

Technical and Bibliographic Notes / Notes techniques et bibliographiques

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

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

Coloured covers/  
Couverture de couleur

Coloured pages/  
Pages de couleur

Covers damaged/  
Couverture endommagée

Pages damaged/  
Pages endommagées

Covers restored and/or laminated/  
Couverture restaurée et/ou pelliculée

Pages restored and/or laminated/  
Pages restaurées et/ou pelliculées

Cover title missing/  
Le titre de couverture manque

Pages discoloured, stained or foxed/  
Pages décolorées, tachetées ou piquées

Coloured maps/  
Cartes géographiques en couleur

Pages detached/  
Pages détachées

Coloured ink (i.e. other than blue or black)/  
Encre de couleur (i.e. autre que bleue ou noire)

Showthrough/  
Transparence

Coloured plates and/or illustrations/  
Planches et/ou illustrations en couleur

Quality of print varies/  
Qualité inégale de l'impression

Bound with other material/  
Relié avec d'autres documents

Continuous pagination/  
Pagination continue

Tight binding may cause shadows or distortion along interior margin/  
La reliure serrée peut causer de l'ombre ou de la distorsion le long de la marge intérieure

Includes index(es)/  
Comprend un (des) index

Blank leaves added during restoration may appear within the text. Whenever possible, these have been omitted from filming/  
Il se peut que certaines pages blanches ajoutées lors d'une restauration apparaissent dans le texte, mais, lorsque cela était possible, ces pages n'ont pas été filmées.

Title on header taken from:/  
Le titre de l'en-tête provient:

Title page of issue/  
Page de titre de la livraison

Caption of issue/  
Titre de départ de la livraison

Masthead/  
Générique (périodiques) de la livraison

Additional comments:/  
Commentaires supplémentaires:

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

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

# THE CANADIAN AGRICULTURAL JOURNAL.

VOL. II.

MONTREAL, NOVEMBER 1, 1845.

No 11.

## THE POTATOE FAILURE.

We have copied much from our English exchange paper on the subject of the disease in potatoes, as the information may be useful, the disease being exactly the same that affects the potatoes in this country as in Europe. We before expressed our opinion that the disease first attacked the stalks, but we are certain that it was not from the effects of frost that the stalks decayed at once last year or this. In our own case last year, the stalks turned black in the hottest time of the month of August, before there was the slightest frost, and a third or a fourth of the crop was destroyed, principally the potatoes nearest the surface. This year the tops of our potatoes were not much withered up to the 13th October, the time we commenced taking them up, and very few were affected by the disease, and only those partly uncovered. The potatoes were very deep in the soil in consequence of the manner of planting them, namely, ploughed in grass land, previously manured by top dressing, placing the seed in every third furrow, as the plough went on, harrowing the surface after, and then passing the plough between every four rows of those planted, and shoveling the soil raised by the plough this time over the rows planted on each side. There was no further trouble but twice hewing, to keep down grass, but no other weeds appeared in the crop. We are aware that this mode of cultivation might not answer on all descriptions of soil, unless great care was observed to have the land well drained; but we think it would be possible to do this by shoveling out between every fifth row, and making it answer a drain for two rows of potatoes on each side of it. We have not the slightest doubt, that this mode of planting potatoes would give a better chance to the crop to escape the disease than any other we know of. The new fresh turf will be more likely to preserve the crop of potatoes healthy than soil in tillage the previous year, and manured when planting the potatoes. We recommend this mode of cultivation, having

tried it with success—but by all means, it would be prudent to have seed if possible from a crop not much diseased this year. We have examined the stalks, and potatoes effected with the disease, and in both we found small white transparent worms, and bugs nearly of the same colour. The insects were exactly the same in the stalk, and the part decaying of the potato, but they did not appear in any part of the potato except that which was decayed. Our potatoes and the stalks exhibited the same appearance last year, but as we then observed, we could not say whether the vermin was produced by the disease, or the disease produced by the vermin. The latter supposition appears the most probable, inasmuch as the sound part of a diseased potato has no vermin. On the other hand, if the disease first attacks the stalk, and the worms and bugs are first found in the stalk, which we believe to be the case, this may extend to the tubers, and first to those nearest the surface, and the diseased stalks which are generally found to be the most diseased. We find the disease, and the effects of it, but certainly, we have not yet seen any satisfactory cause assigned for a disease which was never before known in this useful root.

There may be some plausibility in the theory that is published, attempting to account for the disease, but there is no proof of its correctness. We observe no change in the atmosphere or climate, that has any effect upon the other plants cultivated, and why should it have on potatoes? The only cause we can see, probable is, that by our cultivation, we have produced a change in the nature of the potato, which first showed itself by dry-rot in the seed planted, and now by the same disease in the new crop while yet in the soil. The seed potato affected by dry-rot, and the potato now affected by disease while in the soil, exhibits exactly the same appearance, when viewed through the microscope, and has the same vermin. It is expedient, at all events, in planting next year, to procure seed from potatoes that has

kept well during the coming winter, wherever they can be had, as it will be a great risk to plant any others.

### THE DISEASE IN THE POTATO CROP.

On the 1st day of April last, Mr. Hudson, of Cartmeal, planted a quantity of early kidney potatoes, known by the name of Ladies' Fingers, and on the 1st of June the crop was taken from the ground, a large and excellent produce. Within three days after, the same ground was again planted with similar seed, and the produce, which proved even better than the first crop, was taken up a few days ago. Thus two fine crops of potatoes were reared on the same ground in the short space of about four months.—*Lancaster Gazette*.

The *Cologne Gazette* states that, notwithstanding the late fine weather, nearly the whole of the growth of potatoes in the Rhenish province is lost. The Chamber of Commerce at Elberfeld has sent a petition to the Minister of Finances, praying that the exportation of potatoes from the provinces of the Rhine and Westphalia may be interdicted; and the same application is expected to be made by the other Chambers of Commerce. The last accounts from Belgium confirm the reports as to the disease in the potatoes; and add, that the quantity of good potatoes this year, in that country, is not equal to one-sixth of the average annual produce. The mayor of Valenciennes has published a notice forbidding potatoes, marked with yellow or brown spots, the sign of the disease which has lately prevailed in that root, to be sold in the market of the town.

The Antwerp journals arrived to-day mention that accounts received there from all parts of Belgium, relative to the potato harvest, are most distressing. The decay or rot affecting this esculent has been found general, no district of the kingdom being entirely exempt. In the province of Antwerp the deficiency would be fully one-third of the crop. In the north of Germany, according to letters from Hamburg, the same scarcity would be felt. The advices concerning the wheat harvest were more encouraging. About Verviers, Spa, and other localities of the province of Liege, they were planting their potato fields afresh. The Flemish prints are full of the subject of the failure of the potato crops, a proof of the extreme importance attached to it.

At the present season, when it is likely that potatoes will not keep in the usual way, it may be useful to many persons to know that, when steamed or boiled, and then trod firmly into pits, they will keep as food for pigs or cattle for twelve months or more; the little earth that will adhere to them is of no consequence when used for pigs; and can be cut off with very little waste if given to cattle.

Potatoes looked well up till about the 20th. The heavy rains and wind afterwards, and nights tending to frost, have changed the appearance generally for the worse; and a disease, probably the same said to be prevalent over England, is appearing very generally on crops most advanced in maturity. The stem is broken just above the ground, rots and falls down, and becoming withered and sapless, the general aspect of the field is that of premature ripening. A small black substance is found in the stem where injured, and sometime insects. The disease is attacking the most luxuriant and promising crops, as well as the weaker; and is most general on the earlier sorts of potatoes. Farmers look with anxiety to the progress it may make, and the extent of injury it may produce, by stopping the growth of the

root. The same disease was observed, and considerable injury ensued, in the year 1830—a season similar in character—and less or more of it has been noticed in other years. These remarks apply to the middle and upper parts of Annandale, which have fallen under the writer's observation; and as these appearances have only attracted attention during this last week, it cannot be stated how far they extend over the county.—*Dumfries Herald*, Sept. 4.

We regret to hear that large patches of potatoes in this neighbourhood have become diseased and unfit for food; some have been brought to our office for examination, which appeared in a very bad state, approaching to rottenness. The stalk is first affected, which becomes decayed and spreads to the root; in some places the crops have been taken up and burnt, being considered unfit even for pigs. Nor is the disease caused altogether by wet, as even on the chalky soil at Gogmagog and Fulbourn it has made its appearance. This is a very serious matter as regards the poor, especially as a great breadth of land was this year planted, and there was every appearance of a prolific crop; but great care is now requisite in the purchase of potatoes for the table, and on no account should any be eaten that are at all diseased.—*Cambridge Independent*.

The potato harvest may be now said to have commenced early and under unusual circumstances, which now has spread throughout Somersetshire, confining itself to no locality, soil, or stage of the crop. The symptoms of the disease and its effects have been described in your paper already. To make the best of the injury is now our purpose; and as I have been giving my attention to this, I will state the conclusion arrived at. We have been very busy getting them up this fine weather, and I believe much depends on their being held dry, as, since this fine weather has set in, a check has been given to the disease as affecting the potato; and there are very few, on cutting, found to be rotted deep under the surface of the potato; and if kept dry, and not in heaps, I think a large portion of the affected ones would keep a long time for the use of pigs, &c. In many cases I have found, after the bad are taken out, a saving crop of the early ones remain: these should be put away thin, in as airy a place as possible, to remain a month, when, if they are again carefully examined, and all the bad ones taken out, the remainder will, I think, keep sound. Directly the leaves and stalks are dead, or before, I should advise their being dug up and separated, the worst may be consumed at once, the others injured kept thin, and if they can be kept without heating quite, the disease will be, I think, averted; but should we have much wet, and the potatoes placed where fermentation is promoted or accelerated, I think much injury will be sustained. I have given to pigs the worst picked out; they eat them very readily, and have done well by them: and I have found when the injured parts is cut off the potato in paring, the remainder eats very well, and it would not have been known, except from it not being quite so floury, that anything had been the matter with it. Those that are sound, taken from the same plant as the unsound ones, I have found very good, and have no doubt a large portion may yet be saved if care is taken in getting them in. The bulk of the late potatoes will be most injured, as the leaves die away, from the disease, even when they have not been long above ground. If any of these observations are worth a place in your paper, they are at your service.—*Street*, Sep. 5.

We regret to have to state that we have had communications from more than one well-informed correspondent, announcing the fact of the appearance of what is called "cholera" in potatoes in Ireland, especially in the north. In one instance the party had been digging potatoes—the finest he had ever seen—from a particular field, and a particular ridge of that field, up to Monday last. On digging in the same ridge on Tuesday, he found the tubers all blasted, and unfit for the use of man or beast. We are most anxious to receive information as to the state of the potato crop in all parts, for the purpose either of allaying unnecessary alarm, or giving timely warning. All through Fingal serious damage has been already sustained.—*Dublin Freeman*.

