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THE FARMER AND MECHANIC,

A MONTHLY PERIODICAL,

DEVOTED TO

Agricultural, Horticultural, Mechanical,

AND

DOMESTIC SUBJECTS.

VOL. I. OCTOBER, 1848. NO. 1.

TERMS,

THREE SHILLINGS & NINEPENCE A YEAR,

Five Copies for $3! Three Copies for $2!!

Except to Agricultural Societies, invariably in advance.

Agricultural Societies and Parties procuring Ten Subscribers, or upwards, allowed a deduction of one-third. It is not requisite that the whole number should be subscribed for at one time, or that they should be sent to one address. The same allowance made for all additional Subscribers over Ten; and Parties procuring Twenty Subscribers, or upwards, will be presented with an extra copy.

TORONTO, C.W.:

Published by Eastwood & Co., 67, Yonge Street,

To whom all Orders must be addressed.

ADVERTISEMENTS,

Relating to Agricultural and Mechanical subjects, inserted at the following Rates, viz.:—Fourpence per Line for the First Insertion, and Twopence for each repetition. None inserted for a longer period than Four Months, as not more than three pages will be devoted to this purpose.

To our American Exchanges.—Under the present Postal arrangement between Canada and the United States, it is necessary for our American Exchanges to pay the Postage to the lines. We trust they will not object to do this, inasmuch as we are obliged to do the same. They will much oblige by sending us the last Number issued previous to the receipt of this.

To the Friends of Agricultural and Mechanical Progress, Agricultural Societies, Post Masters, Country Storekeepers, School Teachers, Millers, &c., &c.

That the individual and general prosperity of Canada wholly depends upon the successful efforts of the Farmer and Mechanic, we think few, if any, will deny; that the establishment of Manufactories would much assist these two, as well as other classes, can, in our opinion, be fully demonstrated; but, from the present want of capital, however desirable, it is not probable that Manufactories will, for some time, be established to any great extent. Canada has, therefore, to look for the elements of her property wholly among the two classes we have named—the Farmer and Mechanic. It is, therefore, the duty and interest of all parties to assist and encourage them. Among other means, the establishment of

AGRICULTURAL SOCIETIES

Has been found the most efficient; but these, from their nature, must necessarily fall far short of what is required, without the assistance of a vehicle for the dissemination of their views and intentions. We, therefore, present our Journal to their notice, as a means through which the desired end may be attained, and in the hope that it may be found worthy of their encouragement and support.

Post Masters, Country Storekeepers, School Teachers, Millers, &c., &c.

Receiving their support immediately from the Farmers and Mechanics, must necessarily feel a direct interest in their prosperity; that a Magazine, such as ours, is calculated to do much towards their advancement, we feel assured; and we therefore trust they will exert themselves, and procure for us a large list of patrons in their respective neighbourhoods, and we are much encouraged in our expectations that they will, from the fact that, in addition to what has been stated above, it may be made a source of profit. This will at once be seen by a reference to our Terms.

Recollect that our Journal is the *Cheapest* in *British North America;* and it shall be our constant endeavour to make it worthy of the support and encouragement of the Farmers and Mechanics, for whose especial benefit it has been established,—not by presenting to them our own particular views, but the result of successful experiments and inventions, both in Agriculture and Mechanics, as the lessons of time and experience of a number must necessarily be entitled to more confidence than of an individual. We therefore trust, that all classes will give us their support, as the usefulness of such a work as this is in direct proportion to the extent of its circulation.

It is not our intention to have any Travelling Agents; we, therefore, trust to the spontaneous efforts of the friends of Agricultural and Mechanical Improvement, to get our Journal into general circulation.

All Orders and Communications to be addressed to the Publishers,

EASTWOOD & Co.,

October, 1848. 67, Yonge Street, Toronto.

THE FARMER AND MECHANIC.

Vol. I. TORONTO, CANADA WEST, OCTOBER, 1848. No. 1.

To our Readers.

In presenting the first number of the *Farmer & Mechanic* to the Canadian public, we shall, in as concise a manner as possible, explain the leading features of our magazine, and the results which we hope in some measure to be instrumental in obtaining. Agriculture and the mechanical branches are the only sources of profitable employment in which the great bulk of our population can hope to sustain an honorable position in society, and therefore the press should devote more attention in aiding to develope the various branches of industry with which these noble and useful professions are capable of being improved. All classes of the community have of late become convinced of the utility of periodicals like our own, and many are willing to acknowledge that they have individually derived a greater degree of benefit, in their respective callings, from this source, than could have been procured. at a much greater expense, from books, or any other mode of intellectual improvement. The good that has been conferred to a few, through the medium of the Agricultural and Mechanical periodicals, is proposed by the publisher of this journal, to be placed within the reach of the many; and the means by which it is hoped this great result will be accomplished, are, first, the exceedingly cheap rate at which it is published, and secondly, the plain, practical style in which the various subjects appropriate to its columns will be discussed by the editor, thus enabling all who can read to understand correctly the principles and influences that govern the everyday operations of life.

There is an old but trite saying that "no man should write upon a subject on which he is not well informed," and, acting upon that maxim, the publisher has, at a considerable expense, secured the services of an editor who has all his life devoted his time and means to the acquisition of both a practical and scientific acquaintance with agriculture and those mechanical branches that are closely connected with the profitable management of the farm. By the aid of numerous contributors, and the selections made from the agricultural press, together with his own experience and everyday practice on the farm, the editor flatters himself that he will be able to compile a monthly sheet, which, in point of practical utility and general interest, will favorably compare with any publication of the kind extant.

In issuing the first number of our magazine we do not intend to be lavish in fair promises of what we shall aim at accomplishing, but nevertheless, it may not be thought egotistical to state a few of the leading features of our work, which, for convenience sake, shall be divided under different heads, first,

PRACTICAL AGRICULTURE.

All subjects under this department of the work will be discussed under their appropriate heads in a style that will be plain and practical, and especially adapted to the soil and climate of the country, and the circumstances of its population. In suggesting improvements, great care will be taken in recommending none but such as will, in their results, prove of use to the parties who carry them out in practice. The only true standard of computing the value of new modes of culture, the introduction of improved implements of husbandry, and the improvements generally in the various branches of mechanical arts, is that of comparing the value of the products with the cost of production, either in labor or

money. The mode or system of improvement that gives the largest yield at the least expense, is, to our mind, the safest and most economical one that can be practised in a new country situated, as this is, with an almost total absence of capital for investment in agriculture, and where labor bears so disproportionate a value to the products of the farm or workshop. In presenting new modes of cultivation, and in suggesting improvements for adoption, by those of our readers who, like ourselves, obtain their livelihood by the cultivation of the soil, it shall be our frequent practice to enter into a careful computation by figures that cannot be misunderstood, showing the cost of each item of expense, with the probable results, and thus shall be able to clearly illustrate the advantage that may be derived from the adoption of improved systems of agriculture, not generally practised in this country, and likewise the difference of those systems, as compared in their results, with the present style and condition of the agriculture of Canada. In almost every township in Canada there may be found a few intelligent farmers who evince a lively interest in agricultural improvement, and many of whom have doubtless made experiments in agriculture, which, if properly reported, and widely published through the medium of such a magazine as we intend ours to be, would be a means of begeting, on the part of the farmers generally, a laudable spirit of emulation, which would, as certainly as two and two make four, be the means of greatly increasing the real wealth of the country. Every friend of agricultural improvement must have noticed with much interest, the willingness with which ordinary farmers copy the improvements introduced and practised by the few zealous promoters of agricultural reform that are interspersed through the land; and what is done in this way in isolated instances, should be carried out in practice by the farmers throughout the entire country. The most efficient method of bringing about this result is to publish reports of the most successful experiments made in agriculture, which can only be done through such a medium of communication as ours, provided that the intelligent farmers would make voluntary contributions for publication. In all instances where it is practicable such communications will be published, and we would suggest the propriety of agricultural societies adopting effective measures, with a view of encouraging the production of useful reports and essays, on the various subjects connected with rural and mechanical arts. Being aware of the delicacy that farmers evince in writing for the press, it may be here stated that we do not anticipate much aid from that quarter until we shall have awakened in the breasts of those capable of committing their thoughts to paper, a patriotic zeal in moving forward the great car of agricultural improvement. We however expect that all those who are friendly to the cause will lend us their aid both in increasing the subscription list, and in contributing to our columns the results of their improved practice. If this system become pretty general, the editor will not be obliged to copy so largely from his cotemporaries, nor would there be a necessity for lengthy dissertations from his pen, which, as a matter of course, would be principally an embodiment of his own views and experience. Although the opinions of the editor may be entitled to profound respect and confidence, still they cannot be made to perform the same important office that might with ease and credit be executed by some four or five score of farmers scattered throughout the various portions of the province. So far as the mere bodily and mental labor of furnishing original matter from the pen of the editor, for the entire pages of such a periodical as ours, is concerned, we should not shrink from such a task, believing that the important branches of industry our magazine has been established to promote, will furnish an ample and abundant field of enquiry and discovery on which to found suffi-

cient matter for a work twice as copious as our own. But the system of confining the columns of a journal devoted to practical sciences to the opinions of one man, or to one set views, is not exactly the thing that is required. Free discussion should be courted; and those who have made any discovery in agriculture or mechanics, should be prevailed upon to furnish the results of such for the press. We shall make it a point to urge upon the promoters of agricultural improvement to write for our columns, and if we can prevail, the good that will result to the country from such a course will be almost incalculable. If we do not succeed, we shall only be obliged to do as many have done before us, viz., write long editorials, and make copious extracts.

SCIENTIFIC AGRICULTURE.

It may with some propriety be stated, so far as an acquaintance with the science of agriculture is concerned, that the great bulk of the Canadian farmers are quite unprepared to read with profit long and able dissertations on that somewhat new and complex science, with a view of turning such information to any practical account; we therefore shall not devote much space to subjects connected with agriculture, in which the proper names and terms employed are understood only by scientific and very learned men. It must be remembered that it was only the other day, comparatively speaking, that agriculture ranked among the practical sciences, and that even yet the analysis of plants and soils, and the requisite food required for the full developement and maturity of the various plants, are very imperfectly understood by the learned men of the present age, who have devoted their whole time and fortunes in investigating these subjects. Great progress is, however, being made in this interesting and valuable science, and in order to keep pace with the times, we shall at least make it a point to apprise our readers of any discoveries that may be made in this or other countries, which would have for their object the more perfect developement of the agricultural resources of this province. In performing this promise, we shall endeavor to employ the most simple language and terms that can be used, for the purpose of explaining the connection that science bears to agriculture; and any remarks of our own on this and kindred subjects, shall be made in the most familiar style that can be employed, so that the every-day practical farmer and his sons may, by degrees, become acquainted with the importance of looking more closely into the causes and influences that produce effects in the various branches of their important occupation.

MECHANICS.

Although as a Canadian, we make the acknowledgment with a great degree of shame and reluctance, still it is nevertheless a fact that the mechanical branches have not had that encouragement and attention at the hands of our rulers and leading men, as their importance justly entitled them to have received. The various mechanical branches that may be prosecuted with advantage in this colony, in point of importance are closely akin to that of agriculture. In viewing the matter minutely, we find that while agricultural improvement has been promoted by legislative grants, for the United Provinces to an amount equal to nearly $40,000 per annum, barely a few paltry pounds have been granted for the purpose of encouraging improvements in the mechanical branches. Up to this moment there has not yet been held a "Mechanic's Fair in Canada", and with the exception of the few premiums that have been awarded by the Provincial Agricultural Association and some of the local societies, the mechanics have not had an opportunity of exhibiting specimens of their skill, nor have there been any efforts made to develope the mechanical genius of our population. In appropriating a portion of the *Farmer & Mechanic* to

the discussion of those subjects that will more particularly be interesting to mechanics and manufacturers in general, we shall not fail to show, in the clearest light possible, the benefits that would accrue to the country, provided that a portion of the public funds were set aside for the better encouragement of improvements in those branches of mechanics and manufactures, in which, by the proper application of science and skill, the artizan of this country may reasonably hope to compete with the neighboring and other countries from which our imports are supplied.

