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THE

CANADIAN AGRICULTURAL JOURNAL.

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The present spring has been the most favourable for agricultural work and for vegetation that we recollect while we have been in Canada. Several days in May we had rain which rendered some land rather wet for sowing or planting, but the spring altogether was favourable. The leaves and blossoms on trees are, we believe, a fortnight in advance of any other season for several years past. The spring commenced early, and afforded farmers an opportunity to execute their work in good time, and with very little interruption. This is a great advantage. We hope the season will continue favourable to the end, and as much wheat has been sown, that the farmer's hopes will be crowned with success. If a good crop of wheat is raised in Canada this year, it will give a new stimulous to agricultural improvement, and afford the farmer the means to introduce an improved system. Low priced grain will never give encouragement to improved husbandry, because it will not remunerate the farmer. The produce of agriculture must pay so as to remunerate the practical farmer, or we need not expect to see *a system of good husbandry* general throughout the country. Individuals who have means may for amusement expend money, by following the most approved system of husbandry, whether it will pay or not; but to insure a general system of good husbandry remuneration must be certain to the farmer. All, therefore, who desire to see the agriculture of Canada improving, and the occupiers of the soil in a flourishing condition, should be anxious that a fair remuneration should be secured to the farmers. There is not much probability that they will make large fortunes, however industrious they may be. They never can accumulate great wealth, by appropriating a large share of the labour of others for themselves, as other classes do. Indeed, they receive less remuneration for their labour and capital than would satisfy any other class of the community—and men who make large profits, by buying at a low price, and without giving any additional value to the commodities, selling them at a high price, are the first to resist the farmers in any application they might make to the Government and Legislature for a reasonable share of protection from foreign competition, that might give them a chance of fair remuneration for their labour and capital. A farm cannot be drained and cultivated in the most judicious manner, without considerable outlay, and there must be valuable returns to repay this outlay; the inferior grains will not do it. We must raise wheat, beef, pork, butter, hemp and flax, or we cannot pay for a perfect system of improved agriculture. We may have all these articles of produce in perfection if we cultivate properly for them, and there is no doubt we shall cultivate well if remuneration will be secured to us. We have frequently urged the necessity of erecting mills for dressing hemp, and flax, but nothing has been done in that way We are convinced that until there is sufficient public spirit in the country to construct machinery for this purpose, this species of agricultural produce will not be cultivated. The only way to encourage it would be for the owners of machinery to purchase from the farmers the hemp and flax in a green state in the fields; or the farmers might take off the seed, and dry and stack the hemp and flax, and make it lighter and more easy to carry away, to be steeped by the manufacturer or mill-owner. There are many ways to secure the improvement and prosperity of agriculture, if the wealthy and educated would only be induced to take an active part in the matter. It is greatly to be regretted that if we do not see a certainty of obtaining direct profit, we carefully abstain from taking any trouble about matters of general interest. In no country on earth we believe has this feeling more influence than in Canada—and the consequences are manifest in the neglected state of her agriculture. We hope to see a change for the better very soon—and then the country will prove what it is capable of. We have often stated our opinion of the country to be most favourable—and this opinion remains unchanged. We are firmly persuaded that both climate and soil are as well adapted for agriculture as any we know, and any objections offered against either is a flimsy excuse for bad farming. Capital, skill, and labour, might make our agriculture, with reasonable protection, equal to any on earth, notwithstanding the long winters and short summers of Canada.

BONES, GUANO, AND ASHES.

Mr. Slaney, of Walford Manor, near Shrewsbury, communicated to the Council the results obtained by Mr. T. C. Eyton, a member of the Society, residing at Donerville, in the county of Salop, in his experiments on artificial manures, especially on bones dissolved in sulphuric acid, embodied in a lecture delivered by that gentleman to the members of the Wellington Farmer's Club, and at their request printed and published, at a small nominal price, by Simpkin, Marshall & Co., London. Mr. Eyton, having detailed various experiments made by other parties, proceeds to those instituted by himself, and which are of a very interesting character. "The manures and mixtures of manures I tried," says Mr. Eyton, "are calculated per acre. The turnips, which were Skirving's Swedes, were mildewed, or, probably, the crops would have been larger. The largest crop is that raised upon guano and wood-ashes, at an expense of about two pounds four shillings per acre, or at three half-pence for each bushel of turnips; the cheapest, that raised upon bone-dust dissolved in sulphuric acid, at an expense of eight shillings and five-pence half-penny per acre. Both guano and muriate of ammonia were tried by themselves, and also mixed with gypsum, at the rate of 220lbs. to the acre; where the gypsum was applied

with muriate of ammonia, the crop was worse than where the muriate of ammonia was applied alone; where gypsum was applied with guano, the crop was only better by six cwt. in the acre than where none was applied, which may have been caused by the vicinity of a drain. We may, therefore, I think, fairly conclude, that gypsum is no manure for turnips, whatever it may be for clover and other crops. I confess, I am much puzzled by this result, as from an analysis of the subsoil of the field, by the Messrs. Blunt, of Shrewsbury, it appears that it contains merely a trace of sulphate of lime, or gypsum; from which I should, until these experiments were tried, have supposed that gypsum would have had a powerful effect. Muriate of ammonia does not appear to answer well in the quantity used, and if larger quantities were applied it would be too expensive for the farmer.

