men, prominent in agricultural matters, state to day that every doubt they have heretofore entertained in regard to the profitable production of both sugar and syrup upon our prairies is entirely dispelled by the samples now on exhibition here and the statements accompanying them.

Advantages of Crushing Oats.

The London Omnibus Company have lately made a report on feeding horses, which discloses some interesting information, not only to farmers, but to every owner of a horse. As a great number of horses are now used in the army for cavalry, artillery and draft purposes, the facts stated are of great value at the present time. The London Company uses no less than 6,000 horses; 3,000 of this number had for their feed bruised oats, and cut hay and straw, and the other 3,000, got whole oats and hay. The allowance accorded the first was, bruised oats, 16lbs.; cut hay, 7¼lbs.; cut straw 2¼lbs. The allowance accorded to the second was, unbruised oats 18lbs., uncut hay 13lbs. The bruised oats, cut hay and cut straw amounted to 26lbs.; the unbruised oats, etc. to 32lbs. The horse which had bruised oats, with cut hay and straw, and consumed 26lbs. per day, could do the same work, as well, and was kept in as good condition, as the horse which received 32lbs. per day. Here was a saving of 6lbs per day on the feeding of each horse receiving bruised oats, cut hay and straw. The advantage of bruised oats and cut hay over unbruised oats and uncut hay is estimated at 5c. per day on each horse, amounting to upwards of $300 per day for the company's 6,000 horses.

Importations of Animals for Stock.—The following resolutions have been adopted by the Board of Agriculture of Lower Canada:—Resolved that, in the opinion of this Board, agriculture would derive great advantages from the importation for many years to come of improved stock of cattle. That, in order to procure the best results, as the most prompt and most general, this Board recommends to all the Agricultural Societies of Lower Canada to appropriate for the period at least of three years an annual sum for the importation of animals of good stock. That Board, in order to facilitate these importations and to diminish the expense thereof, engages itself to purchase these animals and deliver them to the different societies without other charge than those of purchase and carriage.

EFFECT OF COLD ON FATTENING ANIMALS.—Dr. Playfair, in the Journal of the Royal Agricultural Society, in speaking of the necessity of warmth to fatten an animal readily, says that to keep up the animal heat, the oxygen of the air unites with that portion of blood which goes to form fat and tissue, and converts it into carbonic acid, water, and ammonia. Where all the vitality of the animal is used to manufacture heat, there is no power left to increase the fat. If we would fatten animals in winter we must give them a summer temperature, by warming the shed and stable they occupy. The air that they breath should be as pure as possible.

Horticultural.

For the "Agriculturist."

Dwarf Apple Trees.

On seeing a few remarks in the April number of the *Agriculturist*, made by Mr. Atkins, I would say to him that I believe from his experience, together with mine, that the representations made by the nursery-men in their catalogues and books, that the dwarf apple will bear when it is a small bush, or like the dwarf pear, is only a humbug, and done for the purpose of selling their trees; for, like Mr. Atkins, I have fine model trees eight or ten feet high, and the tops over ten feet in circumference, with limbs branching out from the ground, that have never borne an apple yet. These trees were purchased from the most responsible nurserymen in Rochester, and recommended to bear the second or third year after planting, and are now eight or ten years old.

Mr Atkins says, if he wanted to make more dwarf trees he would graft them to Keswick Codlin, Hawthorn Dean, and Duchess of Oldenburgh. These trees are early bearers, but they grow as large as any tree, and bear on young standard trees as well as on the Paradise stock. I have late bearing kinds, such as the Northern Spy and St. Lawrence on the Paradise stock, in order to throw them into early bearing, but without effect. I have likewise visited the Rochester nurseries, and found their dwarf apple trees just like my own, and none in bearing except the early bearing kinds as above mentioned. But I am satisfied they are a better stock to graft on than the common standard, as they are more hardy and more fibrous, not forming such large prongs, running deep in the cold and wet ground. Their branching from the ground is also a self protection to the tree, and will be the cause of it being more hardy; for no fruit tree in this country should be trimmed up and stortled, leaving a long trunk to the merciless extremes of heat and cold of our extreme climate, which will disarrange the sap vessels and cause the tree to become diseased and short-lived.

I now wish to ask for more information respecting the dwarf apple trees, to show if the above statement is not true, that others may not be deceived as to the nature of the trees, as we have been. Any information respecting the nature and habits of the dwarf apple tree, or what treatment will cause them to bear when young and small, will be thankfully received.

R. B. WERDEN.

Picton, Prince Edward County, Jan. 1862.

Cultivation of Plums.

The following observations on Plum culture, written by J. M. Barret, of Canterbury, N. Y., and published in a recent number of the *Horticulturist*, will be acceptable to fruit growers generally.]

So much has been said and written of late upon the Grape question, that I begin to fear that we may forget that other fruits can be successfully raised. I therefore propose to give you my experience in raising Plums, in which I have made a profitable experiment, willing that my fellow readers of the *Horticulturist* may go and do likewise, if they believe the Yankee maxim, that some things may be done as well as others, and that one man can do what another has done *if he tries.*

In 1856, I set out with care what remained of 700 or 800 Plum trees, which had been struck out by contract two years before, and up to that time had refused to thrive. This transplanting revived them, and from that period I date the beginning of my experiment, which, including the present season, makes six years that they have been under treatment. The ground between the Plum trees has been regularly plowed and cultivated for the Raspberry crop, the product of which has paid all expenses, including $50 per year ground-rent, for two acres and a quarter, and a profit besides. In 1859, I spread under each tree half a peck of common salt.

The black knot upon these Plum trees has appeared regularly every year, and has been cut out clean to the healthy wood in the month of June, say within a fortnight after its first appearnce, and while the excrescence was still soft. It is then easily removed without injury to the tree, the wound generally healing over the same season. For the last three years this disease has decreased yearly. The past season I removed the whole from 640 trees in less than half a day. In 1859, these trees began to bear fruit, yielding twenty bushels, which was sold for fifty-five dollars, after paying expenses. In 1860, the crop was nine bushels and one peck, which brought

three dollars a bushel. In 1861, I gathered and marketed seventy-two bushels, for which I received five dollars and twenty cents a bushel, after paying expenses. The total receipts for the three years amount to four hundred and forty-eight dollars and seventy-five cents, after paying all expenses, and amounts to about three times the original outlay, including cost of trees, labour of setting, and transplanting. I know of no business which pays a better profit upon the investment. Only about one-half of my trees have yet borne fruit. Many of them produced from six to twenty Plums the past season. Of course, the production may be expected to increase for many years.

The variety cultivated by me is the freestone frost Plum, which is the most prolific. The cling-stone is much the finest variety, holds good on the tree two or three weeks later, and brings a higher price in market.

The secret of my success may be summed up as follows:

1. By selecting varieties that are but little troubled by curculio, and that are marked without damage to the fruit; these, being used for preserves, are gathered before they become soft and mellow enough to eat; consequently, they are not injured by transportation to market, and are sure to bring a good price.

2. By careful planting in ground previously prepared and mellowed, and kept so by yearly working.

3. By use of salt as manure.

4. By an unsparing use of the knife upon the black knot in the month of June of each year, instead of waiting until fall or the next spring, or perhaps neglecting it altogether.

In former years the Plum crop of this country was a source of profit to almost every farmer, but the curculio has attacked and destroyed the finer varieties of fruit, and the black knot made such havoc among the blue Plum trees as to discouaage its culture. May we not hope to see this fruit again generally cultivated for market purposes.

Fruits, Flowers and Seeds of the West.

Nebraska is not entirely void of those little comforts that render it a home to us. Many wild fruits are to be found in abundance.—The plum, grape, gooseberry, strawberry and raspberry grow spontaneously all along our little streams and on the borders of woodlands. Gooseberries of an enormous size and fine flavor, that do not mildew and are hardy, give us their yearly crop of wholesome fruits. There are plums growing in some portions of the Territory that are *curculio* proof, and are large, fine and delicious.

But the "Flora" of the Western prairies and plains is the admiration of all that behold them. There are a great many flowers growing wild of greater beauty and attraction than hundreds now in the flower gardens of the East, that have cost them vast amounts to get them there, while these prairie beauties are left for us to enjoy. They are left because they are not known to eastern botanists and gardeners.

We have a friend who, we understand, has been engaged the past season in collecting many kinds of shrub, flower and creeper seeds of Nebraska, Kansas, Utah, Minnesota, for a nursyman of Utica, New York, who will be the first to introduce them to the cultivator and amateurs of the East. When once introduced, the catalogues of eastern seed dealers will have more than one new novelty that it did not possess heretofore.—*Nebraska Farmer.*

The Dairy.

Dairy Management.

[It is well known that the breed, and particularly the feeding of cows, have a great influence on the amount and character of dairy products, to which we may more fully advert hereafter. In the meanwhile we give our readers some excellent information on the Dairy Management, from the *Irish Agricultural Gazette* of January 4th.—EDS.]

BUTTER.

The first essential, in either case, is a proper dairy or milk-house; and when we consider the abominable manner in which milk is frequently kept in dwelling houses, even in sleeping apartments, in barns, where there is no protection against dust from the thatched roof and cobwebbed walls, we cannot feel surprised that there is so much good milk annually wasted in making atrociously bad butter. The milk-house should be sufficiently roomy, and fitted up so that it can be easily kept clean, and perfectly dry. For this purpose, polished stone is the best material; and the immense quantities of marble which are found in many parts of Ireland could be turned to great advantage in this way, whilst, at the same time, shelving of that nature would not be too expensive. Caithness pavement, being hard, dry, and susceptible of a high degree of polish, which is given to it before the stones are shipped, forms also very superior pavement and shelving, and is obtainable at moderate cost. Ventilation is likewise a necessary point in a dairy, and it must be so arranged that the milk room shall be cool in summer, and yet kept at a sufficiently high temperature during winter, which should never be below 50 degrees F. The

average temperature of Mr. Horsefall's dairy is 52 degrees to 56 degrees; and he is now recognized as a standard authority on many points of dairy management.

Earthenware dishes are much better adapted than wooden ones for holding milk, because the latter require much more labour in keeping them clean, and some dairymaids are apt to be negligent on this point. Cleanliness—extreme cleanliness, in fact—is all-important in dairy management; for the least mustiness in milk-vessels will taint the milk, and injure the butter. The churns must be thoroughly scalded after each churning, and kept clean, sweet, and dry.

