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.

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

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.

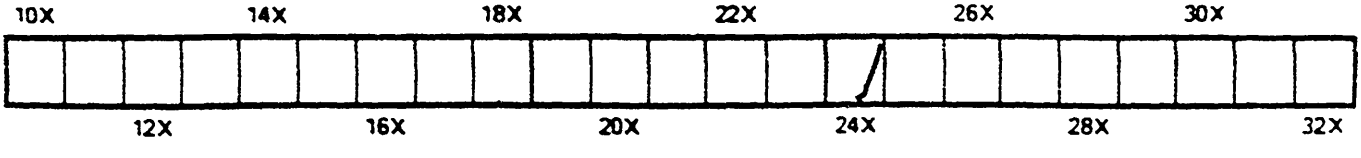
- ☐ Coloured pages/ Pages de couleur
- ☐ Pages damaged/ Pages endommagées
- ☐ Pages restored and/or laminated/ Pages restaurées et/ou pelliculées
- ☑ Pages discoloured, stained or foxed/ Pages décolorées, tachetées ou piquées
- ☑ Pages detached/ Pages détachées
- ☑ Showthrough/ Transparence
- ☑ Quality of print varies/ Qualité inégale de l'impression
- ☑ Continuous pagination/ Pagination continue
- ☐ Includes index(es)/ Comprend un (des) index

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

- ☐ Title page of issue/ Page de titre de la livraison
- ☐ Caption of issue/ Titre de départ de la livraison
- ☐ Masthead/ Générique (périodiques) de la livraison

☐ Additional comments:/ Commentaires supplémentaires:

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



THE

CANADIAN AGRICULTURAL JOURNAL.

Vol. III. MONTREAL, AUGUST 1, 1846. No. 8.

We have so often denied that the poor of England pay a tax upon bread for our advantage that it requires some proof from us in explanation. From the returns submitted to the Imperial Parliament, it appeared that the average duty paid on foreign wheat from the passing of the Corn Laws in 1815 to the year 1843, was five shillings and some pence per quarter. Canada grown wheat was, we believe, during all that period subject to a duty of five shillings sterling per quarter. The amount of encouragement, therefore, to the Canadian farmer was very trifling indeed, not amounting to one penny per bushel. During the same period there was a heavy duty on Colonial salted-meat, cheese and butter, nearly equal to a prohibition of these articles. But in addition to these duties, the high freights paid for exports of agricultural products from this country to the protected shipping of Britain enhanced the value of food to the poor without profiting the Canadian farmer. It is easy to make assertions, and denounce the Corn Laws as an injurious and oppressive tax upon the poor in favour of farmers, but if the state of the case was properly investigated, there is a class of persons that comes between the farmer and other producers, and the poor laborer, that are the true taxers of the food and other necessaries of the poor, and we hesitate not to say, that the free-traders generally belong to this class. It is not at any time the prices that farmers obtain for produce, except in case of failure or shortness of crops, that would be found oppressive upon the poor, but it is the large profits that other parties require, who come between the farmer and consumer, and who would desire to purchase in an open market of free competition, and sell in a protected one. When men come honestly forward and call for the total abolition of every law that restricts the free circulation of the productions of the earth and of man's industry, we shall be disposed to give them credit for their pretensions to be free-traders, but certainly not before. Maintaining duties for revenue, or any other pretence, upon one article, and taking it off another, is contrary to the very terms—free-trade and to every principle of justice and equity. A bushel of wheat when finally converted into bread, sells for more than double the price the farmer obtained for it, and thus the miller and baker, who are free from foreign competition, obtain more for their labor than the farmer gets for his labor, land and seed, and we cry out against the farmer for his covetousness in making bread dear for the poor. The brewer sells the proceeds of barley and hops at the same increased price over what the farmers obtain for these articles. Every article of produce and manufacture is in the same or greater proportion enhanced in value by those who traffic in them between the producer and consumer, and yet the farmer is accused for desiring to have food dear. There is not a class of the community, here or elsewhere, so ill-paid as the farmer; and the only advantage he has to make up for hard work and small pay is, that he enjoys the clear pure air of the country, and is continually surrounded by the beautiful works of the Creator, instead of the impure air of cities and towns, and the works of man. This is certainly an enjoyment that is not to be valued by pounds, shillings and pence, or that would be exchanged for pounds, shillings and pence by any true admirer of the beautiful works of God. We should not occupy so much of this Journal in the discussion of this subject, but that we apprehend that the contemplated changes in our laws and system will produce great confusion and embarrassment; because nothing short of totally abolishing every restriction on trade, commerce and industry will be doing justice to all classes and interests, and how that is to be effected, and a sufficient revenue raised, is beyond our comprehension. As we have repeatedly observed, it is the most unqualified injustice towards the principal interest in every country, to do away with every species of protection to agriculture, while there is protection continued to other interests. There is another product of Canada—timber—that is said to have been protected at the expense of the people of England, but if the real state of the case was examined it would be found that this protection was not of much advantage to the poor Canadian lumber-

man, who has all the labour, trouble, and great risk of bringing his lumber to the shipping ports of Canada. The price he obtains for it at these ports is very trifling in amount, compared to what this same lumber ultimately sells for to the English consumer, and all the amount of this enhanced value and price goes into the pockets of ship-owners and merchants. So that in reality the tax paid by the people of the British Isles upon our timber is not paid to us, but to parties who are fully protected by the English Navigation laws, and who are resident in the British Isles. It is very easy to say to the people of Canada, that the favour bestowed upon our producer has been a constant tax upon the British people; but we conceive that it is as easy of proof to show the contrary. If by the late change in the Custom House laws all protection and encouragement is taken away from our products, why should we be prevented from taking our produce by the cheapest means of transporting them to a market of sale. We cannot perceive the justice of saying to us—"It is true we have taken away all protection and encouragement from your products, but at the same time we must insist upon being allowed to transport all this produce for you at our own terms, and for our own exclusive advantage. You cannot be allowed to employ any other means of transport but protected British shipping." Now this is exactly the sort of free-trade that we think so objectionable, because it is not free-trade, and is not allowing to buy in the cheapest and sell in the dearest market. Indeed, unless all restrictions are done away, as well as the duties on provisions, we shall be in a worse position than foreigners, because we can only bring our products to the consumers by the employment of British ships that are completely protected by the Navigation Laws of England, and who can in consequence charge what they please for transport, and always have done so. The consideration of these matters is now forced upon us by the changes recently made in the Custom House Laws. We did not seek these changes, and those who have made them are accountable for all the consequences that must inevitably follow. It is absurd to pretend thatso great an injustice would be expedient as to do away all protection to the products of agriculture, and retain protective duties upon every other article of consumption, and upon the ships that carry all description of products which we may buy or sell. The agricultural classes, here and in the British Isles, are possessed of a degree of power, if they will only exercise it unanimously and judiciously, that will be much greater and more irresistible than was ever possessed by the Corn Law League, who have now dissolved themselves on obtaining the repeal of the Corn Laws, and are perfectly content that all other protective laws should be retained. Let agriculturists now unite and demand free-trade in all other commodities as well as in their own products, and they must succeed in obtaining this common justice, which is their due. They desire not to tax other classes for their benefit; but neither will they submit to be taxed for the benefit of others.

LECTURE ON THE CHEMICAL COMPOSITION AND NATURE OF MANURES.

BY J. C. NESBET, F. G. S., M. C. S. L., &C., OF THE AGRICULTURAL AND SCIENTIFIC SCHOOL, KENNINGTON, LONDON.

(Continued.)

The substance called chalk, with which you are all so well acquainted, contains a large quantity of this carbonate acid, which can easily be liberated by means of a stronger acid. I will liberate a little from this chalk. I will put some chalk into this jar with some water, and pour in some spirits of salt; and you will find that the gas will at once become liberated. This gas, I should tell you, will not support flame: you see perfectly well that this candle is now burning brightly; but if I pass the candle into the vessel of gas which is now being liberated from the chalk, it will at once be extinguished. This gas—this carbonic acid gas—which you now see generated from chalk, is the same that is produced by the fermentation and decomposition of all your manures. I will explain to you how it is that this gas gets to the bottom of wells and vats: it is simply from this reason—that it is heavier than the atmospheric air. Now, I will make a little more of it: I have now a sufficient quantity to extinguish this candle. This gas being nearly twice as heavy as the air, I can pour it out of one vessel into another with the greatest ease. I have now poured some gas into this vessel, and you see by pouring it out upon the flame of the candle I have extinguished it. (Experiment performed).

You cannot see the gas itself; you cannot behold it; but it, nevertheless, exists, and you can see its effects. I will now show you a property which this substance has of giving to lime water a white colour. You perceive that as soon as I pour a little lime-water into the vessel containing the carbonic acid, there is a curdy precipitate; and this precipitate is exactly the same substance as that from which I originally prepared the carbonic acid, viz., carbonate of lime, or chalk. From the lungs of man, and other animals, the same gas is given out as that which was evolved by putting the acid upon the chalk. The very gas which the vegetables require for their growth is given out from the lungs of animals, as you will see by a very simple experiment. I will take this glass vessel of lime-water, and, with a tube, breathe the respired air of my lungs into it; you see that there is the same white precipitate as there was in the other experiment—a conclu-

sive proof that the gasses are identical *(applause.)* The same white precipitate may be obtained from the gas produced by burning paper. This is the very substance which the plants require, and the air is the great receptacle from which they derive it. Now, nine-tenths, or I might say nineteen-twentieths of the substances of your crops are derived from the atmosphere. The charcoal they derive from carbonic acid gas; the nitrogen from ammonia; the hydrogen from water.

The mineral ingredients contained in the soil are several: you see them on this diagram:—

Constituents of Soils.

Potash,	Alumina,
Soda,	Chlorine,
Lime,	Fluorine,
Magnesia,	Silica,
Iron,	Phosphoric acid,
Manganese,	Sulphuric acid.