It is obvious to all who have given the matter their serious consideration, that the artizans of Canada, in many very important particulars, are inferior to those in the Eastern and Northern States of the Union. Of course there are honorable exceptions to this, as in all general rules, but in the main the above opinion will be found correct. Now, it is not because the Mechanics of Canada are less industrious, or are endowed with intellectual powers of an inferior description to those in the United States, that they will not favorably compare with them in point of efficiency, both in practical and scientific attainments, but it is because no fostering care has been extended to the mechanical branches of industry and manufacturing exterprises in the Province, that we are obliged to draw the unfavorable comparison. Much will have to be done before the products of our workshops will equal in style and quality, goods of a similar description manufactured in the United States. The scarcity of capital to be employed in manufacturing, the comparatively small field, and the number of population to vend the products of those manufactures, the absence of a spirit of manufacturing enterprise on the part of our population, and withal, an almost total want of patriotism in supporting the few useful enterprises of this kind that have sprung up in the colony, are among the most substantial reasons for our people not having made greater progress in developing the mechanical resources of the country. We do not pretend to urge any claims of a superior order, which would lead the reader to suppose that Canada will, for a long time to come, become a great manufacturing country; our object is simply to favor the opinion that many of the substantial comforts and luxuries of life, for which we are indebted to other countries, may be manufactured as cheaply, and equal, if not superior in quality, to the imported article.

That powerful engine, the press, has yet never been properly brought to bear upon those subjects, and whilst we intend to honestly chronicle every improvement that comes under our observation and knowledge, in those mechanical branches adapted to the wants and condition of this country, we shall, at the same time, urge certain amendments in those laws that affect the condition of our artizans, and likewise shall press upon the attention of all classes, the claims that manufacturing enterprises demand at their hands. Indeed we do not believe it is possible that Canada can be prosperous, and her people contented and happy, unless she becomes more independent of other countries, for the supply of the real necessaries and comforts of life. Entertaining these views, and believing that they are not susceptible of being controverted, we shall most cordially enter into a full and thorough discussion of those points that will have for their object a tendency to awaken, within the breasts of all classes of our population, a desire to encourage domestic genius, and manufacturing enterprise.

HORTICULTURE.

When we take into account that only about half a century ago the white man first set foot upon Western Canada, with the view of becoming a cultivator of the soil, it will not appear strange that so little progress should have been made among our farmers, in the

cultivation and management of their gardens and orchards. It is scarcely to be expected that the pioneers of a new country, who began the world with little, and scarcely any other means than a strong arm, an axe, and with a willing and contented heart to use it, should evince a great degree of taste in the art of gardening and the culture of fruit, and the otherwise useful ornamenting of the grounds adjacent to their dwellings and farm office; but, nevertheless, it is reasonable to expect that the succeeding generations, who inherit well cultivated farms, should not neglect those refined and important branches of rural labor. A very large proportion of the present holders of land in Canada have inherited them from their forefathers, and if their education has not been sadly neglected, they have either begun, or are preparing to beautify and usefully ornament their grounds with shade trees, the almost endless varieties of fruits that may be profitably cultivated, and in the more perfect arrangement and cultivation of their gardens. If the present holders of land would only be as vigilant in the management of their orchards and gardens, and also of course in the improved cultivation of their farms, as were their fathers in subduing the forests, the entire face of the country would shortly be changed, and homes that to external appearance, look cheerless and unhappy, would shortly "bloom and blossom like the rose," and become really a spot worthy the abode of intellectual man. A well cultivated farm, with a neat mansion erected at a respectable distance from the road, surrounded with a large orchard, consisting of the most improved varieties of fruit, that are adapted to the climate and soil of the country, with a garden well stored with the small fruits and vegetables, and a neat and well arranged flower-garden, under the superintendence and management of the good housewife, immediately in front of the mansion, and bordering along the lawn, and small groups of shady trees placed here and there to protect the tender fruits and herbs from chilling winds, and likewise for shade in summer, and ornament, and withal, good out offices and farm buildings to store the grain, vegetables, and fruits, and to shelter the horses, horned cattle, sheep, swine and fowls, which should be of the most improved breeds, are, we say, objects worthy the admiration of the greatest nobles, statesmen, and scholars of the day. To accomplish so great and praiseworthy an object as the one here pictured to the fancy, should be, as far as possible, the desire of every yeoman in the country. The whole cannot be done in one year, nor in ten years, without the expenditure of a large capital, which probably cannot be recommended, but a commencement in the right direction should be made, and by degrees a large amount of comfort, and an abundance of those almost endless luxuries that the soil is capable of producing, will be the result. To improve the tastes of the Canadian people in the culture and general management of their gardens and orchards, shall be a matter with us in our editorial capacity, which, in point of attention and importance, shall follow in order next to the two leading interests already described. The space that will be devoted to this branch of our paper will necessarily have to be limited to a few pages in each of those numbers that are issued, whilst the operations can be practically performed, but as we shall in this as in all other matters come directly to the point, it is to be hoped that this department of our work will be found most interesting and useful to all classes of the community.

LADIES' DEPARTMENT.

Periodicals intended for general circulation, such as our own, should not neglect the important interests of the ladies. Whilst intellectual, moral, and social improvements are, with rapid strides, pervading every department of life in which man finds profitable employment, it may in fairness be said, the advancement made by the ladies, in those private

walks of life, in which their delicate constitutions, and sweet and affectionate dispositions, so admirably adapt them for their due and proper performance, are as great as those performed by man. The character of the children, generally moulded for good or for evil, by the mother, and the happiness or misery of her family and domestic circle, are in her hands. Her influence, if properly directed, is far greater on mankind and the world than has been generally acknowledged. As our object in adding another journal to the almost overgrown list, is that of promoting improvements in every useful branch of industry, and in almost every department of life, we think that we should be inexcusable were we to neglect so important an interest as that of the ladies. The style and character of our articles shall of course be varied to suit the taste and condition of the reader. In preparing suitable matter for the fair sex, we shall take it for granted that the majority of them are the wives and daughters of farmers and mechanics, and shall therefore oftimes enter freely into details, suited to the improved management of the diary, kitchen, and garden, management of fowls, cooking, and various other portions of domestic economy, and shall beside intersperse, through the columns devoted to this department, appropriate poetry, and moral and chaste pieces, adapted to the tastes of our fair readers.

BOYS' DEPARTMENT.

How frequently it happens that parents send their boys to schools, and although they may learn to read tolerably well, still they cannot, during their leisure moments, be persuaded to read a useful book, or even a common newspaper or periodical. The fault sometimes may be attributed to the negligence and thoughtlessness of the child, but in a great majority of cases, the habit may be correctly traced to one or the other of the parents, who have either spoiled the child in the training or else have neglected to place in his hands a variety of useful and interesting reading, the meaning of which he could comprehend. The intellect of boys, by force of habit, may be made as keen and as susceptible of correct impressions, as that of adults, but as their moral and intellectual training are too generally neglected, we do not find them as careful of precious time as they should be, nor are they sufficiently guarded in receiving first impressions, which become grounded in their character, and not unfrequently destroy them for fields of future usefulness. With the parents the greatest responsibility that rests upon their shoulders, is the proper education and training of their children. All other branches of business and duties, speaking in a worldly sense, are as nothingness to this. Farms, houses, money invested in the public stocks, or other securities, gold and silver in almost endless quantities, are all as dross, when compared to the intellectual, moral, and religious training of the child. When this duty is neglected, and the child is allowed to grow up to the stature of a man, with the full privilege of indulging in his sensual and depraved appetite he becomes a disgrace to his parents, a nuisance to his neighbourhood, and unless he reforms, the vengeance of the Almighty will surely follow him to an untimely grave. As those boys who may have the privilege of receiving profit by the regular perusal of the *Farmer & Mechanic*, will, in a very few years, if their lives be spared, be called upon to occupy the position now held by men, and many of them doubtless posts of honor and emolument, it is to be hoped that we shall be pardoned for the free expression of those opinions we may be induced to advance, which shall have for their object the improvement of youth. In the main the articles under this department will emanate from the pen of the editor, and as in all his other writings, he will endeavour to mould his style, language, and ideas to the easy comprehension of his numerous class of readers.

THE MARKETS.

Since the operations of free trade have become the order of the day, it is somewhat difficult to anticipate the probable state of the markets, even one month ahead, and in fact the only thing that a journalist is safe in doing, is to give an account, from time to time, of the state of the local and foreign markets, and the results of the harvests of those countries that would be likely to affect the markets of this country. This duty shall be performed to the best of our ability, and nearly an entire page will be given to this department, as soon as we shall be in possession of the leading foreign and local papers.

Agricultural.

AUTUMN PLOUGHING.

On strong clay soils, too much importance cannot be placed to the operation of Fall Ploughing. Although it may be difficult to advance any suggestions for the proper execution of this work, that would under all circumstances be applicable, still a few hints may not be thought out of place, especially as this is the season when most of them may be put into practice. When land is very foul with couch grass, weeds of any description, or wild grasses, it should be ploughed in the autumn, as early as possible; and a light furrow, if neatly turned, is preferable to a deep one, when it is intended to give the land a second furrow in autumn. As soon as a field is ploughed, it should be harrowed a number of times, until the furrow laps are completely covered, and the whole surface thoroughly pulverised. It may then be allowed to remain undisturbed until the period nearly arrives for the setting in of winter, when it should be cross-ploughed, with an open furrow, as deep as it is possible for the team to plough. Ploughing with an open furrow or drilling, as it is usually termed, resembles very much in appearance, when completed, turnip drills. In performing this work, the ploughman need not be alarmed if he brings to the surface a large quantity of subsoil; the whole will become thoroughly pulverised with the winter frost; and when the harrows are put on the land, in the spring, the soil will separate from the couch grass and weeds, and the latter will come to the surface, and may be raked, and removed off the land, without much difficulty.

The system of ribbing may also with advantage be practiced, where the land is not foul, and when the ploughman finds himself pressed for time to plough the desired quantity before the setting in of winter. As the furrows are thirty inches apart, a good team, even in the short days of November, may rib without difficulty three acres per day. In all cases where this system of fall ploughing is practiced, it must be understood that the land in the Spring will require harrowing, and a seed or cross furrow. When the land is intended to be sown in the Spring with peas, the only Spring ploughing required is an open seed furrow, averaging in width about twelve inches. The seed being harrowed in lengthwise of the drill, will come up in rows as regularly as if sown with a drilling machine, and may be kept clean with a hand hoe, thus cleaning the land, and preparing it as well for Fall wheat as if Summer fallowed. If those portions of the field that lies low, and on which water in the Autumn and Spring is likely to remain stagnated, are drained by running with the plough deep cross furrows: in those places it will greatly facilitate early Spring harrowing, ploughing, and seeding. This is obvious, from the fact that the deep open furrows will completely drain the land, provided that the leading channels for conveying

the water out of the field are made deep, and kept open.

The above system, however, cannot be practiced with advantage only under certain circumstances; and therefore it would be better for those farmers who have never put it to the test to do so on a small scale, by which means they will in a very short time be able to judge correctly of the advantages it possesses over other systems of Autumn ploughing.