Butter is made either solely from cream or from the whole milk; that is, the cream is not separated from the milk, in the latter as in the former case, but both are kept and churned together. There is a difference of opinion as to which mode produces most butter. We would remind those who are not accustomed to the latter method that they must not attempt to churn the *whole milk* while it remains sweet, otherwise their labour will be lost, for it will yield no butter; the whole milk must be kept until it has become sour, when if all other points are equally attended to, as good butter will be produced as from cream alone.

Supposing the cows to be all milked—and this must be thoroughly done, for the last milk which can be drawn from the udder is the richest—then the milk is poured through a milk sieve in to the dishes, so as not to be more than two inches in depth; at the same time, 4 to 6 inches is more common. Cream will not rise when there is a considerable depth of milk placed in the dish, and some people do not allow it to exceed one inch. It also rises sooner in warm weather than in cold, and for this reason it must be skimmed sooner when the weather is warmer than usual. In ordinary cases, the cream should be skimmed about 20 to 24 hours after the milk has been put into the dish; in warm weather taking it off somewhat sooner, and allowing it to remain a little longer in cold weather. As the cream is skimmed, it is put into an earthenware jar, the top of which is covered with a piece of muslin, in order to prevent flies or dust getting into the cream, whilst it admits air. As additions of cream are made to that in the jar, the whole should be thoroughly stirred and intermixed together, and the contents should not be allowed to remain longer than three or four days without being churned.

When the whole milk is churned, it is strained, as milked, into milk dishes or coolers; but a greater quantity is put into each dish than is done when the cream is to be taken off. In the north of Ireland, where churning the whole milk is a prevalent practice, the milk is strained into a jar or "crock," successive milkings being added until the jar is full, but avoiding putting in new milk just before churning; that is, suppose the churning takes place in the course of the forenoon, the morning's milk is not added to the contents of the crock which are to be churned, but put into a fresh crock, and becomes the beginning of another gathering. This system, however, is not so good as keeping each milking by itself, so that the warm and cold milk is not mixed together. The frequency of the churning will partly depend on the weather, but the whole milk ought not to be allowed to remain longer than three days in ordinary cases, or, perhaps, four without being churned; and, in warm weather, it may be churned in two days from the time the first of it was taken from the cows.

In large and even moderate-dairies the churns are driven by power, which is preferable to manual labour. Hot water is often added to milk or cream, to bring it up to the proper temperature for churning—say 52 or 53 degrees; but this is not a good practice, and where an increase in the temperature is necessary, it is better to acquire it by putting the churn containing the milk or cream into a tub filled with a sufficient quantity of water to bring the contents to a proper state. During the process of churning, the temperature will rise to 56 or 58 degrees; but it is requisite that attention be paid, so that it may not rise much higher than that point, otherwise the butter will be injured. When whole milk is churned, it will stand, however, a higher temperature than cream. Rapid churning is not desirable, and over churning is equally bad; but the best medium will be found when it takes an hour and a quarter of steady churning in ordinary weather, to produce butter.

There is a difference of opinion as to the mode of handling butter after it is taken from the churn. Some put it into a small, flat tub, and wash the buttermilk out of it by kneading it among clear, cold spring water, the milky water being occasionally poured off, and flesh supplies added, until it ceases to become tinged with milk; others knead and beat it in a clean cloth, which absorbs the buttermilk, and is frequently wrung dry, until the buttermilk is entirely taken away; whilst a third set of butter makers say that it ought to be worked by means of a wooden skimming dish, and that to work it in any degree by the hand is to spoil it, for the heat and perspiration, which is said to render the butter waxy. Mr. Ballantine's method, as detailed in the prize report in the *Transactions of the Highland Society*, was to extract the milk by working it with the cool hand, but the butter itself was not washed or worked in water. Mr. Dillon Croker, who paid great attention to the management of butter, recommended that, after finishing the churning, the milk should by drawn off by a plug from the bottom of the churn, and replaced by a quantity of pure spring water. A few turns of the wheel is then given, and the water run off; this is to be repeated until the water appears as clean as when it is put into the churn, showing that the milk has been all extracted. A strong

pickle, well strained is now put on the butter and several turns of the paddles given, so that every part will feel the effect, which finishes the operation. If the weather should prove warm, it will be advisable, he considered, to let the butter lie in the churn for a few hours, which will render it firmer than it was when the washing was finished.

The salting process should commence directly after the buttermilk has been all extracted from the butter, and the quantity of salt must be regulated by the purpose for which the butter is intended. When it is to be sold merely powdered, a quarter of an ounce of salt will be a sufficient for a pound of butter. For ordinary keeping purposes, or the London market, it may be cured with half an ounce of salt to the bound of butter, and many add a quarter of an ounce of yellow sugar, and one-eighth of an ounce of powdered nitre. For export to the colonies, or long keeping, more salt is necessary, and as much as one ounce of salt, with a proportionate quantity of sugar, and the foregoing quantity of nitre, will be required. Nitre and sugar are both omitted by many, but these ingredients assist in flavoring and preserving the latter.

The salt used must be of the purest description, free from salts of lime and magnesia which exist in ordinary sea salt. Prof. Johnson recommended the purification of common salt for dairy purposes "by pouring two quarts of boiling water upon one stone or two of salt; stirring the whole well about, now and then, for a couple of hours, and afterwards straining it through a clean cloth. The water which runs through it is a saturated solution of salt, and contains all the impurities, but may be used for common culinary purposes, or may be mixed with the food of cattle. The salt which remains in the cloth is free from the soluble salts of lime and magnesia, and may be hung up in the cloth till it is dry enough to be used for mixing with the butter, or with cheese" The salt must be rendered as fine as possible, which may be done by crushing it with a rolling-pin, and the nitre and sugar well mixed with salt, when these ingredients are used along with it. In salting, the butter is spread out thin in the tub, and the salt, &c., carefully sprinkled over it, and worked in with "the heel of the hand," until the whole is thoroughly intermixed. Some only work in half the salt at first, and then lay the butter aside till next day, when the remainder is added after pouring off any brine which has come from the butter. A great deal of Irsh butter is spoilt by over salting.

When the salting process is completed, the butter is packed into "crocks"—earthenware jars —or into small casks. The former answers well enough when the butter is intended for home use, but when it is to be sent by rail or steam-boat it should be packed in firkins. These are made of ash and oak, and previous to being filled with butter, they must be first filled with boiling water which will be allowed to remain in them for 20 or 24 hours; they are then rinsed in clean, cold water, and filled wtth strong, hot pickle, which may remain in them until they are required for use. The firkins are weighed before the butter is put in, and half a being allowed for any additional soakage that may take place, the weight of the firkin is branded upon it. A little fine salt is then sprinkled in the bottom, and the butter packed tightly with a wooden rammer, or with the knuckles, and the greatest attention must be paid to this operation, so that there shall not be any vacant point left, as the air contained in that vacant space, no matter how small, would soon spoil the butter. If the firkin or jar is not filled at one churning, the butter must be covered with pickle, or some salt is sprinkled over it, and a clean cloth pressed close upon it, to keep out the air until the next churning is ready, when the pickle is poured off, or the salt carefully removed with a spoon, and the smooth surface is roughened or raised into furrows, for the purpose of allowing the last packed butter to become perfectly united to the first, without any appearance of seam, which would be the case were this precaution neglected. When the firkin or jar is filled, a little salt is strewn on the surface, and a piece of linen, dipped in strong salt and water, is spread equally over the top, when the cask may be headed, and is then ready for market, to which it should be sent with as little delay as possible.

Butter which has been improperly packed, or otherwise affected by the air, becomes rancid, but this may be cured by beating in water into which from 12 to 15 drops of chloride of lime to the pound of butter have been added. After working it well leave it lying in the water for two hours, and then wash it in pure cold water, when it will be found to have become sweetened.

CHEESE.

There is considerable diversity in the manufacture of this article; so much so that not only is there a marked distinction between the cheese produced in different districts, but it frequently happens that such is also the case on adjoining farms in the same district. In the latter case, no doubt, whilst the distinction may arise from natural causes, such as the nature of the pasture and of the breed to which the cows belong; still it is well known that much of the character of cheese arises from the manner in which the milk has been previously treated, and, in the case of skim milk cheese, from the proportion of cream which has been allowed to remain on the milk. Some "goodwives" are notorious for keeping what is called "a good creaming-dish;" that is, they are very particular in removing every particle of cream from the milk, for the purpose of making butter, and the cheese made from such milk is, therefore, of a peculiarly leathery texture. It was an article of this kind which elicited a rather pithy criticism from a half witted fellow who got a living by running errands about Dunblane, in Scotland. On one occasion, he was

sent to a farm-house where the "creaming-dish" was very vigorously used, and on being set down to a repast being composed of bread, butter, and cheese, he was observed to spread the butter pretty thickly over slices of cheese, muttering all the while, quite loud enough to be heard by the bystanders, "Deil be in their fingers that ever pairted ye."

But it appears to be the case that for some unknown reason cheese cannot be successfully made in some parts of the country, and we have found some marked instances of this in Ireland, both on the sown grasses of a five shift course and on the old pastures of the Golden Vale, and that, too, where it had been tried by persons who had been all their lives well acquainted with the process of manufacture as practised in Cheshire and Ayrshire. At the same time, we found excellent cheese made on other farms at no great distance, but certainly where the soil and pasture were somewhat different, showing that there is nothin the climate at least, as some allege, to prevent cheese making being carried on in Ireland It has never gained a footing in Ireland, however.

When skimmed milk is set aside for cheese making it must be scalded, *but not boiled*, in order to prevent it from turning sour, which would spoil the cheese. In making sweet milk cheese—that is, when the milk is used without being deprived of the cream—the morning's milk is mixed with that of the preceding evening—supposing there is a sufficient quantity of milk to allow a whole cheese to be made every day—the cream which has gathered on the evening's milk being mixed through the entire quantity, the temperature of the whole being raised to a certain degree by heating a sufficient quantity of milk in a pan set in boiling water, and then pouring this warmed milk into the rest. The temperature to which the milk is raised ranges from 75° to 80°, and even 90°, a higher temperature being requisite in cold than in warm weather. The milk at this stage is all in one tub, and it is at this point that the "rennet" is added. This is prepared from calves' stomachs, which have been salted a year before they are used. These can generally be procured from shopkeepers in the dairy districts; and where cheese is the sole object of manufacture, two bags," or "vells," as they are sometimes termed, are necessary for the milk of each cow during the season. In some cheese districts, stale rennet is used; in others, as in Cheshire, it is prepared on the day previous to being put into the milk. The Cheshire system is to cut two bits of two or three square inches of the vells or bagskins, and those bits are "put into half a pint of warm water the day before use, along with a teaspoonful of salt, and this infusion suffices for 50 or 60 gallons of milk" (Morton). In Gloucestershire, where stale rennet is used, 6 vells are put to every 2 gallons of brine, and in large dairies a 30 to 40 gallon cask is prepared at once. The infusion is considered to improve with age, that is, if it is not further diluted by the addition of more brine. Stale rennet is also used in Ayrshire in the manufacture of Dunlop cheese, and in that which is made according to the Cheddar system, a tablespoonful of the rennet being added to every 20 gallons of milk. It is at this stage also that annato is added for the purpose of colouring the cheese—a practice which, we think, ought to be given up; for it is only a mere fancy, and does not improve the quality of the cheese in any degree.