Of these bodies *Fluorine*, *Manganese*, and *Alumina* are found in plants in only minute quantities; and it has yet to be determined whether their presence is essential or accidental. *Silica*, or soluble sand, is found in most plants, and *Phosphoric acid* (the base of bones), united with *Lime*, *Magnesia*, *Potash*, or *Soda*, is found in the seeds of all plants yet examined. *Soda* is found in the ashes of all sea-plants; and *Potash* can be produced from the ashes of most land plants. *Magnesia* is the base of Epsom salts. *Lime* everybody knows. *Iron* is also well-known; it is found in plants and the soil generally in the state of the red oxide, or rust of iron. *Sulphuric acid* is made of sulphur and oxygen, and is well-known under the name of oil of vitriol. *Chlorine*, united with hydrogen, constitutes muriatic acid, or spirit of salt. Common salt contains *Chlorine* and *Soda*. Every plant will, if possible, take something from the soil, to enable it to take something from the air. But if the roots cannot take that which is necessary out of the soil, the leaves are not in a condition to take that which is required out of the air, and accordingly the growth of the plant does not go on in a satisfactory manner. Your object is not merely to get returned to you ear for ear, the corn which the land has previously grown —you want to produce a hundredfold by the application of every scientific improvement, and every new and scientific suggestion. One of the most important of the mineral ingredients is phosphoric acid (contained in bone-dust); and I will speak of this first as being of primary importance: all animals require it to form the base of their bones; and they must derive it from the vegetables upon which they live. If you attempted to feed them upon vegetables which did not contain any phosphoric acid, they would not grow at all. If the Almighty had intended them to live without bones, they might have grown upon food not containing phosphoric acid; but as that is not the case, they must have it. You have it in many soils; but owing to the practice of mankind, which prevails, of burying bodies in places of interment separate from the land, and owing to the bones of cows, horses, and sheep never having been put back into the ground, it happens that bone-dust is generally contained in the ground in much smaller quantities than is desirable or necessary to give many plants this acid in sufficient quantity. For thousands of years the bones of animals have never been put back again into the land, and consequently there it a deficiency of this substance unless supplied by artificial means. When, however, a farm has got up to its proper pitch of cultivation in this respect, it requires very little to keep it so. Another of these important substances is potash; it is required in large quantities by most plants, and especially by turnips. It is this potash which enables the leaves to absorb the carbon or charcoal; and without a sufficient quantity of it, you will never get the carbon absorbed. Then lime and magnesia are both requisite, as both are found in the bones of animals. Iron, also, is found in the bodies of animals: you could not live without iron. By its action with the oxygen certain vital forces of the body are liberated; it is the oxide and peroxide of iron which are the principal agents in the circulation of oxygen in the system. Alumina, or clay, is found in almost all good soils; but, singular to relate, it is only found in the most minute quantities in plants. I have in one or two instances discovered a small quantity, but so very minute as to leave it doubtful whether it did not proceed from some of the impurities of the soil which had adhered to the plants when pulling them up. It has a great attraction for ammonia, and if made red hot the ammonia will immediately be smelt. I will next touch upon silicic acid, or soluble sand, as a substance of very great importance to you. Now, glass is only a composition of silica and soda or potash. The stalk of wheat, you have no doubt observed, has a glassy appearance; in point of fact, it has a perfect coating of glass over it, which is produced simply by the union of silica with potash or soda. The object of this coating is doubtless to protect the plant against the attacks of insects, and to strengthen the stem. There are two sorts of silica; one that is soluble, the other that is insoluble. It is with respect to these two kinds, something like the substance resembling coal which was found in a certain part of America. The persons who discovered it said, It looks like coal, it smells like coal, it tastes like coal—it must be coal. But the only difference they could discover between it and coal was, that the one would burn and the other would not *(laughter)*; and the only difference between these two kinds of silica is, that one is soluble and the other is not. But silica is not generally soluble unless previously combined with potash or soda. Granite rocks contain it in large quantities; and in these rocks you will see pieces of white substance, in six-sided crystals—this is feldspar. The granite rocks are the oldest rocks we have, and they contain about 17 per cent. of feldspar, and 60 or 70 of silica. The carbonic acid in the air has a great attraction for silica, and readily unites with it. All our river waters contain soluble silica; all your soils contain some silica and potash which is not quite decomposed. It is the soluble silica that becomes available for plants; and the more rain you have, the more of it becomes soluble. The straw of your wheat not only requires a great deal of potash and silica, but also a great deal of bone-dust. In a wet or damp spring you will have a large produce of straw, and a small produce of wheat; in a fine season, on the contrary you will have a small produce of straw, and a large produce of wheat (*Hear, hear*). Now, how does this arise? Why, probably in this way. Owing to the large quantity of rain falling, there is a larger quantity of silica, disintegrated and taken up, as well, as an increased quantity of bonecust You get a double quantity of straw, and you get a double quantity of phosphoric acid taken up, as well as an increased quantity of the bonedust. You get a double quantity of phosphoric acid taken up; and when the time comes for forming the ear, there is no bonedust left for the purpose. Now this is the reason why in a wet spring there is always a large supply of straw, and often a small supply of grain. This however, can be remedied by putting a larger quantity of bonedust into the land I now wish to refer you to your own farm-yards. I

shall address you in plain and familiar terms. I do not want to play the orator, but rather to take the part of the teacher, if I can succeed in so doing (*cheers*), I wish first to speak to you about ploughing.

There are all kinds of ploughing, the use of fallows and *the use of draining*. Now *these operations are* intimately connected together. In the first place, what does the plough do? I will show you. Every year the atmosphere must make soluble a number of the chemical substances to which I have alluded (I need not go over their names again), to be taken up by your plants; otherwise those plants will not grow, The atmosphere is always acting on the land. Now suppose it is acting on an acre of land, and you take the plough, and throw up the soil to a depth of six, eight, or ten inches. After you have done this, only perceive to what an extent of surface it then operates, compared with what it did before the acre had been ploughed and when the upper surface only could be acted upon By thus opening up the land, you let in the atmosphere; the soil is disintegrated, so as to set free the largest quantity of those necessary substances for the succeeding crop. I can imagine gentlemen saying, "If I were to stir that land to the depth of eight inches, I should never get any thing to grow." But could you not subsoil it first? (*Hear*). Messrs, Drewit, of Guildford, have actually ploughed into chalk, and made a soil for themselves, But they manure well, gentlemen (*Hear*). Ploughing is comparatively of very little use unless deep: it is perfectly absurd to see them in Norfolk ploughing to the depth only of two inches and a half, I think they are wrong, because they prevent the action of the atmosphere upon the substances of which I have been speaking. Now what do fallows do? Why the very same thing, they leave the land exposed to the action of the air, but by ploughing deeply you accomplish the same end. (A member observed "Fallows are pretty well out of fashion now") so that fallows are nothing more than a*ssistance to the plough. It is, however unnecessary*; you can always do without it, except in cases where there are great quantities of weeds to be eradicated and these should never have been allowed by a good farmer to get ahead. A spring fallow for turnips is quite sufficient; but a fallow in the early part of the spring is all that ought ever to be attempted. For it is much better to have green crops and plough them in, than to have any fallow at all. Well, then comes the draining. Draining acts in two ways: one way in assisting the operation of opening up the land to the action of the atmospheric air, and the other in taking away the redundant water from the roots of plants. The water either arises from springs in the land, or it falls from the heavens. That which arises from springs is generally best got rid of by boring; and that which falls upon the surface, you do not want to take off the cream of the joke, or, what is the same thing, the cream of the land. You want it to percolate; so that all the substances alluded to may let very little else than pure water go away. There has been a good deal of talk about the respective merits of deep and shallow draining. My opinion is, that deep draining is much the best. The marrow of the landlies between the drain and the surface: the marrow of these useful substances will with deep draining be retained, and the water will run away slowly. Draining acts also in another way. After you have made a drain, you will soon observe a great number of fissures in the land, this will be the case even in the stiffest clay. These fissures rise up to the very surface, and allowing the air to get in, the same effect is produced as by ploughing. This is constantly at work; as the water goes down the fissures are left open. Thus there is a constant action of air and water—air and water which are of the greatest benefit to the plants of the soil, in liberating those useful mineral substances (*Hear, hear*). Now the drains prevent an excess of water, which is a great object to be accomplished; for the *moment the plants have had enough*, that which remains and was useful at first, now begins to act as a poison. Draining is also highly beneficial in carrying the water of the surface of the land: if it lies upon the surface of the land it has the effect of cooling it; and you all know that you want heat. You well know the difference between what is called cold land, and a warm genial soil (*Hear*); and this difference plainly depends upon the presence or absence of an excess of water. If you have your land covered or saturated with water the sun is employed only in evaporating that water instead of heating the land.

The next point to which I propose to call your attention is the process of making mixens, and manures in general. Now these manures must consist of oxygen, nitrogen, hydrogen, and carbon, with the mineral ingredients before mentioned. Your manures are made up of vegetable matter, straw, and animal excrement. Some people think—I have met with many people who think that the lands derive great advantage from sheep being put upon them; they imagine, if they put a flock of sheep upon twenty tons of swedes, that these sheep have some unaccountable way of benefiting the land. Why, they cannot put anything upon the land which they do not derive from the turnips. They have no power of making manure themselves; hey will in fact take something from the land. Twenty tons of turnips rotted in the land, would give more manure than the sheep will give by eating the same amount of turnips upon the land I do not say that it is better to rot your turnips than to feed your sheep upon them, but I am stating a matter of fact in relation to the comparative amount of manure to be derived; and I repeat, that the whole of the manure *which they can put upon the land, they derive from* the turnips. When you use hay, or linseed, or oil cake in addition to the turnips, you are adding manure to the land, for the major portion goes upon it. These sheep, then, derive the whole of their manuring power from the food which they consume; bullocks do the same. Where do vegetables derive their sustenance? —From the mineral substances in the land; from the air, and the principles of those from the air, are carbon and nitrogen. The carbon is there in sufficient quantities, but the nitrogen it is well to supply in the form of ammonia. Your mixens consist of fodder for the cattle, their excrement, &c., all put together in a heap in your farm-yards. These yards are generally made with a gentle slope down to the horsepond; then the outhouses and sheds are constructed with the greatest ingenuity, so that all the urine may run away from the mixens; taking care that the whole shall be washed by the drippings from the outhouses, and that all the washings shall be drained off into the horsepond ("*Hear.' and laughter*). Why, I believe,—I know it has actually been conjectured by some people, that this mixture, this part of the manure, which would have been invaluable to the vegetable when preserved, was beneficial to the animals that drank out of the ponds. Now allow me to say, that I believe that one half of the consumptions in cattle arise from their drinking this abominable mixture: diseases of the lungs must be generated by drinking such a compound Putting this matter however, out of the question, this urine and this soluble matter which are thus washed away are the most valuable portions of the manure, By allowing these to run off, you take from your manure the potash, the soda, the chief part of the phos-