In those sections of the covntry where Winter wheat is very subject to rust, and when the subsoil consists of a rich chocolate or straw-coloured clay, an excellent means of evading the rust, and of ensuring a large yield of wheat, of a superior sample, is to bring up to the surface, in the autumn, from three to four inches of the subsoil. This may be done either by ploughing from ten to twelve inches deep. with a strong team, with one furrow, or one plough may be made to follow the other. the first ploughing a furrow as deep as can be done with one span of horses, and the second should be made to bring as much as possible of the subsoil to the surface. In the Spring, as soon as the ground becomes sufficiently dry. it should be harrowed, and ploughed lightly, and sown with peas. Ribbing or drilling are preferable to sowing broadcast, for a single horse hoeing of the peas will pulverise the subsoil, and tend to ameliorate its condition, by mixing it with the surface mould. which of course is buried a few inches from the surface. When the peas are harrowed, the ploughings for wheat may be made about six inches deep, thus mixing the buried surface mould with the subsoil in nearly equal proportions. This system may be new to some, and many may question its efficacy in preventing rust, and in securing to the farmer an average of from forty to fifty bushels of wheat per acre, upon land that would not yield more than half that quantity, and that, too, of an inferior quality. If there be any skeptics on this point, it would be well for such to satisfy themselves, by making an experiment of the system here laid down, which, if done even upon a small scale, will as correctly set the matter to rest, in their own minds, as if it had been done upon a large one. In some instances, autumn ploughing may be executed late in the season, with a well-turned, seven by ten-inch furrow, and in the spring will require no other ploughing, for oats, than simply a stirring with one of the improved two-horse cultivators, which, if not in general use, should be as speedily as possible, as it greatly facilitates spring work.

Subsoil ploughing may be done with greater advantage late in the Fall, when the ground is soft, than at any other season of the year. As subsoil ploughs are very scarce, it is not to be supposed that this mode of deepening the soil can be practiced to any extent. Subsoiling simply consists in ploughing two furrows deep, and the last furrow is not brought to the top, but is allowed to remain in the bottom of the furrow, which is effected by the subsoil plough having no mould board. An iron plough, with the mould board off, makes a good substitute for, and is a pretty correct likeness of a regular subsoil plough. Those who have iron ploughs would do well to make a trial of subsoil ploughing, although it be on a small scale.

AUTUMN WHEAT.

By this time autumn wheat should be sown, and therefore we shall not be able to give much advice on this important crop, that can be put into practice this autumn. In consequence of the heavy falls of rain that prevailed last fall, and the openness of the winter, the *larvæ* of the Hessian and Wheat Flies were destroyed; and doubtless the severity of the spring frosts also contributed to the same end. Hence it is fair to inter that the Canadian wheat grower need not apprehend as much damage from those

natural enemies to the wheat plant as was supposed by many would be the case. Whilst late sowing, in both autumn and spring, are found the most certain means that the farmer can adopt to evade the attack of those insects on his winter and spring wheat crops, it has been fully ascertained that it is almost certain to promote rust, which, of the two evils, is greater than that produced by the fly. The rule, if any can be laid down that would be generally applicable, for sowing autumn wheat, is to sow it as near as possible to that period when the plants will be likely to make a growth, in the fall, almost sufficient to send out stools, from which tqe stalks that support the heads shoot forth. If those stools make their appearance, and any of the joints are formed, which would make that portion of the plant which is usually denominated straw, it is quite certain that the prospect of a crop of wheat the following summer is totally destroyed. The best period for sowing wheat, to arrive at the above result, without risking the damage alluded to, is from the 1st to the 15th of September. Where the ground is very rich, and the plants, towards the closing in of winter, have a very good appearance, sufficiently so to induce the belief that many of them have commenced to send out stools, it would be advisable, in such a case, to put on all the calves and young colts that could be had, with a view of feeding it down to check its growth. Some farmers allow their horses, cows, sheep, and in fact all their farm stock, to roam at pleasure over their wheat fields during the winter months, by which means they seldom obtain half an average yield when they come to harvest their crop. Of all the animals that can be turned upon wheat in winter, sheep are decidedly the most destructive, as they paw and eat out the heart of the plants, and thus leave them exposed to the action of the frosts.

The system of pasturing wheat in autumn and winter should only be practised in extreme cases, such as those previously pointed out, for the very obvious reason that the roots of the plants, if the tops be strong and luxuriant, will be sheltered and considerably protected by the leaves, from the action of the frosts and chilling spring winds. There are seasons, however, when this treatment does not serve a good purpose, but as they do not happen more than about one year in ten, it would be extremely unwise to practise a system adapted only for those years. Allusion is now made to the influence that exceedingly deep snows have on winter wheat, when winter sets in before the ground becomes crusted over or frozen. When this happens, the winter wheat plants, that have reached a very strong growth, are very liable to take a mould and become, as the term is commonly used, smothered. There appears no remedy for this, excepting that of turning all the horses and cattle upon the fields in winter, and by driving them a great number of times backward and forward, the air and frost will thus find their way down to the plants, and the crop may be saved.

The greatest difficulty that the Canadian farmers find in obtaining large yields of winter wheat, is to get the plant of this crops safely secured from the destructive influence of the winter and spring frosts. Draining the land with the plough and spade are certainly means by which this end may be attained in some measure, that no one should neglect. In consequence of the high price of labour and the scarcity of hands to do the work, many points are neglected that otherwise would be done. That of draining the land, especially for winter wheat, is a branch of labor that should be regarded almost as being indispensable, and still it is seldom practised any further than running out a few furrows with a plough. The season is now past for doing this work to the best advantage, but even yet it may be practised on a small scale, in many instances with much profit. Where there are low pieces of ground, which is certain to fre-

quently occur where the land is high and undulating, which has not been deeply drained, the water will lodge upon such ground in the autumn and spring, and the wheat plant thereby will certainly be destroyed. To obviate in some measure, loss in this way, drains may be made with a spade any time before the frost and heavy fall rains set in. Those drains should not be made less than thirty inches deep, and the removed earth may either be scattered thinly and evenly over the ground adjacent to the drain, or it may be left at the edge, except where the furrows made by the plough intersect it, which of course should be kept open, where it may be allowed to remain until after harvest the following year, when the drain should be widened and deepened, and made wit' either stones, or poles and slabs of cedar, a covered or under-drain. The advantage to be derived from the adoption of this mode, are, first, the saving of a large breadth of wheat, that would without question, be destroyed, and secondly, when land is once drained in the manner described some twenty or thirty succeeding crops may be grown, without much if any repairs being required to the drains.

It has already been said that it is a difficult point to get the autumn wheat plant safely wintered, without receiving more or less damage from the winter and spring frosts. Where straw is abundant it may be scattered evenly over the wheat plants early in autumn, something after the style practised in spreading flax over the ground, for the purpose of rotting. About a ton of straw will spread an acre, and if done early in the season, the plants will not only be materially protected, but a strong, healthy and vigorous growth will be the result the following summer. When straw cannot be had, half-rotted barnyard manure may be spread over the ground as soon as it is sufficiently frozen to bear a wagon.

Cure for a Burn.—Take a sufficient quantity of green tea to cover the part affected, add water enough to soak the leaves well, and bind it on as a poultice. It will afford instant and permanent relief.

WINTER MANAGEMENT OF AGRICULTURAL LIVE STOCK.

The season is fast approaching when the farmer will find it his interest to make the best arrangement in his power for the wintering of his horses, horned cattle, sheep and swine. In a new country like this it is quite impossible to have business performed with so much exactness and nicety as can be done in old countries, where capital is abundant and labor cheap; yet it is quite easy to adopt certain rules and systems that will be applicable to the circumstances of the country. Those rules and systems, as far as possible, will be, from time to time, entered in detail, in the columns of the *Farmer & Mechanic*, so that those who do not, and can as well as not, practice them, may be induced to do so. One great point to be aimed at in this northern climate, is to provide animals with good warm stables to shelter them from the cold and storms. Where care is practised in this particular, much less food will be required to carry them in good condition through the winter, and the same quantity and quality of food given to cattle housed and unhoused, will be more nutritious and fattening to the former than the latter. By stabling or housing animals, a great economy in food is effected, and the manure heap is both increased in quantity and improved in quality. From this source alone the husbandman will be amply repaid for any expense or trouble that he may be put to in providing good comfortable stables and sheds for his cattle. The manure heap should be viewed strictly as the farmer's bank. If rich and abundant *deposits* are made, and the *drafts* carefully and judiciously disposed of, in proper and regular order through the farm, it will be found that old mother earth will be more grateful in bestowing a rich reward for such kind attention than would

be granted by any banking institution in the country, were favor and obligation of an equal extent in value conferred upon it. Manure applied at the most suitable season, and for those crops that require it most, cannot scarcely be laid upon the soil in too great abundance. The proper application of manure to the soil being a distinct branch of farming operations, will be discussed in some future paper; allusion is made to it here to show that it must first be made before it can be put on the land, and to make it of good quality, and in the greatest possible degree of abundance, attention must both be paid to the description of food given to cattle and to their warmth and comfort during those months of the year in which they are dependent upon the hand of man for a supply of food. In all cases where it is practicable to do so, the juices from the manure heap should not be allowed to run off from the yard. The water from the roofs of buildings should also not be allowed to enter the barn yard, and if the whole grounds where the manure is kept could be completely covered under, so that no rains nor water could reach it, the quality of the manure would thereby become improved. The black juices or liquid seen running from the manure heap during a heavy fall of rain, is the gold, and the half rotted straw or deposit left behind is the dross.

No more cattle should be kept by a farmer during winter than can be wintered through in good condition. Whilst this is strictly the case, it should not be forgotten that all the races and varieties of cattle kept by the farmer are to him manufacturing operatives. Without cattle it is useless to expect a full and regular supply of manure, to keep up the fertility of the soil. A farmer may almost calculate his annual profits by the number and condition of his live stock; of course when condition is here alluded to, the inference must not be made, that the stock should be anything beyond a healthy growing condition; more than this would be a waste of means, and rather than indulge in such a practice, it would be better to keep a greater number of cattle.

It is to be deplored that root culture for wintering live stock should be so much neglected by the Canadian farmers. Admitting that labor is high, in comparison to the average value of beef, mutton, pork, butter and cheese, it nevertheless does not follow that a few acres of root crops cannot be profitably cultivated. No farmer can cultivate his land to advantage who does not have at least one tenth of it annually cultivated with such root crops as the climate and his soil may admit of profitable culture, nor can he hope to be very successful in rearing stock, unless root culture form an important branch in the economy of his farming operations. When one tenth of a farm is cultivated in rotation, with turnips, potatoes, indian corn mangel wortzel, and carrots, nearly the whole of the manure annually manufactured, will be required for those crops. A farmer with 200 acres of arable land, upon this rule would have annually 20 acres of those crops enumerated above, which would not only provide a profitable market, if the term may be used, for his yearly stock of manure, but if those crops are thoroughly cultivated and hoed, the land will be cleaned as well, if not better than if it had been summer fallowed. Objections will be raised to this system by some, on the score that they could not afford the time that would have to be given to the culture of the land and hoeings required for those crops. In replying to these objections it may with truth be argued, that making naked summer fallows may be entirely dispensed with, and the time and labour given to summer fallowing land, may be made to yield a much better profit if transferred to the culture of root crops, for the winter feeding of stock.

If a straw cutter is not in use for the cutting up of straw, corn stalks, and hay, for horses and horned cattle, a neglect has been made in the economy of farming, that should

speedily be remedied. Good articles of this kind may now be had at a reasonable price, and no farmer would neglect to use this machine, if due regard be had for the economy of his provender and the appearance of his stock.

POTATOE DISEASE.