No. of Exp.	Description of Manure.	Cost per acre. £	s.	d.	Weight of crop per acre tons	cwt	Measure per acre bushels.	Cost per bushel. d.
I.	165lbs. of muriate of ammonia, 220lbs. of gypsum.	1	10	11	7	1½	154	2½
II.	330lbs of guano.	1	13	0	15	1	308	1¼
III.	165lbs. of muriate of ammonia 330lbs of guano.	1	6	6	8	16	192½	1¾
IV.	220lbs. of gypsum. 330lbs of guano.	1	17	5	15	14¾	346½	1¼
V.	11 bushels of wood ashes, at 1s per bushel.	2	4	0	17	7¾	423½	1¼
VI.	165lbs of muriate of ammonia. 11 bushels of wood ashes.	1	17	6	14	19¾	385	1¾
VII.	1,322 gallons of liquid manure (consisting of urine and soap-suds.)		.....		11	9½	269	—
VIII.	66lbs. of bones. 8¼ qts., or 33lbs. of sulphuric acid. 550 gallons of water.	0	8	5½	14	6	346½	0¾
IX.	484lbs. of bone-dust.	1	1	7½	14	19¾	308	0¾

"In the above calculation, fractional parts are not included." The following is an analysis of the subsoil. I was told by a former tenant of the field that it would not grow turnips; it was, however, drained shortly before the turnips were sown.

"One hundred parts of the soil were found to contain—

Water	11 parts.
Silica (or sand)	70 "
Alumina (or clay)	15 "
Red oxide of iron	1½ "
Carbonate of lime	1½ "
(Loss)	1 "
A trace of sulphate of lime, in weight not appreciable	....
	100

The proportion of Silica is that yielded by the soil after the largest stones or pebbles had been removed from it. The seed was sown on the 17th of May, 1843, and the turnips pulled and weighed on the 22nd of November. The plants all came up together; nor was there any perceptible difference in their appearance on the 27th of May. On the 14th of June, No. II. appeared to take the lead; I., VII., VIII., looking the worst, and being more backward than the others; on the 20th of June they were horse and hand-hoed, Nos. IX., X., VIII., IV., V., were equal in appearance to No. II; on the 21st of July No. V. looked best, and No. I worst of all." Mr. Slaney then proceeded to call the attention of the Council to the comparative cost of the different manures tried by Mr. Eyton, and stated in the table just read to them; from which it appeared that the bones and ulphuric acid cost only one farthing per bushel on the turnips grown, whilst the other manures cost from three to ten times as much. The soil on which they were raised was a tolerably light loam, and, as Mr. Eyton had stated, had been recently drained. The bones used were ground into powder, and were the fine siftings from collections of bones. This bone powder being put into an earthenware vessel, a small quantity of water was first poured over it, and the sulphuric acid then added: when the whole mixture was stirred with a stick until the bone-powder was entirely dissolved, and the solution being diluted with more water was ready for use. It was applied to the land as liquid manure, either by means of a common watering-pan, or the distributing-trough of a liquid manure cart, care being taken that the liquid should fall on the rows of turnips just sown. This process, Mr. Slaney understood, was repeated after the plants came up; and in submitting this brief statement of Mr. Eyton's experiments to the Council, he trusted that the interesting results obtained might stimulate other Members of the Society to extend the inquiry to other artificial manures with a view to the determination of their economical application and practical value. Mr. Davenport, of Capesthorne, near Congleton, Cheshire, fully corroborated the statement made by Mr. Slaney, in reference to the mode in which the mixture of sulphuric acid and bone-dust should be conducted; and as some danger to the inexperienced operator was to be apprehended from a different mode of proceeding, it was desirable that great care should be taken not only to effect the solution of the bones, but also to add the sulphuric acid in so cautious a manner as to prevent its accidental ejectment from the vessel in consequence of the violence of chemical action. With regard to the abstract value of sulphuric acid and bones as a manure, he adduced the opinion of Mr. Burness, of Manchester, a pupil of Professor Liebig, and who had been delivering a lecture or two in Cheshire on agricultural chemistry, as unfavourable to its exclusive use; for although it was no doubt a powerful and excellent restorer of land, it could not be considered as a permanent and efficient manure for rotation of crops, unless combined with other substances. Mr. Davenport preferred bone manure in a dry, concrete form, to its being in the state of liquid solution; and had found a mixture of half a ton of bone powder and two hundred weight of guano answer extremely well. The African guano just imported was offered at 3l. per ton less in price than the Peruvian, but he understood that it contained a correspondingly greater amount of water in its composition. Mr. Townshend Mainwaring, M. P., of Marchiviel Hall, near Wrexhrm, Denbigshire, stated, that with him the application of the sulphuric acid and bones had been attended with decided injury rather than advantage to his crops: a result, he had since learned, occasioned probably by the bones employed being left in fragments of too large a size, and consequently not in a state to be at once subject to the chemical action of the sulphuric acid as their solvent; his land having thus not only lost the advantage of the nutriment contained in the bones, but received on the contrary the injury of a strong, corrosive, and unneutralized acid. Mr. John Raymond Barker, of Fairford Park, Gloucestershire, communicated the results of two experiments he tried last year on the effects of ashes, both singly and mixed with guano, on the growth of Swedish turnips. The first experiment was made by applying a mixture of 40 bushels of coal ashes and 20 bushels of wood ashes, per acre, to a bad piece of heavy land, sown with Skirving's purple-top Swedes drilled in rows 18 inches apart. The turnips on being cleared of their tops and tails were weighed, and found to give an average of 39 tons 15 cwt. to the acre. The other experiment was made in a field of good light land, manured with 25 bushels of coal-ashes and one cwt. of guano per acre, and sown with Skirving's purple-top, in rows 27 inches apart. In this experiment the turnips were much larger than in the former, and Mr. Barker expressed his regret that the result had not been weighed, as the crop was, without exception, the finest he had ever witnessed, the turnips being of excellent quality and of immense size.