phoric acid, as well as the greater portion of the soluble silicia, and all the ammonia, (which is quite soluble), and all the nitrogen compounds which decompose into ammonia. In short, at the most moderate computation, one-third of the manure is washed away and utterly lost (*Hear, hear*). The farmer in many cases, loses as much as half his rent by allowing the rain to wash away, that which is the most useful part of the manure. These soluble portions of manure are most easily taken away, and therefore they ought to be taken most care of; yet, acording to the general practice, they are allowed to run away, as if they they were of no value. I wish to say, not only to the farmer, but to the landlord also, that the constructions of farm-buildings is a matter of the greatest importance to both. For those very substances which you allow, to be washed away, you have to supply either by the purchase of guano, oilcake, London dung, or some other substance. Mr. Warnes, of Trimmingham in Norfolk, has adopted an excellent plan for preserving his manures; he has sheds, constructed in the yards, open on one side only, in which the cattle stand with their heads turned towards the rack or manger, and their tails towards the open yard; each beast stands in a sort of box (without being tethered), sunk about one foot deep into the ground; the bottom is covered with straw; and as the boxes get full, the manure is carried away and nothing is lost; all the liquid portions of the manure, gets absorbed in the more solid parts, and the cattle are kept admirably clean. I went into these sheds myself, examined the cattle, and found that their hoofs were perfectly clean; in fact I do not think there is a better practical plan adopted than that of this gentleman. He sometime since published many letters on "Box feeding," and he has just published a work, "On the cultivation of Flax," which I can highly recommend. (A gentleman here asked Mr. Nesbit, whether he did not think flax growing injurious to the land). Mr. Nesbit replied: I do not think it is; and I know that is Professor Kane's opinion also. By Mr. Warnes' method, all you want is a box for each beast, two feet deep, with a composed bottom, and you then lose nothing. Nothing goes away, because there is nothing to wash it away. The straw absorbs all the liquid, for straw, bear in mind, will absorb its own weight of fluid Having now come to the end of my remarks, I beg to say that I shall be happy to hear gentlemen present, put as many questions as they please; and it will afford me great pleasure to answer them (*cheers*). I always think myself, that the little discussions which follow the lecture are the best part of the business; because matters are suggested by different minds which might never occur to the lecturer on a subject embracing so wide a field (*Hear, hear*). Before I sit down, however, I will say a word or two upon Guano. The value of Guano depends principally upon the presence of bonedust and ammonia; as to potash, it never contains more than from 2½ to 4 per cent. of that; this guano is the excrement of sea fowls, which feed upon fish. You know of how much importance sprats and other fish are in the manuring of land, simply because they supply bone dust and ammonia; and in this respect Guano is a very important manure. But I want the farmer to save manure for himself. It is of no use to go and spend two hundred a year, on guano, and then let the best part of your manure run out of the yard. I do not think there are a hundred farms that would not be benefited by the application of new manure. This sample of the best Peruvian Guano which is now before me contains 20 per cent of ammonia, and 20 per cent of bone dust; this other sample of Ichaboe guano, about 12 per cent. of ammonia, and more bone-dust. In purchasing guano you are very likely to be taken in, unless you are very cautious. I have known some of the dealers to adulterate it to the extent of 34 per cent. When you want to buy do not go to the dealers at all. Unless satisfied of their probity, but go directly to a respectable importer, and then you will not be cheated. There is another thing that I will advise, and that is never to apply guano by itself. I told you that guano contains only from 2½ to 4 per cent. of potash; now the ashes of peas contain 35 per cent., beans 21 per cent and wheat 24 per cent. of this substance. Consequently if you use guano constantly and by itself, you would impoverish the land; therefore, always put with it either salt-petre, or mitrate of soda, wood ashes, or other bodies of the same composition. Make it a rule always to mix your manures. The mere fact of mixing them is one of the greatest points next to being chemist enough to know the exact and proper quantities. Put farm-yard dung with it one year, lime another, and nitrate of soda another; changing each year, so as gradually to work the whole of the farm into the same state. It is very desirable to equalise the state of your farm all round; there are very few who have their farms of equal quality throughout. But the best way to attain this is to make frequent changes of your manures. Another very good manure is common salt; it is exceedingly valuable in many cases, especially where the land is sheltered from the sea. I know a gentleman residing near Guildford who has applied as much as 4 cwts. per acre of salt to his land, and says it is the cheapest manure he ever uses; it makes the straw beautiful yellow; now nature disseminates salt to a great extent; and you ought to help nature in circumstances when there may be any thing to impede this operation. I have known all the windows and trees in a town to be covered over with a thick incrustation of salt after a storm, when the wind was blowing in from the sea; and in some cases salt will travel in the atmosphere as much as one hundred and fifty miles from the ocean before it is deposited. In conclusion, gentlemen, I beg to say that I feel I have placed this important subject very imperfectly before you (*No no*). If however, I shall have scattered a new thought here and there, and conveyed any information which may be turned to account, I shall feel the greatest satisfaction in having met you here this evening (*cheers*)

J. A. Gordon, Esq: I think, gentlemen, you will all agree with me when I say that we have heard Mr. Nesbit's admirable lecture with great pleasure, and that we have also derived from it a considerable amount of instruction, (*cheers*). I therefore beg to propose that the thanks of this meeting be accorded to that gentleman, (*renewed cheers*).

William Jennl Esq: I have very great pleasure in seconding that motion.

The thanks of the Association were immediately carried by acclamation.

Mr. Nesbit: Gentlemen, I beg to return you my best thanks for the warm and handsome manner in which you have expressed your approbation of my imperfect efforts. I can only say that I am quite at your command, and I trust I shall have a perfect shower of questions (*cheers*).

Mr. Pope: When I have applied Guano, I have generally also applied nitrate of soda or potash about three weeks afterwards.

Mr. Nesbit: that is a very good plan. With regard to arresting the loss of ammonia from your mixens, I will suggest, that if you *will not* follow the plan which I have described to you, adopted by Mr. Warnes, of Trimmingham, that you should make them in this

way: If you *will* have them in the open air, lay down a bed of ditch-stuff, upon that put about a foot and a half of the dung, &c., which comes from the cattle, and upon that scatter some gypsum; then place another layer of dung, and add more gypsum; then place another layer of dung, and add more gypsum, and so on to the end. Observe not to have it laid too light, for if you do, it will heat, and may take fire. You must not make it too light or too heavy, but just light enough to keep it warm; if it gets too warm, press it well down. You should also have shoots or gutters in your farm-yards to carry off the water. Where this is done I don't care so much about the rain of heaven, because the straw absorbs so much. In this district there are not more than 24 inches of rain in a year. In the north part of Lancashire and at Keswick, there are as many as 57 inches.

Mr. Pope: Manchester is very bad.

Mr. Nesbit: Manchester and London are pretty nearly on a par. In London there are 28 inches and at Manchester about 30.

A Member: how often is it found necessary to clean out the cattle boxes of which you were speaking?

Mr. Nesbit: about once in six weeks. You would be surprised at the condition of the animals when that plan is adopted so different from those which are running about the farm-yard. In fact there is no comparison between them. They were fed upon turnips and linseed, mixed with pea-haulm, &c.

Mr. Pope: Mr. Warnes asserts that he can produce as much meat with six pounds of this mixture on his plan as he could with twelve pounds of oil cake on the ordinary plan.

Mr. Nesbit: If you were to expend as much money as the Duke of Devonshire has upon his conservatory at Chatsworth, I do not think you could much improve on Mr. Warnes' plan of sheds. Perhaps the cattle might be kept a little warmer by having the sheds closed in. If this were done in a manner consistent with ventilation, it would be an improvement, as at present the wind rolls in and cools them; and it would be better to have them kept in an atmosphere of a nice genial temperature. The great defect of Lord Torrington's plan is, that the ventilation is bad; and no system will answer where the ventilation is bad. It is highly important that cattle should be kept in well ventilated buildings. Why, a bullock consumes 79 ounces of charcoal, and destroys 13 hundred cubic feet of air, in a day.

Mr. Pope: I rather think it is better to have one side of the sheds open.

Mr. Nesbit: why you must recollect that if you do not keep the animal warm by artificial means, he will consume a certain part of his food, to keep himself warm, instead of for the purpose of making fat; and it is much better to warm him with a pound of coals, than with a pound of fat, (*hear, hear*).

Mr. Dawe: you were speaking, Mr. Nesbit, of sulphate of lime or gypsum. Now, there is a general impression that where there is a deficiency of that you cannot grow clover, but I have not found that to be the case.

Mr. Nesbit: Wherever you have *hard* water, gypsum is of no use at all—this you may take as a general rule; but where you have not lime in the soil it is of great use.

Mr. Dawe: I think too much importance attaches to the use of gypsum.

Mr. Nesbit: This is a question of some importance. You will recollect that I stated that sulphate of lime acted beneficially by preventing the volatility of ammonia; but it acts directly in supplying one of the mineral constituents of the crops.

Mr. Dawe: I have found the ashes of burnt wheat very productive. I had a rick of wheat accidentally burnt, and I used the ashes for manure; the consequence was as good a crop as I could have had from guano, (*Hear*).

Mr. Nesbit: Exactly so. Now does not that prove just what I have been saying with regard to manures? viz., the value of the mineral ingredients.

Mr. Dawe: You certainly could not have a better proof of what you have stated.

Mr. Nesbit: By the application to the land of the substances required by the plant, you make it productive. But if you use manure not containing the whole of these substances, you will impoverish the soil. In the burnt wheat you had all you wanted.

A Member asked if there was not sulphuric acid in the ashes of wheat.

Mr. Nesbit: Yes, a small quantity—from 2½ to 4 per cent.

Mr. Griffin: I very much agree with you in what you have said respecting the growth of straw. I have always found that in wet seasons I had a large quantity of straw, and a deficiency of yield in the ear.

Mr. Nesbit: You will always find that to be the case. Wheat only contains 2 per cent. of silica, and the ashes of the straw contain 60 to 70 per cent., and in wet weather this is conveyed very freely from the soil to the plant. Of phosphoric acid the ashes of the wheat contain 45 per cent., and those of the straw only 10 per cent. But the straw weighs a great deal more than the ear. The principal things for the growth of straw are silica and potash. They are derived from the land in great abundance in a wet spring; and the straw growing up rapidly, takes the phosphoric acid which would otherwise have gone into the grain. This happens from the straw being "first in the field;" and when the wheat comes to demand its share, where is it to be got? (*Hear*). When there is this deficiency in the ear, you will often observe that the leaves turn yellow.

Mr. Griffin: I have found that to be the case when I have used saltpetre.

Mr. Nesbit: precisely so. If you use saltpetre you should use guano or a similar manure.

Mr. Griffin: I do not myself think guano a very genial thing.

Mr. Nesbit: Where do you get your guano, pray? Now I am an apostle of agricultural chemistry, and think nothing any trouble which relates thereto. If, when you are about to purchase guano, you will send me a specimen of it, I will analyze it, and let you know its precise qualities without any expense (*cheers*).

Mr. Pope: With regard to deep ploughing, may it not be bad economy in a wet season?