The time requisite for coagulation varies according to the temperature of the milk when the rennet is put into it. Where the temperature ranges from 75 to 80 degrees, the curd will usually take an hour to form; but where the temperature is from 85 to 90 degrees, it may only require half the time, or even less. Too rapid coagulation is not desirable.

The subsequent steps in the manufacture of Cheshire cheese are described in the following manner in Morton's excellent little work, the *The Hand book of Dairy Husbandry*. After the curd is fully formed,

"It is then cut slowly with a wire curd-breaker, and the curd sinking, the whey is baled out; the curd is collected and squeezed, both by hand and the direct pressure of a weight above a board placed upon it; and the last of the whey being removed, it is lifted either into a basket or into one of the Cheshire cheese vats ('thrusting tubs') pierced with holes for the further escape of the fluid, the lower part being a wooden cylindrical vat, and the upper a tinned cylinder slipping into it, as the curd on pressure sinks. After a certain pressure in this *form*, the curd is removed and cut, and broken by hand or a curd mill, and from 1 to 2 lbs. of fine salt is scattered over it, according to the weight of the cheese; about 1 lb. to every 40 lbs. of cheese is a common quantity. The whole curd being then re-broken, is refilled into the vat, in which a cheese cloth has previously been placed. It is then put gradually under pressure [in a lever cheese press,] which after the second or third day amounts to nearly a ton weight upon each cheese.

"Every day the cheese is turned, and wrapped in fresh cloths, and on the seventh or eighth day of this treatment, or as soon as dry, it is removed to the loft, and there swathed around with strong girthing, and placed on a bench. By-and-by it is laid, still swathed as before, on a layer of straw on the floor of the room, and there it lies till from ten weeks to four months old, when it is ready for sale."

It is of the greatest importance that the curd be freed entirely from the whey; for if any whey is left, the cheese is apt to swell and burst. For this reason, in some dairies it is the practice, on the first day when the cheese is put under the press, to thrust skewers into it through the holes in the cheese-vats, in order that the whey may more readily drain off through the holes pierced with skewers. The whey is scalded and given to pigs.

VARNISHING CHEESE.—A writer in the Dairy *Farmer* states that it is the practice of some dairy-men to coat each cheese thinly with varnish made from shellac dissolved in alcohol, when about to ship to market. It is said to improve the appearance of the cheese and to keep it from losing weight and gathering mold. We cannot say as to the value of its recommendation.

Domestic.

Housek-epers' Recipes.

To Make White Indian Meal Cakes.—I read one of your receipts for making "Indian cakes" to my wife, from one of your late numbers, and we had a laugh over it. Annexed is her mode of making them: To enough white meal for breakfast add sufficient salt, then mix entirely with boiling water, to the consistency of a stiff batter, and bake immediately on a hot griddle, well greased—the batter to be put on the griddle with a large spoon, one spoonful for each cake. No mixture of Indian meal can exceed these cakes in delicacy of flavor. This is the way we make them down in Deleware.—*Germantown Telegraph.*

For Killing Rats.—Mix some unslacked lime with corn meal, and place it where the rats may accidentally find it. They will soon become very thirsty, and upon drinking water, the lime slacks and swells the rat till it kills him. In the Bahama Isles, sponge is fried and placed in in their way; they eat it, drink, swell, burst and die. Lime and meal should be, of the first one part and meal two parts, well mixed together and dry.

Starch.—There is no better way for making nice starch for shirt bosoms, than to boil it thoroughly after mixing, adding a little fine salt and a few shavings of a star or spermaceti candle; the star or pressed candle is quite as good as sperm. Let the starch boil at least ten minutes, and it will give a gloss, if neatly ironed, fully satisfactory.

Mince Pie without Meat.—Four soda crackers, four cups of water, two cups of sugar, one cup of butter, one cup of chopped raisins, half a cup of vinegar, one lemon, grated citron, nutmeg, allspice, cloves, cinnamon, etc.

To Broil a Fowl.—Split the fowl down the back, season it very well with pepper, and put it on the gridiron, with the inner part next the fire, and allow the fowl to remain until it is nearly half done; then turn it, taking great care that it does not burn. Broil it of a fine brown. A duck may be broiled in the same way. If the fowl is very large, half roast it, and then cut it into quarters and finish it on the gridiron.

Indian Meal Muffins.—To a quart of meal, pour boiling water, stirring constantly until a thick batter; let it cool; while warm, add a small teacup of butter, a tea-spoonful of salt and a tablespoonful of yeast, with two well beaten eggs; set it on a warm place for two hours, then stir it smooth, and bake in small cakes on a griddle: when one side is rich brown turn the other; lay them singly on a hot dish and serve. These may be made without the yeast, and baked as soon as mixed.

Muffins.—Mix a quart of wheat flower smoothly with a pint and a half of lukewarm milk, half a teacup of yeast, a couple of beaten eggs, a teaspoonful of salt, a couple of tablespoonsful of lukewarm melted butter. Set the batter in a warm place to rise. When light, butter your muffin cups, turn in the mixture, and bake the muffins a light brown.

Cleaning Papered Walls.—The prudent housewife who, on account of "hard times," has decided not to re-paper the sitting-room, as desirable, will find the old paper very much improve in appearance by simply rubbing it well with a flannel cloth dipped in oatmeal.

To Clean Knives.—One of the best substances for cleaning knives and forks is charcoal, reduced to a fine powder, and applied in the same manner as brick-dust is used. This is a recent and valuable discovery.

Preparation of Chicory.

EDITORS OF THE AGRICULTURIST.—Can you or any of your subscribers inform us of the best way to prepare chicory for mixing with coffee? We grow it, and are fond of it, but think we have not the proper method of preparing it for use.

NIAGARA, Jan. 1862. W. C.

[We are not aware that there is any other mode of preparing chicory for use as a substitute for coffee, than that of first drying, and then roasting and grinding the root. After the roots have been cleaned, and sliced in the thick parts, they may be placed in an oven, after the bread has been removed, and remain there till they cool. If one such baking should not dry them sufficiently the operation may be repeated. The Rev. W. L. Rham, in his Dictionary of the Farm, in speaking of the cultivation and preparation of chicory in Belgium and Germany as an article of commerce, says:—

"In September the leaves should be finally gathered and the roots taken up, which may be done with a common potato fork. They are then cleaned by scraping and washing, split where they are thickest, and cut across in pieces about two or three inches long. These pieces

are dried by means of a slow oven or a kiln. Some nicety is required in drying, to prevent the root from being scorched, and to keep the proper flavor. In this state it is sold to the merchants, packed in bags. It is afterwards cut or chopped into small pieces, and roasted exactly as coffee, ground in a mill, and packed in papers in pounds and half pounds for retail sale. When coffee, as well as all colonial produce, became too dear for the laboring classes in France and Germany, chicory was almost universally used as the best substitute, and the taste is by many thought so grateful, that they prefer the coffee with which a fourth or a fifth part of chicory has been mixed."

We have seen it stated that chicory is apt to produce injurious effects upon the constitution when used too freely. Should any of our correspondents know a better way of preparing it for use than the above, we shall be happy to hear from them.—EDITORS AGRICULTURIST.]

The Poultry Yard.

Profitable Poultry Keeping.

Fowls and their Breeds.—A poultry keeper, in the *Journal of Horticulture*, places in order of profitable merit different fowls, in the following order:—

1. *The Speckled Dorking.*—Good layers, setters, and nurses; chickens come early to profit; preferred by dealer.

2. *The White Dorking.*—Flesh of these chickens a better color than the speckled.

3. *The Hamburg Everlasting Layers.*—Lay from 200 to 250 eggs yearly; do not sit well; flesh good.

4 *The Game.*—Flesh and eggs excellent; but rear with difficulty.

5. *The Cochin.*—Best for confined places; rear early; eggs excellent, sits true; good nurses; flesh not very good.

6. *The Spanish.*—Shy layers, poor sitters; bad nurses; eggs large and poorish; do not rear well. Poultry should be kept perfectly clean, have access to chalk, and a dust heap carefully kept dry for them to busk in.

Poultry.

We are indebted to the *Irish Farmer's Gazette* for the following remarks, gathered from different sources. In the old country fowls are generally prepared for table in the natural way, but French feeders prefer a system of forced feeding, the details of which may be gathered from the following description given in a recent number of the *Journal of Agriculture*:—

"A sketch of the mode in which the La Fleche virgin cocks and poulards are fattened will convey a good notion of the manner in which this process is frequently managed in France. It is undertaken chiefly by country dealers and small cultivators, called *poulaillers*, and although attended with a good deal of trouble and expense, they manage to realise fair profits—some of them even small fortunes. These individuals buy up, from the markets and their neighbours, the young *coqs vierges* and pullets, which they name *gelines*, that appear to be finest, and best fitted for fattening. About the age of seven or eight months, they are considered best adapted to the purpose. From fifty to a hundred are subjected to the process at one time, and it generally commences in October. In the apartment where it takes place, a series of boxes or frames, formed of rough timber, are placed on the floor—one portion of the covering fixed, the other movable—for the purpose of putting in and taking out the fowls. The dimensions of these boxes vary, but they should never contain more than six birds, and the space should be such as to accommodate each comfortably, without permitting it to move about. No light is admitted from without, and very little air. In order to accustom the fowls gradually to the dietary regimen and seclusion to which they are to be subjected, for the first eight days they are enclosed in a place only partially darkened, and fed on a somewhat thin paste, composed of meal, with a mixture of a third or a half of bran, and they are allowed to eat and drink at pleasure. The paste cakes, or *patons*, on which they are to be fattened, are composed, the one-half of buckwheat meal, a third of barleymeal, a sixth of oatmeal, the coarse bran being removed. Every day this substance is steeped in milk in the quantity necessary for two meals. Some add to the paste a little lard, particularly when the treatment is drawing to a close. Being neither too hard nor soft, it is easily rolled in small cakes or patons nearly in the form of an olive, and of a size adapted to the throat of the fowls.