The season is now so far advanced, that any suggestions we might have to make, that would have for their object the preservation of the potatoe crop from disease, could not be turned to any practical account, but as it is a subject, however, that is second to no other with the farmer, in point of importance, a little space will be devoted to it, in the hope that it may be the means of affording some light in giving a solution of this difficult question. All who have examined the subject minutely are satisfied that the disease first shows itself upon the top leaves of the plants, and that it shortly afterwards may be seen on the stems and stalks, and generally extends itself downwards until it reaches the tubers, and when it once comes in contact with the potatoes, no remedy whatever can be applied to save them. Some say that the disease is generated by an insect, and others that it is produced by atmospheric influences. After carefully examining the disease in question, in all its stages, for four years, we are inclined to favor the former opinion. We cannot further stop to examine minutely into the cause at this time, it is sufficient to know the characteristic features of its various stages, in order to adopt steps to evade it. The means of evading it are, planting early varieties, early planting, good cultivation to push them forward to early maturity, either early digging or removing the tops before the disease shows itself on the stem. Some seasons the disease attacks the potato itself much earlier than in others, and even in the same country it exhibits itself much earlier in some districts than in the adjoining ones. The cause of this is perfectly obvious. As has already been stated, it proceeds from the haulms to the tubers, and to our mind the agents by which it is carried there, are heavy dews and rains. Where those occur in the greatest abundance, the disease will first make its appearance, and where little or no rains have fallen during the months of August and September, there the disease will have shown itself very slightly upon the tubers. It is a remarkable fact in the history of this disease, that the potatoes were never better before the disease was known than they have been since, up to a short period before the crop come to maturity. That period being in this country about the last of August or first of September, is one in which the tops should be carefully removed from the ground, and the potatoes left to cure or ripen, or else they should be gathered and spread under open sheds to dry. The period for removing them to the cellar or pits may be ascertained by the condition of the external skin; when it adheres closely to the potatoes and cannot be easily removed by the thumb and finger, they will then be in a fit state for pitting. The disease being exceedingly infectious, care must be taken by those whose crops are affected, to sort them over a number of times during autumn and winter, and the diseased should be separated from the sound ones and thrown away as useless. Where parties cannot obtain as early varieties as they would wish for seed, by exposing the ordinary sorts to the rays of the sun until they become a green color, at least a fortnight will be thus gained in the period of ripening, and if it be done in the autumn, they will not be so likely to take the disease.

ECONOMY IN SAVING STRAW.

Nothing is more common, as thrashing machines are in general use, than for farmers to thrash out their wheat and barley in autumn, and put out their straw into the open air to be destroyed by rains. Although it

may require some labour to stack, or remove the straw into the barn, still it should be done at all hazards, as it will be found valuable for winter food for cattle, and may be liberally used for bedding for stock, including sheep and swine.

AGRICULTURAL CHEMISTRY.

Land which from long-continued tillage, had become unfruitful, being unable to supply the demands of food made upon it by any particular crop. How is such land to be restored to fertility? Animals eat the vegetable which you have grown, these turn part of the organic matter of which they consist, ane ultimately make it resort to the original form from which it sprung—carbonic acid, ammonia, and water. But of these we take little notice, for they went again to the great magazine of food, the atmosphere, to be extracted from thence as before. But the valuable mineral treasures of the soil could not assume the form of air, and therefore they remained, the ashes of the consumers' food, and were voided in the solid and liquid excrements. If these were carefully collected and restored to the soil, it must be preserved in an unimpaired state.—[Lecture of Dr. Plafair. before the Royal Agricultural Society of England, in Farmers' Magazine, Feb. 1845.

DETECTION OF PREGNANCY IN THE MARE AND COW.

If half the period of gestation had passed, and on gentle tapping I could get the little stranger to move, and it was a cow I had to do with, I would have her held steadily, while I stooped and applied my ear flat upon the flank, and then slowly and with gentle pressure upwards and downwards, and forwards and backwards, over the flank, and the lower part of it, until I heard—and which I should do in a great majority of cases—the pulsations of the heart of the fœtus, I should recognize them by their quickness, being more than double those of the mother. If it was a mare, I would have a halter put on her, and while she was held by the head, and also one of her legs kept up, and kneeling under the belly of the mare, pass my ear along an imaginary line from between the teats to the chest, deviating a little from one side to the other. By this means I would recognize the quick pulsations of the fœtal heart. In the mare, the fœtus occupies nearly the centre of the belly, while in the cow it is huddled up in the right side of the abdomen; there its motions are most seen, and the beatings of its heart best heard.—[Transactions of Royal Agricultural Society of England.

THE PRINCIPLES OF ARTIFICIAL MANURING

BY PROFESSOR JUSTUS LIEBIG.

Twenty-five years ago, when the manufacture of spa and mineral waters began, they met with violent opposition from the members of the Faculty, as being deprived of all the good qualities of the natural ones—as wanting, in a certain *conditia, sine qua non*—in a *spiritus rector*, or vital power, which alone gave them any medicinal qualities. Those times have passed now—Chemistry has demonstrated to a certainty what the constituents of these various waters are, and under what forms and compounds they are united in them. It has succeeded in combining them exactly in the same proportions, and in rendering them not only equal to the natural ones, but even more effective. Only from that time physicians were induced to connect certain effects on the human body with certain elements in the waters, and were enabled by the light of Science to add more of this element, or more of that; nay, to apply, instead of the waters themselves, the one active element alone, as is, for instance, the case with iodine in indurations and struma. It is well known that at this moment there are extensive manufactures of mineral waters in England, at Berlin, at Dresden, at Vienna, &c.

Now, I believe that the same principle may be applied, partially, at least, to the use of manufactured manures, which in England, has just been called into existence. Guano, that powerful manure, the efficacy of which, in a judicious application, has been clearly demonstrated by the testimony of the most intelligent farmers, cannot be supplied for a much longer period, because the rich stores in Chili and Africa must be shortly exhausted. As it is only in very dry countries that it is found, we cannot expect to discover many more places containing it, and what are we *then* to do? My attention has often been directed to the question whether, according to our experience and the present state of Science, a manure might not be composed which could replace the genuine guano in its effects, and whether I could not, by a series of experiments, point out a way of preparing one equal to it in all its chemical and physical properties? You are well aware that we know with certainty all the elements of the guano, as well as the urine and solid fæces of men and animals. In like manner it seems to have verified the opinion which I have laid down in my work on Agriculture, that the salts manufactured in the laboratory have the same effect on the growth of plants if they are embodied to the fields, in the same forms in which the animals furnish them in their excrements. This must be evident to every one who knows

that to produce these compounds in the laboratory, the same agencies and means are made use of which are employed by Nature. The fabrication of a manure, equal in its composition and effects to the solid and fluid excrements of animals and men, seems to me one of the most essential demands of our time—more especially for a country like England, in which, from various circumstances, a rational Agriculture without a supply of manure, in some shape or other, *from without*, seems nearly impossible. Our reasoning will appear the more correct when if we remember how different are the results which have been obtained by the different analyses of the different sorts of guano how little the farmer can depend upon producing from a given *quantity* a certain *effect*, as the latter naturally varies according to the composition of the former. There are scarcely any two samples in the market with the same composition—nay, not even similar. The following salts may be regarded as the essential constituents of a powerful manure applicable to all description of soil.

Earthy Phosphates.—The most important of these is *Phosphate of Lime*, which occurs in nature as a mineral called *apatite*. It is the principal component in bones, which, it may be observed, have been found most efficacious if calcined, consequently deprived of their animal matter. The rapidity of the effects of phosphate of lime on the growth of plants depends upon its greater of lesser solubily. Its amount of glue (gelatine) diminishes this solubility if the soil is rich in vegetable matters, which furnish carbonic acid by their decomposition, and which acid is required for rendering the phosphate of lime soluble in water, and introducing it into the organism of the plants. In the calcined state the bones act sufficiently quickly; but in those soils which this cause of solubility is wanting their action is slower. In my work I had recommended the addition of a certain quantity of sulphuric acid, both in order to render the bones more soluble, and to change the neutral phosphate of the bones into gypsum, and into a phosphate which contains more acid —superphosphate of lime. I have been informed that this advice has been most extensively adopted, that the superphospate of lime has been found to be a most efficacious manure, and that it forms already a most important article of commerce. A second earthy phosphate, not less important, is the *Phosphate of Magnesia*, which it is well known enters in a still larger proportion than the *phosphate of lime* into the composition of the grain.

The *Alkaline Phosphates*, although not originally found in nature, are important elements of the seeds of grain, of peas, beans, &c. A rational farmer must provide them in sufficient quantities to those plants which require them for their developement, from knowing that human excrements increase the produce of grain in a far greater proportion, because they *contain* alkaline phosphates, than the animal excrements, in which they *do not exist*.

The *Alkalies*—potash and soda—must be constitutents of every rationally composed manure, because by them the original fertile condition of the fields is preserved. A soil which contains the *alkalies* in too small a quantity is, perhaps, fertile for grain; but is not necessarily so for turnips or potatoes, which require a great quantity of alkali. By supplying an alkaline manure, fallows or the cultivation of those plants which are growing during the time of fallowing, become less necessary.

Sulphate of Potash is a constituent of all plants, although in small quantity, as well as *common salt* and *chloride of potassium*, which are found in milk in rather a large proportion. The *salts of lime*, especially *gypsum*, are important nourishment to the leguminous plants. *Silica* is never wanting in all sorts of soils—it is a constituent of all rocks, by the decomposition of which all productive soils are formed, and the Cerealia find it everywhere in sufficient quantity, and in a form capable of being taken up by the plants, *if the alkalies are provided* wherever they are present in too small quantity.

Salts of Ammonia.—It may be regarded as certain that the nitrogen of the plants are derived either from the ammonia of the atmosphere, or from the manure which is provided in the shape of animal fluid and solid excrements, and that nitrogenious compound exercises an effect on the growth of plants only in so far as they give up their nitrogen in the form of ammonia during their decomposition and decay. We may, therefore, profitably replace all the nitrogenous substances with compounds of ammonia

Decaying vegetable matters, which contain carbon, are useful to the fields in so far as they provide a source of carbonic acid: but they are quite dispensible in manure, if it be rationally combined, as the atmospheric air is an inexhaustible source of carbonic acid, from which the plants derive their carbon, *i. e.*, if in the manure, the mineral substances are provided which are necessary to the assimilation of the carbonic acid. These are the substances which *together* give fertility to the soil; but, although each of them, under certain circumstances—viz., where the soil is defective, or where it is not indifferent to the plant to take up one instead of another, as, for instance, may be the case with soda instead of potash—increase the fertility, not *one* of them can be regarded as manure, according to the common meaning of the word, for the simple reason that only *all of them, in certain proportions*, will fulfill the purpose for which the common manure is applied. This purpose is the restoration or the increase of the

original fertility, and by manure we must replace all the constituents of the plants which have been taken away in the harvest, or which are contained in the plants which we are desirous to cultivate.

What then, are the constituents of the soil which we remove by the straw, seeds, tuberculous roots, stalks, &c., of our plants of culture? It is obvious that we must know these first, in *order* to restore them in sufficient quantities. To this we answer, by giving the analysis of the ashes of plants and their seeds. Hundred weights of the ashes of the following plants contain—

Constituents.	*Straw of*				*Ashes of*
	Beans.	Peas.	Potatoes.	Clover.	Hay.
Alkaline Carbonates	22.38	12.43	4 34	31.63	3.0
Carbonate of Lime	39.50	47.81	43.68	41.61	6.9
Phosphate of Lime	6.43	5.15	5.73	1.180	40.8
Phosphate of Magnesia	6.66	4.37	7.82	0.91	
Sulphate of Potash of Soda	12.40	10.15		2 23	8 84
Magnesia					21 8
Chloride of Sodium or Potasium	0.28	4.63	2.8	2.27	3 06
Phosphate of Iron, Phosphate of Alumina, &c.					1.27

In those analysis silica has not been taken into account, as it is found in all soils, and need not be supplied. One hundred weight of the ashes of potatoes, and the seeds of the following plants, contain—

Constituents.	Potatoes.	Wheat.	Beans.*vicia faba.*
Alkaline Phosphates	15.75	52.98	68.59
Phosphate of Lime and Magnesia	9.00	38.02	28.46
Phosphate of Iron	0.20	0.67	
Sulphate of Potash	15.07		1 84
Carbonate of Potash and Soda	51.70		

What is wanting in the 100 of the above analysis is sand, coal, or loss. From these researches it appears that for stalks and leaves we require other elements than for seeds. The former contain no alkaline phosphates, but they require for their developement and growth a rich supply of alkaline corbonates and sulphate. On the other hand the carbonates are entirely wanting in the seeds, which, however, are very rich in phosphates. It is sufficiently obvious that a rational farmer must supply both, as well as all the others. If he supply only phosphates, and do not restore the alkaline carabonats, his soil will become gradually barren—it will be exhausted in those necessary elements for the developement of stalks and seeds, without which no formation of seed can be expected. If he supplies the alkalies, lime, and suiphates alone in a given time he will not get any more grain. All constituents of the manure, if they are supplied alone, have this great defect, that by them the soil is impoverished in other equally important substances. No *one* of itself can sustain the fertility. Keeping this in view, we may easily judge of the comparative value of artificial and natural manures, and the various *arcana* which have been praised as *panaceas* for exhausted soils.