The *Dusseldorf Gazette* states, that a farmer living on one of the estates of the Duke d'Artemberg, near Dusseldorf, has discovered a mode of preventing the rotting of potatoes, and even of curing it when it has already commenced. The method is very simple; it consists in merely harrowing deeply the earth in which the tubercles are planted, so as to produce an evaporation, which will diminish the fermentation caused by humidity. This plan has proved completely successful.

In this country (says the *Cork Constitution*) the potato crop is in quality excellent, and in quantity most abundant.

A correspondent informs us that he has examined a great many crops in our neighbourhood, and has uniformly found that wherever the potato is affected, it is from exposure to wet. He has taken up a great number of roots, and those tubers which were situated deep in the soil, or at a distance from the parent stock, have escaped; but that if they were fleet in the soil, and even exposed to air (which latter circumstance would have caused them to become green), they were invariably diseased; and also if the old stock had not completely decayed away, or were originally of large size, it apparently acted as a reservoir of moisture, and exerted the same influence over those deep in the soil which the combined effect of air and moisture had upon those on the surface. Those tubers which were developed upon long root fibres a moderate depth in the ground were always healthy. These remarks hold good with every variety of potato on every variety of soil, as far as the neighbourhood of Bury is concerned, except in very small patches of land which appear singularly healthy in the midst of a vast deal of blight.—*Suffolk Herald*.

The Society of Medicine at Antwerp has addressed to the Governor of this province a letter, dated the 5th inst., in which the society gives it as its opinion, "That the best thing to be done to preserve the winter crop from a speedy destruction would be to take out of the earth the tubercles of which the herbaceous parts have died, and to extract the starch. This operation, which is an easy one, might be undertaken at a small cost by the Bureau of Bienfaisance, to supply the wants of the numerous poor that they have to nourish during winter. With respect to the potatoes that are to be given to beasts, it would be enough to scrape the potatoes after having previously washed them and cleaned them from their diseased parts, and then to submit the pulp thus scraped to the action of a press. These last, to be preserved, need only be dried in some receptacle properly heated."—*Globe*.

The failure in the crop of late potatoes promises to be more serious than was at first imagined. A gentleman, who has just travelled through the pota-

to districts of Somersetshire, informs us that for miles on either side the road the tops have been mown down with the scythe, in order, if possible, to save the roots. One large grower in the Mendip district, whose crop generally averages from a thousand to twelve hundred sacks, has offered to sell the whole in the ground for £30. Another large grower calculates upon being £150 out of pocket. The disease attacks the tops, which shrivel away as though burnt, and gradually extends downwards from the leaves to the roots. The diseased fruit, in several instances, poisoned pigs to whom it was given; and there is too much reason to fear that the crops, when once affected, will become entirely useless.—*Cheltenham Examiner*.

The extraordinary disease which has destroyed the potatoes in England has extended its ravages over Belgium and the north of France. In the latter there has been a complete panic on the subject, and, according to a statement in one of the Rouen journals, the mayor of one commune ordered that no travellers were to be supplied with potatoes. The Central Society of Horticulture for the department of the Siene Inferieure deputed a commission to visit the parts around Rouen where the potato is cultivated. Immense fields were found entirely destroyed. In all the neighbouring districts the disease was found to be prevalent. In fields with a north or south aspect, having a good or bad situation, in all sorts of soils—stiff clayey, light sandy, deep and shallow, the disease is the same. The only difference is that the red potatoes are less affected by it than the others. The disease begins at the stalk, small black spots make their appearance, they increase, and spread, and multiply till in the end they cover the whole stalk. It begins on the surface, and soon sinks beneath it; the vessels of the plant then take up the virus, it descends with the juices, and destroys the texture of the plant. The stalks dry and wither. The leaves die the last. The virus being carried to the tubers of the descending sap, small black spots appear in the middle of the potato; they enlarge and spread. When the disease reaches the skin, the starch or pulp decomposes and becomes dry, hard, and black. The skin breaks, decomposition is then complete, and the potato is rotten. It is supposed that the cold nights and rain have caused this disease. The stalks look as if they had been frozen. The commission learnt that the peasants have given these diseased potatoes to their cattle without causing them any injury. The commissioners, therefore, had some of those which were just spotted boiled for themselves, and partook of them without inconvenience. The amount of the crop destroyed in the north of France is estimated at one-fifth of the whole.—*Rouen Paper*.

USE OF THE ROOT IN WORKHOUSES.—The Board of Guardians of the Totnes Union, on Saturday week, came to the following resolution: "That, in consequence of the very unwholesome state of the potatoes (as reported by the medical officer and master), the use of potatoes in the workhouse be discontinued for the present, and that in lieu thereof bread and rice be substituted, on alternate days, at the rate of six oz. of bread, or four oz. of rice (uncooked), in lieu of one lb. of potatoes."

We regret to hear that the disease of the potato crop, which appears to be so general throughout the kingdom, has committed its ravages to a very great extent in this district. Upwards of half the crop is said to be unfit for use.—*Brighton Gazette*.

A cargo of potatoes was expected at Bruges from Scotland, and supplies from the same quarter will most likely be called for by other of the Belgian cities.

Potatoes have universally failed—there is not a garden, much less a field, to be seen green: they are all black, and rotten above ground, and the roots small, unripe, and said to be unwholesome for food; they certainly will not keep. Keep of all kinds for cattle promises to be very abundant. It is curious to see potatoes, turnips, and mangel wurzel in the same field, the former dead, and the two latter luxuriant; proving, I think, that the disease in the former is not owing to the moisture of the ground, but must be something peculiar to the plant itself. All these observations hold as to the district ten miles this; as my inquiries went towards Sussex, 16 miles south, the reports improved, and some in that quarter said their crops were fine: a good deal of the crop has been cut down, but not much carried yet.—*Mark Lane Express.*

#### CORRESPONDENCE ON THE POTATOE BLIGHT.

It will be remembered that at the commencement of this year we were favoured by a long continuance of warm growing showers; these had a wonderful effect on the growth of the haulm of the potato, which became large and juicy in a remarkable degree. The leaves and stems, celebrated in ordinary years for their succulency, became in this way exceedingly susceptible of cold, and in fact utterly unable to bear the wind, the wet, the cold, the hoar frost, and fogs of June and July. As a consequence, the plants were partially killed or bitten, and on the pitted portions the botrytides made their appearance, and spread with the spreading evil, till the death of the plants and the absorption of its putrefying genius followed. The wet and cold acting on a plant as tender as a balsam were therefore the causes of the disaster, and not the mouldy funguses described. We have found this opinion supported by an examination of portions of the infected plants made with the microscope. In early stages of the decay, the fungus was not discoverable, the disorganised tissues of a red colour being alone visible. It may be hoped, therefore, that with the inclement season the plague may pass away, and that we may not be left, as many people imagine, to struggle with an infinitely prolific evil, sown in the soil, and beyond human antidote.

The following letter on the cure of a portion of the diseased potatoes has been addressed by Mr. W. Herapath to the *Bristol Mercury* of the 6th of September:—

SIR.—My attention has been given to the disease which has shown itself so extensively amongst the growing potatoes. I find, in almost every instance, that the epidermis of the stalk below the surface of the ground, is more or less in a state of decay, often disintegrated, and completely rotten; the leaves and branches accord with the state of that part of the stalk below the ground. The tuber, beneath the outer skin, is first spotted brown (like a bruised apple): these spots extend and penetrate towards the centre, quite changing the nature of the potato. Those near the surface are most injured; in some cases the lowest on the root are not at all affected, while the upper ones are useless. I should therefore expect that the longer the crop remains in the land, the greater the injury will be. It seems, from the microscopic appearance, that the starch escapes injury for a long time after the skin and cellular parts are gone; and as the whole of the nutritive powers of the potato reside in the starch, I should recommend that wherever the disease has shown itself to any extent, the crop should be dug, whether ripe or not, and the starch extracted by the following simple process:—

After washing the roots, let them be rasped fine, and thrown into a large tub or other vessel; pour a considerable quantity of water, and well agitate and rub the pulp with the hands; all the starch or fecula will, from its great weight, fall to the bottom, while the skin and fibrous matter will be carried away by the water; wash the starch with one or two more waters, allowing it to fall after each washing; spread it upon cloths in a warm room, to dry—in this way about 20 or 21 lbs. will be obtained from every 10 lbs. of potatoes, and it contains as much nourishment as the original roots; it will keep any length of time, and might be used with flour to make bread, pies, puddings, &c., as well as farinaceous spoon-meat.

This is much better than throwing away the diseased roots, and will furnish food for tens of thousands who might otherwise want it.

WILLIAM HERAPATH.

(To the Editor of the *Mark-Lane Express.*)

SIR,—I will not apologise in thus troubling you with some observations on the potato crop: the subject is momentous, and I feel sure any hint which may tend to mitigate an evil so generally and widely spread will be received in the spirit which dictates this communication. In this district the crops are very much diseased: I have seen none which are free. I have several acres, and not a root, that I am aware of, has escaped. I am convinced the cold and rainy weather experienced in July is the cause. Long before the haulm showed any observable sign of disease, the root was spotted. On examination, I found the stems damaged just below the surface of the soil to that part attached to the old set. As the supply of sap was thus cut off, the tops soon afterwards began to show the effect: some died down very rapidly—others threw out fresh roots, that prolonged the existence of the stems, which still retain a greenish hue.

Some potatoes taken up in July for family use were so black that they were laid aside: the crown end was generally the worst. I have since frequently examined these potatoes, and from their present appearance I conceive that exposure to the atmosphere will stay the disease from sinking into the potatoes. These potatoes soon became pitted, the diseased parts fell in, and became dry and hard, and now peels off with the skin, shewing a sound and uninjured remnant beneath. This circumstance, I think, proves excess of moisture, aided by the cold state of the atmosphere, which prevented the usual exhalations, to be the cause of the disease.

In those potatoes which remain in the earth, the disease may not increase or proceed, but I feel sure that by turning the crop out of the ground, and leaving the damaged exposed several days to dry, a great portion of them may be made very serviceable. I have some experiments in progress, which will determine me in what way to store both good and bad; but my present conviction is, that as no late potatoes had attained their growth, and are yet unripe and stunted, more than the usual care will be required to preserve them, and that by exposure to the atmosphere the injured will be available to a much greater extent than is generally imagined. I shall be glad if you can make use of the foregoing, as it may lead to other communications: "among a multitude of councillors there is safety;" and the preservation of so important a root as the potato is, I conceive, of as much, if not of more importance than the corn-law question. I hope some means will be discovered to avert what may be termed a national calamity. There is no substitute for the potato, nor can any importation supply the deficiency at a reasonable rate.—I am, Sir, your humble servant,

G. S. C. BURROWS.

Stoke Holy Cross, Sept. 9.