"Sam," said a lady to a milk boy, "I guess from the looks of your milk, that your mother put dirty water in it." "No she did n't nuther—I seed her draw it clean out of the well, 'fore she put it in."

SALT AS A MANURE.

TO THE EDITOR OF THE LIVERPOOL MAIL.

Sir,—I beg to call the attention of your agricultural readers, who are in the habit of using guano and artificial manures, to the fact that most of the carbonate of ammonia contained in them, or generated during their decomposition in the soil, is quickly evaporated before the plants derive any benefit from it. At least 20 or 30 per cent. of animal manures may be saved by the use of salt, which will prevent the ammonia escaping into the atmosphere, and two substances highly necessary to vegetation will be formed. The merits of salt as an agent in agricultural operations seem to have been nearly entirely overlooked by our experimental farmers ; but I am satisfied, from extensive experience of my own, that when it is properly applied it will be found a most valuable addition to the various natural and artificial manures now offered to the public.

I am, &c.,

A Farmer.

EXTRACT FROM A FARMER'S DIARY.

"During the process of fermentation which takes place when large quantities of stable and farm-yard manure are thrown together, a considerable portion of the most valuable part is lost in the shape of carbonate of ammonia, which flies off. To prevent this great waste common salt may be used. It is a principle in chemistry that substances combine more freely at the moment of their generation or disengagement than at any other time. The chloride of sodium or common salt immediately unites with the carbonate of ammonia as it is formed, and a double decomposition takes place, producing muriate of ammonia and carbonate of soda.

"A recent discovery in chemistry has elicited this fact, and goes far to prove the utility of salt as applicable to manure. That the ancients were acquainted with the several properties of salt and its uses, in sufficiently shown by the following passage from Scripture :—Salt is good ; but if the salt have lost its savour, wherewith shall it be seasoned ? It is neither good for the land nor yet for the dunghill : men cast it out.'

"To render this quotation perfectly intelligible, it is necessary to observe that in parts of Syria a species of rock-salt exists, which, if exposed for any length of time to the atmosphere, loses its saline properties, but retains its outward appearance. 'It has lost its savour ;' 'men cast it out ;' 'it is neither good for the land nor yet for the dunghill.' Here are two distinct uses, besides domestic purposes, to which salt was applied, and in both cases it was good. Upon the land it produces various effects according to the quantity used, and most agriculturists are acquainted with its nature ; but the great source of its utility is upon the dunghill. There, in nature's laboratory, a chemical change takes place, and carbonate of soda and muriate of ammonia are formed.

"Sir H. Davy, in his 'Agricultural Chemistry,' remarks that farm-yard dung, in its decomposition, loses from half to two-thirds its weight ; besides a saving of this immense loss, all noxious weeds and seeds are destroyed by the salt, as also the larvæ of insects, and the insects themselves, which consume great portions of the dung. To all farmers who are desirous of increasing the value of their farm-yard manure, I would strongly recommend the use of salt on the dunghill. It may be used in a liquid state, sprinkled amongst the manure at the time of throwing it into a heap, or spread afterwards in a dry state as a covering to the whole."

GLASS MILK-PANS.