It is not less easy to understand why the farmers have such different opinions on the relative value of the constituents of manures—why one, whose farm is rich in phosphates, produces an uncommon fertility by the application of nitrate of soda, or the supply of alkalies, while another does not see any favorable effect at all; why bones—phosphates of lime—produce in many fields wonders, and are not of the slightest benefit to others, which are deficient in alkalies or alakaline salts. From the composition of animal manures, it results with certainty that by applying the latter—solid and fluid excrements of men and animals—we supply to the soil not one but all the elements which have been taken away in the harvest. Fertility is perfectly restored to the field by a corresponding supply of this manure, and it may be increased by it to a certain amount. This will be the more intelligible, if we compare the mineral elements of the urine of horses and cattle with the mineral elements of herbs, straw, roots, &c, of our cultivated plants. It will be found that in their quality they are perfectly identical.

Constituents.	Urine of a Horse.	Of another.	Of Oxen.
Carbonate of Lime	12.50	31.00	1.07
Do. Magnesia	9.46	13.07	6.93
Do. Potash	46.09	40.33	77.28
Do. Soda	10.33		
Sulphate of Potash	13.34	9.02	13.30
Chloride of Sodium	0.55		0.30

These salts in the urine of horses amount to nearly 4 per cent.; in that of oxen 2½ per cent of their weights. If we compare the composition of these different sorts of urine withthe composition of the straw of peas, beans, and potatoes, of clover and hay, it will at once be obvious that in stable dung we replace by the urine the alkaline carbonates which we have removed in harvest. What in this urine is wanting in phosphates and carbonate of lime and phosphate of magnesia, forms the principal constituents of the solid excrements of animals; *both together*—solid excrements and urine—restore to the field its original composition, and thus a new generation of cultivated plants meet with the mineral ingredients necessary for their developement. If we farther compare the guano and the fæces of men with the composition of the animal urine, the analysis shows that both are entirely defective in *alkaline carbonates*—they contain phosphates and sulphates as well as chloride of sodium, but no free alkali—they contain phosphate of lime and phosphate of magnesia; in short, their elements are in *quality* identical with the important mineral elements of the seeds of wheat, peas, beans. The urine of swine is in its composition intermediate between the urine of man and horses.

ANALYSIS OF THE URINE OF SWINE.

Carbonate of Potash	12.1
Phosphate of Soda	19.0
Sulphate of Soda	7.0
Chloride of Sodium / Do. Potassium	53.1
Phosphate of Lime / Do. Magnesia	8.8
Traces of Iron	

The solid excrements of Swine contain principally phosphate of lime.

What the practical results of a knowledge of composition of these manures are, is clear. If it were possible to provide our fields with the dung of swine in sufficient quantity, we would replace by it, in a soil which contains *silica* and *lime*, all the remaining elements of the plants—the field might be made fertile for all kinds of plants—we have in it not only alkaline phosphates, the principal elements of the seeds, but also alkaline carbonates, which are required by the leaves, stalks, and roots. This purpose cannot be attained, however, by manuring with guano or human excrements alone, but perfectly so by stable manure, from its containing alkaline carabonates. If I have said that stable manure contains the mineral elements of the nurture of the plants, exactly in a state and condition in which they are furnished by Nature—that a field manured by it resembles the primitive state of America and Hungary, this assertion will not be found exaggerated. It is certain that stable dung contains no alkaline phosphates, but Nature does not furnish these to the plants even in the most fertile soil, although we find them in large quantity in all the seeds of wild plants. It is obvious that, notwithstanding their absence from the soil, the phosphates are formed in the organism of the plants, and they are produced from the phosphate of lime and magnesia and the supplied alkalies, by an exchange of the elements of each. The alkalies are necessary for forming *alkaline phosphates*, which cannot originate in the phosphate of lime alone. Both together are present in stable dung. In human excrements and in guano, the alkaline carbonates are entirely wanting. The practice of the farmer, in some places, of supplying to the field not pure guano, but a mixture of it with gypsum, shows clearly that the phosphates of alkaline bases are really formed on the organism of the plants from the phosphate of lime and magnesia, because this mixture (guano and gypsum) contains less phosphate of potash or soda than the guano itself; or, in certain proportions of gypsum, no alkaline phosphates at all; the soluble phosphates in the guano decomposing the gypsum into phosphate of lime and magnesia, and into sulphate of potash. I am far from asserting that we should not provide the fields with alkaline phosphates; the excellent effect of the guano and of the human excrements is too well known to question it, and we perceive from this fact that plants are in this respect like domestic animals which, with a normal food, are healthy and strong, but do not fatten. On the contrary, we know that if we prepare the food of these animals artificially, so as to render it more easily digested and assimilated, they are enabled to consume, in a given time, a greater quantity of it, by which all their parts increase in weight. The same happens with plants: if we give them their nourishment in a state most appropriate for assimilation, their capability to attract the gaseous elements from the atmosphere increases and their developement is accelerated. If we recollect the favorable effect of guano upon our fields depends on its amount of *ammonical salts*, of *alkaline phosphates* and the *other mineral constituents* of the seeds, but that it is deficient in *alkalies*, the principal constituents of the *herbs*, *straw*, and *roots*, it is easilyunderstood why the opinions of farmers on the value of guano as a manure are so very different. On a soil which is defective in alkalies its effect is small; on a soil rich in them it increases the produce in a remarkable degree; but, as I have already observed, the

continued application of guano must gradually diminish the fertility of our fields for a number of plants, because the elements of those organs, of the leaves, stalks, roots, &c., without which the plants cannot be developed and cannot produce seeds, are taken off in the harvest without any restoration of them. I think it, therefore, certain that the stable dung can replace the guano to a certain degree, but not *vice versa*. A rational agriculturist, in using guano, cannot dispense with stable dung.

During my excursions in England, I have repeatedly directed the attention of the agriculturists, as Messrs. Pusey and Miles, will, perhaps, recollect, to the necessity of supplying the alkalies, and not merely the phosphates and other salts; by a partial supply the equilibrium of fertility is not restored, and if we supply guano alone, we do not act wisely, because we consume our capital by rich interests, and leave to our children an exhausted soil.

And now the principles above-mentioned must guide us in the manufacture of an artificial manure. If they are neglected—if the artificial manure is defective in one or two of the necessary ingredients—the farmer, in making use of it, will, in a very short time, discover the fact by the injury he will have sustained.

In the manufacture of an artificial manure, it must be kept in view that the application of stable dung, of human excrements, and of guano, is attended with a great loss, in consequence of the too great solubility of their most efficacious constituents; and this must be prevented by artificial means. This is evident, if we remember those countries whence guano is derived. It is known that the collection and preservation of the excrements on the African islands, and the coasts of Peru and Chili, depend upon the scarcity of rain in those countries. The best sorts of guano contain, in fact, more than one-half of their weight of soluble salts, which, if exposed to the rain, are exactly in the same condition as, under similar conditions, a heap of *salt*. They dissolve in water, and are removed. Some months of rain would deprive those countries of all their riches. The remainder would have lost the greater part of its fertilizing power. Such effects, however, take place upon the guano with which our fields are manured. Only a small portion of its efficacious salts produce the beneficial effect they are capable of doing, the greater part being carried off by the rain. The stable dung is, in this respect, in the same condition as guano; indeed, its principal compounds are already in a dissolved state, and, therefore, are carried of more easily than those of guano.

A covering for those places in which stable dung is preserved, in order to shelter it from the effects of the rain, has been regarded in Germany as essential for preserving its manuring power. In consequence of the experience that the soluble elements of stable dung are the most efficacious, it has, in some cases, been drawn out with water, and it has been found advantageous to carry *only this fluid* to the fields. I need only refer to the foregoing analysis of the urine of animals, in order to see upon *which elements* of it this effect depends.

The reason why, in certain years, the influence of the best and most plentiful manuring is scarcely perceptible, is that during the moist and rainy springs and summers the *phosphates* and *other salts with alkaline bases*, as also the *soluble ammonical salts*, are entirely or partly removed. A great amount of rain and moisture removes, in the greatest quantity, the very substances which are most indispensable to the plants at the time that they begin to form and mature seeds. The system of draining, which of late has been so extensively followed in England, brings the land into the state of a great filter, through which the soluble alkalies are *drawn off* in consequence of the percolation of rain, and it must, therefore, become more deficient in its *soluble* efficacious elements.

Attentive farmers must have observed that after a certain time the quality of the grain on land laid dry according to this principle, deteriorates; that the produce of grain bears no due proportion to the produce of straw.

What is more evident, after these remarks, than that intelligent farmers must strive to give to the soil the manuring substances in such a state as to render possible their acting favorably on the plants during the whole time of their growth? Art must find out the means of reducing the solubility of the manuring substances to a certain limit—in a word, of bringing them into the same state in which they can be best assimilated by the virgin plants.

The attention which I have paid to this subject has been crowned with success. I have succeeded in combining the efficacious elements of manure in such a manner as that they will not be washed, and thus their efficiency will be doubled. Owing to this, the injurious consequences of the present system of draining are removed; Agriculture is placed upon as certain principles as well arranged manufactories; and instead of the uncertainty of mere empiricism, the operations of Agriculture may be carried on with security, and in place of waiting the results of our labors with anxiety and doubt, our minds will be filled with prudence and confidence.

KEEPING BEEF FRESH.—Combe says the ribs will keep longest, or five or six days in summer, the middle of the loin next, the rump next, the round next, and the brisket the worst, which will not keep longer than three days in summer.

Horticultural.

MANAGEMENT OF FRUIT TREES.

But little can be said on this subject at this season of the year, that could, with hopes of immediate profit, be turned to account. As orcharding, however, has been sadly neglected by the great bulk of our farmers, we shall advance a few hints that may, with advantage, be put into practice by many this autumn. The ground for a distance of four feet around the tree, should be kept clean with the spade and hoe, and if this matter has not been properly attended to, probably no better time will offer than the present to perform it. Where the trees are thoroughly imbedded with grass, it will be a work that will require much labour and time to clean them. As soon as the trees are cleaned in this manner, and the ground dug at least a foot deep and pulverised, a liberal dressing of well fermented barn yard manure may be spread around them, which should be well mixed in with the earth.