The times of feeding require to be strictly attended to, and the poultryman or feeder, aided by the light of a lamp, takes three fowls at once, ties them altogether by the feet, and rests them on his knees. He then makes them swallow a spoonful of water or whey (although this

is occasionally dispensed with), inserts a paton in the beak of each, and gently slips it downwards by the pressure of his two fore-fingers and thumb, rubbing his hand along the neck till the food reaches its destination: this prevents its being rejected. The time required for this in each case affords sufficient leisure for deglutition in the others. During the first few days only a small number of patons are given, but they are gradually increased till each dose consists of a dozen or fifteen. They are dipped in water before being administered, in order that they may be more easily swallowed. By this process some fowls are fattened in six weeks, others take two months; the time depends on the constitution of the animal and its degree of strength. Some cannot be brought to the desired plumpness without risk, and in such cases the feeding must be interrupted or modified, as the occasion seems to demand. It is calculated that some fowls consume 20 litres of meal, others one-half more. Two feeds must be regularly given in the twenty four hours, and the diet indicated must never be altered in its composition. A curious feature in the process is, that the feeding-house must never be cleaned, the fowls have no litter under them, and their dung is never removed. The highly azotised emanations which prevail in the feeding-house are considered necessary to assist the fattening process, although they are disagreeable to the attendants, and not seldom injurious to their health. The fowls are never subjected to any mutilation, as is the case with capons, and often with fowls fattened in other ways. The finer specimens of poulardes attain a weight of upwards of 8 lb, the cocks 13 lb., and these weights are sometimes exceeded."

Another mode of forced feeding consists in

"Causing the fowls to swallow, by means of a funnel inserted into the mouth, farinaceous substances in a liquid state. This latter method, named *entonnage*, is so simple and rapid, that it is thought likely to be adopted in preference to any other. The filler or funnel, made of white iron, should be of sufficient size to holds one meal, having a ring below the rim externally for receiving the forefinger and thumb, and the orifice at the lower extremity cut aslant, the edges surrounded with a thin coating of india rubber, to prevent injury to the walls of the throat. The beverage, which by this means is to be introduced, consists of barley meal (not bruised barley), mixed up without knots in equal parts of milk and water. When all is ready, the fowl is seized by the wings near the shoulder, the head held forward between the knees and grasped by the left hand, while the right holds the funnel, opens the beak, introduces the intrument into the gullet, and the proper quantity of the mixture is poured in. The quantity of the latter should be about the eighth part of a litre, but only half that quantity is given during the first three days. This dose must be given regularly three times in the four-and-twenty hours, at intervals of eight hours. The boxes or frames containing the fowls should be placed in a stable or other temperate place, protected from currents of air, and they should be littered with straw, the litter frequently renewed, and every impurity removed, unlike the practice followed with the La Fleche pullets. The duration of this treatment is from fifteen to twenty days; if it fails to be successful within that time, the subjects should be withdrawn and otherwise disposed of."

Alluding to the insipidity of the flesh of poultry as an article of food, and which we endeavour to correct by eating it along with ham or tongue, the writer of the article in the *Journal of Agriculture* suggests the possibility of imparting different degrees and kinds of flavour to it by mingling aromatic substances with the usual farinaceous food, the forcing system of feeding presenting the means of accomplishing this end. He reasons from the fact that the nature of the food has an effect on the flesh of animals—thus, "that of the capercaille has the scent of the fir shoots on which the bird feeds; hares inhabiting low wooded regions have less flavour than such as live on mountains. Domestic rabbits are always insipid when compared with wild ones. Birds feeding on certain berries—those, for example, of the juniper—acquire the perfume of their principal food." The flesh of grouse, also, he might have added, has a strong flavour of heather shoots. "Flavoured berries, such as the juniper, the aromatic buds of trees, tops of labiate plants, such as thyme, lavender, odoriferous barks, &c., would form the materials to work with. They would not require to be used but towards the close of the period of fattening, as a short treatment would be sufficient to perfume, at our wish, the whole flesh of the animal. In this way the value of our common fowls might be greatly increased, and they might be brought to equal, and even surpass, many kinds of game." The suggestion is well worth being put to the test of careful practical experiment.

The exhibition of fowls at poultry shows having now become a subject of general interest, we shall be doing young exhibitors a service by transcribing the following useful remarks on this subject from the poultry department of the *Journal of Horticulture* (Nov. 19, 1861):—

"Fowls, to be successful, must be sent in high condition; but even in those classes where weight is an essential, mere fat will not do—large frame-work is necessary. Judges are not guided by mere weight, but the size of the fowl is ascertained and tested by measurement. Excessive fat, so far from being desirable, is a great disadvantage. Fowls suffering from it are necessarily dull and sleepy, they get into the corner of a cage, whence they will hardly allow themselves to be moved, and are spiritless and unattractive. The greatest amount of weight must be attained that is consistent with exer-

e and hard condition. Beauty of plumage is great help to success, and this cannot exist th much fat, as its tendency is to loosen the athers and make them hollow. Fowls should sent to a show with clean plumage, and those at should be white and are not white should washed to make them so. Soap and water ay be easily and safely used with a flannel; d if the birds are afterwards put in a straw sket with soft straw, and placed before a good e, they soon become dry. All fowls should so be sent to a show with clean legs. Even here the birds shown do not belong to a breed which feather is the principal merit, it is de- able to choose those that match as nearly as ssible; and in every breed it must be recol- cted that positive similarity of comb and lour are imperatively necessary to constitute competing hen in *any* class.

"We advise sending fowls away early to a ow. They get more care in unpacking, and ey look better before the judges, from having d more time to recover the effects of packing d the journey. It is, besides, due to the mem- rs of any committee who undertake the task unpacking. There is no reason why they ould be kept at their unpleasant work all ght. It is also far better, where they have a ng journey before them, that fowls should avel at night. Those who manage to a nicety e sometimes too late, and at others they ar- ve after the judges have commenced their ork. One is almost as bad as the other. With gard to the food they should have before they art, it should be of a light character. They ve no opportunity in their baskets of finding ones to assist in digestion, and for that reason e object to whole corn. We believe sopped ead to be the best thing they can have, and very severe weather it is a wise precaution to ve them a part of their meal steeped in strong er."

"All baskets should be round, to prevent any athers from being broken. There is no angle such a one for a bird to get into to escape om beating, or to crouch to roost. If it is in otion, the tail follows round, and the feathers e not injured. The basket should be covered ith double canvas. It should be large enough allow all the birds to sit down, and high ough to allow the cock to stand upright with- at injury to comb or top-knot."

(Concluded in next number.)

The Apiary.

On the Management of Bees.

To the Editor of the Canadian Agriculturist.

Sir,—In the October number of your valu- le journal I noticed the following enquiries by Apiarian," addressed to the bee-keeping commu ity, for information as to the results of their experience in reference to the most profitable system, stating the average yield of honey, cost of stocks or swarms, the best time to stock an apiary, and any other particulars that might be useful? I have been looking for the requested information in answer to those enquiries, in the subsequent numbers of your publication, as an interchange of sentiment upon the practice of this pursuit, would have been acceptable to myself and, no doubt, to many others of your subscribers, especially from those apiarians who have made it a special business, but have not yet met with it. In the absence of such information, I here submit a brief statement of part of my experience, in connection with particulars from other sources. But, from the limits of a communication of this sort, much of the details of operations in manipulating with the bees is necessarily omitted.

Having taken much interest in the natural history and practical management of this wonderful insect for the past twenty years, and keeping a limited number of stocks, I conceived this insect evidently intended for domestication, as much so as any other stock of the farm, its instincts and habits being devised in reference to the benefit of man.

This branch of rural industry is in a very low state, from the small amount of encouragement given by the different local agricultural societies in Canada West, in connection with the large number of failures,—by which bee-keepers have had to renew their stock every few years,—arising from defective management, and too often *no* management, excepting, of course, the hiving of a swarm and placing it upon the stand, and leaving the subsequent results to luck. The absurdity of a corresponding amount of management in connection with other crops, would be easily seen, and failure anticipated. This low state of the industry has given rise to an unfavorable impression in regard to its profitableness and importance, as a natural resource of the country. But a land flowing with milk is inseparably connected with a flow of honey. And if the practical knowledge and attention be given, that the present state of improved bee-management requires, it can be made a profitable business. On the other hand, a deceptive or too sanguine an impression may be produced, from the perusal of those accounts of large profits inserted in many of the published papers, perhaps the results of one year in ten.

The average yield of honey in one locality will not be a reliable criterion for an expected result in another, as different seasons, situation, and the strength of the stock, materially affect the amount of the returns. In the absence of a record of profits, I should judge that from 30 to 50 per cent. on the capital invested in honey would be a safe estimate, leaving a limited number of young stocks, to offset expenses of hives, stands, &c. The prospective profits of the lo-

cality, in which your correspondent resides, will be best judged of, from a view of the surrounding vegetation. White clover, buckwheat, linden, raspberry, the orchards, &c, are the chief sources from which honey is obtained in this country. But white clover takes precedence of all other plants, for its superiority in quantity and quality, often denominated *Fine Canada.*

The growth, maturity, and harvesting of all crops in Canada, is confined to a limited period, and the harvest of honey is not an exception. Consequently, the strength of the stocks should be promoted in advance, by every means within the power of the apiarian, so as to meet the required demand of labour, for a successful improvement of the short time allotted for an efficient gathering of not only an abundance but often a superabundance of the honey, that may be secreted by plants in blossom. For its duration upon the blossoms may prove uncertain. The pasture of bees, is not like pasture of other stock, what is left by cattle to-day can be eaten the next, or the next week, but a storm of rain or a few days of wet weather, will wash the greatest abundance from the blossoms, or a cold spell of weather or drought may check the plentiful secretion for that season. It is obvious from this reasoning, if correct, that *strong stocks,* at the commencement of the season, in this climate, are *the foundation of certain success,* other circumstances being equal, as it is only those stocks, in ordinary seasons, that will realize a surplus of honey, over the quantity required to keep them over winter; and in a season of scarcity, weak stocks must perish, if not previously fed, taken up, or united with other stock. Therefore, assuming my stocks to be strong, at the commencement of the honey and swarming season, I endeavour to keep them so, by limiting the swarms, and returning them to the old stocks, or if movable comb-hives are in use, remove the remainder of queen's cells, in excess of the number of swarms permitted to leave. This hive is an improvement upon the chamber-box, box hives, and a legion of worthless patents, as it gives the apiarian control and power of inspecting the interior, and the past seasons's trial by myself will justify their future use. This mode of increase of stocks is much at variance with the practice of a large number of bee kepers throughout the country. The advantages over the old system are unquestionable, whatever merits other methods may possess, as the loss and waste of a valuable swarm, brood, and beebread, with the labour and time in accumulating this wasted product committed to the brimstone pit are *saved,* and are properly directed in the most profitable way, when the increase must be saved or lost. And it will prove ultimately a better guarantee of profitable increase than where more swarms, that is to say, all the first and consequently the best swarms, are allowed to leave without reducing the old stock to become a prey to the moth.