(To the Editor of the *Mark-Lane Express.*)

DEAR SIR,—I beg leave, through your widely circulated paper, to offer a few remarks on the present potato crop from actual observations.

A most awful and alarming disease has befallen the potato crop in this neighbourhood, which at present threatens destruction generally. Every situation whether high or low, confined or exposed, is affected more or less with it; and it appears from the public journals that other counties share the same fate as that of our own immediate neighbourhood. The disease is not only alarming, but I may say unprecedented. I have surveyed the crop for twenty miles up the Trent, as also the same extent up the Ouse, two very important districts for the growth of potatoes, and find them bad almost beyond description; several farmers on the east of Trent would be very glad, and have offered to sell the whole of their crop at from 10s. to 20s. per acre.

This great failure of our land's produce is greatly to be lamented, particularly in the face of a certain ascertained deficiency in the general yield of the present wheat crop; but such are the facts, which no doubt will be felt seriously by all classes of the community.—Yours very respectfully,

JOHN BROWN.

Burton-on-Trent, near Humber, Sept. 10.

(To the Editor of the Morning Herald.)

SIR,—It may appear very presumptuous in an unscientific observer to differ from the authorities who have given their learned opinions on the cause of the mischief to which the potato crops have been subject this season: I shall, however, give you the result of my investigations in my own garden, and you—and, if you please, the public—may judge whether my conclusion is of any value.

Hearing and reading numerous complaints, and not having myself seen any potatoes bad of those which had been brought to table from my garden, I made inquiry, and had presently produced three or four which were affected by the brown corruption on the surface so generally complained of. I next emptied the boxes in which those taken up had been deposited, and found from three to four per cent. on the whole lot similarly affected; but observing, accidentally, that several of those so damaged were also tinged with green, from exposure in their growth, in part, to the outer air, I found, on particular examination, that every potato damaged by the surface corruption had been in like manner partially exposed to the air in its growth. These were the early ash-leaved sort, of a larger growth than usual.

I now proceeded to examine those in the ground, being five different sorts:—1, champions; 2, Sussex whites; 3, pink kidneys; 4, red roughs; 5, light red long-keepers. Of all these sorts my crop is better than usual as to numbers, and the size is equal to my average (except the pink kidneys, which are only half grown); but I am persuaded that had the season been more favourable, the size would have been considerably increased, as their growth has evidently been prematurely stopped.

In every case I have found the same result. The potatoes exposed to the air in any part are tainted more or less by the rot on their surface. Those only one inch under ground are perfectly safe. The haulm of all is withered, except in certain spots under trees, and there it is still erect, and its end leaves still green, although it generally withers first in those spots in ordinary seasons.

I should here observe that my garden is on the north-base of a hill 600 feet high; that it is so much shaded by trees as to have in the height of summer not much sun, and in the early spring the sun scarcely touches it, rising very little above the hill. Yet at such seasons, when my neighbours on more open spots, even on the south side of the hill, complain of sharp night frosts, my garden scarcely, if at all, suffers; and my crops are generally as good and very nearly as forward as theirs.

From these premises, I come to the conclusion that the cause of the mischief to the potatoes is the cold, and nothing but the cold, which we had in July after great heats.

The potato (native of Chili) is always sensitive of cold,

the slightest frost in spring cutting off all above ground: and I conclude that when the tuber is in a state of rapid growth during the heats of July, a sudden and great diminution of temperature, without amounting actually to frost, is enough to damage its surface.

We see the effect here, in the corruption of such tubers as have grown in contact with the outward air, as well as in the general withering of the haulm, while that which is protected by trees overhanging is preserved, and there seems to be hardly a reasonable doubt that the cold alone is the cause.

Of course, in districts exposed to the colds, as potato grounds usually are, the effect will be much more severe; and the failures of the crop in Belgium (a flat open country), about which there has been so much learned speculation, seem to fall in with the theory.

I find that my neighbours, who have suffered most, plant as shallow as possible. I have my potatoes planted at six inches depth, whenever I can overlook the gardener, and oblige him to comply with my whim.—Your constant reader,

E. V.

Bath, Sept. 11.

(From the Pictorial Times.)

The blight of this most important crop is, with the happy exception of Ireland, common to all Europe. In Belgium and the Netherlands, the destruction of the crops is total; in France and Germany the injury is partial, and confined to particular localities; but in England and Scotland it has spread itself abroad, sparing few localities, and appearing on all soils and in every stage of the crop.

The causes of this destructive visitation are variously, and in our opinion erroneously, described.

By some, and a very large class, the blight is attributed to the use of animal manure, and particularly to that of guano. But these are to be regarded as mere conjectures unsupported by evidence. By others it is suspected to be a modification of an old disease called the "curl," which is supposed to originate in the preternaturally inspissated state of the sap in the dry and farinaceous varieties. The sap is supposed to be deficient in fluidity, to become stagnant, to close the fine vessels of the leaf during growth, and thus to cause consumption and death. But this, again, is a theory unsupported by the facts of the present case, and although true, as the statements of an individual disease, is wholly insufficient to account for the universal failure of this year's crop.

A third and highly scientific class of observers attributes the blight to the prevalence of those minute vegetable parasites, the *Mucorini* of botanists. Their views have been put forth by M. Morren, professor of agriculture in the University of Liege. In a letter addressed to the *Independence*, a Brussels paper, he says:—

At this moment, when the disease of the potato in various districts in England seems to be rapidly spreading, the following paper on the subject will be read with extreme interest:—

A general disease, as our readers are perhaps aware, has attacked the potatoes in Belgium, and it seems that the crop of that first-rate necessary esculent is very seriously endangered in that country. The disease is said to threaten also the potato crop in certain parts of France. We republish, therefore, the advice which M. Morren, professor of agriculture in the University of Liege, has addressed to the public, in a letter in the *Independence*, a Brussels paper. M. Morren, after saying that the evil had prevailed in Belgium for several years, though to a less alarming degree, proceeds:—

"The real cause of the evil is a fungus, or sort of mushroom, a mouldering which the learned will classify under their genus *botrydis*, but which agriculturists, with-

out further specification, will call a spot, a blemish, or blotches, and which they will attribute, some to humidity, and some to dryness—some to a bad wind come from France, and some to insects. It is not, however, matter of indifference to know the true cause of the phenomenon, for that knowledge will put us in the way of diminishing or destroying the evil, if it is possible.

"For some time I have been following, day by day and step by step, the progress of the evil, by keeping my observation fixed on several potato fields. The disease decidedly begins with the leaves, and at the top of the leaves; I have even seen the flowers and fruits attacked first. A part of the green tissue loses its hue and quickly turns to yellow; the spot soon becomes more grey at the bottom, and it is always at the lower surface of the leaf, or on the fruit, that a whitish down makes its appearance the next day, or the day but one, after the formation of the yellow spot. By applying the microscope, you then see that this down proceeds from a fungus or mushroom, that is fructifying amidst the numerous hairs that cover the inner side of the leaf of the potato.

"This mushroom is of extreme tenuity, but it breeds amazingly, and reproduces itself by thousands. Its stems are formed of little straight hollow threads, which bear on their summits one or more branches always divided into two, and at the end of these branches reproductive bodies are found, which have the form of eggs, but which are scarcely the hundredth part of a millimètre in size, and even less. It will be said that this is a very small body to do so much mischief, but I answer that the itch is not a disease the less to be feared, because the *acare* which produces it can be seen only by the aid of the microscope.

"After the formation of the yellow spot, and the development of the *botrydis* on the leaf of the potato, the stalk receives the deleterious influence. Here and there its epidermis turns brown, blackens, and following with the microscope the phases of the evil, you perceive that it is by the rind that the stalk is attacked. The morbid agent carries its action from the rind on to the epidermis, and though the epidermis does not always disclose mushrooms it is not the less for that struck with death. Whoever has any notions of vegetable physiology will easily understand these effects. The sap modified into living juices, into vegetable blood, is formed in the leaf, whence it descends by the rind into the stem and the root. Here this sap is diseased, it carries death; it bears the poison of the leaf to the stem, and the latter perishes. Indeed, as soon as the black spots show themselves on the stems, the leaves dry up and die; they fall to the ground propagating, unfortunately, the source of the evil, or depositing its germs in the earth. I shall presently point out means of stopping this fatal communication.

"The infection soon descends into the tubercule itself. If the disease follows its course, the tubercule mortifies forthwith. A potato is not a root, but a real branch; whence it follows that a tubercule contains a marrow, which is the eatable part to be preferred, and a separate rind; between the marrow and the rind there is a zone of vessels, which represent wood. This construction is apparent to any one who chooses to cut a thin slice of potato, and place it between his eye and the daylight. The infection attacks that part which receives the sap on its descent, that part by which the morbid agent has itself come down. When a potato is attacked, you perceive a series of livid, brown, or yellow spots, sometimes grey and blackish, and the series extends over the whole of the lignous zone. By following the progress of the evil upon a great number of tainted tubercules, I have been able to see how the evil, by one continuous progress, at length reaches the heart itself of the potato, and corrupts the vegetable entirely. The skin of the diseased potato comes off easily; the flesh no longer cracks under the knife, a fatulent liquid drips from the potato, a musty, and presently an animal smell, analogous to the smell of mushrooms recently cut, manifests itself, and occasions considerable nausea. The very animals refuse to eat of a food that may be considered as hurtful as deleterious mushrooms themselves.

"As soon as the inside of the potato has mortified, three days at the utmost are sufficient for the *botrydis* to make its way to the exterior. The white efflorescence shows itself in the eyes of the tubercules, and then it spreads itself like little white fleeces upon the surface, that is roundish at first, but which finishes by invading the whole of the tubercules; then the potato is altogether destroyed.

"The evil being traced to its source, the cultivator must direct all his attention to the destruction of the fungus, or mushroom, for it is unfortunately but too true that all the parasites of this genus once introduced into a country remain there and propagate. This year the epidemic has been general; the germ exists everywhere; thousands and thousands of propagules, if their numbers are not diminished by time, will, next year, be attacking the plants, and it will then be more difficult than ever to eradicate the scourge.

"It is essential to adopt the following precautions:—

"1. When, then, the leaves are decidedly spoilt, cut them down forthwith and burn them on the spot, instead of taking them away. The ashes may serve to be scattered on the soil. In collecting them, shake them as little as possible. I have seen with regret cultivators cut down the diseased leaves, and keep them in heaps on the field, or throw them over the hedges. It is preserving the scourge for the following year.

"2. When certain varieties or certain localities are free from the scourge at the time of the harvest, it is always prudent to burn the leaves, for a field may appear secure from the *botrydis* when it is not so; several leaves are attacked; these leaves throw the propagules on to the tubercules, which being preserved for purposes of reproduction, will spread the plant the following year.