Grafting choice varieties of fruits upon comparatively worthless sorts, is practised only by a few. It requires little or no art to graft and bud fruit trees, and where persons have been unsuccessful in obtaining a good selection of those descriptions of fruit that can be profitably grown in their locality, certainly they would greatly neglect their own interests, if they failed in banishing bad fruit from their orchards whilst they could get, with very little labor, and scarcely any expense, the very best qualities, the surplus of which, after supplying their own families, would always command a high and remunerating price in the market. As this is not the season for grafting, the only thing that can be done is to select from the nurseries or neighbouring orchards those varieties that are highly prized, and have such limbs labelled, if possible, when the fruit is on, or whilst the name or character of the fruit is fresh on the mind of the person in charge, so that in the month of February, the scions or grafts may be carefully taken from the trees and laid by in the cellar till the period arrive for grafting. This practice need not be confined to apples, but may, with advantage be extended to the plum, cherry, and pear orchard. In many portions of the country the common wild Canadian plum may be seen on various portions of the farm and about the farm house, in great abundance. Now, since there are upwards of a dozen improved varieties of plums cultivated by our gardeners and most tasty farmers, it would be a very easy matter to procure a few hundred scions of the best varieties, and have them engrafted on those old standard trees, which would shortly repay the trouble ten times over, by giving a return of an abundant supply of fruit, of a superior quality. In some instances, those trees may require to be removed, and if so, the plan to be adopted to ensure success, is to dig a trench around the tree, to the depth of 18 inches, and at such a distance from it as will not require large roots to be cut; the trench or hole should be filled up with water, which, when dried, will form a hard ball around the roots of the trees. This ball of earth being removed with the tree, will protect the roots from injury by the removal, and by this method the largest fruit trees may be transplanted without injury, even when the buds are much swollen. The early part of May, in this northern climate, is the best period for removing large trees, and it is simply here mentioned to show that it may be done, and to induce our readers who have the common red plum scattered over their farms to remove them near their dwelling, and engraft thereon the choicest varieties of fruit that can be had without too much cost and trouble.

On sandy dry soils fruit trees should be planted in autumn, but if the soil be wet and clayey, the spring is to be preferred. The following remarks on orcharding are from Downing's Horticulturist, the best authority in America:—

From the Horticulturist

ON TRANSPLANTING FRUIT TREES AND THE CARE OF ORCHARDS.

BY L. C. EATON, OF PROVIDENCE, R. I.

We do not expect to add any thing new upon this subject, to that which has already been written, but carelessness or ignorance still prevails to such extent, that some advantage may result by repeatedly noticing the directions which experienced cultivators have recommended.

Before transplanting trees, the ground should be well cultivated and in good condition. Deep ploughing is highly beneficial in promoting their growth and vigor. The holes should be dug at least three times as large as will admit the roots, extended in their natural position, and to the depth of twenty inches to two feet. The earth should be well mixed with a liberal allowance of well rotted manure and peat or muck, the whole so finely pulverized as to be admitted freely around the smallest roots. The bottom of the hole should be loosened up by the spade and the prepared earth filled in to the height at which it is proper to set the roots of the trees, and be sloped off in each direction, so as to form a slight mound or hillock. Pare off the wounded parts of the roots smoothly, to prevent canker or decay, and to enable them to heal over the sooner.

Place the tree upon the hillock and seperate the roots, and extend them to their entire length; fill in the earth, observing that no cavities or hollows are left, and that the fibres are not crowded together. When the earth is entirely filled in, press it down with the foot, and "finish by making a slight hollow or basin to catch the rain and convey it to the roots." Shaking the tree to settle the earth, injures the smaller roots and lifts them from the correct position. It has been frequently recommended to set the tree deeper than it formerly stood. We are not aware that any one has given a reason for so doing, or that any benefit can possibly result from it. Much injury is liable to be sustained by deep planting. The roots, buried too low beneath the surface, are deprived in a great measure of the influence of air, heat and moisture, and are "starved by the poverty of the soil." In preparing the soil, "a compost of two thirds muck or peat earth reduced by fermenting it for several months in a heap with one-third barn yard manure," has been highly, and we believe most deservedly recommended. We had an opportunity a few years since of observing the beneficial effects of peat alone upon trees We made several heaps of it in our orchard, of ten or fifteen loads each, not intending to make use of it immediately. The second summer after, we noticed that the trees nearest the heaps, though several feet distant, had grown much more vigorously that season than others, and that the leaves were larger and of much deeper green. This difference of growth was observable at some distance, and when the attention of others was drawn to it, it was so marked that it was presumed the heaps must be in part composed of manure. When the heaps were removed, it was found that the roots had pushed up through the earth, and that the peat, in some places, was matted with their numerous small fibres. We have since used it in large quantities in cultivating trees, and with much advantage.

If any one intends to have his trees transplated in the best manner, the only way to insure it, is, to have the work done under his own eye, as it too often otherwise happens that those to whom you may give directions will neglect to follow them in some particular, either through a want of care or a belief it is of no importance. Care and tact are required in taking up a tree properly, as well as in transplanting it; and we believe as much loss oftentimes occurs from the want of it in one instance as in the other. The work is too frequently regarded as mere drudgery, to be performed with as much expedition as possible; and is usually done by common labourers, wholly unskilled in the operation. The roots are torn from the body of the tree, or so split and mangled and curtailed in length, as either to destroy its life, or so far impair its strength and vigor, as to require years for its recovery.

The most thrifty, is liable to sustain the greatest damage, as its roots are apt to be larger and more numerous, or more deeply imbedded in the soil. We have seen trees taken up in this manner, some of which have been thereby rendered entirely worthless, so carefully packed for transportation, that not a branch, or even a twig, could receive the slightest injury. A portion of the labor would have been much more advantageous to the purchasers, if it had been expended in removing them properly. It is far preferable that the limbs should be mutilated than the roots; for though the tree may have a bad appearance when first transplanted, if the roots are well preserved it will soon recover from the injury. A nurseryman cannot at all times oversee this work, and in the press of business it may be carelessly performed without his knowledge and against his express direction. The purchaser would confer a benefit by informing him, whenever there is a serious cause of complaint; and it would not be amiss in some cases, when an order is given, to make the request that care should be taken in removing the trees to preserve the roots as entire as practicable. If the trees could be removed with every root entire, there would be no necessity of shortening or trimming out the branches, any further than to shape the top of the tree in a correct form.

To have trees grow thrifily, and bear good crops of fruit, it is necessary that the soil should be keept in good condition by cultivation and frequent manuring. It should seldom be laid down to grass, and never with the view of obtaining the crop for more than one season or two at the most.

After an orchard is planted eight or ten years, if the trees are vigorous, but little or nothing is gained by clearing the grass from around the tree three or four feet, and applying manure; for the small fibrous roots from which they derive their chief sustenance, grow at much

more greater distance; and it would then be more necessary to cultivate half of the intermediate space between the rows and equidistant than any other part.

In the fruit garden, the spade, of course, only is to be used. The earth should be thoroughly trenched to the depth of twenty inches or two feet, the upper stratum, with a compost of manure and peat or muck, being first filled in, and the subsoil turned over and upon it. This work can be done with more advantage before the trees are transplanted.

In ploughing an orchard, use oxen in preference to horses. It is necessary that the trees should be so trimmed as to admit of the team passing beneath, without injury to the branches. Care should be taken not to cut or bruise the roots. By examining the furrows the depth at which they lie can often be detected, and the plough should gradually run nearer the surface as a line of trees is approached. When the bark and the stems is accidently bruised or knocked off, it is not in general best, at first to try any application. Pare off smoothly the edges of the wound; and if the albumen is untouched, or but slightly injured, it will soon heal up. We have known persons rub over the injured part with dirt or some other application, thereby entirely destroying the albumen, and making a wound permanent.

It is a great trial of temper and patience to have trees badly marred and the work of ploughing should be trusted only to skilful hands.

It is a matter of surprise, that orchards are so productive, and that the supply of fruit indifferent in size and quality, as much of it is, is so great, when we consider how many obstacles placed in her way, nature is obliged to overcome. Horticulture is beginning to be better understood, and the knowledge and information of experienced cultivators more highly appreciated.

In the state in which we reside, orchards, with but very few exceptions, are much neglected. They are mostly kept in grass, and not ploughed oftener than once in five or six years; and then not so much with a view of benefiting the trees, as to obtain profitable crops of hay.

In many instances, such of the trees as have survived an injudicious method of planting, and the depredations of cattle, are a prey to every species of vermin that can live upon them. The borers, caterpillars and lice, have undisputed possession. The trunks, surrounded by suckers, are covered with moss, and from the untrimmed tops, dead and cankered branches extend in every direction. In some neighborhoods, under the idea, or with the apology that stony soil is advantageous to their growth, orchards have been located upon rocky side hills, wholly inaccessible to the plough, and fit only for pasturage; and the dwarfish and stunted trees occasionally yield a small crop of miserable fruit. This is rather a sad description, but far from being overdrawn. We believe there is too much truth in a remark made by one of our most intelligent cultivators, that "if nine-tenths of our orchards should be cut down, and the labour and cultivation which they receive be expended upon the remaining tenth, more and better fruit would be raised."

We are happy to say that of late, attention has been more drawn to the cultivation of fruit, and that there is reason to expect a speedy progress in improvement.

MANAGEMENT OF FORESTS.

In most of the old settled portions of the Province, especially where the soil is particularly well adapted for the culture of wheat, timbered land is yearly growing scarcer, and it is high time that steps should be taken in those sections of country to secure a young or second growth of wood. How this can be the most cheaply and efficiently done is now the question to be determined. That forests can be replenished by culture and hand planting, as is done in old and densely populated countries, and the growth of wood can be made to compensate for the expense and trouble, no one at all acquainted with the business will pretend to advocate; nor is it likely any one will be so prodigal of their money as to make such an experiment. Nevertheless, the fact stares the beholder in the face, that timbered land is rapidly growing scarcer, and that no new wood is springing up to take the place of the full grown trees that either fall down by the wind or are removed for firewood. A young growth of wood may be had by fencing in the wood land, and by carefully keeping out all kinds of cattle for a period of at least five years. By that time the growth of the young wood will have attained a sufficient height to withstand any attacks of horned cattle. and the only attention that will be required will be to occasionally thin the wood. In the course of ten years the trees will have made sufficient wood for hoop poles, for which purpose those that are suitable may be cut and sold, at prices that will amply repay the whole expense.

At this season of the year, a supply of winter fuel may be chopped and piled up in the woods, and where there is any quantity of fallen wood that is sound, it should also be chopped and piled up to be in readiness to be drawn to the farm house in winter. Where it is an object to manufacture maple sugar, if possible the wood should be chopped in the autumn, so that it might be removed to the spot where it will be required for use, before the snow leaves the ground. Where this precaution is not observed, it frequently happens that fuel becomes scarce before the close of the sugar season, and thereby more or less standing green wood is chopped, which makes an opening in the wood lot, thus admitting strong currents of wind which uproot and destroy much valuable wood.

PROFITS OF ORCHARDS.

The past season has been remarkable for the inequality of the apple crop; for while in some parts of the country it has been a total failure, in others, orchards have been uncommonly productive. Perhaps no where have they yielded more abundantly than in the western part of New York, and the adjacent region. The following are not extraordinary examples, and all occurring within one mile of the residence of the writer. On one farm, one acre of ground is occupied chiefly with large trees of the Rhode Island Greening. The product was two hundred barrels, after reserving a sufficient quantity for domestic use. The price was sixty-two and a half cents per barrel, and the aggregate amount one hundred and twenty-five dollars. Deducting twenty-five dollars for picking and carting to market on the Erie Canal, which is more than the actual cost, we have one hundred dollars the nett proceeds of a single acre. It would require but a small farm, at this rate, to yield a greater revenue than the salary of the Governor of the State.

On another farm, half a mile distant, there are four and a half acres of orchard, with vacancies nearly equal to one acre. The proprietor sold six hundred and fifty barrels for four hundred and six dollars, besides reserving a supply for his own use; which is very near the amount per acre in the former instance. In this orchard, one tree of the Rhode Island Greening, bore forty bushels; and two neighbors had each a tree of the same variety, the crop from each exceeding forty bushels, or ten dollars per tree.