Captain Stanley Carr, of Tuschenbeck, near Lubeck, transmitted to the Society, through Sir John W. Lubbock, Bart., and at the request of Mr. Handley, a specimen of the glass milk-pans employed so successfully in his German dairy, and referred to in his paper on the Rural Economy of Schleswig, Holstein, and Lauenburg, in the first volume of the Society's Journal (page 380). "The milk," says Captain Carr, "when brought to the dairy, is immediately strained through a horse-hair sieve into the vessels, whether of wood, earthenware, copper tinned, zinc, cast-iron (lined with a china-like composition), or *glass*, placed in rows on the floor. All these different kinds of utensils have been tried with various success, in the hope of discovering how, in hot weather, more especially when a thunder storm is gathering, the milk can be guarded against a too early acidity ; for, as it is a fixed and invariable rule that the cream must be removed from the milk before the latter gets at all sour, and an equally established fact, that all the oily particles cannot be obtained in a shorter period than 36 hours, vessels in which, during sultry, and especially damp weather, the milk could be kept the due time, are a great desideratum. As yet, however, there reigns much diversity of opinion on the subject, and shallow wooden vessels, as nearly as possible equally wide at top and bottom, containing, when full, about eight quarts, but in which, during summer, seldom more than six quarts are poured, are in most general use. They have, however, some disadvantages, of which the chief is the great difficulty and the consequent labour and close attention requisite to remove all acidity (which in some states of the atmosphere, is almost unavoidable), and which, penetrating the pores of the wood, sometimes resists all the patient scrubbing ; first, with hot water and small birch scrabblers, and secondly, with boiling water and a hard round brush made of pigs' bristles (with which every hair's breadth is carefully polished over,) so that the despairing dairymaid is compelled to resort to washing in a ley of wood-ashes, or boiling, or even scorching over lighted chips, followed by countless rinsings in pure spring water. To diminish, in some measure, this labour, the plan of painting the milk pails and dishes with a preparation of cinnabar, linseed-oil, and litharge has been adopted by the milk venders in some country dairies : not only, however, is the expense considerable, as the vessels must be finished off with peculiar care, and require to get three coats of the composition at first, and one yearly afterwards, but the milk, for some days after they are brought into use, has a perceptible taste of paint. The tinned copper milk pans are very costly, and must be carefully watched lest they should require re-tinning. The zinc are, as yet, little known, and the assertion of their effect in better severing the cream from the milk not sufficiently proved. The cast-iron lined with enamel, though assuredly durable and very clean, seem too expensive ; and the *glass* have many opponents on account of their brittleness, and the vague notions respecting glass and electricity inducing the idea that if the electric fluid get into the milk it cannot get out again ! whereas, as it is ascertained that it always attaches itself to a conductor, and, in the absence of anything more attractive, runs along the surface, it is more likely that the milk should be protected in glass, which is a non-conductor, than in any other substance. In my dairy, which contains upwards of 180 cows, the glass vessels have been used for more than four years ; and I give them a decided preference over all others. Their form is good, being sixteen inches broad at the top, and twelve at the bottom ; the glass is dark bottle-green, transparent, and perfectly smooth, about one-eighth of an inch thick, and provided with a rounded rim at the upper edge, which makes it easy to retain a safe hold of them, even full. They contain eight quarts, but never receive more than six. They cost 8d. a piece, and their durability may be estimated by the fact, that to encourage carefulness, each dairymaid is allowed one dollar per annum extra, as *pan-money*, being bound at the same time to pay 10d. for each one she breaks : yet hitherto, no girl has broken to the extent of her dollar. It is self-evident that acidity cannot be communicated to glass, and the ease and rapidity with which they are cleaned, requiring merely to be first washed with lukewarm water, then rinsed in cold water and placed in a rack to dry, effect such a saving in fuel and labour (diminishing the number of our dairymaids by at least two), that the less quantity of butter obtained, supposing (which I by no means concede) that the milk, during a few weeks in summer, does sour sooner, and consequent throws up less cream in glass than in wood, is more than compensated by the lessened expense of the establishment, not to mention the great advantage of attaining the

indispensable cleanliness and purity of the vessels with more certainty, because at a less expenditure of time and trouble. Although it is an ascertained and undeniable fact that the quality of the butter depends much upon the nature of the pasture and locality of the dairy, the universally prevailing cleanliness of the whole management, and *very* essentially on the purity of the water employed, still I ascribe much of the reputation which our butter has of late years enjoyed (and which is verified by our obtaining at all seasons one penny per pound above market-price in our neighbourhood) to the beneficial introduction of glass milk-dishes."—At the suggestion of Mr. Hayter, M. P., it has been ascertained from Mr. Apsley Pelatt, of the Falcon Glass Works, Blackfriars, that in consequence of heavy duty and restrictions of the Excise on manufactured glass articles in this country, glass milk-pans of a size and shape similar to those of Captain Carr, but of white flint glass and stronger mould, could not be made for sale in England for less than 7s. 6d. each; but should that price, under the restrictive circumstances of the case, obtain purchasers, there would be no difficulty in manufacturing a superior and serviceable article of the kind to any extent that might be required. The milk-pan presented by Captain Carr to the Society is of the common dark green bottle-glass, and weighs 6¾lbs. It is round in shape, and nearly 4 inches deep, measuring 17 inches across the outside of the top, and 11 inches across that of the bottom.

CULTIVATION OF THE POTATO.

To the Editor of the Mark-Lane Express.

SIR,—Various have been the conjectures respecting the failure in the potato crops so prevalent within the last 12 or 15 years; and as the potato is the most valuable of all the vegetable tribe, producing in their cultivation an abundance of labor, and is also a favorite vegetable with the prince and the peasant, not only with the latter as a substitute for bread, but also at the table of the wealthy, they are used to a considerable extent. Viewing them collectively under such favourable advantages, may we not conclude that a failure to any extent might justly be considered a national loss in food and labour? With such impressions, and with a sincere desire to impart to others similar benefits to those I have received, I am desirous to offer a few practical observations. Having been a potato grower upwards of 30 years, although seldom planting more than 50 acres in a season, still I have paid some attention to their cultivation.