"3. If the tubercules themselves are attacked, it is essential to take them out of the earth, and to speedily choose amongst them, which is an easy proceeding, for habit soon enables one to distinguish between the tubercules that are tainted and those that are not. The tubercules that are still sound must be turned to account as soon as possible, for they are not noxious so long as the rind does not become yellow. The smell alone is sufficient to indicate the development of the disease. The diseased tubercules must be burnt.

"4. In order to obviate the disastrous consequences of a scanty harvest, it would be important to adopt in our country the practice now prevalent in Scotland of cultivating potatoes during winter.

"5. As it is infinitely probable that the tubercules which will be preserved for putting in the ground will be infected with the spawn of the mushroom, it would be advisable, by means of the government, or in the course of commerce, or in some way or another, that our cultivators should have at their disposal for reproduction tubercules perfectly pure and non-infected, and in that respect the potatoes of Pennsylvania or of Ireland would suit us extremely. The present scourge is unknown in those two countries. You must be aware of the German potatoes, in which the dry gangrene, the *crispure*, and the ulceration of the tubercules are but too apparent. The occasion of the proposed importation on a large scale should be seized to introduce into our country the varieties the most useful to our soil.

"6. Should the agriculturists persist in using for reproduction the tubercules harvested in the country this year, it will be necessary to submit the tubercules to the agency of lime, as is practised with wheat, barley, oats, and all plants that are liable to the invasion of parasitical bodies. The process ought to be by the immersion of the tubercules, because a study of the *botrydis* shows that it is the eye of the potato, a point that is most often sunken in, that is attacked. The lime-water should, therefore, bathe this lethiferous eye; 25 kilogrammes (50 lbs.) of lime, a quarter of a pound of sulphate of copper, and 3 kilogrammes (6 lbs.) of marine salt, for 25 litres (quarts) of water, constitute a preparation, the utility of which in the destruction of parasite plants has been recognised by a great number of well informed cultivators.

"7. In the plantations, whether of the winter of 1845

or of the spring of 1846, it is essential to plant with potatoes only such districts as are as far as possible removed from the districts actually infected; for it is clear that the chance of transmission by the preservation in the soil of the spawn of the mushroom is much greater in plantations that are close to each other than when the plantations are at a greater distance.

"8. When M. de Martins visited Belgium and investigated in our different provinces the state of our potatoes, he informed me, in one of his interesting conversations, that the cultivators on the banks of the Rhine had observed that the dry gangrene attacked oftener the potatoes planted in the afternoon than those planted in the morning, and he explained this phenomenon by a very simple fact. When the sun has passed the meridian, the heat of the coatings of air is at its maximum; this heat accelerates the vitality of the plants; their propagules float about more easily in a dilated air; the insects, in their flight, disperse more easily a mass of little bodies of which the atmosphere is the vehiculum; and the dissemination of these germs is then at its maximum too. The cultivator is in the very midst of this atmosphere, and the potato which he is planting has to go through it too; the potato gathers on to it the spawn, which is thus sown with it, and there then happens to the potato what happens to the corn that has not been submitted to the action of the lime-water, namely, that the poison grows with the plant, and at a later period attacks it and kills it. Cultivators, consequently, would do well to plant their potatoes in the morning.

"9. The use of lime and of marine salt, with a slight mixture of sulphate of copper, is, as I have already said, of acknowledged efficacy in the destruction of the germs of parasite plants. Consequently, to powder over with such a mixture a soil that has been planted with diseased potatoes, is a good operation for destroying in that land the germs of the scourge. The operation ought to be strongly recommended everywhere.

"10. The preserving of the potatoes that shall have escaped the scourge this year in caves, cellars, &c., will certainly be to deposit the spawn of the mushroom in those very places. The cellars must be thoroughly cleaned, and scoured with lime, which will destroy the spawn, and then scattering lime or ground coal on the soil where the tubercles have been spread will conclude the series of operations, the most rational and the most certain for destroying, if it is possible, the evil at its root."

C. H. MORREN,

Member of the Royal Academy of Sciences, &c.

Liege, August 18, 1845.

#### WAKEFIELD FARMERS' CLUB.

At a meeting of this club, which took place on Friday the 18th ult., Mr Heanley read the following paper:—

"Steam power is one of the mighty agents which has advanced the manufacturing, the mining, and the maritime interest of our country to its present proud position. Why is not the same powerful assistant applied to agriculture? The use of machinery in agriculture is to produce a cheaper description of labour, with the advantage of enabling the farmer to expedite all his operations by a cheaper management than can be effected by manure or horse power. To show the necessity of that principle, look at the advantage the farmer derives in erecting a threshing machine to work by horses; but now let us look at steam power, and you will find a great saving can be effected by using steam for threshing, grinding, chopping hay or straw, and steaming food for cattle:—1st, On threshing corn by steam power, the saving is 2d. per load, for if wheat costs 5d. per load by horse power, it can be thrashed for 3d. per load by steam; a fact I am enabled to speak to from experience the last two

years. Another advantage is, a portion of the crop might be threshed out immediately as it is carried from the field. The ancient practice was to thresh out the whole of the grain before it was removed from the field, and this custom would probably have still remained had it been practicable. In the present state of harvest-work such an operation is altogether impossible, because your horses are otherwise engaged, and manual labour could not do it, however great the advantage might be. It would lessen the amount of loss of corn, for loss must necessarily be incurred in building stacks and taking them down. It would lessen the amount of labour in carrying the corn, for it would be taken from the field to the threshing-mill, and would enable the farmer to bring a large portion of his new corn earlier into the market; and it would be also when it contained the greatest quantity of nutritious matter. It has been ascertained by numerous experiments that wheat carried immediately from the field is of greater bulk, or measures better than at any other time, and in this respect is in the most profitable state for selling upon the general average of years. It appears from the experience of practical farmers, that corn when kept in stack for several months loses a great deal, and the quantity of meal or flour is seriously diminished. This is a fact with which every thinking farmer is acquainted, and, however strange it may appear, is almost totally overlooked or neglected; and the common excuse practical men make is, that the value of straw would be deteriorated if not given to the cattle as it is threshed; but the excuse is inadmissible, for the straw being made into large stacks immediately it is threshed out, it would keep as well when built into stacks with the corn in it unthreshed. I am aware there is a tenacity to old customs, and also a feeling of pride in the show of having an old corn stack or two left over-year. By the application of steam threshing the farmer would have it in his power to sell his corn at the time it fetches the highest price; and this could only be partially done by the application of horse power.

The advantages are as follows:—1st. The cost by steam-power being much cheaper than by horse-power, in some cases nearly half. 2nd. You can always have a supply of meal without being dependent on the miller. 3rd. I grind all the small corn and seeds of weeds which is of little value unground, but when ground makes good flour for pigs. 4th. I have always less loss in waste of grinding, for when sent to a mill the waste is about 2lbs. per bushel. 5th. The engine and works are so easily managed, that any farm man or labourer can superintend the work, and the cost of dressing and keeping in order the mill-stones is very trifling, say about 6s. per year. 6th. By chopping the hay and straw you give to the stock kept in the yard, a great saving is effected: many are of opinion that straw for bedding is better cut, of course into longer lengths than for fodder, as the manure is fit for use much sooner than it could if not cut. 7th. Another great advantage arising from steam is, that the spare steam, after working the engine, may be easily applied to the steaming of food for cattle.

I make the difference in cost of steam thrashing and that done by horse as follows:—

By Steam-power, say

3 men at 2s. per day . . . . .	6s.	0d.
2 women at 1s ditto . . . . .	2	0
2 lads at 6d. and 8d. ditto . . . . .	1	0
Oil for machine and engine . . . . .	0	10



Coals and slack for engine fire	1s.	6d.
Allow for wear and tear	3	6
	<hr/>	
	15	0

Thrashing 60 loads per day would be 3d. per load.

By Horse-power:

	s.	d.
3 men at 3s. per day	6	0
2 women at 1s. per ditto	2	0
2 lads at 6d. and 8d. ditto	1	2
Oil	0	4
8 horses at 2s. ditto	16	0
	<hr/>	
	£1	5 6

Which makes it cost a fraction more than 5d. per load for 60 loads of 3 bushels.

The cost of an engine and thrashing-machine, fixed ready for work is .125 0 0

The cost of horse thrashing-machine, &c., about . 90 0 0

Extra cost of engine . 35 0 0

Mr. C. H. Johnson expressed great pleasure in having had the privilege of listening to a subject so highly interesting; and more particularly its having been so clearly stated rendered it practically useful, and coinciding with his own views, he having paid some attention and spent a little thought upon it.

Mr. Jno. Dawson thought, if steam could be applied to farming purposes in this way, it would be highly advantageous. He could easily conceive that corn thrashed as it comes in from the field would be more in quantity, because it contains more moisture than when it has been in the stack for a length of time. He also noticed the advantages of steaming food for cattle, as dry food is apt to disturb the stomach, and by grinding the corn for horses and cows, they would derive more sustenance from it.

Mr. Andrews, of Kirbair Lodge, said—I feel much pleased in having heard the remarks which have been made by the preceding speakers; it really appears to me that the advantages of using steam in farming are very great. I calculate a horse cannot last on an average above fifteen years, whilst an engine with moderate care will last one hundred years. Horses, whether working or not, are expensive in their keeping; but when an engine stands still, it is costing nothing. The small boilers you have named I have no doubt would do the quantity of work you state, but it is best to have your boiler large enough their being then less risk. A four-horse engine will do more work than eight horses—I mean yoked at the same time—for they never are all of one mind for pulling together, whereas an engine is steady in its work, and its whole energies are applied at once. I recollect once employing eighteen horses to do some work; that is, six at a time, in three sets, relieving each other as they required; but it proved tiring work. I put up a six-horse engine, and it did the same work well. Ten per cent. upon the cost will keep an engine in repair, which works every day for twenty years; but the cost of those used for farming purposes, as has been stated, may be about seven per cent.—say five per cent. for the outlay of capital, and two per cent. for wear and tear. Another point worthy of remark is, that where steam power is used for thrashing, should corn be required for market, it need not stop the regular operations in the farm, as the horses need not be taken off their work. At some periods of the year this must be highly valuable, as your other works are proceeding, and you

may thrash corn to a very large extent in a short time. In whatever way you employ steam power, it is the cheapest and best way of getting work done, and done well; but I believe a locomotive engine may be made to do all that has been said of the stationary one, and will no doubt be the best for farmers. It could be applied in various places. Take it into the field when the corn is ready, and thrash it out. Use it for irrigation, by having a supply-pipe that could be lengthened as wanted, and work it in a semicircular manner until a field is well watered; or apply liquid manure in the same way. May I now be permitted to make a remark or two, which may justly be deemed a digression from steam? I was very glad to hear of the efforts you are making to get the meeting for 1846 of the Yorkshire Agricultural Society to Wakefield. This is decidedly the best way to raise farming in this neighbourhood, as very small farmers would be able to benefit by the exhibition, and to them it would be a stimulus to exertion so much wanted. Although this is wandering from steam, I could not help expressing my great pleasure.