Such profitable returns have caused a great variety of new orchards to be set out, in addition to many within a year or two past. But the market will not be soon glutted; for while a few only keep their newly planted orchards well manured, cultivated, the soil mellow, and the earth round the trees entirely free from grass, weeds, or any sown crop, the great majority plant out their trees in meadows, pastures or grain fields, to be overrun with grass and weeds. A hill of corn thus treated would produce nothing; and the young trees (which require as good treatment as corn,) make but little growth, if indeed they happen to live through the treatment they receive. Thus, instead of yielding a profitable return, as they might do in five years, they are not likely to bear much in less than fifteen or twenty. It is true that many who pursue this course are not aware of the disadvantages under which they are working; although they expend twenty-five or thirty dollars for trees, they "can't any how afford" to take an agricultutal or horticultural paper, which would show them a better way. This is, emphatically, wasting at the bung, in order to save at the tap.

A REMEDY FOR BLIGHT IN PEAR TREES.

A correspondent states that he has found iron ore, or cinders of iron, placed round the roots of trees, drives away the insect which depesites the eggs that produce the worm. Having tried this remedy in a sandy soil, and in a stiff soil, and in places distant from each other; and having driven off the insect when the trees of others were very much injured or destroyed in the neighbourhood, he advises all those who are troubled by these insects to try the use of iron, rather than be under the necessity of continually topping off the limbs which contain the worm or young insect. He thinks it probable that the iron is unfavorable to the worm, which drops from the branches, and makes its winterng place at the root of the tree, and then the insect avoids an unvavorable place for its young. But whatever may be the theory, it is sufficient that iron has the desired effect.—[Gardeners' Gazette

GRAFTING CURRANTS.

The *Gardener's Chronicle* recommends for the pretty appearance presented, as well as for improved flavor, to graft currants of different colours, as the red, black, and white, variously intermixed, on stocks trimmed up to a single stem three or four feet high. The tops may be headed down to a compact head, or trained as espaliers in the horizontal or fan method.

Mechanical.

THE MECHANIC.

That portion of the Canadian population who devote their time and researches to the practice and study of mechanical branches, not having had an organ to advocate their interests, and to give wide publicity to those improvements that take place in the various departments of mechanics, must not expect too much at our hands, for the obvious reason that those branches of industry are not so well represented by the press in other countries, as are the interests of agriculture and horticulture. To do justice to this important feature of our periodical, we shall require all the aid that can possibly be had from those who are practically acquainted with those subjects. Contributions of this kind, emanating from practical mechanics, and embracing the most recent improvements made in their several departments, would be invaluable, if carefully prepared for the press, and widely circulated through the country. It need scarcely be repeated that the columns of the *Farmer & Mechanic* are open for useful communications on improvements in any of the branches of mechanics, and that such favors will at all times be gratefully received by us, as they doubtless will be by a large and respectable circle of readers.

AGRICULTURAL MECHANICS.

For convenience sake this portion of our work will be divided into different sections, and the above, embracing the various appliances required on the farm, for the efficient and speedy performance of labour, being by far the most useful and interesting branch of mechanics for an agricultural population like ours, shall receive at our hands a large amount of attention. Indeed every implement and machine employed on the farm, as well as those required by others than agriculturists, in a rural district, will be described, and the nature and utility of the improvements made thereon will be fully explained in such a manner that the most ordinary intellect will comprehend their use and mode of construction.

In the performance of this task, in most cases, we shall require not only to see the machine or article described, but shall make it a point to see it put to a practical test. This will not now be so difficult a matter to perform as formerly would have been the case, as there is a prospect of an agricultural implement and general machine warehouse being established in this city, where the mechanics of this and our neighboring country may send specimens of their goods to be sold, and where also farmers and mechanics may get supplied with articles that can be relied on, having been thoroughly tried before being offered for sale. We repeat that this enterprise, of which more particular notice will be taken elsewhere in this paper, if properly supported by the farmers and mechanics of Canada, will contribute largely to make that portion of our periodical devoted to mechanics both generally useful and interesting. If it could be afforded, the implements and machines described, would be accompanied with correct perspective and working drawings, but as the expense of this would quite exceed the profits of the publication, it cannot on a large scale be done. This much, however, in this respect, will be done,—the four outside pages will be devoted to advertisements, and the entire proceeds thereof will be expended in procuring well executed engravings for the illustration of those subjects embraced in our work that can better be described in this way than any other. Without further preface we shall describe some of those useful labour-saving machines, that have either recently been introduced into this country, or are attracting much interest in Great Britain

and elsewhere. In this number we shall make a few remarks on—

AGRICULTURAL ROLLERS.

Among the numerous implements of husbandry that have of late years undergone a thorough improvement, and also a complete change both in principle and mode of operation, is the Roller. The old-fashioned, smooth-surfaced cylinder roller, in many points of view, has been a valuable implement to the farmer, especially in imparting to the land a fine, even surface, for the cultivated grasses; still, it frequently happened that the grain crops were damaged rather than improved by its use. Every farmer who has repeatedly used the roller will bear testimony to this fact; and such as examine a little closer than merely at the surface of things must have become convinced that the damage from this source proceeded from the compactness of the whole surface, whereby the moisture and gasses from decomposing vegetable substances, in the soil, had no chance of escaping: or, in other words, to use a comparison peculiar to animal physiology, the pores of the soil became stopped, thus preventing the free discharge of those substances in the soil that would not be received by the rootlets of the plants, and which were not required for the promotion of a healthy growth; and also preventing the free admission of air to the roots. If a fall of rain should ensue soon after the land had been subjected to the process of rolling, a hard crust would be formed on the surface of the ground, from the small particles of soil, which has a blighting influence on most plants. To remedy this unfavourable influence, and to provide the farmer with an implement that will thoroughly break down the clods, and impart a fine surface, without subjecting the crops to the injurious influences alluded to, a great number of mechanics, in England and elsewhere, have been busily employed in inventing such a machine. The result has been, as might have been expected, that an almost endless variety of machines have been announced, and puffed into notice, but only few have met with public favour.

At this time, notice will be taken of three of those clod-crushers, or rollers; the whole of which might with advantage be employed by the farmers in the oldest settled portions of Canada.

CROSSKILL'S PATENT ROLLER.

This is a recent invention of Mr. Wm. Crosskill, of Beverley, Yorkshire, England. It is particularly useful in rolling wheat in the spring, and is as efficacious to the plants in heavy as on light lands. Sheep treading, and other means for giving solidity to loose soils in the spring, are not nearly as effectual in their operation as is this roller. The serrated, or uneven-like appearance of the outer surface of the roller presses the fine top soil around the plants, thus securely fixing the roots into the ground, thereby increasing the quantity, and improving the quality of the grain. In this way it will be invaluable on barley, spring wheat, and oats. By passing this machine over the land, it will effectually kill slugs of all kinds, stop the ravages of wire-worms, and destroy grasshoppers, or any other of the vast tribes of insects that prey upon the crops. It is unequalled as a clod-crusher; and by passing it over heavy clay lands, the most rough and cloddy surface may be made as fine as could be desired for grain crops. To the patent serrated roller was awarded the special honorary gold medal, by the Royal Agricultural Society of England, as being THE MOST BENEFICIAL IMPLEMENT USED IN AGRICULTURE. A higher encomium than this could not have been given; and from the numerous testimonies in its favour, and from the large patronage received, it is not saying too much to state, that if this implement could be brought

into general use in Canada it would be the means of saving many thousands of pounds annually to our farmers. They are made almost entirely of iron, and hence their cost is greatly augmented. A machine six feet wide, and weighing 16 cwt., would cost about £35. It would serve a number of farmers, and would last an age with proper usage. Its mode of construction is very simple, consisting of about 20 cast-iron wheels, four inches wide and three feet in diameter, which are suspended at the centre by a round wrought-iron axle, two inches in diameter, and nearly seven feet long. To this axle a frame of wood is attached, resembling very much in use and and appearance those used on the improved wooded roller: and the tongue or shafts are secured also in the same manner on the one implement as the other. The twenty cast-iron wheels are all of one size, and revolve on the axle independently of each other, and thus, to some extent, regulate themselves to suit the inequalities of the ground. The machine would require from three to four horses to propel it with ease; and about ten acres per day is about an average day's work. In England a number of experiments have been made with it on wheat, and the average increased yield of fall wheat, from its use, may be reckoned at ten bushels per acre; and an equal advantage may be expected from its use on spring grains, clover, and in the preparation of land for turneps and other root crops.

PATENT PRESS WHEAT ROLLER.

This implement was invented by Mr. Wm. Cambridge, of Market Leavington, near Devizes, and is also a clod-crusher, as well as a roller. It consists of about the same number of wheels as the machine just described, which revolve independently of each other, on an axle, each wheel presenting on its surface-edge the sharp-edged appearance of two tea-saucers placed together, with the bottom side of each outwards. These sharp edges will cut through the hardest clods; and from the nearness of the wheels to each other, they will completely pulverize and compress the roughest land, without producing that even, compact appearance so much to be dreaded on some soils from a common roller. This machine is in every respect, except in the particular mentioned, like the Beverley clod-crusher, and is its superior on meadow and pasture lands. It also embraces another feature, that is worthy of the highest commendation, particularly when employed on light lands. By placing the wheels about seven inches asunder, on the axle, and by using cast-iron washers, to keep them that distance apart, light land that has been ploughed, and properly prepared for seed, may be greatly improved, both in tilth and appearance, by passing this land presser over it, just before sowing the grain. The proper method of thus using the land presser on a large scale is to plough the seed furrow in the style of ribbing, and if the furrows are made regular, and in perfectly straight lines, the wheels of the presser may each be made to pass at the bottom of the furrow, and thus an even and regular bed or furrow roll will be made for the reception of the seed.

In addition to the foregoing advantage, which is peculiar to this machine, two or three of the wheels may be taken off the axle, and by a very simple contrivance, a presser for compressing inverted sods may be made, which, in point of value, cannot be too highly prized by clover and wheat farmers. In ploughing clover lea, for wheat, by the use of the presser the clover plants may be thoroughly buried, and the bed in which the seed is to lie will become hardened, and made fit for the reception of seed, which, by the operations of seed harrows, passed over the ground lengthwise of the furrows, will cause the grain to be buried a good depth into the land, and to have the appearance, while growing, of being sown with a drilling machine.

The rollers here described are expensive, and in the present condition of agricultural improvement in Canada will scarcely warrant the opinion that they will come into immediate use. A cheaper kind of clod-crusher may be made, by using a series of strong wooden bars, as a substitute for the smooth surface of the solid cylindar. When the land is dry, this forms an effective clod-crusher. It is very simple in its construction, consisting of some thirty strong oaken bars, attached to three wheels, about three feet in diameter, one at each end, and the other in the centre, to which is added a frame and tongue, precisely like those already described. Any person at all acquainted with the use of edge tools may make a roller or clod-crusher of this kind; and on heavy clay soils it would be found an efficient implement in reducing them to a perfect tilth and friable condition. In most cases it would not be found sufficiently heavy to break the clods; and to remedy this, a quantity of stones may be piled on the top of the frame, which may be regulated to suit the strength of the team, or condition of the land.

THE REAPING MACHINE.