Respecting the failure of the crops, I consider it may arise from various causes. A serious injury, no doubt, is often produced by the potatoes heating in the hills when first put together, and also in allowing them to vegetate in the spring before they are removed, by which their germinative qualities become so greatly weakened; although the set makes an effort, it is often seen that the plant has not sufficient power to throw up a shoot through the surface—hence we perceive them producing small buttons, or, what has been termed, Bobbin Joans. A similar effect is often produced by the potatoes heating in consequence of being a long time retained in a vessel by contrary winds, &c.

A disease called the dry rot has, within a period of 15 years, proved the most fatal; frequently half a ship's cargo damaged. Potatoes planted so infected must also prove a failure.

Experience has often proved that the plants are frequently seriously injured by the land being in too wet a state, the most effectual remedy on such land would be a thorough drainage.

Although, singular as it may appear, I am of opinion that there are more failures in the potato crop in a season, such as the present, when the weather is both hot and droughty, than even in a wet season, and that such failures arise from the dry state of the land, combined with the effect the atmospheric influence has on the plant, impeding its germinative powers, by which the set becomes in a stagnant state, vegetation ceasing, consequently it is destroyed by centipedes and various insects, after throwing out small puny shoots, few of them rising through the surface.

Before I state the system I have found so beneficial in seasons such as the present, I will just hint for the benefit of the young practitioner that it is advisable in droughty seasons to keep the land well harrowed and rolled in order to retain the moisture, and to put on the manure also in a moist state, ploughing it in as quick as possible, and, as potatoes are an exhausting crop, not to spare the manure, that the next crop may not suffer.

There are so many systems of planting potatoes; most persons consider their own the best; my plan is to draw the drills 25 inches apart, lay in the manure well washed, and the sets on it, ploughing them in.

We lastly come to the system of preparing the sets, which I consider of the utmost importance in seasons when the land is in a dry state; it has been my invariable practice for the last eight years. Mr. Cowan, to whom I am indebted for the discovery, found the following the only effectual remedy, after trying various experiments:—Take fresh slacked lime, into which dip the cut part whilst moist, which absorbs the watery part on the outside, forming a crust. I have no doubt that such acts as a shield against the atmospheric influence hence penetrating the cut part, and is also a substitute for the rind; hence it is that many prefer planting whole potatoes, to which I have two objections—first, that it frequently occurs that in consequence of such a number of eyes, small tubers are produced, and in a season when potatoes are at a high price it is more expensive; late years they have not been found a very profitable crop.

To return to the application of the lime: I have adopted the system of setting a strong lad to about 7 women cutting, who spreads three bushels at a time on a floor, and with a fine sieve shakes some lime over them, giving one turn, which answers the purpose of dipping, and is more expeditious.

I must apologise for entering into such a lengthened statement—the importance of the subject must be my plea. As the season for planting is now advancing, I trust you will do me the favour to publish in your next journal, in order that your correspondents may have the opportunity of trying the experiment, which I offer them with the fullest confidence.

TIME VERSUS LIFE.

BY B. R. T. CRUCIFIX, M. D.

Sherwood, Gilbert, and Piper, Paternoster-row.

This work might not have been inappropriately named Prudence *versus* Time, as showing how much the ravages of time are accelerated or retarded by a prudent course of living. The following extracts will exhibit the character of the work more strikingly than we can describe it;—

"After much consideration it is here endeavoured to place the subject in question in a form, tangible alike to the profession and the public. The plan and scope of the argument will develop themselves more clearly as the particulars are opened; at present it may be sufficient to premise that the following pages may be considered as *an attempt to trace the causes which accelerate the destructive influence of time on the human species, and to point out the measures (medicinal, dietetic, and moral) by which that influence can be so far modified, that, in many cases, life may be preserved to the ordinary period, or even, in some instances, extended beyond it.*"

"*What liquid diet is most favourable to longevity?* This question can no more be replied to from appropriate and authentic records of experience than in the case with respect to solid food. Yet, if we take that which appears a fair rule, viz., that whatever has a manifest tendency to produce disease tends to shorten life most rapidly, we shall establish very readily what liquids favour the operation of time in the greatest degree, namely, all *vinous and spirituous drinks*, however disguised, diluted, or modified; and, on the other hand, we may infer with equal certainty, from the opposite series of facts, that *water*, of the ordinary purity as found in the earth, is that which supports life the longest.

"But in what degree the artificial drinks that are taken by all nations injure or nourish, is a problem much more

difficult of solution, and yet well worthy of consideration; because intoxicating and inebriating potations of various kinds will continue to be taken, whether injurious or not, and partly because, such is the force of habit, that their omission by those persons habituated to their use, would be attended, in many instances, with evil consequences.

"Of strong potations, wine or beer, taken in moderation, appears to do less mischief than any others. Indeed, in civilized life, where many circumstances tend to depress the nervous system and weaken its tone, wine is truly a medicine. It enables the stomach to digest, and the heart to circulate the blood through the fountains of life, when their unaided powers would be inadequate to the due performance of their necessary offices. When taken to that degree which stimulates the system sensibly, it appears to do little mischief, if the habits of life are regular, and exercise is used; but beyond this point, or in slothful habits, wine commences effects of a serious kind: the body is enlarged, the face bloated, and the brain oppressed. Wine is, on this account, injurious to the aged, since it appears proportionably to stimulate the vessels of the brain in a greater degree than even spirituous liquors.