The best time to stock an apiary, is the last of winter or early spring. The operation at this time is attended with the least loss of bees, and any reasonable enhancement of price over the fall stock, will be fully compensated for in the avoidance of care and risk of wintering; although bees can be removed at any seasons of the year, and successfully when swarming, and artificial swarms are the better for being removed some distance. The price of stock will average four dollars, in this section of the country, in common boxhives. Some practical experience in purchasing, is necessary at any season of the year. The common method of judging by the weight of the skip, is not always a safe guide, as old stocks are much heavier in proportion to their contents, and many queenless hives will prove quite heavy.

Some care and attention are requisite in wintering bees, more from the length than the severity of the winter, in order to counteract the accumulation of moisture, generated in the wooden hives, by the breath and heat of the bees becoming frozen, without direct or upright ventilation, but this is is some measure a necessary evil. This is the reason that the common boxhive, placed upon blocks or pins, is so successful, exposed as it is, in many instances to every vicissitude of the weather. The cold dry air, and driving winds, dry up the moisture in some measure, but at the expense of the vitality and animal heat of the bees, and extra consumption of food. The evils of this unmerciful exposure of bees, to the severity of a Canadian winter, are increased by the sudden changes of temperature, as a sudden change from a thaw to severe freezing, before the inside becomes dry will often prove fatal. But, as protection and properly regulated ventilation becomes better understood, this old system will gradually disappear.

Straw hives are better adapted to wintering bees, than wood, as this material is a non-conductor, consequently warmer in winter and cooler in summer, and will absorb and evaporate moisture, and when combined with external protection, either of the same material or wood will obviate the necessity of direct upright ventilation. But where movable comb frames and surplus honey boxes are the system, the straw cannot be worked into the proper shape, without being combined with wood. And those complicated arrangements for ventilation can never be adjusted to the sudden changes of the weather by ordinary bee keepers.

There are some objections to straw, as affording a harbour for the moth, but the depredations of this enemy of the bee are better prevented by other means than the adoption of any material of which the hive is constructed, as they will enter any hive that was ever invented, if not prevented by the bees themselves And honey boxes are the best in every respect for the deposit of surplus honey, both for its security

ansport and convenience of keeping, and a re guarantee of its purity, devoid of beebread d broodcomb, as the bee store it for themlves, and not for the owner. Whereas hive ney is more or less intermixed with beebread d broodcomb, and the separation cannot be fected in all of it without straining one through e other.

The scarcity of honey has given rise to heavy portations of Cuba, and other West India ney, much of it unfit for table consumption, e best often repacked in kegs, and sold as rained Canadian honey, but box honey requires warrantee for its purity, and the comb will t exceed one-third of an ounce to the pound. public revenue derived from this source, as mpared with the present public expenditure, rough importations, or even a supply equivat to the demand for home consumption, apars somewhat distant, and will remain so until corresponding interest is awakened in this anch of rural economy.

The importance attached to this pursuit in ermany, where it is followed as a profitable ployment by a large number of its populan, and the interest evinced by a large portion the clergy, as practical apiarians, aided by veral publications devoted to this and its kinl subjects, have produced corresponding pub- results, as a few figures here, taken from ngstroth, furnished by Wagner from the statical tables of Hanover, will show.

The average annual production of wax, in the ovince of Lunenburg, is 300,000 lbs., and asming one pound of wax for each hive, we ve that number taken up, and computing the ole number, with every allowance for casual-s, the lowest estimate would be 60'),000 ocks, giving 141 to each square mile, to secure e results in the tables, and this district is so rren that it has been called the Arabia of Gerny. And according to Œttl, page 389, Boma contained 160,000 stocks in 1853, and from careful estimate, he thinks the country would pport four times that number,—the kingdom ntains 20,200 square miles. The official reits of Denmark show the export of wax to be m that country, 118,379 lbs. In 1857, the cial estimates returned 58,964 stocks for the ndom of Wirtemberg. And in the same ar the yield of honey and wax, in the empire Austria, was estimated at seven millions of llars.

As there is unquestionably a lack of informan and a degree of uncertainty existing in the nds of a large number of bee-keepers, as to best method and the probable profits of beeeping, it would tend much to the removal of se apparent difficulties, if the different sysis were made public, through the columns of r journal.

Respectfully,

JAS. HESLOP.

West Flamboro', Jan 5th, 1862.

Veterinary.

Warts on Cattle.

MR. EDITOR:—Will you please inform me through the columns of the *Farmer* what is the most effective cure for warts on cattle? If you will you will greatly oblige G. C. B.

NOTE. There are several modes of curing warts. Nitric acid diluted with water, applied occasionally, has been successfully used. Chloride of zinc made into a paste with an equal amount of flour, and applied, will act as a caustic and destroy them. A tincture of iodine applied two or three times a week has been known to destroy them. All these things act as caustic more or less strong, which destroys the vitality of the wart, and it is then thrown off as dead matter.—ED.

We cut the above from an exchange paper. Warts consist in a morbidly increased growth of the outer skin. They generally originate on young animals, and are supposed to be associated with that state of the system when the tissues are in a growing state, as they usually appear during the period of growth, and disappear as age advances. Epidermic warts, when seen in the horse, are found to occupy various situations, as on the nose eyelids, ears, between the hind legs, or sheath, and under the abdomen. When occurring in cattle, they are chiefly confined to the inferior parts of the abdomen, teats, dewlap, or about the head.

Treatment.—The easiest and quickest method of getting rid of warts, when extening over a large surface, is to remove as much as possible with the knife, and apply a hot iron to stop the bleeding, or tie the blood-vessels, and afterwards dress cautiously with arsenical ointment, at intervals of several days. When presenting a well defined neck they may be removed by tying tightly around them a piece of waxed whip-cord; this cuts off all nutrition, and as a consequence they drop off. Calomel is also useful in removing these excrescences.

The Cattle Disease in Montgomeryshire, Wales.

[REPORT OF PROFESSOR SIMONDS.]

Royal Veterinary College.

In continuation of my former report on the outbreak of a destructive disease among the cattle belonging pricipally to Mr. Harvey

Jones' tenants in the parish of Llandinam, Montgomeryshire, I have to speak more fully of the nature of the affection, and the causes which produced it; as also of the means which were adopted to arrest its progress, together with the result. In the previous report it was stated that upwards of fifty animals, of various ages, had died up to the time of my visit, and that others were being attacked almost daily. For the first few days after my investigation, the disease continued to prevail with unabated fatality, but it then ceased, and no more cases have since occurred. This sudden disappearance of the affection I believe to be entirely due to the preventive measures which were adopted, and I am warranted in giving this opinion, because all the local causes were still existing.

Causes.—Under this head we must class the kind of weather which prevailed during the existence of the disease, the nature of the soil, the character of the food, and the management pursued towards the animals.

The cases occurred principally during October—a month remarkable for its humidity and warmth. The state of atmosphere which then prevailed was accompanied with heavy fogs, and particularly in the district in question. The fogs often hung over the fields excepting for an hour or two throughout the entire day, and were so dense as frequently to hide the animals from observation, although but a few yards distant. Constant exposure to weather of this kind would of itself prove detrimental to health, by impeding the process of respiration, and also the decarbonization of the blood; but besides this it would have an indirect effect on the animal economy no less injurious.

Speaking in general terms of the entire parish, it may be said to have a character of soil described as a clayey loam overlying slate shale. The soil is necessarily very retentive of moisture, and as much more rain had fallen in the district than, as may be said by way of contrast, had done in the vicinity of London or elsewhere, so the land was more than ordinarily wet. I was particularly struck with this, for many of the roads leading to different farms were literally mid-leg deep in mud, and perfectly impassable except on horseback.

The warmth of the atmosphere necessarily induced under such circumstances an abundant growth of grass, and it was stated, in answer to my inquiries, that more keep existed in the pastures than was often to be found in the month of June. The grass however produced under these circumstances would of necessity be not only surcharged with moisture, but proportionally deficient both in albuminous and other proximate principles which are imperatively necessary for the making of pure and healthy blood. Hence we have another powerful cause in the food itself in inducing the disease.

The abundance of grass likewise led the proprietors of the cattle to leave the animals out night and day without any other provender, with a view of saving their winter keep. These several things being combined brought about a state of the blood by which it was unfitted for the purposes of life, and as an immediate consequence, local hæmastasia resulted—in other words, the contaminated blood became partially stagnant in the vessels. Sometimes this stagnation took place in one part of the system and sometimes in another. The affected structures became swollen, hard, and painful. The head and throat were the principal seat of the local symptoms, but occasionally the fore or the hind extremities would be attacked. Nor were the external organs exempt, as the lungs were now and then primarily affected.

The duration of the malady varied a little, but was rarely longer than 24 hours; while many of the animals, apparently unaffected in the morning, were dead before night.

In several respects the local symptoms were closely allied to those seen in hæmatosepsis, "black leg," but no gaseous matters were evolved into the cellular tissue, as is the case in that malady. Cattle also of all ages were its victims, and that without respect to their being milking or fattening animals, or store stock.

It was not to be expected that curative means would be of much avail in such a disease, and therefore I learned, without surprise, that little or no advantage had resulted from their application. A case occurring while I was staying with Mr. Powell, Mr. Jones's agent, and the chief occupier in the parish, afforded me the opportunity of giving trial to curative measures, but without much relief, as the animal died in about twenty-eight hours from the time of the attack.