There are at least eight different machines for harvesting grain that are propelled by horse power. Of these there is only one that may really be termed a labor-saving and economising machine. That machine was invented by Mr. Obed Hussey, of Baltimore, Maryland, upwards of fifteen years ago. Mr. Hussey being a plain unassuming mechanic, has allowed his machine to speak for itself, and it has therefore very gradualty obtained popular favor. It has, however, given unqualified satisfaction to all who have purchased or seen them in operation. About three hundred machines per annum of this kind are sold, and the demand for them was so great the past season, that twice that number might have been sold if they could have been supplied in time for the harvest. Unlike most inventors, Mr. Hussey has retained the sole right of manufacturing his machines, and they are made only at Baltimore, under his immediate inspection and superintendence, and at Auburn, N. Y., under the management of his brother. Last year he applied to Congress for the extension of the period of his patent, and to indemnify him in some measure for the great service he has rendered his country, an additional fourteen years will have to expire before his machine becomes public property, at least to the citizens of the United States. Although a long period has now elapsed since the invention and use of Hussey's Reaper, still in point of intrinsic improvement, it has undergone very little change. The speed of the blades, or cutting principle, by an alteration in the gearing, has been increased, and the place where the person who attends the machine sits, has been changed, enabling him with greater ease to discharge the cut grain behind the machine. These are about all the improvements that have been effected in the machine, since its first introduction to public notice.

The machine consists of a low frame, which may be elevated or lowered to any reasonable extent, to suit the grain to be harvested, resting on two wheels, the large or power wheel being about 3½ feet in diameter, and the small one which supports the side next to the standing grain, only fourteen inches in diameter. They are both made of cast iron, and may be detached from the platform on which lies the grain, whenever the machine has to be transported any great distance. The main or power wheel weighs upwards of 300 lbs., and is firmly keyed to an axle on which is also a cog wheel which communicates motion to the cutters. The cutting apparatus consists of steel blades about five inches long, and three wide at the base. They are formed like lancets, being sharp on both sides, and come perfectly to a point, and are rivetted on an iron rod, forming an instrument, to appearance, like a saw. Arrow of strong iron spikes or guards are firmly fixed to the front edge of the platform, pointing horizontally forward, each of which

is formed of an upper and a lower piece, leaving barely space for the blades to pass through. The points or spikes being steel, and case hardened, standing forward of the blades upwards of two inches, form a complete protection to them, so that there is no danger whatever of breaking or injuring them by coming in contact with stumps, stones, or other hard substances. The blades occupy three inches each on the rod, so there must be as many spikes as blades. The crank which moves the rod on which the blades are attached, has a sweep also of three inches, thus causing all the blades to operate at once, and making each blade vibrate between the spikes for every revolution of the crank. As the blades pass out of one spike into the other, the grain is cut as it comes in between the spikes, something after the style of cutting with shears. The spikes being double, or having an aperture for the ingress and egress of the blades, form a bearing to resist the straw or substance to be cut, both above and below the blades, and therefore, the cutting power of the machine is somewhat governed by the speed of the horses. As the machine moves forward, the motion, where the grain stands thick and heavy, causes the heads to fall backwards on the platform, and when sufficient is cut for a sheaf, the raker pushes off the grain in sheaves or heaps for binding. The raker sits with his face towards the side of the platform, and when sufficient is on for a sheaf, he makes a motion pretty much as a man would in paddling a boat, and shoves it off behind the machine, and directly in its track. The binders follow, and as fast as the sheaves are bound, they are removed a little to one side to make a clear track for the horses. Although the wheat or other grain to be cut may be very heavy, there will be no difficulty in raking it off in separate bundles, and the space of ground between each will be perfectly clean; indeed no system of cutting grain can be more perfect, and the grain will be delivered in bundles for binding much more perfectly than could be laid by the most experienced reaper. It has already been said that the motion made by the operator on the machine very much resembles that of a man paddling in a boat; where the grain is light this motion will have to be kept constantly up to prevent it from falling forward, and thus the machine would be choked. When the grain is heavy, if cut at the base, its own weight will incline it backwards on the platform, but just the opposite is the case when the grain is light.

To remedy this evil a reel may be attached, such as is used on McCormick's machine, and by its use the man sitting on the machine will have only to watch until sufficient is on the apron or platform for a sheaf, and by a slight motion of the rake it will be shoved off the machine. The reel, being the invention of another, cannot be used by Mr. Hussey, but in this country that restriction is inoperative, neither machines being patented. The writer has used Hussey's machine with and without a reel, and has cut very light as well as exceedingly heavy grain, the latter being laid perfectly flat to the ground, and twisted and twined in every direction, but not so as to even slightly affect the efficient working of the machinery, and he is prepared to give unqualified approval of the reel in light grain, but would consider it perfectly useless in heavy or lodged grain.

This machine is quite durable, not requiring an average of five shillings per annum to keep it in repair, and it may be made with care to last twenty years. A machine cutting a swarth of six feet in width, will cut without difficulty, an acre and a quarter of heavy wheat per hour, and the five foot machine will cut easily an acre per hour. It requires two horses to propel the machine, a boy to drive, a man to attend it, and four binders and a shocker to keep up to it. It is quite within the mark to say that twelve acres is an average day's work with the machine, and in some cases even as high as twenty acres have been cut in a day with it, The horses may almost trot with it when the grain is in good condition for cutting, and of course the faster they travel the more grain will be cut.

McCormick's Reaper has been before the

public nearly as long a period as Hussey's, and by pushing them into market nearly twice the number have been sold. In very few instances indeed have they given satisfaction, and in several cases the purchasers have been obliged to return them to the manufacturer. In the Western States some 800 of them have been sold, but they cost so much to keep in repair and are constantly getting out of order, and besides will not cut the grain when it is wet, or early in the morning or late in the afternoon when the dew is on, or when the grain is lodged, or has become too ripe, so that persons who bought them three years ago, and who thought much of them then, since seeing Hussey's machine, have condemned them, and consider them absolutely worthless. We cannot afford to give a full description of them, as we consider them a failure in this country, and that by their introduction an actual loss has been sustained by the country, as many will now be deterred from getting a better description of machine, until they have seen them fully tried.

Useful Recipes.

TO PRESERVE EGGS.

For preserving eggs the following directions are given in the Boston Cultivator, in a way to inspire the fullest confidence —

"We have seen many receipes for preserving eggs, and have tried several without success. They have been saved in good condition a year or more, in lime water; but this requires much skill, as the lime-water may be too weak or too strong, there being a vast difference in the quality of lime. These nice chemical preparations may answer for those who are doing business on a large scale, but for common domestic purposes they will not answer. We put down some eggs in plaster of Paris last July, (1844,) in a close vessel. First, a layer of plaster, then a layer of eggs, not allowing one egg to touch another. On top we put a few inches of plaster, then covered the vessel over closely. The eggs were fresh, being put down as fast as they were laid, or within three or four days. They were placed with the small end downward, and placed in a dry cellar. In another vessel we put some at the same time, and in the same manner, with fine salt. Eggs from both lots have been tried every month from January; the last trial was on the first of this month, (June, 1845,) when the eggs had been put down nearly eleven months. They have all proved to be perfectly sweet and pure; and at the last trial, the white, in a raw state, had its natural taste, and those saved in salt had no perceptible taste of salt. The eggs looked, when broken, like recently laid eggs, excepting for the last three months. In those saved in salt, the yolk adhered to the shell; on this account, and as salt is liable to melt in a cellar, we prefer the plaster."

TO EXTERMINATE BEETLES.

Place a few lumps of unslacked lime where they frequent; or set a dish or trap containing a little beer or syrup at the bottom, and place a few sticks slanting against its sides, so as to form a sort of gangway for the beetles to climb up by, when they will go headlong into the bait set for them. Another plan: mix equal weights of red lead, sugar and flour, and place it nightly near their haunts. This last mixture made into sheets, forms the beetle-wafers sold at the oil shops.—*Ib.*

INDELIBLE INK.—This may be made much cheaper than purchased, as follows:—Two drachms of nitrate of silver, added to four drachms of a weak solution of tincture of galls. Another:—nitrate of silver, one drachm, mixed with a solution of half an ounce of gum arabic, in half a pint of pure rain water. Moisten the cloth previously with a strong solution of pearl, or salt of tartar, and iron it dry.

INCOMBUSTIBLE WHITEWASH. — Pass fine freshly-slacked lime through a fine seive, and to six quarts of the fine pulverized lime thus obtained, add one quart of the purest salt, and one gallon of water, and boil the mixture, and skim it clean. Then to every five gallons of this mixture, add one pound of alum, half a pound of copperas, and slowly add three quarters of a pound of potash, and four quarts of fine sand. It adheres firmly to wood or brick.

FROST PROOF CEMENT.—MIX tar with sand; it gradually hardens, and as moisture cannot in the least degree penetrate it, it will never crack by frost. This was proved by the accidental upsetting of a tar barrel on a spot of sand—the cement thus accidentally formed remaining impenetrably hard for years, although under the rain-water spout, and exposed to all weathers.

INK SPOTS on mahogany may be easily removed by rubbing them with wet blotting paper, and afterwards rubbing the spot with a dry cloth.

☞ We must apologize to our fair and youthful readers for the omission of their Departments. This arose from causes we could not controul, but in future we shall prevent this again occurring.

		Toronto, Sep. 28.				New York, Sep. 28.				Montreal, Sep. 28.				Buffalo, Sept. 28.				Liverpool, Sept. 8. Prices in Stirling.				
		s.	d.		s.	d.	s.	d.		s.	d.	s.	d.	s.	d.		s.	d.		s.	d.	
Flour,	per barrel, 196lbs.	25	0	a	26	3	26	9	a	28	1½	28	6	a	0	0	23	6	a	24	4½	per barrel.	33	0	a	34	6
Wheat,	per bushel, 60lbs.	4	6	a	5	0	6	5	a	8	1½	6	0	a	6	3	4	0	a	4	3	per 70lbs.	8	3	a	9	0
Oats,	" 34lbs.	1	2	a	1	3	1	9	a	0	0											per 47lbs.	2	6	a	3	0
Rye,	" 60lbs.	3	0	a	0	0																					
Barley,	" 48lbs.	2	0	a	2	3																					
Corn,							3	0	a	3	1											per 480lbs.	34	0	a	36	0
Peas,	" 60lbs.	2	0	a	2	3											2	8	a	0	0						
Pork, Mess,	per barrel.						65	0	a	0	0											per barrel.	40	0	a	56	0
do. Prime,	"						50	0	a	55	7½												30	0	a	36	0
do. Fresh,	100lbs.	17	6	a	20	0																					
Beef,	per barrel.																					per barrel.	36	0	a	46	0
do. Fresh,	100lbs.	77	6	a	20	0	0	5½	a	0	6½																
Lard,	per lb.																					per cwt.	44	0	a	46	0
Hams,	"	0	5½	a	0	6																per cwt.	35	0	a	40	0
Sides,	"	0	4½	a	0	5	0	4	a	0	0																
Cheese,	"	0	4	a	0	6	0	4	a	0	5																
Butter,	"	0	7½	a	0	9																					
Potatoes,	per bushel.	2	0	a	2	6																					
Apples,		2	0	a	2	6																					
Eggs,	per dozen.	0	5	a	0	6																					
Wood,	per Cord.	10	0	a	11	3																					
Pot Ashes,	per barrel.											28	3	a	0	0											
Pearl Ashes,	"											28	6	a	28	9											
Oatmeal,	" 196lbs.	25	0	a	0	0																per 240lbs.	14	0	a	27	0
Hay,	per ton.	60	0	a	65	0																					

FREIGHTS.	Flour, per barrel.				Wheat, per bushel.				Ashes, per barrel.				Corn, per bushel.			
	s.	d.		s.	d.	s.	d.		s.	d.		s.	d.	s.	d.		s.	d.
From New York to Liverpool,	2	6	a	0	0	0	0	a	0	8								
" Montreal to Liverpool,	5	6	a	5	9	0	0	a	0	11	40	0	a	0	0			
" Buffalo to New York,	3	5	a	0	0	0	0	a	0	11						0	0	o 0 9
" Toronto to Montreal,																		
" Toronto to New York,																		

DUTY.

Entering United States,			
" Great Britain, from Foreign Countries,	Sterling.	3 7 per barrel.	6 0 per quarter.
" Great Britain, from Canada,	"		