Mr. Wm. Barrat, of St. John's, said—To me this has been a rich treat, to hear a subject so ably treated which promises fairly to aid the farmers of Britain so much as the application of steam power is very likely to do in many ways. What has contributed so much to England's present elevated position as a commercial country as the application of steam to manufactures? Her sea-girt island—a mere speck in creation—could soon manufacture enough of goods to supply the world; and I say success to the manufactures of England! because, amongst other benefits to be derived from them, an extensive trade is sure to benefit farmers in the prices and demand for their produce; and, again, we want all the auxiliaries we can for the farmers, to help them to contend with foreign countries in the raising of grain. I do not wish it to be understood that I think steam power can do proportionately as much for the farmer as it has done and is capable of doing for the manufacturer and the traveller; but that, if connected with other improvements, it will enable the farmer to triumph over the threatening aspect from free trade in corn. Let, I say, the dormant energies of the country be roused on this point, and, I repeat, farmers have nothing to fear. I am not an enthusiast on steam farming, but just contemplate steam thrashing, grinding, crushing corn and malt, and cutting straw and hay for cattle, saving at least 15 per cent.; keeping horses and cows, and feeding cattle, and steaming fodder, say 10 per cent. more. Causing less horses to be needed is another saving, as well as cutting turnips for cattle and sheep. Steaming food for cattle is yet but very partially practised, but highly deserving of universal application. The mouldy hay, or weather-injured straw, by steaming, have the deleterious properties quite removed, rendering the food more easy to digest, removing all the danger arising from giving dry or even wetted chop to cattle. I have no doubt steam will, ere long, be generally applied, and I think the sooner the better.

The following resolution was then put from the chair and carried unanimously—"That in the opinion of this meeting. Mr. Heanley has treated this subject in a very lucid manner, practically illustrated its uses, and clearly shown its advantages to the farmer, and that a vote of thanks be given to him for introducing a subject which so highly interested the meeting."

## The Canadian Agricultural Journal.

MONTREAL, SEPTEMBER 1, 1845.

In our last number we reminded our Subscribers, and others to whom we sent this Journal, that it would be difficult and expensive to send an agent to collect the subscriptions due to us, and requested that, as the amount was so trifling, it might be forwarded to us, or paid to our publisher, Mr. Becket. We regret, however, to have to say, that from the issue of our last publication up to this moment, we have not received one dollar subscription from any one. We regret it the more, as an indication how very little interest is taken by the educated and wealthy portion of this community in agriculture or its improvement. Our Journal may not be all that is desirable, but we endeavour to make it as useful as we can, and it is the only Agricultural Journal published in Eastern Canada. With all the appearance of wealth in the city of Montreal, not one individual has responded to our appeal by paying a dollar subscription to this paper. It may be possible they have not seen our call in the last number, but we fear that no attention has been given to it, because the subject was not worth a dollar in the estimation of any one to whom it was addressed. These remarks have no reference to those who have paid their subscription regularly. The Journal cannot be published without considerable expense; and the only means we have to refund us this expenditure is by the subscriptions we may receive. The proposition may be disputed by some, that the continued prosperity of Montreal must depend upon the prosperity of the country and the abundance and value of its productions, but it is not the less certain—notwithstanding, however, many may dispute it. In all we have ever published, our sole aim was to endeavour to promote, in the best way in our power, the improvement and prosperity of the country, and if we have failed in our object, it certainly was not our fault.

## AGRICULTURAL REPORT.

From the date of our last report, to the 15th of October, the weather was very wet, and we are sorry to say that there was then a considerable part of the grain crop still unhoused, which cannot fail to have been injured. There certainly is no necessity in ordinary seasons, and we consider this season as an ordinary one, that any part of the grain crop should be unhoused after the 1st of October. The want of sufficient draining prevents early sowing, and retards the ripening of

crops; indeed, good or profitable crops are not to be expected on undrained soil. Farmers may, therefore, at once commence their improvements by draining sufficiently the land they have in cultivation, or they need not attempt any other improvement. It is an object well worthy the attention of agricultural societies to encourage Canadian farmers to drain their land in a proper manner. We can assure these societies that they would produce much more of general good to the country by encouraging good draining and good ploughing than any improvement they would be able to effect in the general state of Canadian agriculture by cattle shows. Let them commence at the root of the evil, by first rendering the land fit to keep good cattle, and produce good crops. The premiums paid from public funds should be for the general good state of farms, stock, implements, crops, &c., and that three premiums should be offered in each parish for these. Thus example farms would soon be found in every parish, and the general improvement of agriculture would make certain and rapid progress. The premiums might be so classed that, for the present, Canadian farmers of French origin would not have to compete with farmers from the old country. Let encouragement be offered for draining the land, ploughing it well, manuring it sufficiently, keeping down weeds—good crops, good pastures, a general stock of suitable animals—good implements, well constructed dairy, and good produce from it, the funds thus applied will be productive of general good.

Up to the 15th of October, so far as regarded temperature, and the quantity of rain that fell, it was very similar to the previous month, September. On the 15th, however, the weather became dry, and we had night frosts occasionally to the end. The beginning of the month was very unfavourable for the harvesting of the grain crops which were out in some parts of the country; indeed, we believe, that what of the grain crop that was not secured previous to the 1st October, is of very little value. If farmers are not able to cultivate so as to have the crops of grain secured previous to the 1st October, they may as well not attempt to cultivate them. The potato crop, generally, is affected with the disease, which causes them to rot before and after they are taken from the soil. Potatoes which appeared to the owner perfectly sound, when taken up, have rotted in the cellars, and been thrown out.

for manure. The disease has now assumed a most alarming character, and unless some remedy shall be discovered, it is probable we shall be unable to grow that most useful root with the same success as in time past. It is a very remarkable coincidence that the rot in potatoes, (first in the seed planted), should have commenced at the same time as the failure in wheat from the ravages of the wheat fly. We could never discover any change in climate or general temperature from what it was previously, and therefore, we cannot but attribute (the rot in potatoes particularly) to some change in the constitution of the plants, effected by our cultivation of them. This may be disputed, and we admit we cannot prove our proposition, but we believe it is correct nevertheless. The great difficulty will be next year to obtain seed that will be fit to plant. The disease appears to advance westward, and is very likely to visit every part of Canada. If any new seed can be raised from the apple, it would be very desirable that it should be done, wherever the potatoe vines produced the apple this year.

The disease in potatoes will be very seriously felt here and elsewhere, and it would be well that the people should have some substitute for potatoes, and not be dependent on any particular species of food, in case of failure of that species. Oat meal, and properly prepared barley, would be a good substitute. We have seen excellent flour made from barley, as white as the flour of wheat, and made good bread. What is known as pot-barley, might also be made use of in many ways as food. It may be necessary to try many experiments, should no remedy be discovered to prevent the rot in potatoes. Fortunately we have now got wheat that may be cultivated successfully, or it will be the farmers own fault. Some are of opinion that this new variety of wheat is not so good in quality, as the wheat formerly cultivated here, but we are sure it will make up in the quantity of grain and straw, for any defect in the quality, if it is really inferior. We believe the new variety of wheat is that known as the revit wheat in England, and we published some time ago, a statement of the produce of this wheat in grain and straw, compared with other wheats. Though the revit wheat is of less value, by about a tenth, than other good wheats, yet, by the experiment, the revit wheat made up in quantity of grain and straw, and exceeded in

value all other wheats. We published this experiment before in order to induce some measures to be adopted to obtain an importation of this wheat, but nothing was done until very lately.

From all accounts, we may conclude that much wheat has been injured this year by rust, fly, and sprouting, and this is chiefly to be attributed to neglect on the part of farmers and others, who did not provide proper seed. There is, therefore, no doubt that all sorts of grain will bring a high price this year, particularly as the potato crop cannot be depended upon for any great aid in the shape of food. Hay will also be high, and bring a good price now. Farmers very frequently, have had to sell this article of produce for less than the cost of harvesting and bringing to market, and lost all the benefit of their best land. It is probable that this state of things will not occur again, as hay is a bulky produce, and cannot be brought far to market without a heavy expense, and if we can grow wheat, less land will be appropriated to the production of hay.

The land is in excellent condition for ploughing, and we hope the weather will continue favourable for completing that work. All lands intended for summer fallow next year should be ploughed this fall, and well water-furrowed.

The produce of the dairy brings a fair price. So does butchers' mteat.

The prospects of the farmer as regards prices for what he may have to sell are encouraging, but those who think them too high, do not consider the many draw-backs the farmer has this year—a short crop of hay, certainly much loss of labour, and in many instances extensive injury to crops by a wet harvest—and last, but not least, the disease in potatoes. We say it advisedly, that no portion of the community are so ill paid for their capital and labour as the farmer, and hitherto there has appeared a disposition in all who had the power, that they should be the worst paid, but we hope better prospects are now offered to us, if we act judiciously.

Cote St. Paul, October 22, 1845.

It is a matter of the utmost consequence that every man interested in the welfare of the country, should endeavour to discover some remedy for the very great evil of the disease in potatoes, if a remedy is possible. We wish the time was come that every individual of a community would feel that he has an interest in the general welfare of that community, as well as in his own. It is unfortunate that those who have the means to provide what they require, feel very little interest in the situation of others, whether they feast or starve. It has been a constant matter of astonish-

ment to us that the Representatives of a Canadian Constituency, who are nine-tenths dependent on agriculture, should appear so little interested in the prosperity of agriculture. They have voted a part of the public revenue for the encouragement of agriculture, but what conditions have been attached to this vote to insure the judicious application of this money to this purpose? The public revenue does not belong to the Legislature more than to any other portion of the community, only that they are intrusted by the people with the appropriation of it for the peoples' benefit. We take upon us to say, that during our long residence in Canada, very little, indeed, of the public funds has been expended in the instruction of the people in the art of agriculture, or the encouragement of an improved system of husbandry, where improvement was most required. What then can be the benefit of votes of public money, if they are not so expended as to produce the improvement for which it is pretended the money is granted. If new varieties of seed-wheat had been brought into the country, when our wheat was first destroyed by the fly, as we suggested at the time, this would have been a real benefit: that, perhaps, would have made the country richer this moment by five or six millions of pounds currency. Has this money given to agricultural societies remedied, or been applied to remedy, this great evil, by the appropriation of one shilling to such a purpose? Not to our knowledge, certainly. We were honoured by the medal of the Montreal Natural History Society for an essay on wheat fly; its history, habits, &c., but this was the only mark of approval we ever received for this essay. We also obtained the medal of the same society for an essay on the Cultivation of Hemp and Flax, but no agricultural society in Canada took the slightest notice of either essays. In England a large portion of the funds of agricultural societies are appropriated to encourage essays on many useful subjects,—to circulate useful information—the construction of the best agricultural implements, &c., but here all the funds of our societies, or mostly all, go to the owners of the best cattle, who must, of course, be so fortunate as to be the most skilful farmers, have ample capital, and have their farms in good order. We incur considerable expense to procure the very latest and best information on agricultural improvement, and print and publish this in our Journal. We have offered twenty-five copies to the Montreal Agricultural Society gratis, for distribution in the country to farmers who do not subscribe to any agricultural paper, and our offer has not yet been accepted, though we have agricultural societies in the most distant parts of Upper Canada who take a large number of our Journal *and pay for them*, for distribution. Subscribers who do read our Journal may judge whether it would be worth distributing under such circumstances as we proposed, by any agricultural society who were disposed to

forward the improvement of Canadian Husbandry, when it might be done without cost, or taking any part of the funds which they require for premiums on cattle. If our Journal is not worth distribution, neither is the best Agricultural Journal in the British Isles or on this continent; because we make the best selections from all these. So far as regards this Journal, we have no object but to promote the improvement and prosperity of Canadian agriculture, and the interests of those who make it a profession.