Preventives.—It was self-evident that benefit could only result from the application of prophylactics, and especially from removing the causes of the disease to as great extent as possible. With this view I ordered that the animals should no longer be kept in the pastures at night, but be brought into the yard and fed on hay, hay chaff, and bran, and also crushed corn. It appeared to me to be a matter of minor importance what kind of corn was given, and therefore this varied in different instances according to the convenience of the occupier. The chief thing was to limit the amount of succulent diet, and to substitute food rich in the elements of blood. Instructions were also given for the animals to be kept entirely in the sheds and yards on foggy, but especially on wet days.

Besides this alteration in the diet, location and management of the animals, orders were

given for each to take of nitrate of potash in owder in a bran mash every other night, from wo to four drachms, varying according to its ge and condition. These doses to be given o the extent of about six or eight in number.

In a few instances, as in Mr. Powell's case, ho had been the greatest sufferer, I directed hat an aperient combined with a diffusible timulant should be administered at the com- ncement of the preventive treatment, which as to consist of sulphate of magnesia, half a ound; compound solution of aloes, from two o three ounces; compound tincture of gen- ian in the same quantities, and two drachms f powdered ginger. The whole to be given n some well boiled gruel.

As previously stated, these measures at once roved most effective for good, by entirely utting a stop to the further progress of the alady.

In concluding this report, I may remark at these cases possess an especial interest to ne pathologist as tending to prove the neces- ty of giving greater heed to the state of the uids in many affections of the solids than has itherto been done, and also in showing that me of the most destructive maladies occur- ng among herbivorous animals depend im- ediately for their production on the quan- ty and quality of their food, the manage- ent which is pursued towards them, and the ature of the soil they inhabit.

They also prove to the practical agricultu- st that very often the simplest means, when ghtly directed and founded upon a scientific quiry, will suffice to arrest the most fatal isease which may be raging among flocks or rds.

Miscellaneous.

The Domestic Tyrant.—It is to me a oroughly disgusting sight to see, as we some- es do, the wife and children of a family pt in constant terror of the bashaw at head of the house, and ever on the watch yield in every petty manner to his whims and ncies. Sometimes, where he is a hard-wrought d anxious man, whose hard work earns his ildren's bread, and whose life is the sole stay is needful that he should be deferred to in many ings, lest the over-tasked brain, and over-strain- nervous system should break down or grow qual to the task. But I am not thinking such cases. I mean cases in which the head the family is a great fat, bullying, selfish, ondrel; who devours sullenly the choice es at dinner, and walks into all the fruit or sert, while his wife looks on in silence, and the e-stricken children dare not hint that they uld like a little of what the brutal hound is oaring. I mean cases in which the contempt- ible dog is extremely well-dressed, while his wife and child en's attire is thin and bare; in which he liberally tosses about his money in the billiard room, and goes off in autumn for a tour on the continent by himself, leaving them to the joyless routine of their unvaried life. It is sad to see the sudden hush that falls upon the little things when he enters the house: how their sports are cut short, and they try to steal away from the room. Would that I were the Emperor of Russia, and such a man my subject! Should not he taste the knout? Should not I make him howl? That would be his suitable punish- ment; for he will never feel what worthier mor- tals would regard as the heaviest penalty by far, the utter absence of confidence or real affection between him and his children when they grow up. He will not mind that there ever was a day when the toddling creatures set up a shout of delight at his entrance, and rushed at him, and scaled him, and searched his pockets, and pulled him about; nor that the day will never come when, growing into men and women, they will come to him for sympathy and guidance in their little trials and perplexities. Oh! woeful to think there are parents, held in general estimation, too, to whom their children would no more think of going for kindly sympathy, than they would think of going to Nova Zembla for warmth.—*Country Parson.*

Habit of the Hippopotamus—There can be little doubt that the "Behemoth," of Scripture is identical with the animal we have named Hippopotamus. In the fortieth chapter of the book of Job, Behemoth is spoken of as an animal "that lieth down in the shade of the trees, in the covert of the reeds and fens:" "whose bones are as bars of iron." "He eateth grass, like an ox." "The shady trees cover him with their shadows; the willows of the brook compass him about." "Behold he drinketh up a river: he trusteth that he can draw up Jordan into his mouth." Although the researches of geologists have put it beyond doubt that, at a remote period of the world's history, the hippopotamus was common to Europe and Asia, it is now found only in Africa, and there not universally; with the exception of the Nile, none of the rivers that fall into the Mediterranean producing it. He is a shy brute, and retreats rapidly before civilization; indeed, it is only in the large and solitary rivers and lakes, running from the confines of the Cape Colony to about the twenty-third degree of north latitude, that the hippopotamus is found at home and at his ease. And no beast of the field can boast of a home so vastly grand and beautiful. Great silent lakes spread out on every side, with fairy islands dotting between—islands, jutting green from the transparent water, and studded with the date, the black-stemmed mimosa the wild wide spreading sycamore, the elegant msboma, and other great straggling ragged fruit-bearers, the yellow, and scarlet, and pearly-white

frui flickering and flashing in the sun, like col.r-ed lamps, and the wonderful fan palm, each leaf of which is as d licate and daint y s ap d as a lady's fan, and which bears as fruit mahogany-coloured apples, that have for a core a round, hard, stony substance, like ivory. Through the rank underwood glide snakes of all the colours of the rainbow, and Lizards, looking like animated masses of jewels; and above these dart and flutter birds, large and small, some with forked tails, and some with crowns, some vermilion, and some the colour of flame. The hippopotami at the Zoological Gardens, Regent's Park, are fine specimens. The larger of the two was shipped during its infancy, subsisting, during its voyage to England, on the milk of two cows and three goats. This, however, was soon found to be insufficien, so a few quarts of Indian meal were thrown in. By degrees he was "weaned," and vegetable diet supplied him instead of milk. At the present time its allowance is one hundredweight daily of hay, corn, bran, mangelwurzel, and white cabbage; and, during the ten years he has honoured this country by his presence he has increased in weight more than a ton.—*Wild Sports of the World.*

The Flax and Linen Trade of Ireland.—Belfast, the great emporium of the lin n trade last year exported 65,000,000 yards of linen, and 15,200 000 lbs. of linen yarn and thread. Next to importance to the flax industry is the trade in sewed muslins, employing about half a million persons in Ireland. Another manufacture carried on in Belfast is important in the consumption of agricultural produce — viz., starch-making from wheat. Ten firms use nearly 30 000 quarts of the finest red wheat every year. The wheaten starch made by the old fermentative process, is largely used by old bleachers, the goods retaining their stiffness longer than if dressed with rice and other starches. The whole of this business is at present paralyzed, as America was the best market for Irish linen goods, very limited quantities of which have been imported during the past nine months.

Cows v. Horses.—At a plowing match held on the estate of Right Hon. Earl Ducie, Crummel Park, we noticed a team of cows engaged in plowing at one end of the field; and as they appeared to excite a tolerable amount of attention, we thought it would while to make a note or two on the spot. The animals were polled cows in full milk, and belonged to Mr. John Evans, of Woodfood, Gloucestershire, who is, we believe, a small enterprising farmer. Two of the cows were rather old, the hindmost one, the owner assured us, had been worked regularly during the last seven years, and had had a calf every year, and one season was worked up to the day previous to calving. The middle cow was a three-year old, and this was her second season, the owner putting his cows to the plow at two years old. Our readers must bear in mind that the cows were in full milk, being milked twice every day; on very hot days it was found necessary to milk them three times. Mr. Evans assured us that the cows gave more and richer milk when they were regularly worked, and that the cows were larger in amount, as well as better in quality; to use his own words when there was less quality of goods made, his wife would tell him that he had not worked the cows so much which was invariably the fact. Our readers will, of course, imagine that the cows were, as ought to be well fed; hay, oil cake bran and chaff, we were told, was the food given them during their working time. We give the opinion as to the policy of working dairy cows above, leaving our readers to draw their own conclusion; we must say we thought it rather slow work, although the plowing was pretty well done, and there seemed no lack of strength or will on the part of the cows.

An Easy Way to Dissolve Bones.—Jas. S. Greenfield, practices dissolving bones by a method which seems worthy of notice from its simplicity and convenience. Casks having either but one head are provided; a layer of bones six or seven inches thick placed on the bottom then strong, unleached wood ashes are sprinkled over the bones to the thickness of two inches or more. The casks are filled in this way, taking care to have a pretty good thickness of ashes on the top to prevent the exhalation of ammonia. The process of thus packing the bones goes on through the season, as ashes accumulate in the house and they remain in the casks till spring, when the casks are emptied, and the bones are found to be generally well pulverized, or so soft that they can easily be broken as fine as desired. The mixed bones and ashes are excellent manure for most crops, and especially for fruit trees. —*Boston Cultivator.*

Physical Strength and Dexterity.—Physically, no man is made the most of. Like an acrobat or a boxer: there is what you limbs *might have been made for* strength and agility. That is the potential which is in man naturally in these respects. I never witness a prize-fight, and assuredly I never will witness one; but I am told that when the champion appear in the ring, stripped for the contest (however bestial and blackguard-looking in countenances may be), the clearness and beauty of their skin testify, that by skilful physical discipline, a great deal more may be made of the human hide than is usually made of it. But if you wish to know what may be made of human muscles as regards rapid dexterity, look at the Wizard of the North or at an Indian Juggler. I am very far indeed from saying or thinking that this peculiar pre-eminence is worth the pains it must cost to acquire it. Nothing have a word to say against the man who maintains his children by bringing some

ulty of the body to absolute perfection. I ready even to admit that it is a very right d fit thing that one man in five or six millions uld devote his life to showing the very ut- at that can be made of the human fingers, or human muscular system as a whole. It is fit t a rare man here and there should cultivate e accomplishment to a perfection that looks gical, just as it is fit that a man here and re should live in a house that cost a million pounds to build, and round which a wide tract country shows what might be made of trees l fields where unlimited wealth and exquisite e have done their best to improve nature to fairest forms of which it is capable. But n if it were possible, it would not be desira- that all human beings should live in dwellings Hamilton Palace or Arundel Castle; and ould serve no good end at all—certainly no worth the cost—to have all educated men mu-cular as Tom Sayers, or swift of hand as bert Houdin. Practical efficiency is wanted the business of this life, not absolute perfec- —*Frazer's Magazine.*