Mr. Nesbit: That is a question, Sir, which I should not like at present to take upon me to decide. Mr. Warrington, of Apothecaries' Hall, took a bitter extract, and filtered it through some animal charcoal or ivory black; and when this solution came through, it had some of the bitter taste left. He then took some sulphate of quinine, and performed the same experiment. The liquid passed out perfectly pure in this instance, as in the former: in fact, the charcoal had retained all the original qualities. He then tried Glauber's salts and Epsom salts, and the result was the same. I therefore think that perhaps the capillary attraction of the earth will retain most of the essential qualities. For instance if you send water through the land with 20 per cent of salt in it, it may not contain 10 per cent. when it comes out.

Mr. GORDON: What do you think of land producing wheat 18 times without a fallow? What composition of soil would that be?

Mr. NESBIT: I cannot tell without seeing it, or knowing something of its situation.

Mr. GORDON. It is in the parish of Mere.

Mr. NESBIT: "Mere"—that looks like water.

Mr. GORDON: Oh, I will admit it is an alluvial soil.

Mr. NESBIT: There you come to the point at once. (*Hear, and a laugh*). A friend of mine tells me that in the marshes of Erith and Dartford, whenever they put any manure on the land, they always diminish the crops. The fact is, the lands are, in both cases, supplied with both mineral and organic substances from the neighbouring rivers.

Mr. POPE: There are farms in Essex of the same character.

Mr. NESBIT: Yes, that is just on the other side of the river. There is no more productive land in the kingdom, perhaps, than that of the Plumstead, Erith and Dartford marshes.

Mr. POPE: What do you think, Mr. Nesbit, of the sewage company?

Mr. NESBIT Why, Sir, I would not take shares in it (*laughter*).

Mr. GORDON: Mr. Smith, of Deanston, told me that they were about to bring down the sewage from Aberdeen upon a large tract of sand near that city, and convert it into a soil. Do you think that practicable?

Mr. NESBIT: Oh, yes, it is practicable enough; but the question is, will it pay? (*hear*).

After some further conversation, Mr. Nesbit announced to the meeting that his lectures would from time to time appear in the *Mark Lane Express*; and the members of the association then separated, expressing their warm satisfaction with the instructive addresses which that gentleman had delivered.

CHEMICAL AGRICULTURE.

Of all the subjects which, at the present period, occupy the attention of the scientific world, there is none perhaps so practically important to mankind as that department of chemical knowledge which has for its object the improvement of the productive qualities of the soil, and the increase of the amount of the edible produce of the land. Surely a greater patriot and philanthropist there cannot be than that man who, after years of toil and dangerous experiment, brings all his literary powers to bear on a question so vitally important; and he who is able by his scientific researches to make one acre of land produce one quarter of wheat more than had been gained before, ought rather to be lauded for his merit, than despised as an underminer of old established customs. Let us make a direct appeal to the justice and common sense which every agriculturist of England must possess, whether custom can always be relied on; if so, why do they so assiduously read those publications which profess to describe the greatest improvements of the day? why do they so eagerly snatch at suggestions for the amendment of the implements of tillage? The answer is uniformly the same—"We may improve the works which we have made, but we must not interfere with the operations of nature." If a man is sick, does he not send for the physician, or does he passively yield up the dictates of his mind and give way under the adverse results of natural causes? this is not the case. Every faculty is strained, and every energy exerted to renovate the system, to supply the deficiences of nature, and to restore the body, which is the garden of the mind, to its pristine vigour and beauty. This is the case with the diseased soil. Sow wheat on the same land for many consecutive years, and every farmer knows the result. The land at first yields plenteously; but gradually the crop falls off;—the soil actually becomes sick, and incapacitated to furnish the ingredients necessary to the nutrition of the wheat. The farmer perceiving this, abandons the idea of sowing more wheat, so removes his seed to fresh land, where he may get an adequate return for his labour and his pecuniary outlay.

Were the farmer as well acquainted with the abnormal changes which take place in the economy of soil, as he is with the general routine of husbandry, how much labour and how much money would be saved for the comforts of his household, which are now expended in support of his ignorance or his indolence! For in the present state of our knowledge we know for instance, that wheat will not grow for consecutive years in the same soil, because the stimulus to solution of those portions or ingredients of the soil which are absolutely necessary to its growth, is deficient, or because there is a real paucity of such substances. In either case, or in both combined, Chemistry comes directly to our aid We apply manure, and thus supply at random the necessaries to the crop. We use electricity, and administer, in uncertainty, stimulus to the growth of the wheat. Now it is the part of agricultural and organic chemistry to substitute definite design in manuring for random fertilizing, and to replace certain stimulus by effectual promotion of growth. We propose now to consider briefly the different properties of the chemical manures now in use, as evincing the superiority over common farmyard dung, to which the agriculturists of England appear inseparably united by the bonds of custom and long-established experience.

Of all the varieties of guano imported into this country, there is none perhaps superior, reasoning from analogy, than that lately brought from the Patagonian coast. Its riches in ammonia presents the highest claims o the agriculturist's attention. I am informed by Mr. J. W. Hopkins, agricultural chemist, of Manchester, who has devoted great time and labour to the study of the fertilizing properties of substances in general, that the ammonia is in large masses, and especially adapted for the promotion of vegetable growth on account of its great solubidity, Guano is well adapted for the growth of certain plants but must not be considered as a universal fertilizer, for though it abounds in animal matters and ammonia it nevertheless is deficient in the principal salts, which are equally necessary for the production of a flourishing crop. Guano is not adapted for potatoes, turnips, mangel-wurzel, &c. No manure can be perfect, unless it contain every ingredient that plants may require; nor is it absolutely necessary that such ingredients be mixed in the exact proportion in which they are found on analyses of such plants, for plants are endowed with a peculiar vegetable instinct, which enables them, by the spongioles of their radicles, and by means of an intricate process of endosmose, and exosmose, to absorb into their system such principles as may contribute to their growth, and to excrete and reject those which would have a contrary tendency.—Numerous attempts have been made so to combine vegetable essentials, if I may be allowed the term, as to form a chemical composition adapted to the adequate supply of the deficiencies of soils, but in the majority of cases such attempts have proved failures; for, in the first place, they have been palmed upon the agricultural world at such low prices that no chemical ingredient of any value could possibly have entered in any quantity into the composition; and in the second place, the principal ingredient has been of such an evanescent

character, that on a trifling exposure to the influence of the atmosphere, they have been altogether deprived of any fertilizing power which they might possess. I believe the Pinguedo to be a compost the *most exempt* from what has just been stated, for I have seen its virtues tried, and know by analysks, that its intrinsic value nearly equals its price. I know that it contains, a large per centage of fixed ammonia, which I disengaged by adding quick lime, and then pouring water on the mixture. It contains also a good dose of carbonic anid, which I have set free by adding a few drops of sulphuric acid. It contains salts of potash, soda and magnesia, phosphates of potash and soda, and several other ingredients indispensable to the growth of plants of all descriptions. To return to the object of this paper, I would urge all those who call themselves agriculturists to penetrate by observation and research into the mysteries of nature, not with the idea of diving into obscurities or metaphysical questions, but in order to obtain clear views in tracing natural results to natural causes: for we are assured that agriculture, conducted on scientific principles, will not only be more sure in its results, but more economical in its details. That farmer who knows and properly understands the nature of chemistry, to the improvement of the soil, will gain credit as a man of science, and save money by the purchase of such articles as can be turned to the best use. Thus the unscientific farmer now might mix lime and guano, (which I know now to be done) whereas the chemical agriculturist well knows that he would lose, in the ammonia set free, what he hod hoped to gain. I have little doubt that from the rapid strides by which chemical knowledge is gaining upon the darkness of old established custom—I have little doubt, I would repeat—that at no very long period from the present, England will see the sons of her soil sowing and reaping under the guidance of those immutable laws which have ever been found to preside over all natural operations.—*G. M. Burton, Manchester.*

The Canadian Agricultural Journal.

MONTREAL, AUGUST 1, 1846.

A highly respected correspondent has made some enquiries that is not very easy to reply to with any degree of accuracy, there is so wide a range between the lowest and highest returns of wheat obtained from land. We shall, however, endeavour to give the most correct reply we have in our power to make. 1st, What can be called an average crop of wheat per acre in Lower Canada, Upper Canada, and the Western States.

A fair average crop in Lower Canada, when the wheat is not injured by the fly may be from 20 to 25 bushels per acre, always provided the and is cultivated properly, and in good condition when sown. We have raised thirty minots per acre but on only one occasion. We know parties who have raised much more, but the averages we have first stated, may be readily obtained by good management, or merely cultivating and draining, in the way that wheat should always be cultivated. In Upper Canada, we know that much larger crops may be obtained on land that is summer fallowed, and sown in the fall, but from all we can learn of the scarcity, and high price of labour, and other circumstances we do not believe that the general average of Upper Canada is much larger than may be obtained in Lower Canada, from the greater liability of fall wheat to rust. No doubt that in Upper Canada, very large crops are often raised under favourable circumstances; larger we believe than can be obtained under any circumstances in Lower Canada, but the general average we are convinced is not over twenty bushels per acre, and perhaps less. The same reply we may give with regard to the Western States; large crops are often raised under fortunate circumstances, but the high price of labour will not admit of cultivating so as to make the land produce all the crop it is capable of—the practise is, to take up new land, and cultivate it, at the least possible expense of labour with oxen raised upon the farm, whose keep cost very little owing to the favourable climate Hence it is that large quantities of wheat can be raised in the Western States, not by large averages per acre, but by the cultivation of millions of acres.

2nd. What is the probable amount of wheat crop in Lower Canada, from 1832 to 46, and the same in Upper-Canada? From the year 1834 we have had the fly in parts of Lower Canada, and from 1835 their ravages have been general throughout that country. The consequence was, that with the exception of the two first years, and the two last years, very little wheat was produced in Lower Canada, nothing near the quantity required for its inhabitants,. We have often calculated the probable loss sustained by the ravages of the fly in Lower Canada, during that period, and are fully persuaded, it could not be less than six millions of pounds, currency. In 1834, the produce of wheat, in Lower Canada was supposed to be from three to four million bushels, but since that period up to 1844, we not believe it has not been near half the quantity. We believe, the produce might be brought to eight, or ten million bushels, very readily by careful cultivation, and a suitable variety of seed.

3rd. What will be the cost price of one bushel of wheat to the farmer in Lower Canada, what in Upper Canada, and what in the Western States? Estimating the value of capital employed in the land, the labour, and seed, in Lower Canada, it will cost at least four shillings currency per bushel,

and in Upper Canada, a shilling less, perhaps, from what we can learn, of their mode of cultivation, harvesting and returns—more certain climate, and favorable period of the season for harvesting the crops, being much more early than in Lower Canada. In the Western States we cannot say much of the exact cost of producing wheat per bushel, but believe they do produce it at much less actual expense than in either Canada. The reports of their mode of cultivation and harvesting, and requiring no fences, dry climate, &c., must lessen the expenses of production most materially, and particularly as no expense is incurred in maintaining the fertility of the soil.