"The drinking of raw spirits, as it is the lowest and most invincible custom in which men indulge, so it is that which most certainly shortens life: the wine-bibber and the grog-drinker are occasionally found advanced in life, the dram-krinker never. The first is often distinguished by ruddiness and fulness, which, though by no means indicative of the most lasting health, still points out its present existence; and of the second class many consume several tumblers of spirits and water daily, without evincing material disorder. But the *last* is always pale and emaciated, with a nervous system so shattered that its ordinary functions can only be kept up by a constant repetition of the same baleful stimulus."

Whoso readeth the above let him ponder it well.

Destruction of Insects.—Mr. Read, of Regent Circus, Piccadilly, had leave given him to submit to the inspection of the Council his garden syringes for throwing currents of aqueous vapour or narcotic fumes over the surfaces of trees and plants infested with noxious insects, without the slightest injury to their bloom or foliage. By an ingenious arrangement of the nozzles of the syringes, the currents could be directed to any given point, without inconvenience to the operator; and water being introduced into the syringe in its liquid state, passed out through the nozzle as vapour or mist, settling on the plants as the gentlest dew. Mr. Read had the thanks of the Council for the favour of this inspection.

On Feeding Farm Horses.—In Roxburgshire the following plan of keeping farm horses is generally adopted:—As soon as there is a sufficient bite (which is not usually the case till the middle or end of May), the horses are turned out to grass at nights, and receive their usual allowance of corn—three feeds, of a gallon each, and perhaps a little hay during the day. This management continues till the clover is ready for cutting, a bunch of which is substituted for the mid-day feed of corn. When the turnips are all sown, and the hard work consequently over, most farmers reduce the allowance of oats, and give clover instead; and in the early part of harvest, when horses are generally quite idle, they often get no corn. When the reading-in of the crop commences they are again put up to corn; and as the clover is then generally all consumed, they receive tares instead as their mid-day meal; and when these are finished, corn or hay. During all this time, the horses have been constantly turned out at nights; but about the middle of October, or whenever the weather becomes chilly or unsettled, they are kept in the house, and they now receive full feeding—*i. e.*, three feeds of corn per diem, and hay *ab libitum*. This management is continued throughout the winter; but most farmers, during the short days, give oat or wheat straw instead of hay for two or three months, generally those of November, December, and January. Throughout the winter, too, most farmers give boiled or steamed barley at nights, twice or thrice a week; of this, each horse gets about two gallons. To such horses as will eat them, one or two Swedish turnips are also given once a day which tends greatly to keep them in condition. When Whitsunday again comes round, the horses are put out to grass, as I began by describing. Although there are many little differences in practice, yet the above is the general management of farm horses in this country, and, indeed, throughout all the southern counties of Scotland. The working hours are, in spring, summer, and autumn, from 6 o'clock till 11, and from 1 till 5. In the winter months they are from daylight till dark, with an interval generally of an hour, or an hour and a half, as the days lengthen.

Who is the best customer? or, "Look on this picture and on that:"—

	Home Use.	Exported (including to our Colonies.)
Woollens	£14,500,000	£ 5,500,000
Hardware	11,000,000	5,600,000
Cottons (exclusive of yarn)	20,322,812	17,164,001
Leather	8,000,000	400,000
Paper	14,000,000	500,000
Silks	6,000,000	800,000
	£73,822,812	£29,964,001

Extraordinary Ewe.—Mr. George Underwood, of Shenley Dens Farm, has, for the last ten years, had in his possession an ewe which has, during that period, yeaned the immense number of forty-four lambs! The animal died this year. The lambs were yeaned as follows:—1835, five lambs; 1836, five ditto; 1837, five ditto; 1838, four ditto; 1839, three ditto; 1840, five ditto; 1841, four ditto; 1842, four ditto; 1843, four ditto; 1844, five ditto—total, forty-four.

Hydrophobia Cured by Vinegar.—At Udina, in Friule, a poor man suffering under the agonising tortures of hydrophobia, was cured with draughts of vinegar given him by mistake, instead of another potion. A physician, at Padua, got intelligence of this event, and tried the same remedy upon a patient at the hospital, administering a pound of vinegar in the morning, another at noon, and a third at sun-set, and the man was speedily and perfectly cured.

Cure for Burns.—After opening the vesicles, if they are formed, the part is dipped in cold water, and then plunged, still wet, into flour, keeping it there for a minute or two; by this means a certain quantity adheres to the part, and prevents the access of the air. It is remarkable that the flour falls in scales from the surrounding parts the next day, whilst on the burn it remains adherent.—*Medical Times.*

Effects of Drainage on Human Life.—The Rev. Proffessor Buckland, at a public meeting held in Oxford last week, said that in the parish of St. Margaret, Leicester, containing 22,000 inhabitants, it appeared that one portion of it was effectually drained, some parts but partially so, and others not at all. In the latter, the average duration of life is 13 years and a half, while in the same parish, where the drainage is only partial, the average is 22 years and a half, thereby showing the frightful effects of a bad atmosphere.