Good Smokehouse.—We lately observed a l-planned smokehouse on the premises of a farmer, worthy of a brief description. It about six feet square, the lower half built of , furnished with an iron-lined door, and ing as an ash-house, and place for the fire. upper part about four feet high, besides the nt of the roof, was made of wood. It was rated from the lower part by scantling ts, a space of two or three inches between n, through which smoke and air could freely ; but sufficient to catch any ham that might dentally fall, and thus save it from the fire. upper part as well as the lower, was entered door from the outside; this upper door be kept locked, except when admitting or drawing hams: but the lower may be left cked, for the hired men to build fires, with- any danger of the contents above being n, as the thief cannot pass through the ings between the joists.— *Country Gentle-*

-BIRDS.—The question is often asked, re do sea-birds obtain fresh water to slake thirst? but we have never seen it satisfac- y answered till a few days ago. An old per, with whom we were conversing on the ct, said that he had frequently seen these at sea, far from any land that could furnish with water, hovering round and under a cloud, clattering like ducks on a hot day pond, and drinking in the drops of rain as fell. They will smell a rain squall a hun- miles, or even further off, and scud for it almost inconceivable swiftness. How long irds can exist without water is only a mat- f conjecture; but probably their powers of ing thurst are increased by habit, and pos- they can go without for many days, if not veral weeks.—*Wilson.*

Notes on Raven Stories.—It is a curious fact that a bird of so grave and sedate a demeanour should so affect inns and taverns. Whether it is that, being burdened with an evil conscience, he seeks there to drown it—not by indulging in intoxicating liquor, but rather in the row and riot consequent on its absorption by mortals: or whether, being of a cynical turn, he delights in the contemplation of folks going the same thing from the most opposite reasons —drinking, because they are jolly, and because they are miserable, because they can afford it, and because they are so wretchedly poor —is more than I can say. I only know that of the few remaining ravens in London, at least one half are attached to public-houses, and nearly always to such houses as adhere to the old custom of sign-posts and water-troughs. Some years ago there was attached to a tavern at Stoke Newington a raven, whose great antipathy was grey or white horses. Brown, black or roan horses might halt outside, and welcome; but so sure as one of the detested colour drew up and appeared at the water-trough, Peg was on the alert. She would perch on the edge of the trough and abuse the poor animal in the very choicest Billingsgate, or "gee, whoa!" in exact imitation of a carter, and start it off. I should have thought all this was done for pure fun and love of mischief, but for an incident related to me by the landlord, and which at once proved that the bird was actuated by sheer malice. It happened one day that Peg was particularly curious respecting a tobacco box belonging to a sailor who was drinking ale in the parlour. Presently the sailor took a "quid" from the box, and put it in his mouth. Peg watched the operation with great attention, and observing that the sailor relished the disgusting mouthful, as soon as his back was turned she darted at the box and swallowed its contents at a gulp. The consequence was that for the remainder of that day and the next she was very ill indeed. A few days after an unlucky white horse, attached to a hay cart, arrived at the house in question, and was drawn up to the trough to drink, and the raven instantly began her prosecution. The white horse, however, had met Peg several times before, and had learned to treat her impudence with indifference. Finding abuse and assault of no avail Peg turned into the house, and, finding some men smoking in the taproom, she caught up a paper of tobacco from the table, flew to the edge of the trough with it, and deliberately dropped it into the horse's nose-bag.—*Home Pets. (Oct.)*

The New Artesian Well near Paris.—The sinking of the artesian well at Paris cost £40,000. The result is, however, beyond all previous calculation. Instead of the 12 000, no less than 75,000 cubic feet spring up every twenty-four hours—the well at Grenelle giving only 3 000 at the utmost, now reduced to 2200 cubic feet.

The Passy bore is 60 inches in diameter, and quite a river of pure water flows from it, equal in quantity to one thirty-fifth of the average flow of the Seine! With a few such wells all Paris could be supplied, and at a trifling cost compared with that of the gigantic schemes for bringing water from Champagne and other quarters. The temperature is high—80 degrees—and in this state it can be made very useful for many purposes, though for drinking it must be cooled.

Works of Human Labor.—Nineveh was 15 miles long, 8 wide, and forty miles round, with a wall 100 feet high, and thick enough for three chariots abreast. Babylon was 50 miles within the walls, which were 75 feet thick and 100 high, with a 100 brazen gate. The temple of Diana, Ephesus, was 420 feet to the support of the roof: it was a hundred years in building. The largest of the pyramids is 481 feet high, and 653 on the side; its base covers 11 acres. The stones are about 60 feet in length, and the layers are 208. It employed 330 000 men in building. The labyrinth in Egypt contains 300 chambers and 12 halls. Thebes, in Egypt, presents ruins 27 miles round, and 100 gates. Carthage was 29 round. Athens was 25 miles round, and contained 359 000 citizens and 400,000 slaves. The temple at Delphos was so rich in donations, that it was plundered of $50,000,000, and Nero carried away from it 200 statues. The walls of Rome were 13 miles round.

Sleep vs. Insanity.—In an article on sleep in a late number of the Educator, Dr. Cornell, of Philadelphia, says:—The most frequent and immediate cause of insanity, and one of the most important to guard against, is the want of sleep. Indeed so rarely do we see a recent case of insanity that is not preceded by want of sleep, that it is regarded as almost a sure precursor of mental derangement. Notwithstanding strong hereditary predisposition, ill health, loss of kindred or property, insanity rarely results, unless the exciting causes are such as to produce a loss of sleep. A mother loses her only child; a merchant his fortune; the politician, the scholar, the enthusiast may have their minds powerfully excited and disturbed; yet, if they sleep well, they will not become insane. No advice is so good, therefore, to those who have recovered from an attack, or to those who are in delicate health, as that of securing, by all means, sound regular, and refreshing sleep. "There is no fact," says Dr. Spicer, "more clearly established in the physiology of man than this, that the brain expands its energies and itself during the hours of wakefulness, and that these are recuperated during sleep; if the recuperation does not equal the expenditure, the brain withers—this is insanity. Thus it is that in early English history, persons who were condemned to death by being prevented from sleeping, always died raving maniacs; thus it is, also, that those who starve to death become insane; the brain is not nourished, and they cannot sleep."

Useful Medical Hints.—We find the following remarks (by the editor) in the Cincinnatus, a scientific and agricultural journal published at Cincinnati, Ohio:—If a person swallows any poison whatever, or has fallen into convulsions from having overloaded the stomach, an instantaneous remedy is a teaspoonful of common salt and as much ground mustard, stirred rapidly in a teacup of water, warm or cold, and swallowed instantly. It is scarcely down before it begins to come up, bringing with it the contents of the stomach; and lest there be any remnant of poison, however small, let the white of an egg or teacup full of strong coffee be swallowed as soon as the stomach is quiet; because these nullify many virulent poisons. In case of scalding or burning the body, immersing the part in cold water gives entire relief, as instantaneously as the lightning. Meanwhile, get some common dry flour, and apply it an inch or two thick on the injured part the moment it emerges from the water, and keep sprinkling on the flour through anything like a pepper-box cover, so as to put it on evenly. Do nothing else; drink nothing but water; eat nothing until improvement commences, except some dry bread soaked in very weak tea of some kind. Cures of frightful burnings have been performed in this way, as wonderful as they are painless. We once saved the life of an infant which had been inadvertently drugged with laudanum, which was fast sinking into the sleep which has no waking, by giving it strong coffee, cleared with the white of an egg—a teaspoonful every five minutes—until it it ceased to be drowsy.

How to Treat the Bite of a Dog.—Dr. Stephen Ware, of Boston, in his testimony in a recent case which grew out of the injuries from the bite of a dog, furnished the following valuable advice:—In the case of a bite by a dog, where the teeth of the animal penetrated the flesh, whether the dog was known to be mad or not, he should use the same precautions. I would wash the wound with warm water, extract all the virus possible by sucking the wound with his lips, and then cauterize it deeply with caustic most readily obtained, but should prefer potash if it could be procured at once. The time in which the effects of the bite of a mad dog would be seen, varied from two to three days to as many years, but if no effects were felt after two or three months, as a general rule the patient might consider himself safe. Bites made through clothing are seldom productive of much harm, as even if the dog is mad the clothing absorbs the virus before the teeth reach the flesh. Most of all the fatal cases are where the person was bitten on some naked part. Concerning the possibility of a cure in a real case of hydrophobia nothing was said.

Water the Drink for Soldiers.—Mr. H. Marshall, who was for a long period Dep-

Inspector of Hospitals, in the British Army, says: —"By the daily custom of imbibing spirituous potations a new want is created, intemperance is established as a habit, and frequent intoxication is the consequence. The wretched drunkard must now have a large supply of liquor in the morning to recover from the effects of the quantity drank on the previous night. He perhaps has neither money nor credit, and his clothes are then sold at a small portion of their value. Some do not stop here; for, after having sold all their clothes, they will rob their comrades and with the proceeds of their dishonesty provide the means of intoxication Confinement follows upon confinement, court-martial upon court-martial, and punishment upon punishment, until the worn out wretch dies in hospital of the 'horrors,' fever or dysentery; or if he should for a time resist the fatal attacks of disease, his constitution becomes broken down by the combined influence of the poison of spirits, an exhausting climate and repeated attacks of illness, so that, in a few years, he is found unfit for further service in India."

The personal experience of Mr. Marshall was decidedly in favor of the superior sanitary effects of water drinking, in hot climates. He says:— I have myself marched on foot with troops on actual service, in a tropical climate, where the mean temperature is considerably higher than that of Jamaica, without any other beverage than water, and occasionally a cup of coffee. So far from being calculated to assist the human body in enduring fatigue, I have always found that the strongest liquors were the most enervating; and this in whatever quantity they were consumed, for the daily use of spirits is an evil which retains its pernicious character through all its gradations. Indulged in at all, it can produce nothing better than a diluted or mitigated kind of mischief." Dr. Robert Jackson, who was at one time at the head of the medical staff of the West Indies, expresses his opinion that an English soldier, aided by temperance, may be rendered capable of going through the severest military duty in the hottest islands in the West Indies.

Whiskey was unknown among the iron soldiers of Rome, who were the conquerors of the world. Water was their common drink, sometimes modified by weak sour wine, almost resembling vinegar.