4th. What is the minimum price at which a bushel of fine wheat can be sold to afford profit to a farmer in Lower Canada, Upper Canada, and the Western States ?

The replies we have made to the three first queries will give as correct an idea of what this price should be as we can offer in a separate reply. We have always considered that five shillings, or one dollar, was a fair price for the farmer in Lower Canada to obtain for a minot of wheat, which contains one gallon over the English Imperial bushel. The price should not be less to pay the farmer a reasonable profit for his capital, seed and labor. The price should be in the same proportion in Upper Canada, as it would take the difference to transport the produce here. The measure, however, is less in Upper Canada, and this would make a difference. Perhaps we might say that half-a-dollar would pay the United States farmer of the Far West as well as these prices would pay the Canadian farmer. There is no calculating how much these prices may be reduced by the change in the English Corn Laws.

Agricultural Report for July.

Since our last report, the weather has been excessively hot with occasional showers of rain, which has preserved vegetation from injury by the heat, but has made it rather unfavourable for hay making in the neighbourhood of Montreal, where the crops are generally heavy, and required good weather, to cut, and save them. We believe that in consequence, a considerable portion of hay will be discoloured in saving. The late sown spring wheat looks exceedingly well and promising, and we believe is free from all injury by the fly, at least, all that part sown subsequent to the 18th May, but all wheat sown previous to that time is more or less injured by the fly. We have seen some ears of wheat altogether destroyed. We warned farmers of the danger of sowing early, as we know that the fly is still in the country sufficiently numerous to do much mischief to any wheat that comes into ear about the end of June. Some years the danger may not be so great as in other years, because should there be windy weather about the time of the ear appearing, the fly cannot do much injury, as they do not attempt to deposit their eggs if there is the slightest wind to agitate the ears, but remain sheltered about the roots of the crop, unless the weather is perfectly calm. We always were advocates for early sowing, until the fly appeared in the country, but the risk is now too great to incur by sowing early, and particularly when good crops of wheat can be raised by sowing from the 19th May, to the end of that month, and will be safe both from fly and from rust. Barley and oats may be sown early, and the latter in particular the moment the land is in a fit state to receive the seed, and be harrowed. We have grown the best crops of oats we ever had here, that was sown before the middle of April. Of course the soil being dry. Barley is very much beaten down, and will be difficult to cut, and harvest, and will be wasteful and expensive. Thare are many drawbacks to the farmer, and his crops are subject to many casualties before they are secured, and the expenses often doubled without any fault of his, and the worst of his case is, that he never can sell his produce in due proportion to the expense of it, and he would be only laughed at were he to tell the purchaser of his produce that it cost him so much, and that he required to sell them at a price that would pay him; every other class adopt this rule, and their profits and income consists in what they obtain for their commodities over the cost price of them; but it is not so with the farmer, and when crops cost the most to harvest them, they generally sell for the least price, The crops of every description, with the exception of early sown wheat that is damaged by the fly, never looked better, and if the season is favourable, and not too wet, for bringing them to perfect maturity, and for harvesting, we shall have an average crop of hay and grain, potatoes look well up to this time, but it is impossible to conjecture what may be the ultimate fate of the crop, as the disease did not appear the two last years until the latter end of the month of August. The quantity of potatoes planted

this year is much less than usual, and we are glad of it, until the disease to which they are subject is known to have left us. While the farmer substitutes other crops for potatoes, the loss is not so great, but when a crop of potatoes is lost by disease, it is a great injury to the farmer, as they are expensive to cultivate. We should be sorry to lose the potatoes altogether, but certainly we do not think it a matter of regret that potatoes should not in future be made so much use of, as the food of man, as they have been for the last fifty years. A careful selection of seed, and a particular mode of cultivation may enable farmers to grow potatoes to a limited extent, but until we are sure the disease is at an end, it will be the better way not to plant many. The pastures are better this year, at this period, than we have seen them for many years, and the produce of the dairy should be abundant in proportion. Cattle should also be in good condition and we ought to be able to supply the market with a sufficient quantity of beef, and mutton. The improvement in mutton for the last few years is very great, so much so, that the Montreal market is as well supplied with good mutton as may be desired. It may not be so large and very fat as mutton in the markets of the British Isles, but we believe it is so much better, and more like that quality of mutton that is most esteemed at home, the South Dow. Notwithstanding the large immigration to Canada this year, labourers are more difficult to procure, except at high wages, than other years. All the success of the farmer's labour and expenditure, will depend upon a good, dry, harvest. It is a most dangerous season of the year for the weather to change, to wet about the 25th July, but though such has been the case this month, we hope nevertheless, that we shall have fine weather to save the crops. When the weather changes decidedly at particular periods of the year, it is frequently found that the change continues for some time; and the latter end of July is one of these periods.

Cote St. Paul, 31st July, 1846.

Grass Under Trees.—By sowing nitrate of soda in small quantities, in showery weather, under trees, a most beautiful verdure will be obtained. I have used it under the beech-trees in my grounds, and the grass always looks green. Having succeeded so well on a small scale, I have now sown nitrate of soda amongst the long grass in the plantations, which the cattle never could eat. I now find that the herbage is preferred to the other parts of the field, which have been marled and are a very good pasture.—*Correspondent of Gardeners' Chronicle.*

ARTIFICIAL PREPARATIONS FROM THE POTATO.

There is no other of our agricultural plants which have come in alternately for so great a share of eulogy and abuse as the potato. On one hand we hear of its being one of the best of nature's gifts; and on the other, that to its general cultivation in this country we may ascribe most of the misery of its inhabitants. Notwithstanding all the discussion which has taken place on the subject, it is surprising that the real value of the potato should be so little understood. In its ordinary form it is one of the most perishable articles of food which we possess; but it is capable of being rendered, by artificial means of an extremely simple character, not only portable, but capable of being preserved for an almost indefinite period. There is, in fact, scarcely any other vegetable production capable of being made to assume so many forms, or of being turned to accout in so many different ways; but although this property has been long known to scientific men, it is surprising how little way has hitherto been made in putting the lower classes, who are forced to exist almost exclusively on a potato diet, in possession of this information.

The disease which made such ravages among the potato crop of last season has caused attention to be forcibly directed to these facts: and the conversion of the decaying portion of the crop into farina was a favourite project. It being known that the attention of Government was directed to the matter, numerous statements on the subject were placed before His Excellency; and among others from Mr. Jasper W. Rogers, C. E., who had more than ordinary experience. That gentleman's plan was considered so very satisfactory that His Excellency the Lord Lieutenant at once gave directions that facilities should be granted for having it fairly tested. Some of the results of Mr. Rogers's method of making the potato available as food, in many different forms, were exhibited on Saturday last, in the Board-room of the South Dublin Union Workhouse, before the guardians, and a number of other influential and scientific persons, in the form of an elegant *déjeuné*, all the items of which, with the exception of coffee, were prepared more or less from the potato; when a most satisfactory account was afforded by Mr. Rogers, of the different processes in their preparation, with much interesting information relatve to the value of the potato itself, which he very justly observed, is too much overlooked. Every one present was astonished at the rich treat provided on the occasion, which consisted of soup, stirabout, milk porridge, jellies, blancmange, Spanish flummery, and pastry of all kinds, made as we have already stead, principally of the produce of the potato, either as meal, flour, or fecula.

After the gentlemen present had partaken of the various preparations, Mr. Rogers observed, that the preparation of the meal and flour from the potatoes was so simple that it could be accomplished in the cottage of the poorest peasant. He then described the component parts of each food upon the table. The general proportion being one-half potatoes: some, however—viz: milk porridge, "Scotch bread," and rock buiscuits—being entirely made from it; also the jellies, blancmange, &c., produced from the *pure fecula* without animal matter of any kind—in fact, no addition but the usual seasonings. The soup also, which appeared to be a palatable and nutritious food for the lower classes, was stated to be made of a small quantity of bacon thickened with meal of the potato, and which was capable of being made a in a short period of time, at a cost of about one farthing per pint.

Mr. Rogers then alluded to the general impression as to the want of nutritive power in the potato, and

deprecated the publication of statements which were founded in error, stating that there was "little if any nutriment in the potato." He contended that the nutritive properties of the meal and flour of potatoes were almost if not entirely equal to that of wheat; and then gave the following analyses of each, assuming the constituents for the support of animal life, contained in vegetables, to be starch, sugar, and gluten. When converted into meal, the potato contains—

Starch and sugar	84.8
Gluten	14.82
Oil	1.10
	100

While wheat, converted into meal, contained—

Starch and sugar	78.20
Gluten	17.53
Oil	4.27
	100

Thus showing that the difference between the gluten was but $2\frac{3}{4}$ per cent, while the starch and sugar were more abundant.

The difference between "*meal and flour of potato*," prepared as recommended, and "farina," was pointed out. Farina is the starch of the potato, taken from the fibre, and contains nothing beyond the properties of starch—while the *fibre*, which is thrown away in the manufacture of farina, is rich in animal matter and oil, and by being combined with the farina or fecula, produces, a meal, or flour, closely analogous to that of grain. This fact it was particularly necessary to bear in mind, in order to counteract the impression that there was but little nutriment in potatoes—a strange one, where so many millions lived on them as their only food.

A comparison was then entered into between the relative amount of food obtained from an acre of land, in wheat and potatoes. On this subject, Mr. Rogers stated that he did not rely on his own experience, but cited the authority of practical men as to produce, and eminent scientific men as to the analysis of the respective crops, stating the following as the result of his inquiry:

	Starch & Sugar.	Gluten.	Oil.
1 acre of wheat ...	825lbs.	185lbs.	45lbs.
1 acre of potatoes	3427lbs.	604lbs.	45lbs.

Thus it appears that potatoes will produce of meal and flour, FOUR TIMES, nearly, in weight, what can be had from wheat—a fact not generally known, but which could not be contradicted. He begged to impress this startling fact on the minds of those who heard him, and hoped to rescue the potato from the calumnies thrown upon it. In an establishment such as the South Dublin Union Workhouse, containing from 1,800 to 2,000 persons, Mr. Rogers stated that from fifty to sixty paupers would be able to prepare, of potato meal and flour, by the simple means in operation, a sufficiency—say four to five tons per week—for the use of the house, mixed with other meal—by which a saving would be made in the expenditure of the establishment of above £1500 a year. He sat down amidst much applause.

Sir R. Shaw, Bart., who presided on the occasion, expressed his astonishment at what he had seen, and at the statements made py Mr. Rogers, as to the nutritive properties of the potato, compared with those of corn, which differed greatly from the impression which had been hitherto on his mind on the subject. He would suppose it impossible to put the potato into so many different forms as they had before them. They all owed great obligations to Mr. Rogers, for the handsome manner in which that entertainment had been put before them, and in the name of the guardians, he (the chairman) returned him thanks. He had brought most valuable information before them, which would be of great use, if disseminated through the country.