We have been presented with a copy of "Views of Canada, and the Colonists," by the author, J. B. Brown, Esq., of Montreal, and we intended to have acknowledged the favour in a former number of our Journal, but the article we prepared did not appear, and must have been neglected in some way in the printing office. We have carefully read the book, and have not seen any publication on the subject more interesting and correct in the description it gives of the country and the colonists than this little work. We can recommend the publication to all who feel interested in Canada, and in particular to emigrants about coming to the country who may be desirous to know something certain of it before they leave the land of their fathers. We have seen many descriptions of Canada, but they generally contain greatly exaggerated, and too flattering pictures of the country. Mr. Brown's book, we think, is free from this fault, and may be relied upon. A map of British America, of sufficient size, is published with the work.

#### REMARKS ON PLOUGHING.

BY T. SULLIVAN, ESQ.

All the varieties of ploughs generally used in this country may be divided into three classes, viz., wheel, swing, and turn-wrest ploughs: the first being characterized by the appendage of one or more wheels; the second by the entire absence of wheels; and the third by the possession of two mould-boards, so attached to the body, and connected together, that when one is in operation the other is elevated clear of the ground. The improved Scotch swing-plough is adapted to every soil, situation and country, and is universally regarded as the most simple and efficient tillage-implement which British agriculture can boast of. I am willing to admit that the addition of wheels may, in some districts, bring the instrument within the management of comparatively unskilful workmen; but, even with this advantage, it is highly questionable whether the employment of wheel-ploughs, in any locality, is commendable. They unquestionably tend to perpetuate the evil which they are intended to remedy. In Scotland, the swing-plough has diverged into three leading varieties, possessing distinct characteristic features, viz., Small's, Wilkie's and the Currie plough, each of which is held in the highest estimation in the respective districts in which it is used. The two first have, as we have already seen, undergone numerous slight alterations, forming sub-varieties, but retaining the respective leading features of the concave and convex mould-boards. It may be worthy of remark that, although Small's plough was originally produced in Berwickshire, the implement that seems

most to retain the peculiarities of his mould-board is now almost entirely confined to East Lothian, and differs very essentially from the plough generally used at present in the former county. Wilkie's is frequently denominated the Lanarkshire plough, from the circumstance of its being made near Glasgow; and the Currie is generally distinguished by the appellation of the Mid-Lothian plough, as being chiefly confined to that county. These three ploughs being considered as the existing types of all the varieties of ploughs now used or manufactured in Scotland; a brief description of their general qualities and characteristics, in addition to what has been already given, will not, it is hoped, be unacceptable to the reader.

In the East Lothian plough, which retains the leading features of Small's implement, the proper lines of the body on the land-side lie all in one plane, which, in working, should be held in the vertical position, or very slightly inclining to the left; the coulter is slightly oblique to the land-side plane, the point standing towards the unploughed land. The inclination of the coulter to the plane of the sole-line varies from  $55^{\circ}$  to  $65^{\circ}$ . In the mould-board the vertical sectional lines approximate to straight lines, giving it the character of apparent concavity, and it is truncated forward; the share pointed, with a feather projecting to the right, of five or six inches in width, the outer edge of which lying nearly as low as the plane of the sole. The neck of the share is prolonged backward, joining and coinciding with the curve of the mould-board, which curvature is also carried forward on the back of the feather. The character of this plough is to take a furrow of about 10 inches in breadth by 7 inches in depth, cutting the furrow-slice square-cornered. The resistance of draught is generally below the average of ploughs; and the beam and the handles are invariably made of malleable iron. The entire length of the plough, measured on the base-line, is 10 feet 9 inches: but, following the sinuosities of the beam and handle, the whole length is about 11 feet 3 inches.

In Wilkie's plough, the proper lines of the land-side lie in different planes; thus, when the fore part of the land-side of the body, taken at the junction of the breast with the beam, is vertical; the hind part, taken at the heel, overhangs the sole line  $\frac{3}{4}$  inch; and the beam, at the coulter-box, lies to the right of a vertical line from the land-side of the sole about an inch, the point of the beam being re-curved towards the land-side. In working, the fore part of the body is held in the vertical line, or slightly inclined to the left; the coulter, on account of the bend in the beam to the right, and the point being to the left of the land-side, stands very oblique, but nearly coinciding with the land-side, at the height of 7 inches from the sole. The vertical sectional lines of the mould-board are all convex towards the furrow, giving the mould board the character of convexity, and it is prolonged forward, covering the neck of the share. The share is chisel-pointed, with the feather seldom exceeding  $5\frac{1}{2}$  inches in breadth, the cutting edge rising from the point of an angle of  $8^{\circ}$  till it is one inch above the plane of the sole, when it falls into the curve of the mould-board, while the neck passes under the latter. The character of this plough is to take a furrow-slice whose section is a trapezoid, its breadth from  $7\frac{1}{2}$  to 9 inches, and greatest depth  $6\frac{1}{2}$  inches. The finished ploughing exhibits an acute and high-raised furrow, especially observable in lea-ploughing. Resistance to the draught about the average of ploughs. The ex-

treme length of this plough, measured on the base-line, is 9 feet 10 inches; but following the sinuosities of the beam and handles, the entire length is about 10 feet 6 inches.

In construction the Mid-Lothian plough stands intermediate to the two former. The proper lines of the land-side lie in different planes; thus, when the fore part of the land side, taken as in the former case, is vertical, the hind part, taken at the heel, overhangs the sole-line  $\frac{3}{4}$  inch, but the beam is continued straight. In working, the land-side is held vertical, or slightly inclined to the left. This plough is always worked by a chain-bar under the beam; the coulter stands rather oblique; and the point about  $1\frac{1}{2}$  to 2 inches above the point of the share. The vertical sectional lines of the mould board approximate to straight lines, giving the character of concavity, and the mould board is prolonged forward, covering the neck of the share. The share is chisel pointed, with feather seldom exceeding five inches broad, and, when trimmed for lea-ploughing, the cutting-edge rises from the point at an angle of  $10^{\circ}$  to a height of  $1\frac{1}{2}$  inch above the plane of the sole, when it falls into the curve of the mould-board, while the neck passes under it. The character of this plough is to take a furrow-slice whose transverse section is a trapezoid, with the breadth  $8\frac{1}{2}$  to 9 inches, and usually from 6 to  $6\frac{1}{2}$  inches in depth. The finished ploughing exhibits an acute and high-raised furrow-slice in lea, to which this plough is considered peculiarly applicable. The extreme length on the base line is 10 feet 6 inches; but measuring along the sinuosities of the beam and handles, the entire length is about 11 feet 6 inches.

Although I have in these remarks candidly avowed my decided preference for the Scotch swing-plough under all circumstances, and confined my observations exclusively to it, yet I have no hesitation in expressing my belief that some of the English ploughmakers have produced numerous varieties of this implement, possessing a considerable degree of excellence. The Messrs. Ransome, of Ipswich, in particular, have, through their unceasing exertions, succeeded in raising the character of the English ploughs to a high degree of usefulness. Many of the very numerous implements manufactured by these celebrated mechanists, are, unquestionably, well calculated in the hands of skilful ploughmen to perform unexceptionable work. Ransome's F.F., or Bedfordshire plough, has attained a high character for its general usefulness, and deservedly so; generally it is regarded as the most efficient of the English wheel-ploughs. But, it is to be observed, that these ploughs appear to be principally adapted to the soil of England, and to the practice of shallow ploughing, which her agriculturists so generally countenance.

When describing the beam, an allusion was made to the *line of draught* of the plough, which may be defined as a line passing directly from the point of attachment of the draught-chains on the collars of the working animals to the centre of the resistance met with by the plough at work. In a well-constructed implement, this line intersects the sole of the plough a little behind the setting on of the share; and the centre of resistance may be assumed as a point situated about two inches above the plough's sole, though it is liable to change within short limits. The inclination of the line of draught to the plane of the sole varies with circumstances to be afterwards mentioned; but the average angle in the ordinary practice of ploughing is held to be  $20^{\circ}$ . If the plough were of a quite perfect construction, and

the soil everywhere to present the same uniform resistance to its progress, a cord attached to the centre of resistance, and drawn in the usual oblique direction of the line of draught, would so pull forward the plough that the share would neither point upwards nor downwards, but move horizontally forward. But I need scarcely observe, that it is very difficult to find a plough that will be quite perfect in the form and combination of its parts; and any considerable extent of soil presenting a uniform resistance in ploughing is seldom to be found. It will appear obvious from what has been already said, that the bridle at the extremity of the beam, to which the swing-trees and draught-chains, are attached, must terminate in some part of the line in question: so that whatever may be the length of the beam, or however high it may be raised, the draught-bolt will always be found in this line. We have seen on a former occasion that the beam may be curved to any height above the surface-line, without altering the working-principle of the plough, provided that the part to which the draught is attached be brought down to a certain height above the sole-line.

The direction of the line of draught, or its inclination to the plane of the sole, is subject to constant fluctuation. The length of the draught-chains, or the distance of the working animals from the plough; the height of the horses' shoulders, or of the point on the collar to which the traces are attached; the great diversity in the texture of various soils, from extreme tenacity to extreme porosity, and the different depths to which it is necessary to plough on particular occasions, all produce variations in the angle of draught. If the land to be ploughed offered a uniform resistance to the motive force, the dimensions of the furrow-slice to be fixed, and the instrument itself so complete in its construction, and so well adapted to the nature of the soil and work as to move horizontally forward in such a steady manner that the cutting-irons should not deviate from the exact dimensions of the furrow-slice, then the angle of draught would not be subject to any variation except what may be caused by the distance and different heights of the animals. But such equally constituted soils, and such well-formed ploughs as are here referred to, are rarely indeed to be met with; and hence the bridle seems to be an indispensable appendage to the beam, inasmuch as it enables the ploughman, in a great measure, to adapt his implement to the nature of the soil, and the dimensions to which he is required to plough it. By means of the bridle the plough is thus made to suit itself to the nature of the soil and work, as the line of draught can be readily placed in a position to counteract any tendency of the share to sink too deep into the ground, or to rise to the surface.