In youth we are, unless some very peculiar circumstances control us, friendly, affable, and magnanimous, an indubitable evidence that *the man is good.* The *inner* man, like the negro, is born white, and it is only in course of life that it is coloured black.

Of all the qualities of the mind, prudence is the most useful.

Woman.—The morning star of our youth, the day star of our manhood, the evening star of our age.

HEREFORDS AND SHORT-HORNS.—A gentleman in Leicestershire, who keeps a large dairy of short-horn cows, wishing to make a comparison between them and the Herefords, bought a cow at the Rev. J. R. Smythie's sale in 1839. He soon found that the Hereford gave less milk than any of his short-horns; but as she was a fine looking cow, and good breeder, he continued to use her in his dairy. In the spring of 1843, he determined on making a more exact comparison as to the quantity of the milk given by the respective breeds. For this purpose, a short-horn cow was selected of the same age, and which calved within two days of the same time as the Hereford. The milk of each was carefully measured; the short-horn was found to give nine, and the Hereford six quarts at a meal. The milk was set up and churned separately; that from the Hereford produced *nine* pounds, and the short-horn not quite *five* pounds of butter per week. They stood in the same stall, were fed on the same description of food, and had been kept alike previous to calving. It has also been proved that two quarts of milk from a Hereford will produce as much as three from a short-horn cow. The gentleman is now crossing his short-horn cows with a Hereford bull, with a view of improving the quality of his milk.—*Hereford Times.*

WILTSHIRE CHEESE.—We are aware that many of our readers, following the amiable example of royalty, are becoming partial to a *peep* into the dairy; and by such the following extract will be read with interest:—"In making Wiltshire cheese, the milk is used as soon as it is brought from the cow; or if it is of too high a temperature, it is lowered by the addition of a little skimmed milk. The curd is, in the first place, broken with the hand to various degrees of fineness, according to the sorts of cheese intended to be made. For thin cheese, it is not reduced so fine as in the county of Gloucester; for the thick kind, it is broken still finer; and for loaves, it is almost crushed to atoms. In the first breaking of the curd, care is taken to let the whey run gradually off, lest it should carry with it what is there called the 'fat of the cowl.' As the whey rises, it is poured off, and the curd pressed down; after this it is pared or cut down three or four times, in slices about an inch thick, in order that all the whey may be extracted. It is then scalded in the same manner as Gloucester cheese. In some dairies it is the practice, after the whey is separated, to rebreak the curd, and salt it in the liquor; but in others it is taken, while warm, out of the liquor, and salted in the vat. The thin sorts are disposed, with a small handful of salt, in two layers; thick cheeses, with two handsful of salt, two layers; and loaves, with the same quantity in three or four layers—the salt being spread, and uniformly rubbed among the curd. In general, Wiltshire cheese is twice salted in the press, beneath which it continues according to its thickness; the thin sorts three or four 'meals;' the thicker ones four or five, and loaves five or six.—*Complete Grazier.*

CHARTER OF THE BANK OF ENGLAND.—This is of vast consequence. Government evidently intend to bring forward some measure conected with the Charter of the Bank of England. It is of immence importance to the agricultural districts that they should be plentifully supplied with a sound currency, and have banking establishments which will assist in those outlays of capital which improved husbandry may require.

"Money," says Lord Bacon, "is like manure, good for nothing unless it be spread." A national bank and one pound notes would feed the top of the soil and drain the bottom; £. s. d. would do more than theorists ever dreamt about to raise corn and feed cattle.

WASTE LAND IN IRELAND.—The Ordnance Survey represents the waste land in Ireland to consist, at present, of six millions and a quarter acres; of this two-thirds—rather more than four million acres—are reclaimable.

A beautiful WOMAN pleases the eye, a good woman satisfies the heart—the one is a jewel, the other a treasure.—*Buonaparte.*

The following article we copy from the *Mark-Lane Express*, and though it may be more properly addressed to the agriculturists of England—the farmers of Canada may find it well deserving their attention. There cannot be any separate interest between the manufacturing, mercantile, and agricultural classes—they must stand or fall—decline or prosper, together.

OBSERVATIONS ON AGRICULTURAL IMPROVEMENT.

Although we may justly pride ourselves on the circumstance of our manufactures being conveyed to every part of the globe, and of an amount of capital being invested in this department of industry in Great Britain of which no other nation can boast; yet, if the number of hands employed, or amount of capital so invested, great as it confessedly is, be regarded as the criterion of value in either respect, we believe the manufactures of the country will fall very far short of its agriculture in importance. It is impolitic, however, to seek an undue exaltation of the one or degradation of the other, as it is not by such means that the general improvement of the country can be promoted. The manufacturer should consider his fellow-countrymen, engaged in agricultural pursuits, as his best customers; and that, if through any class legislation, as it is now termed, the phrase being alike applicable to every party in the state seeking privileges peculiar to themselves, either class is depressed with a view of securing some advantage to the other, any such advantage must be extremely temporary in its duration, and ultimately injurious to the entire community. Into the comparative merits or disadvantages of free trade principles, as they are termed, it is not our present purpose to enter; but so long as a certain degree of protection, in the shape of duty on imported articles, is afforded to almost every branch of our manufactures, it seems nothing more than reasonable that the agriculturist should not be the only exception to the rule—that, in fact, our farmers should not be exposed to universal competition whilst every other class of producers was protected by import duties on the articles of other countries. * * *