Mr. Rogers returned thanks, and, in doing so, observed that his great object was to render the manufacture of the potato general, henceforward, throughout the country—not alone for workhouses and jails, but that every poor cottier might be enabled to have bread, his stirabout, and his soup, as well as boiled potato—which could be done, by teaching the people a most simple process, capable of being carried on in every cottage in the country.

Considering the large and influential body of gentlemen before whom Mr. Rogers so successfully exhibited the good account to which our much-abused vegetable may be turned, it is to be hoped that some of them at least, will further test the advantages which he held forth. No better expedient could have been adopted for showing the value of the potato, in a way not likely to forgotten; and it must be remembered, that, although it was extraordinary circumstances which caused the matter to be brought so forcibly under public notice, yet under ordinary circumstances it cannot be questioned that a portion of the crop may be converted into meal, with great advantage, and be made the means of adding largely to the comforts of our peasantry.—*Irish Farmers' Journal.*

As a sequel to the foregoing remarks, and for enabling any one to judge of the crops best worth his growing, as well as for showing the comparative amounts of nutriment afforded by certain crops of corn and vegetables, we subjoin the following table of the average weight per acre of thirteen crops of corn or vegetables; and also of their organic or inorganic constituents, calculated by Edward Solly, Esq., F. R. S.

Average produce per Acre.		Water.	Unazotized Organic Matter.	Protein* Compounds.	Inorganic Matter.
	lbs.	lbs.	lbs.	lbs.	lbs.
1. Turnips	25 tons, or 56000	51800.0	3309.6	442.4	448.0
2. Carrots	15 tons, or 33600	29433.6	3138.2	655.2	383.0
3. Parsnips	12 tons, or 26880	21542.7	4642.2	561.8	333.3
4. Potatoes	8 tons, or 17920	14228.5	2053.6	433.7	204.2
5. Barley	35 bsh., or 1800	237 0	1314.2	205.9	42.3
6. Oats	40 bsh., or 1700	238.0	1215.7	187.8	58.5
7. Peas	25 bsh., or 1600	137.6	1017.7	399.0	45.4
8. Beans	27½ bsh., or 1750	138.2	979.0	581.2	51.6
9. Wheat	25 bsh., or 168	243.6	1184.4	245.4	33.0
10. Cabbage,	10000 plants or 80000	43840.0	4184.0	1456.0	524.0
11. Jerusalem Artichokes	500 bsh., or 28000	22176.0	4888.8	599.0	336.0
12. Beet	or 75000	65850.0	7312.5	1020.0	817.5
13. Buckwheat,	30 bsh., or 1300	162.5	94.52	177.5	17.5

* "Protein compounds" form the nutritive portion.

CATTLE FROM THE CAPE.—We have occasion to notice many remarkable importations now-a-days from various parts of the world, occasioned by new tariffs or other strange unexpected causes; but that which we are about to mention certainly contains a degree of novelty at once curious and remarkable. A vessel, called the Sir Edward Ryan, which arrived in the St. Katherine's Docks ten days ago, reporting from Canton, China, and the Cape of Good Hope, at which latter place she had called on her voyage home, had on board, in addition to an extensive cargo, sixty bags of flour, sixty bags of barley, sundry packages of onions, apples, seeds and flowers, and eighty sheep, the produce of the place. The importation of cattle from the south of Spain is certainly a novelty, and it remains to be seen to how great an extent such importation from the quarter alluded to may or can be carried.

THE NORWEGIAN HARROW.

The following is an extract from a letter received by Mr. Stratton from a gentleman of high standing as an agriculturist in Cumberland, on the merits of this implement. The writer, in answer to Mr. Stratton's inquiries, says:

"Your Norwegian harrow I can, from my conscience, say, is the most valuable and masterly implement I have ever seen or used. I can hardly say too much for it.

"In the first place, I will answer your questions *seraitim*, and afterwards make remarks on points on which they do not touch, but which by practice and close observation, I find of great consequence.

"Question 1.—My land is called light land, but at the same time possessing allumina to make it cake, and bake into very hard and large lumps in dry and hot weather, such as no common harrow can have any effect upon.

"2nd.—My Norwegian is five feet wide. In the first field, very rough and hard, I used two powerful horses (the rowels working at a half depth) equal to draw a ton each on our hilly turnpike roads. They completely pulverized five acres in six hours; bur it was very hard work, too severe. I afterwards employed three, putting the rowels at two thirds their depth, in a fresh field, which was full work for them. I then applyed four horses in the latter field, drove them at a greatly increased sbeed, which was sufficient work for them. Four ordinary good farm horses are required for my sized implement on land without hill. The horses were worked four abreast, one man managing both horses and implement.

When I drove the horses at an increased speed, the perfection of the work was increased cent per cent, the clods were reduced to complete powder; but not when going at a slow speed, in which latter case they were left the size of duck's eggs. As the speed is increased, the perfection of the work is increased in a *compound* ratio; therefore speed, and plenty of power to accomplish, is a great saving of expense; at a *quick* speed *no* land will require more than once going over. The surface is greatly refined by your implement, but the under ground much more so. I used it in a field filled with a black kind of wiggy couch, which formed hard clods bound together by this matted rooted grass. The implement made them quite loose, so that when the common harrow passed over lengthways and crosswise, a single turn of each, roots were brought to the top completely free from earth. I likewise never saw land before so easily, deeply, and perfectly harrowed: they did not give a single jerk, but swam upon the land as in water, the teeth buried to the wooden bars, and bringing the roots up from their whole depth, and which I had gathered up and burnt close after the harrows, so that the roots were nearly burnt when the harrows were leaving the field, the plough following the burners, and stitching the land for turnips, the guano and seed being put in by drill in one operation; the land ploughed up light, fine, and open.

[The writer here suggests a few slight alterations, which he considers would much increase the efficiency of the implement—and thus concludes]:

"Altered as I have suggested, you may recommend your implement with confidence to all persons and all soils, and I am sure that not one can ever find fault with it, for if properly managed, it will always do its work well: it saves a very considerable amount of labour in ploughing, harrowing, and enables you to gain that fine and loose tilth that no other implement can accomplish; besides the great saving of time in getting your land ready for the green crop. In stiff clays its value will be incalculable, as it will make them as easy to work in dry, hot weather, as the light lands are."

Voluminous works have been written upon Agriculture by able, scientific men, in various ages of the world; and the theory of the earth may be well understood, particularly in what are commonly called the improved districts of these kingdoms. The practical art is but imperfectly understood by any others than the operative labourers, one man by dint of experience obtains *a competent knowledge how to set a plough to go steady; and how to hold it straight;* another *how to drill, and to sow broadcast,* a third *how to reap, mow and stack,* others *how to cut and under-drain in a proper direction, some to hedge and ditch;* in short most farm labourers acquire superior information upon some one branch of the art; but unfortunately when these men die, their knowledge dies with them; others young and inexperienced succeed them, and it follows that they unnecessarily toil their own bones, and waste their employer's property, before they acquire sufficient experience to execute the work they take in hand in the most expeditious and correct manner. The farmer's time and attention are occupied in superintending and directing the *general operations* of his farm, the rotation of crops, application of manures, selection of stock, and other important concerns. He knows when his labourers are doing their work well, and he finds fault when he sees they are in error, but unfortunately his small share of *practical or operative information,* does not enable him to put them in the right way of performing their work in a proper manner; here then a treatise upon the practical and operative parts of the several branches of agriculture would be of infinite service.

As a proof of the practical parts of farm operations being but partially understood, or not sufficiently attended to, I have only to instance the operation of ploughing, as it is generally performed in this justly celebrated country.

Ploughing is certainly more expeditiously executed in Norfolk than in most other countries in the kingdom and as far as relates to light soils it may be as well perhaps *better* done. But as all the lands in Norfolk are not light, for on the contrary there are more or less patches of heavy soil in every district, and in some parts the soil is nearly all heavy.

It cannot possibly be right to follow the same principle of plowing upon all descriptions of soil; such, however, is frequently the case in this country, where the leading principles of husbandry, particularly the proper rotation of crops, is so generally understood, that even in asking the commonest laborer, nay, even women and children the question of what crops had such and such fields upon them last year, what this and what they will have next year, it is a great chance if the inquirer does not receive direct and satisfactory, answers to his questions. Very different indeed, in this respect, from any other counties in the kingdom, where even the farm-manager himself, would frequently be found at a loss to answer such questions; and when he does, his answers will not always be found satisfactory, or proper. Although the proper rotation of crops, and some of the other leading principles of agriculture and rural economy, are so generally well understood in this county, yet some other leading principles, as well as the practical or executive parts of many more, are better understood and practised in other countries, less celebrated than Norfolk.

For instance, the husbanding of farm-yard manure; the theory and practise of underdraining land; the system and practise of cutting hedges; the repairing

and making of roads upon scientific principles; the proper management of grass ground; the selection and management of live stock; the brewing of beer; the dairy; and some other important branches of farm management.

CHOICE OF MEAT, POULTRY, AND FISH.

Beef.—The grain of ox-beef when good, is loose, the meat red, and the fat inclining to yellow. Cow beef, on the contrary, has a closer grain, a whiter fat, but meat scarcely as red as that of ox beef. Inferior beef, which is meat obtained from ill-fed animals, or from those which had become too old for food, may be known by a hard skinny fat, a dark red lean, and in old animals a line of a horny texture running through the ribs. When meat pressed by the finger, rises up quickly, it may be considered as that of an animal which was in its prime; when the dent made by the pressure returns slowly, or remains visible, the animal had probably passed its prime, and the meat consequently must be of inferior quality.

Veal should be delicately white, though it is often juicy and well flavoured when rather dark in colour. Butchers it is said, bleed calves purposely before killing them, to make the flesh white; but this also makes it dry, and flavourless. On examining the loin, if the fat enveloping the kidney be white and firm looking, the meat will probably be firm and recently killed. Veal will not keep as long as an older meat, especially in hot or damp weather; when young, the fat becomes soft and moist, the meat flabby and spotted, and somewhat porous like sponge. Large overgrown veal is inferior to small delicate, yet fat veal. The fillet of a cow is known by the udder attached to it, and by the softness of its skin; it is preferable to the veal of a bull calf.

Mutton.—The meat should be firm and close in grain, and red in colour, the fat white and firm. Mutton is in its prime when it is about five years old, though it is often killed much younger; if too young, the flesh feels tender when pinched; if too old, on being pinched it wrinkles up, and so remains. In young mutton the fat readily separates; in old it is held together by strings of kins.