The angle which the line of draught makes with the plane of the plough's sole has some effect upon the force required to draw the implement. When the angle of inclination is about  $20^\circ$ , which is the usual direction of the draught, it is estimated that, in an average of cases, the draught required to impel the plough is 24 stones, or 336 lbs.; and the necessary force diminishes as the line of draught approaches the horizontal line. If the motive power could be applied in the horizontal instead of the oblique direction, it is demonstrable that we should have the plough drawn by the minimum of force. This position, however, is impracticable, as the line of draught would in such a case pass through the solid land of the furrow about to be raised; but it is within the limits of practicability to draw the

plough at an angle of  $12^\circ$ , and the motive force required at this angle would be 1 stone, or 14 lbs. less than is required by drawing at the angle of  $20^\circ$ , which may be held as the average in the ordinary practice of ploughing. A plough drawn at this low angle, namely  $12^\circ$ , would have its beam (if of the ordinary length) so low that the draught-bolt would be only 10 inches above the base line; and this is not an impracticable height, though the traces might be required inconveniently long. On the same principle, the angle of draught might be elevated to  $60^\circ$  or  $70^\circ$ , provided a motive power could be applied at such high angles. In this, as before, the beam and draught-bolt would have to fall into the line of draught, as emanating from the centre of resistance. The whole plough also, under this supposition, would require an almost indefinite increase of weight: and the motive force required to draw the plough at an angle of  $60^\circ$ , would be nearly twice that required in the horizontal direction, or 1/16-1/8th of that of the present practice, exclusive of what might arise from increased weight."

It is evident, from the foregoing extract, that it is altogether impracticable to draw the plough at a much higher angle than at present; and even if it were possible, no advantage could be gained by the change. Neither can we adopt a much lower angle; for by doing so we would necessarily require to place the animals at a very inconvenient distance from the instrument.

The practical ploughman has several means at his command for altering the direction of the line of draught in order to get his implement to move steadily forward, so as to require little exertion on his part to adhere to the exact width and depth determined on for the furrow-slice. Thus, should the plough have a constant tendency to sink deeper into the soil than the required depth (which is, in most cases, a commendable fault), the line of draught can be altered, and the tendency rectified. First, by depressing the point of attachment of the draught-chains on the bridle; and, secondly, by diminishing the length of the traces, and shifting the leather strap that supports them backwards on the horse's back. By either of these means the angle of draught is increased, and consequently the tendency of the plough to penetrate deeper than is required is counteracted. The same effect is produced by the ploughman pressing more forcibly than usual on the handles, and by their power, as levers, inclining the point of the share upwards; or, by diminishing the vertical distance between the coulter and share, and turning the point of the latter upwards with a hammer or otherwise. Should the plough have the contrary tendency, namely, that of rising to the surface, the error may be corrected, first, by elevating the draught-bolt on the bridle; and, secondly, by increasing the length of the traces, and moving the back-band forward towards the horse's shoulders; by either of which means the angle of draught is diminished, and the plough induced to penetrate deeper into the soil. This can also be effected, in some measure, by increasing the vertical distance between the coulter and share, and giving the point of the latter an inclination downwards. Again, should the plough manifest any undue tendency to incline to the unploughed land, or take a broader furrow-slice than is required, the ploughman moves the draught-bolt a little to the left of the centre hole in the horizontal part of the bridle, and thereby counteracts that tendency. The same effect is produced, though in a less degree, by setting the point of the coulter over that of the share (that is, diminu-

ishing their lateral distance apart), and inclining the latter from the land. In like manner, the opposite tendency which the plough may have of inclining too much towards the furrow-side, or taking too narrow a furrow-slice, is rectified by means the reverse of those last mentioned.

It is to be observed that the plough is of the most perfect form, and requires less exertion on the part of the workman in directing, and of the horses in drawing it, when the line of draught is made to pass through the centre of the bridle; and that any considerable deviation from that direction must have the effect of augmenting the force required to impel the implement, besides rendering it unsteady in its motion. To avoid these positive evils the careful and intelligent ploughman will endeavour to have his irons always in good working order. When the soil is very loose and free from stones, the relative positions of the coulter and share have but little effect on the steadiness of the plough or the form of the furrow-slice; but strong adhesive soils and grass-lands require the irons to be carefully tempered and maintained in proper repair. Whatever may be the nature of the land, or the condition in which it is at the time of ploughing, the ploughman will find it of some advantage to set his irons in such a manner as to impart a tendency to the instrument of cutting the slice a little deeper and wider than is required, as he will find it much easier to counteract these tendencies than those of an opposite character; indeed, the degree of pressure which he must necessarily lean upon the handles is generally sufficient to answer this purpose. When the plough-irons are not regularly kept in a proper state of repair, the ploughman cannot possibly perform as good work as he would otherwise be enabled to do; and the labour of draught is evidently increased when the cutting parts are not kept duly sharpened and of sufficient length. This is a point of considerable importance, especially in lea-ploughing, where the defective work of the neglected irons becomes most apparent.

#### ALL PLANTS DO NOT FOUL THE SOIL EQUALLY.

The following remarks, on the succession of crops, is from Chaptal's Agricultural Chemistry:—

“It is said that a plant fouls the soil, when it facilitates or permits the growth of weeds, which exhaust the earth, weary the plant, appropriate to themselves a part of its nourishment, and hasten its decay. All plants not provided with an extensive system of large and vigorous leaves, calculated to cover the ground, foul the soil.

“The grains, from their slender stalks rising into the air, and their long, narrow leaves, easily admit into their intervals those weeds that grow upon the surface, which, being defended from heat and winds, grow by favour of the grain they injure.

“Herbaceous plants, on the contrary, which cover the surface of the soil with their leaves, and raise their stalks to only a moderate height, stifle all that endeavours to grow at their roots, and the earth remains clean. It must be observed, however, that this last is not the case unless the soil be adapted to the plants, and contain a sufficient quantity of manure to support them in a state of healthy and vigorous vegetation: it is for want of these favourable circumstances that we often see these same plants languishing, and allowing the growth of less delicate herbs, which cause them to perish before their time. Vegetables sown and cultivated in fur-

rows, as are the various roots and the greater part of the leguminous plants, allow room for a large number of weeds; but the soil can be easily kept free by a frequent use of the hoe or weeding fork; and by this means may be preserved rich enough for raising a second crop, especially if the first be not allowed to go to seed.

“The seeds that are committed to the ground often contain those of weeds amongst them, and too much care cannot be taken to avoid this: it is more frequently the case, however, that these are brought by the winds, deposited by water, or sown with the manure of the farm-yard.

“The carelessness of those agriculturists who allow thistles and other hurtful plants to remain in their fields, cannot be too much censured; each year these plants produce new seeds, thus exhausting the land and increasing their own numbers, till it becomes almost impossible to free the soil from them. This negligence is carried by some to such an extent, that they will reap the grain all around the thistles, and leave them standing at liberty to complete their growth and fructification. How much better it would be to cut those hurtful plants before they flower, and to add them to the manure of the farm. From the principles which I have just established, we may draw the following conclusions.

1st. That however well prepared a soil may be, it cannot nourish a long succession of crops without becoming exhausted.

2nd. Each harvest impoverishes the soil to a certain extent, depending upon the degree of nourishment which it restores to the earth.

3rd. The cultivation of spindle roots ought to succeed that of running and superficial roots.

4th. It is necessary to avoid returning too soon to the cultivation of the same or of analogous kinds of vegetables, in the same soil.\*

5th. It is very unwise to allow two kinds of plants, which admit of the ready growth of weeds among them, to be raised in succession.

6th. Those plants that derive their principal support from the soil should not be sown, excepting when the soil is sufficiently provided with manure.

7th. When the soil exhibits symptoms of exhaustion from successive harvests, the cultivation of those plants that restore most to the soil, must be resorted to.

These principles are confirmed by experience; they form the basis of a system of agriculture rich in its products, but more rich in its economy, by the diminution of the usual quantity of labour and manure. All cultivators ought to be governed by them, but their application must be modified by the nature of soils and climates, and the particular wants of each locality.

To prescribe a series of successive and various harvests, without paying any regard to the differ-

\* In addition to the reasons I have given why plants of the same or analogous kinds should not be cultivated in succession upon the same soil, there is another which I will here assign. M. Olivier, member of the French Institute, has described with much care all the insects which devour the neck of the roots of grain; these multiply infinitely, if the same or analogous kinds of plants be presented to the soil for several successive years; but perish for want of food, whenever plants not suited to be food for their larvæ, are made to succeed the grains. These insects belong to the family of Tipulæ, or to that of flies. —(Sixteenth Vol. of the *Memoirs of the Royal and Central Agricultural Society of Paris.*)



ence of soils, would be to commit a great error, and to condemn the system of cropping in the eyes of those agriculturists, who are too little enlightened to think of introducing into their grounds the requisite changes.

Clover and sainfoin are placed amongst the vegetables that ought to enter into the system of cropping, but these plants require a deep and not too compact soil, in order that their roots may fix themselves firmly.

Flax, hemp, and corn require a good soil, and can be admitted as a crop only upon those lands that are fertile and well prepared.

Light and dry soils cannot bear the same kind of crop as those that are compact and moist.

Each kind of soil, then, requires a particular system of crops, and each farmer ought to establish his own upon a perfect knowledge of the character and properties of the land he cultivates.

As in each locality the soil presents shades of difference, more or less marked, according to the exposure, composition, depth of the soil, &c., the proprietor ought so to vary his crops, as to give to each portion of the land the plants for which it is best adapted; and thus establish a particular rotation of crops upon the several divisions of his estate.

The wants of the neighbourhood, the facility with which the products may be disposed of, and the comparative value of the various kinds of crops, should all be taken into the calculation of the farmer, in forming his plan of proceedings.