Rules for Reading.—Read the best books which wise and sensible persons advise, and study them with reflection and examination. Read with a firm determination to make use of what you read. Do not, by reading, neglect a more immediate or more important duty. Do not read with a view to make a display of your reading. Do not read too much at a time. Reflect upon what you read, and let it be modestly enjoyed and well digested.

The Bashful Man.—Washington Irving, at a party in England, once told the following story of a bashful friend of his, who, being asked to a dinner-party, sat down to the table next to the hostess in a great state of excitement, owing to his recluse life. A few glasses of wine, mounting to his brain, completed his confusion, and dissipated the small remains of his presence of mind. Casting his eyes down, he saw on his lap some white linen. "My heavens!" thought he, "that's my shirt protruding at my waistband" He immediately commenced to tuck in the offending portion of his dress; but the more he tucked in, the more there seemed to remain; at last he made a desperate effort, when a sudden crash aroused him, and screams from the company brought him to his senses. He had been all the time stuffing the table-cloth into his breeches, and the last attempt had swept everything clean off the table. Thus our bashful friend annexed a table cloth, thinking it was the tail of his own shirt.

Editorial Notices, &c.

The Journal of the Board of Arts and Manufactures of Upper Canada: Toronto.

The first number of Vol. 2 has just come to hand of this useful periodical, and its contents contain much to interest not only the mechanic and manufacturer, but also the general reader. In a young country like Canada, to rouse a spirit of energy and emulation in relation to arts and manufactures, must always be a slow and sometimes difficult work; and this is felt to be more particularly the case at the commencement and during the early stages of such undertakings. We are glad, therefere to find that the exertions of our Board of Arts and Manufactures have already been attended by such an amount of success as to encourage them to bring out their Journal for the current year in an enlarged and improved form, without increasing the price. The present number indicates much care and skill in preparing and editing the various subjects of which it treats, some of which are well illustrated by appropriate wood cuts. Its "getting up," as well as its scientific and literary matter are alike creditable to all concerned in its production. We will only add, that to single subscribers the yearly subscription is $1; to clubs of ten or

more 75 cents; but members of Mechanics' Institutions, *and also those of Agricultural Societies, can procure the work for the very small sam of 50 cents a year!* Communications should be addressed to W. Edwards, Esq., Secretary of the Board of Arts and Manufactures, Toronto.

THE GARDENERS' MONTHLY: Edited by Thos. Meehan; Philadelphia, January 7, 1862.

This excellent gardening periodical has entered on its fourth year, with a constant tendency to improvement, so that it may now be considered as being permanently establishe l. All subjects connected with Horticulture, in its various departments, the management of orchards, &c., are treated in its pages with a fullness and practical skill that must be highly acceptable to all who are in any way interested in these important and pleasing pursuits. We shall be happy to know that the *Gardeners' Monthly* is being increasingly circulated in every county and township in the Province. In this manner the taste and domestic comforts of the people would most surely be raised and increased. A good vegetable garden and orchard are among the indespensibles to the enjoyments of a country life; and the cultivation of a few flowers, and the proper grouping of a few shrubs and trees around a country home, very much tend to increase its beauty and attractiveness. Mr. Fleming, Seedsman and Florist, of this city, will supply subscribers with this interesting and useful work for one dollar a year, a sum extraordinarily low, when its execution and the character of its papers are taken into consideration.

THE RURAL ANNUAL AND HORTICULTURAL DIRECTORY, for the year 1862: Rochester, N. Y., Joseph Harris.

This is the seventh annual publication of this very useful and popular Annual, the high character of which is fully sustained by the present volume. It is, as several of our readers are aware, published by Mr. Joseph Harris, at the office of the *Genesee Farmer*, at Rochester, in the state of New York, from whence it can be obtained by mail, by remitting the price, only 25 cents! This small sum will appear extraordinary when it is considered th' the work is very neatly printed, and illustrated by numerous wood cuts. Publications of this nature cannot fail to ensure a highly beneficial influence on the practice of agriculture, and the *minds* of all that are in any way engaged in country pursuits.

Among the contents of this volume we notice articles on the culture of Apples, Pears, Peaches, Plums, Grapes, etc., with a list of good varieties; also of Strawberries, Raspberries, Currants, etc.; on Annuals and their Culture; on the Manufacture of Domestic Wines; on the Cultivation of Wheat, Barley, Oats, Rye, and Indian Corn; on Cutting Potatoes for Planting; on Harrowing Potatoes; Chinese Hogs; English Mutton Sheep; Making Hay; Covering Grass Land with Straw; Culture of Figs; on Poultry; on the Culture of the Peach in the Middle States; Fruit and Malaria; Protecting Plants from Frost; Summer Pruning Apples; Rules for Arranging Ornamental Grounds; Fire-proof Wash for Roofs, etc.; on Cider-Making; Seeding with Clover among Corn to Kill Canada Thistles; Amount of Roots from Clover and Grasses; to Destroy Insects, the Poultry Mildew; Trimming Osage Orange Hedges; Cultivation of the White Bean; Moss on Roofs; Whitewash; a Novel Ice-House; Application of Manure; Toads and Bees; on the Cultivation of Dwarf and Standard Pears; Mulching the Currant; Mildew on the Grape; Spiræas and their Culture; Cold Graperies; When to Gather Grapes; Low-Headed Trees; the Delaware Grape; Strawberries; Aphides on trees; Covering Grape Vines in Winter; Aeriating the soil; Warts on Cattle; Cut Worm and Corn Grub Killer; Treatment of Milk Cows, etc., etc.

TO AGENTS AND SUBSCRIBERS.—We beg to remind officers of Agricultural Societies and other gentlemen who are in the habit of obtaining subscriptions for this Journal, as well as our readers generally, that it is our invariable practice to stop all papers as soon as the term for which the subscription has been paid has expired. The paper is not again forwarded till the order has been renewed and the amount remitted. Agents will therefore please give full explanation to any subscribers of last year who may not understand the reason of their not receiving our journal since the commencement of the new near. We have already a large proportion of last year's subscribers on our books again for this year, and we shall be happy to receive the whole, with any number in addition, as soon as they please to forward their orders.

BOARD OF AGRICULTURE.

THE Office of the Board of Agriculture has been removed to 188 King Street West, a few doors from the late location adjoining the Government House. Agriculturists and any others who may be so disposed are invited to call and examine the Library, &c., when convenient.

HUGH C. THOMSON,
Toronto, 1861. *Secretary.*

International Exhibition, London, 1862.

THE Commissioners for Canada at the INTERNATIONAL EXHIBITION of 1862, give notice to all parties desirous of exhibiting Canadian products, whether application has been already made for the exhibition of the same or not, that such articles may be sent in for examination and approval to the following places, at any time between the TENTH DAY of FEBRUARY next, and the undermentioned dates, viz:—

IN CANADA WEST.—London, 18th February; Hamilton, 20th February; Toronto, 2nd February; Kingston, 25th February, and Ottawa, 28th February.

IN CANADA EAST.—Quebec, 14th February; Three Rivers, 18th February; St. Hyacinthe, 22nd February; Sherbrooke, 25th February next; and Montreal, 3rd and 4th March next.

Articles will be received and stored at the depots of the Grand Trunk Railway Company at London, Toronto, Kingston, Quebec, Point Levi, Sherbrooke and St. Hyacinthe.

The Commisssoners will begin their examinations at 10 o'clock, A. M., of each day named.

Intending exhibitors must deliver the articles for exhibition at the above named places, free of charge. Should they not be approved, the Grand Trunk Railway will return them free of charge, to any depot on their line from which they have been sent.

Parties sending in Grain or Woods are requested to transmit a certificate, stating the species and varieties, and where grown. Woods should be sent of the usual dimensions for commerce, and Her Majesty's Commissioners have expressed a desire that they be shown in planks two inches thick, showing the sap on both sides, or a 4 inch scantling, and accompanied, wherever practicable, by twigs with leaves or flowers.

Parties desirous of further information, may apply, concerning Minerals and Specimens of Economic Geology, to Sir W. E. Logan, Montreal; concerning products of the Forests and Waters, to Dr. Taché, Quebec, or Dr. Hurlburt, Hamilton; concerning Agricultural produce, to Hon. L. V. Sicotte, St. Hyacinthe, and Col. Thomson, Toronto concerning articles of Canadian Manufacture, to Dr Beatty, Cobourg, or to the Secretary, Montreal, to whom also, communications on all other business of the Commisssion are to be addressed.

R. CHAMBERLIN, Com'r, Secretary.
Montreal, December 12, 1861.

Notice of Co-Partnership.

THE Undersigned have entered into Partnership as Seedsmen and dealers in all kinds of Agricultural and Horticultural Implements, under the firm of James Fleming & Co.

JAMES FLEMING,
GEORGE W. BUCKLAND.

NOTICE.

JAMES FLEMING & CO., Seedsmen to the Agricultural Association of Upper Canada, will carry on the above business, wholesale and Retail, at 126 Yonge-st., 4 doors North of Adelaide-street, until next July, when they will remove to the new Agricultural Hall, at the corner of Queen and Yonge streets.

JAMES FLEMING will continue the business of Retail Seedsman and Florist at his old stand, 350 Yonge-street.

Toronto, January 1st, 1861.

FOR SALE.

AT

WOODHILL, WATERDOWN P. O.

MR. FERGUSSON expects to have several *pure Durham bull calves* to dispose of next Spring, 1862, not intending to raise any this season. These calves will be all of the *well known DUCHESS tribe*, and will be put on the G. W. R. R. at six weeks old for eighty dollars each.

N. B.—Frst come, first served.

Waterdown, Nov. 14, 1861. 4-t.

THOROUGH BRED STOCK FOR SALE.

THE SUBSCBIBER has for Sale Durham and Galloway Cattle, male and female.

Leicester, Cotswold, and Lincolnshire Sheep, male and female.

January 1, 1862. JOHN SNELL,
tf. Edmonton, P. O., C. W.

VETERINARY SURGEON.

ANDREW SMITH, Licentiate of the Edinburgh Veterinary College, and by appointment, Veterinary Surgeon to the Board of Agriculture of Upper Canada, respectfully announces that he has obtained those stables and part of the premises heretofore occupied by John Worthington. Esq., situated corner of Bay and Temperance streets, and which are being fitted up as a *Veterinary Infirmary.*

Medicines for Horses and Cattle always on hand. Horses examined as to soundness, &c.

Veterinary Establishment, Corner of Bay and Temperance Sts.

Toronto, January 22nd, 1862.

Contents of this Number.

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