In sheep diseased of the rot, the flesh is very pale coloured, the fat inclining to yellow, the meat appears loose from the bone, and if squeezed, drops of water ooze out from the grains; after cooking the meat drops clean from the bones.

Wether mutton is preferred to that of the ewe; it may be known by the lump of fat, on the inside of the thigh.

Lamb.—This meat will not keep long after it is killed. the large vein in the neck is bluish in colour when the fore quarter is fresh, green when becoming stale. In the hind-quarter if not recently killed, the fat of the kidney will have a slight smell, and the knuckle will have lost its firmness.

Pork.—When good the rind is thin, smooth, and cool to the touch; when changing from being too long killed, it become flaccid and clammy. Enlarged glands, called kernels, in the fat, are marks of an ill fed or diseased pig.

Bacon should have a thin rind, and the fat should be firm, and tinged red by the curing; the flesh should be of a clear red, without intermixture of yellow, and it should firmly adhere to the bone. To judge of the state of a ham, plunge a knife into it to the bone; on drawing it back, if particles of meat adhere to it, or if the smell is disagreeable, the curing has not been effectual, and the ham is not good; it should in such a state be immediately cooked. In buying a ham, a short thick one is to be preferred to one long and thin. Of English hams, yorkshire, Westmoreland, and Hampshire are most esteemed. Of foreign, the Westphalia.

Venison.—When good the fat is clear, bright, and of considerable thickness. To know when it is necessary to cook it, a knife must be plunged into the haunch; and from the smell the cook must determine on dressing or keeping it.

In choosing poultry, the age of the birds is the chief point to be attended to.

An old turkey has tough and reddish legs; a young one smooth and black. Fresh killed, the eyes are full and clear, and the feet moist. When it has been too long kept the parts about the vent begin to wear a greenish discoloured appearance.

Common domestic fowls—when young have the legs and combs smooth; when old, they are rough, and on the breast long hairs are found instead of feathers. Fowls and chickens should be plump on the breast, fat on the back, and white-legged.

Geese.—The bills and feet are red when old, yellow when young. Fresh killed, the feet are pliable, stiff when too long kept. Geese are called green, when they are only two or three months old.

Ducks.—Choose them with supple feet, and hard plump breast; tame ducks have yellow feet, wild ones red.

Pigeons are very indifferent food when they are too long kept. Suppleness of the feet shows them to be young; the state of the flesh is flaccid when they are getting bad from keeping. Tame pigeons are larger than the wild.

Hares and rabbits, when old, have the haunches thick. the ears dry and tough, and the claws blunt and rugged. A young hare has claws smooth and sharp, ears that easily tear, and a narrow cleft in the lip. A leveret is distinguished from a hare by a knob or small bone near the foot.

Partridges, when young have yellow legs, and dark coloured bills. Old partridges are very indifferent eating.

Woodcocks, and snipes, when old, have the feet thick and hard; when these are soft and tender, they are both young and fresh killed. When their bills become moist, and their throats muddy, they have been too long killed.

BURNT CLAY AS A MANURE.

TO THE EDITOR OF THE LINCOLNSHIRE CHRONICLE.

SIR,—Having observed in your paper of the 17th ult. an interesting extract on "Burnt clay as a manure for heavy clay land" (originally communicated by Mr. Pusey, M.P.), perhaps it may not be altogether uninteresting to some of your readers to know that burnt clay laid on land acts both mechanically and chemically; mechanically, by rendering the soil porous and permeable to the air; chemically, by its property of fixing ammonia in the soil (similar to the action of sulphate of lime (gypsum) and chloride of calcium), which would otherwise be lost from its vitality. As nitrogen is indispensable for the nutrition of all plants, it is the object of the agriculturist not only to provide it in sufficient quantity, but to present it in a condition in which it can be taken up by their roots. This is attained in manuring with burned clay; the *modus operandi* of which as a manure was very unsatisfactorily explained until Liebig threw light upon the subject, by demonstrating the presence of ammonia in the atmosphere and in rain water, and pointing out that the fertility of ferruginous soils and land manured with burnt clay was owing to "the oxides of iron and allumina being distinguished above all other metallic oxides by their power of forming solid compound with ammonia." After stating that "minerals containing alumina, or oxide of iron, possess in an eminent degree the remarkable property of attracting ammonia from the atmosphere and of retaining it," he goes on to say that "soils, which contain oxides of iron and burnt clay must absorb ammonia—an action which is favoured by their porous condition; they further prevent the escape of the ammonia, once absorbed, by their chemical properities; the ammonia absorbed by the clay or ferruginous oxides being separated by every shower of rain and conveyed in solution to the soil." Although in Mr. Pusey's experiment the 3rd lot (manured with

burnt clay and sheep folded)did not show any great increase in yield over the 2nd lot, it is probable that an analysis of its produce, would have shown it to be the richer of the two in gluten, a substance of great value in wheat. This brings me to a subject I wish to remark upon, viz; the culture of barley for malting purposes. Science throws so much light upon the cultivation of land that we may begin to hope the aim of the farmers will be not only to obtain an increase in the bulk of cereal crops, but to increase or diminish the per centage of their proximate principles. The highly nutritious property of gluten and its value in the fermentation of bread renders its presence in wheat and bread corn of vast importance; and manures of rich urine (especially human urine) should be used in their culture to encourage its development—but, in the growth of barley for malting purposes, the object should be to limit development of gluten. In the fermentation of malt liquors gluten is required in small quantity, it being the brewer's interest to have no more than is sufficient for the purpose, and to get rid of it altogether when the proposed attenuation is reached. It is evident, therefore, that inferior barley (as far as regards the perfecting of a malt liquor) would be grown on land manured with urine or other oxidized matter. Cow-dung would seem to be the best of all manures, as it is said to contain the smallest quantity of nitrogen.

Ventilation.—Good ventilation is nowhere more important, although nowhere more neglected than in our bed-chambers. The bad effect of sleeping in small and close rooms has been often mentioned; to which we may likewise add, that of having thick curtains drawn close round the bed, which confine the air that has been exhaled, surrounding us with an impure atmosphere. Provision should be made for a continual change of air in the apartment during the night, by the escape of the heated and foul air and the introduction of cool and fresh air. The first may be effected by some apperture at the top of the room; perhaps keeping the top sash open for about an inch may be sufficient: of course care must be taken that the fresh air brought in at the top of the room; shall not act as a draught striking upon the bed, but that it enters by small apertures, and diffuses itself as quickly as possible; and likewise that there may be the means of regulating the quantity accordind to circumstances. If the temperature of the fresh air can be regulated it will be better.

A little apparatus for ventilating a bed-chamber in the night, invented by the Marquis de Chabannes, though not very effectual for a large room, is perhaps worth mentioning for a small one. It consists of a little box, or enclosure of tin or other metal, having an opening in front, in which may be placed a small lamp. The upper part or flue is to be inserted in the wall on the chimney breast and is to go quite into the flue of the chimney. The air which the lamp requires for combustion will thus pass into the flue, occasioning fresh air into the room to supply its place. This machine is in fact, a little chimney, in which the lamp is the fire. It should be placed near the top of the room.

It is highly deserving of attention, that although we never use fires without flues, yet we very absurdly have long continued to burn lamps of considerable size, which are in fact, so many fires, in the middle of our apartments, even when small, without the least attempt to carry off the burnt air which they are constantly generating. No wonder then, that the air, in such places, is often felt to be oppressive: it is, indeed, extremely unwholesome.—*Cyclopædia of Domestic Economy.*

Italian Rye-grass.—I am quite satisfied of its being the most valuable plant I know of, especially for early spring feed; it comes to perfection for feed quite as early as rye, and the comparison between the two for feeding qualities, is as 10 to 1 in favor of the Italian rye-grass.—*Jour. of Eng. Ag.*

Natural indications of barrenness and fertility.—As the day is now rapidly approaching when the young farmer commonly enters upon his farm, it will be useful to remind him of the scientific indications afforded by soils of their degree of productiveness; since, after all the cautions which skill and practice can suggest, mistakes, especially, by the stranger, are not always very readily escaped. It was thus that that the celebrated Arthur Young was, much to his cost, deceived in hiring (although assisted by his Suffolk bailiff) a farm in Hertfordshire. "I know not." he said in his usual emphatic manner, "what epithet to give this soil. Sterility falls short of the idea: a hungry vitriolic gravel.—I occupied for nine years the soil of a wolf." Amidst many other natural indications, the *colour* of a strange soil should be carefully regarded: barren soils are generally of a lightish brown, foxy, fawn, palered, and whitish yellow colour—a deep yellow is a certain sign of barrenness. Mr. Bravenden thinks all soils should be called barren that do not produce on an average, 20 bushels of wheat, or 30 of beans oats, or barley per acre. The spontaneous growth, in *considerable proportions*, of the following *plants*, is an intdication of a barren soil—

The agrimony	dry sandy soils.
Rough dandelion	dry barren pastures.
Woody betony	in woods.
Canterbury bells	high chalk pastures.
Heath-bell flower	on heaths.
Flea rush	in wet places.
Star knapweed	barren meadows.
Common Cudweed	barren meadows.
Corn marigold	sandy soils.
Smooth cat's-ear	sandy and gravel.
Silver weed	lands subject to floods.
Sheep sorrel	sandy meadows.
Wild thyme	barren elevations.

Of the *natural grasses* which tenant barren soils are—

Common bent	dry heaths, limit of elevation above the sea
White-rooted bent	2000 feet.
Creeping bent	clay soils.
Marsh bent	damp and shady places.
Tufted hair	limit of elevation 1500 ft.
Slender foxtail	black peat.
Common quaking	poor soils.
Soft brome	poor exhausted pastures.
Sheep's fescue	dry sandy soils.
Wood fescue	in damp woods.
Woolly soft	moist peaty pastures.
Wild sainfoin	barren chalk pastures.

Timber trees flourish best on soils, which are for—

Sycamore	sandy lightish.
Maple	deep sandy.
Alder	wet.
Birch	light, moist, and sandy.
Hazel nut	deep sandy; moderately fertile.
Beech	calcareous.
Ash	deep, flourishes on the inferior oolite.
Walnut	dry loamy, rich.
Larch	thin, dry, and rocky.
Poplar	wet, boggy.
Pine	light, dry and rocky.
Elm	deep rich loam.

Of the plants whose chief occupancy of the ground indicate a fertile soil, are—

Stinking May-weed, Dandelion, Fat Hen, Pale Persecaria, Cow Parsley, Sow thistle, Virgin's Bower, Chick-weed, Goose Grass, Nettle.

The same presence of the following grasses also indicate a fertile soil—

The Meadow Foxtail, Meadow Fescue, Sweet-scented Vernal, Rye Grass, Meadow-oat Grass, Rough-stalked Meadow, Fiorin, Perennial Red Clover, Crested Dogstail, White Clover, Cocks-foot, Creeping Vetch.