**COMPARATIVE VALUE OF DIFFERENT KINDS OF FODDER.**—The following table is the result of experiments made by the principal agriculturists of the continent, and published by M. Antoine, at Nancy. The best upland meadow hay is taken as the standard, at 100 lbs.: and the specified weight of the other kinds of fodder enumerated are required to produce the same results:—

	lbs.		lbs.
Good hay,.....	100	Dried stalks of Jerusa-	
Aftermath hay,.....	102	lem artichokes,.....	170
Clover hay made when		Dried stalks of Indian	
the blossom is com-		corn,.....	400
pletely developed,...	90	Millet straw,.....	250
Do. before the blossom		Raw potatoes,.....	201
expands,.....	88	Boiled ditto,.....	175
Clover, second crop,...	98	White Silesian beat,...	220
Lucerne hay,.....	98	Mangold-wurzel,.....	339
Sainfoin hay,.....	89	Turnips,.....	504
Tare hay,.....	91	Carrots,.....	276
Spergula arvensis dried	90	Swedish turnips,.....	308
Clover hay, after the		Ditto, with leaves on,...	350
seed,.....	146	Grain—Rye,.....	54
Green Indian corn,...	275	Barley,.....	54
Green Clover,.....	410	Wheat,.....	42
Vetches or tares, green	457	Oats,.....	59
Green spergula,.....	425	Vetches,.....	50
Stems and leaves of Je-		Peas,.....	45
rusalem artichokes,...	325	Beans,.....	45
Cow-cabbage leaves,...	541	Buck wheat,...	64
Beet-root leaves,.....	600	Indian corn,...	57
Potato haulm,.....	300	Linsced cake,...	69
Rye straw,.....	442	Wheat bran,...	105
Oat straw,.....	196	Rye bran,.....	109
Peas haulm,.....	153	Wheat, peas, and oat	167
Vetch haulm,.....	159	chaff,.....	179
Bean haulm,.....	140	Rye and barley chaff,...	
Buckwheat straw,.....	195		

A cauliflower, weighing 13lbs, the head of which measured one yard in circumference, without the leaves, was gathered in the garden of Mr. John Everton, at Lutterworth, on Wednesday sc'night.

**EFFECT OF OILCAKE ON THE MANURE OF ANIMALS FED ON IT.**—A friend of mine has lately adopted a plan which, under the same circumstance, I should strongly recommend: it is that of giving a small quantity of oilcake to animals grazing, for the sake of improving an ordinary pasture, and its effects are astonishing. The pastures I allude to are small, and one or two bullocks more than they are calculated to carry are put into each; the lot are then allowed 4lbs. of cake per day per head; this, at a cost of about 2s. per head per week—which, I believe, the stock well paid for—has entirely altered the face of pastures from what they were three years ago, when the plan was first adopted by him, and, I believe, without any loss to himself.—G. Dobito—*English Agricultural Society's Journal.*

**THE CULTIVATION OF BEETROOT.**—The *Moniteur* publishes the returns of the produce and consumption of beet-root sugar during the season 1844-45, from which it results that the number of manufactories still existing on the 1st of August last was 294, or 31 less than at the corresponding period of 1844. The quantity of sugar manufactured amounted to 36,241,187 kilogrammes, or 7,780,512 kilogrammes more than in 1844; that sold for consumption to 36,628,474 kilogrammes, and the duties levied on the article to 6,551,721 f.

**THE PROPER DIRECTION OF THE TRACES IN HARNESS.**—It is universally admitted that the best way of applying the power of horse is by means of shafts or traces to carriages. The best position of the traces, or shafts, when a horse is made to exert himself to draw in a carriage, is so well known and understood by those who are daily in the habit of "hanging to," that it needs scarcely be noticed. The trace, when a horse leads forward to draw, should become perpendicular to the collar, and parallel to the plane of the road on which he is moving. In moving up a hill the trace should become parallel to the plane of ascent. When he is standing at ease, the direction of the trace should be a little upwards; because when urged to draw, he leans forward, and in so doing lowers the fore-part of his body, which will tend to bring the trace parallel to the plane when his power is fully applied. If any deviation from the parallel be admitted, it is desirable such deviation should incline upwards rather than downwards. If the direction were downwards below the parallel, the power of the animal would have a tendency to increase the friction by pulling the wheels into the cavities of the road. After contemplating these remarks, the following suggestions present themselves:—The radius of the fore-wheels should be less than the height from the road to the point of the draught on the shoulder of the animal. The shaft or pole should be hung on a level with the centre of the wheel. The least horse, or rather the horse of lowest stature in a team, ought to be selected for the shafts, and he ought not to be so low as to cause them to incline downwards towards the road. In selecting a team, the tallest horse should be placed first, and the others ought to be so placed as to descend regularly down to the stature of the shaft-horse, in order to preserve a continued ascent in the line of traction. If a regular line of ascent be not preserved, as it will not, by placing a low horse between two tall ones, it is not difficult to show that a portion of their power will be lost in acting against one another, and thus render their united effect not so powerful as it might be by a different and proper arrangement. To the individuals acquainted with the elementary principles of mechanics, these suggestions will appear natural and obvious; but, in practice, it is known that the temper, age, and steadiness of the animal mostly regulate the situation in which we find him placed in the team, and therefore deviations from the rule laid down respecting stature will often be necessary, and perhaps desirable. In teams of perfectly well-trained horses, the rule may be adopted with advantage.—*Elements of Road Engineering by a Practical Surveyor.*

There is now to be seen in the Botanic Garden, Liverpool, a splendid specimen of the *Tucca gloriosa*, or Adam's needle, in full flower. The flower-stem alone measures ten feet.



**WIREWORM.**—The following circumstance connected with this pest may be possibly turned to a good account. In February last I planted three gallons of early Cornish kidney potatoes in good soil, under a wall having a southern aspect; to my surprise, only one or two had made their appearance up to the middle of May, and by the 2nd of June three or four more, without the smallest indication of any further vegetation over the whole border. On examining the rows, to my surprise, the remainder of the sets were nearly filled with live wireworms, the potatoes having the appearance of being drilled all through with an auger of the size of a quill. Now, does not this tend to show, that by leaving a few refuse turnips, potatoes, carrots, &c., in the fields in autumn, covered with soil, that these destructive insects may be destroyed in great numbers in the spring by stocking out the roots, and carrying them to a heap of quicklime?—*Lincolnshire Chronicle*.

**RAILWAY WITHOUT STEAM OR FIRE.**—The proposed railway from Callao to Lima, in Peru, will neither require the agency of steam, or the aid of fire. The ground has a gradual and unbroken rise the whole way. Above Lima flows the river Rimac, which passes through a part of the city on its way to the sea near Callao. This river, though not navigable, affords at all seasons of the year a hundred times the water power necessary to work any traffic that can possibly come up on the rail. The saving of the usual expense of fuel is thus effected; and the cost of the steam engines, and, what is no small item in railway expenditure, the charges for their after management, are entirely avoided.—*Times*.

**CHURCH BELLS**—There's something beautiful in the church bells. Beautiful and hopeful! They talk to high and low, rich and poor, in the same voice; there's a sound in them that should scarp pride and envy and meanness of all sorts, from the heart of man; that should make him look upon the world with kind, forgiving eyes; that should make the earth itself seem to him, at least for a time, a holy place. Yes, there is a whole sermon in the very sound of the church bells, if we have only the ears rightly to understand it. There is a preacher in every belfry that cries, Poor weary, struggling, fighting creatures—poor human things! take rest, be quiet. Forget your vanities, your follies, your weekday craft, your heartburnings. And you, ye human vessels, gilt and painted, believe the iron tongue that tells ye, that for all your gilding, all your colours, ye are of the same Adam's earth with the beggar at your gates. "Come away, come!" cries the church bell, "and learn to be humble; learn, that however daubed, and stained, and stuck about with jewels, you are but grave clay! Come, Dives, come; and be taught to at all your glory, as you wear it, is not half so beautiful in the eye of heaven as the sores of uncompromising Lazarus! And ye, poor creatures, livid and faint—stinted and crushed by the pride and hardness of the world—come, come!" cries the bell, with the voice of an angel—"come and learn what is laid up for ye. And learning, take heart, and walk among the wickedness, the cruelty of the world, calmly as Daniel walked among the lions."—*Douglas Jerrold*.

**FROGS IN STONES.**—We have several apparently well authenticated instances on record of frogs and toads having been found enclosed in masses of rock, to the interior of which there was no perceptible means of ingress. It has been the fashion, however, with naturalists to dismiss all such cases on the assumption that there must have been some cleft or opening by which the animal was admitted while in embryo, or while in a very young state; no one, so far as we are aware, believing that the sperm or young animal may have been enclosed when the rock was in the process of formation at the bottom of the shallow waters. Whatever may be the true theory regarding animals so enclosed,

their history is certainly one of the highest interest; and without attempting to solve the problem, we present our readers with an instance taken from the *Mining Journal* of January 18, 1845:—A few days since, as a miner, named W. Ellis, was working in the Penydraran Mine Works, at forty-five feet depth, he struck his mandril into a piece of shale, and to the surprise of the workmen, a frog leaped out of the cleft. When first observed it appeared very weak, and, though of large size, could crawl only with difficulty. On closer examination several peculiarities were observed; its eyes were full sized, though it could not see, and does not now see, as, upon touching the eye, it evinces no feeling. There is a line indicating where the mouth would have been, had it not been confined; but the mouth has never been opened. Several deformities were also observable; and the spine, which has been forced to develop itself in an angular form, appears a sufficient proof of its having grown in very confined space, even if the hollow in the piece of shale, by corresponding to the shape of the back, did not place the matter beyond a reasonable doubt. The frog continues to increase in size and weight, though no food can be given to it; and its vitality is preserved only by breathing through the thin skin covering the lower jaw. Mr. W. Ellis, with a view of giving his prize as much publicity as possible, has deposited it at the New Inn, Merthyr, where it is exhibited as "the greatest wonder in the world; a frog found in a stone forty-five feet from the surface of the earth, where it has been living without food for the last 5,000 years!"—*Chambers' Edinburgh Journal*.

#### THE SONG OF THE SPADE.

All honour be paid to the homely spade—

The sword and the spear are idle things:

To the King in his pride, and his subjects beside,

Its tribute the spade of the husbandman brings.

A bright thought from heaven to the tiller was given,

Who first turned to light the soil richly brown:

God told in the blast how the seed should be cast—

See the first yellow grains by the husbandman sown!

See the first harvest morn, and the ripe yellow corn,

And the first crooked sickle thrust into the grain!

With dancing and singing the valleys are ringing,

For all that the spade has raised out of the plain.

Then all honour be paid to the conquering spade—

The sword and the spear are idle things:

To the king in his pride, and his subjects beside,

Its bounties the spade of the husbandman brings.

### The Canadian Agricultural Journal.

PUBLISHED MONTHLY,  
AT ONE DOLLAR PER ANNUM,  
PAYABLE IN ADVANCE.

Any Post Master or other individual who obtains six subscribers, to be entitled to one copy, gratis.

As the object of this Journal is to improve Canadian Husbandry, by the dissemination of the best and cheapest Agricultural information, the charge for it will be simply sufficient to cover the necessary expense. The subscription price will therefore be Five Shillings per annum, to single Subscribers. Societies or clubs will be furnished at the following rates:—

50 copies for.....\$30

20 copies for.....5

0 copies for.....3

Payable always in advance.

WILLIAM EVANS, EDITOR AND PROPRIETOR.

J. C. BECKET, PRINTER.