Of *aspects*, a northen aspect is rather an indication of barrenness, so is N E. or N W.; pasture lands with these aspects are the most subject to moss. S., SE., or SW., or W. are very favourable aspects. A fertile *inclination*

should not exceed 15°; soils of a greater inclination are thin, and near the rock or subsoil.

Elevation.—1,500 feet may be considered as the limitation of natural fertility. Wheat seldom ripens at above 1000 feet. "High farming, however," adds Mr. Bravenden, "embracing the best modes of cultivation, is found to ameliorate the severity of the climate, and to place us as it were, in well cultivated districts, several degrees nearer the equator, and reduces the highest of our cultivated hills, several hundred feet.

ON THE CULTIVATION OF FLAX, AND THE FATTENING OF CATTLE WITH NATIVE PRODUCE, BOX FEEDING, AND SUMMER GRAZING.

BY JOHN WARNES, ESQ.

We take it that the name attached as the author of this publication will be quite sufficient to command a sale. The interest excited when ever we have had the good fortune to publish a letter from Mr. Warnes, was testified by letters from every part of the kingdom requesting us to give parties his address. The different letters which he has published from time to time in a vigour of style quite new, giving information most material to the farmers and agriculturists of the country, are all compiled with other useful and practical information. As a book of reference, nothing can be better. It is supplied with a curious index. In the preface he remarks:—

If I had ever any solid reasons for promulgating my plan, those reasons are rendered doubly urgent at the present crisis. The repeal of the corn laws is insisted upon by the League, with all the art that human ingenuity can devise, and with all the power that money can command; while agriculturists, formed into protective associations are equally determined to uphold the existing duties. Whatever may be the result of the conflict, it is evident that farmers who have adopted the cultivation of flax, the fattening of cattle upon native produce, &c., &c., must be better prepared to sustain the shock of free trade than those who resort to foreign manure for land, and food for cattle. At all events, it is certain that a high price for the common necessaries of life cannot be sustained, that profits upon land must be derived from increased production, and that farmers ought no longer to hold out against the adoption of new systems of improvement.

Thus it will be perceived that the object of this work is to circulate that money at home that now goes to foreign countries, to improve the soil and employ the poor. It is a most useful and original production.

INDICATIONS OF CHANGE OF WEATHER AFFORDED BY PLANTS.—Very many of our most common plants are excellent indicators of atmospheric changes. The opening and shutting of some flowers depend not so much on the action of light as on the state of the atmosphere, and hence their opening or shutting betokens change. The common chickweed, or stichwort (*Stellaria media*), may be considered a natural barometer; for if the small white upright flowers are closed, it is a certain sign of rain; during dry weather they expand freely, and are regularly open from nine in the morning till noon. After rain they become pendant, but in the course of a few days they again rise. The purple sandwort (*Arenaria rubra*) is another indication of a coming shower. Its beautiful pink flowers expand only during sun shine, and close at the approach of evening or before rain. The pimpernel (*Anagallsis arvensis*) has been very justly named "the Poor Man's Weather Glass." This litte plant blooms in June in our stubble fields and gardens, and continues in flower all the summer. When its tiny brilliant red flowers are widely extended in the morning, we may generally expect a fine day; on the contrary, it is a certain sign of rain when its delicate petals are closed. The goat's-beard (*Tragopozon pratensis*) will not unclose its flowers in cloudy weather. From its habit of closing its flowers at noon, this plant has received the common name of Go-to-bed-at-noon; and the farmers' boys in many districts regulate their dinner hour by the closing of the goat's-beard. According to *Keith's Botany*, if the Siberian sow-thistle shuts at night the ensuing day will be fine; and if it opens, it will be cloudy and rainy. When the African marigold remains closed after seven o'clock in the morning or evening rain may be expected. If the trefoil and the convolvulus contract their leaves, thunder and heavy rain may be expected. Lord Bacon tells us, that the stalks of the trefoil swell and grow more upright previous to rain. The dark and lovely gentianella opens its blue eyes to greet the mid-day sun, but closes its petals against the shower. The germander speedwell (*Veronica chamæbrys*), so universal a favourite in every hedgerow, closes its blue corrola before rain comes on, opening again when it ceases. The red campion (*Lychnis diurna*) uncloses its flowers in the morning. The flowers of the white campion (*Lychnis vespertina*) open and expand themselves at the approach of night.—*Farmer's Encyclopoedia.*

RULES FOR MARKETING.—In marketing, the first rule is to purchase chiefly from known and respectable trades-people, who are likely to go themselves to the best markets, and who have to support the character of their shops.

The second rule to be observed, is that of not purchasing inferior articles under the idea of being economical.

A bargain is seldom a prize: and this is especially the case with regard to butchers' meat.

The best meat and the prime parts are unquestionably the cheapest in the end, although the first must be the greatest. In coarse and inferior joints there is always too great a proportion of gristle, bone, and hard meat, to render them truly economic; these may serve as the bases of soups, gravies or stews; but for roasting or boiling they are wasteful.

The criteria of bad meat, by which must be understood meat that has been too long killed, or meat from animals killed in a state of disease, ought to be well known by those who market, no less than than the value and economy of the different parts and joints.

THE TRAVELS OF THE LEAF.

From the hill to the valley, the grove to the plain,
From the branch where thou never wilt blossom again,
Thy green beauties faded, sere, withered and dying—
Brown leaf of the forest, oh were art thou flying?
I know not—I heed not—I go with the blast
Which swept me away from the bow as it passed.
The storm-gust which shattered the oak where I hung,
Had ruth for the feeble, but none for the strong;
It has rent the tough branch once my glory and stay,
And—the wind for my wildmate—I'm whirled away.
What rede I, or reck? On its cold bosom lying,
I haste to where all things in nature are hieing—
And the sweet garden rose-leaf floats off with the breeze,
Where the zephyr wafts blossoms and buds from the trees.
So lightly I drive to my destiny too.
And it may be to glad me—it may be to rue—
My companions the ilex, the ash the, bright laurel,
And the beech, with its death bloom, as ruddy as coral.
Now read my sad riddle, Sir Seer!—and its moral.

Dublin University Magazine.

A SONG FOR THE TIMES.

BY G. I.

Tune: "*Ye Mariners of England,*"

These fine old halls of England,
How nobly do they stand,
Embosomed 'mid their spreading oaks—
The glory of our land!
While from their ample hearths beneath
The curling smoke ascends—
A pledge for hospitable board,
A welcome to all friends.

The good old English manor-house,
The hall of ancient times—
Its semblance in vain is sought,
Unknown in sunnier climes
It is the home of Englishmen,
A word we hold most dear;
How much is centered in that thought,
Our *fathers* they dwelt here!

Those fair green meads and upland slopes,
Those sunny lawns and trees,
Those fields where golden harvests wave
Before the autumn breeze;
Those natural riches of the land,
The good which God bestows,
We will defend with heart and hand
'Gainst perjured friends and foes.

Nor shall the iron hand of trade,
The Moloch of our day,
Through lust of power, our fields invade,
And make our lands a prey.
Her noble, yeoman, peasant sons,
Who longher fields have trod
Together, shall together stand
For country, home and God.

Dorset Chronicle.

QUEEN VICTORIA'S EMPIRE.—The Queen of England is now sovereign over one continent, a hundred peninsulas, five hundred promontories, a thousand lakes, two thousand rivers, and ten thousand islands. She waves her hand, and five hundred thousand warriors march to battle to conquer or to die. She bends her head, and at the signal a thousand ships of war, and a hundred thousand sailors, perform her bidding on the ocean. Come, all ye conquerors! and kneel before the Queen of England, and acknowledge the superior extent of her dependent provinces, her subjugated kingdoms, and her vanquished empires. The Assyrian empire was not so wealthy. The Roman empire was not so populous. The Persian Empire was not so extensive. The Arabian empire was not so powerful. The Carthagenian empire was not so much dreaded. The Spanish empire was not so widely diffused. We have overrun a greater extent of country than Attila, that scourge of God, ever ruled! we have subdued empires, and dethroned more kings than Alexander of Macedon! We have conquered more nations than Napoleon in the plentitude of his power ever subdued! We have acquired a larger extent of territory than Tamerlane the Tartar, ever spurred his horse's hoof across."—*Finch's Boundary of Empires.*

THE TAKELY HEN.—We some time since mentioned the doings of this little prodigy in the egg-laying line, though we confess with some incredulity; but the fact now comes to us with such strong vouchers that there is no doubt of its correctness. Her feats have been tested by some who were sceptical, and it was found that in three days in one week she laid 10, 17, 12 eggs; after five weeks of unexampled laying, during which she deposited nearly 80 eggs, she is now sitting comfortably upon 17, and if all her progeny possess her prolific properties, we may expect a decline in the price of eggs. The owner of this golden bird (Mrs. Marshall) has been offered £7 for her, but has refused to part with her, "unless a more acceptable offer be tendered."—*Chelmsford Chronicle.*

MONSTER PIG—The Smithfield Club Cattle Show has often exhibited some very large prize cattle, fatted up for the purpose of astonishing the people at Christmas, but all their productions have been surpassed by a huge animal of the porkine species, lately exhibited in Stepney fair. This most extraordinary pig has been fed in the ordinary manner, and weighs rather more than 140 stone, and is much larger than any bullock ever brought to Smithfield. The weight of a good fat ox of ordinary dimensions is about 100 stone. It is two years and a half old, and was bred by Mr. Parish, a farmer of Nasing, Hertfordshire.

COLTSFOOT.—Coltsfoot increases by root and seed: no tillage will destroy the root except it be brought to the surface by scarifying in dry weather, nor prevent it seeding when in bloom unless covered by the plough. If the bloom is cut off and left on the ground, it will produce seed in a few days; or if the bloom is gathered and laid in a heap even under cover on a dry floor, it will become as white as a fleece of wool: hence it is evident that the only mode of preventing its increase by seed is to gather the bloom, and burn, bury and rot it.

March is the proper season to go over the land to gather the first heads: from three to five blossoms grow on each stem commonly. A short narrow hoe is the best tool to cut off the heads—a bag apron the best to stow and carry the heads in. The land should be gone over again in a week or two to gather the second heads, and a third time if seeded heads appear above the clover or other seeds, &c. Each head gathered when seeded should be deposited in the bag separately, lest by filling the hand, much seed be scattered.—*Charles Poppy, Wilnesham, Ipswich, November 17th*, 1845.

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 subcription 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	15
10 copies for	8

Payable always in advance.

WILLIAM EVANS, EDITOR AND PROPRIETOR.

LOVELL AND GIBSON, PRINTERS.