The produce of the country is increased either by the reclamation of waste lands, by which a greater extent of surface is brought under cultivation, or by subjecting those lands already under tillage to an improved system of husbandry. In reference to the former of these objects much has already been said and written, and abstruse calculations entered into, showing the extent of reclaimable bog and mountain, as well as the returns which would be obtained by their being brought into cultivation, many of which, it is to be feared, are mere fanciful speculations, and calculated only to mislead. There is, no doubt, a considerable extent of surface now in an unproductive state, which, by a judicious course of operations, could be improved, and, at the same time, yield a suitable return for the outlay required for that purpose; still, we believe, that both the extent of those lands as well as the profits to be derived from them, have been greatly overrated, as some of our most sanguine improvers have found to their cost. The further improvement of the land already under cultivation is certainly, in the first place, the most important consideration; and after the maximum of produce has been obtained from it, then the reclamation of waste land may legitimately be considered.

The produce of the cultivated lands of the country has been greatly increased since the beginning of the present century, by the improvements which have gradually taken place; and the success attending the half measures already adopted should inspire the cultivator with additional confidence to persevere in the same course. Draining, weeding, and manuring are the chief requisites in good husbandry, combined with a proper system of cultivation; but there is a certain extent beyond which manuring cannot be safely carried, especially in the case of grain crops; an over-supply of that indispensable article being productive of an increased quantity of straw, with a corresponding diminution of grain. From five to six qrs. of wheat the acre, according to the nature of the soil, are usually

regarded as the maximum produce, even with an unlimited supply of manure; and in most cases, the produce is rather under than over that amount. Still, however, in gardens of cottagers, and other places where the soil is rich without the immediate application of manures, the produce has far exceeded this estimation, indeed in some cases almost doubled it. The powers of manure being therefore limited in producing this effect, it is a most important enquiry on the part of the cultivator to ascertain how it is produced, and whether that which has taken place in particular cases could not be more generally obtained.

It is admitted on all hands that the perfection of field culture is to assimilate it to that of the garden. The distinguishing characteristics of garden culture are the deep, intimate, and continued pulverization of the soil, of which the most perfect freedom from weeds is a natural consequence. Even between the growing crops the soil is seldom so long allowed to remain uncleaned as to allow a single weed to appear; and this continued stirring of the soil is also found to contribute powerfully to the growth of the growing crops. The importance of extending this intimate degree of pulverization to the fields has been more and more felt as improvements in agriculture have advanced. Its importance was first acknowledged and acted on by the celebrated Jethro Tull, who maintained that pulverization only was necessary to maintain the soil in the most productive state, and that the application of manures was only beneficial from their serving to maintain a greater degree of porosity in the soil. It is well known that, by perseverance in this system, Tull raised excellent crops for many years; but, in overlooking the important consideration that the growth of any crop deprives the soil of a certain portion of its ingredients, he, of course, fell into error, and by not applying the substances so abstracted again to the soil, it would soon be rendered unfit for cropping altogether. No doubt much of the value of manures, especially that of the farm yard, arises from their mechanical action upon the soil, in preserving it in a state favourable for vegetable development, by the admission of air to the roots of the plants; still the important consideration of restoring the matters to the soil exhausted by cropping, must not be overlooked, as the neglect of this circumstance overthrew Tull's otherwise admirable theory.

Before the soil can be brought into the state here described, unless in the most favoured situations, many obstacles are to be encountered. The most formidable of these is excess of moisture, which, when present, interferes with the proper performance of every operation, rendering it more difficult of execution, and always done out of season. When to these inconveniences is added the inferior produce which is, under any circumstances, obtained from wet lands, the importance of removing excess of moisture by drainage will be acknowledged. This is the great obstacle to tillage over a large proportion of some of the most, in other respects, fertile soils; and on its being thoroughly removed, pulverization afterwards becomes easy; but the details of these operations must be reserved for subsequent papers.

Before concluding these desultory hints on agricultural improvement, another important consideration may be mentioned; namely, the necessity of not only alternating the plants grown, with a view to preserve the fertility of the soil, but also of growing those which will afford the most profitable return, so often as they can be introduced without unduly deteriorating the fertility of the soil or the value of the crops themselves, as few of our cultivated plants will bear to be frequently repeated. The judicious cultivator will of course guard against the error of attempting to cultivate two crops of the same kind in immediate succession. The greater the variation in the nature of the crops grown, indeed, the more valuable will each crop individually be. Thus, clovers, when grown too frequently on the same soil, fall off more and more every repetition; and the same remark is applicable, though perhaps in a lesser degree, to our other cultivated crops. The introduction of plants into more general cultivation, which are now only partially grown in particular districts, is also often attended with the best results. The flax and hemp plants, for example, have been grown from the earliest period in particular districts of the United Kingdom, often with the most abundant success, still, strange to say, there are other districts in which they are *entirely unknown*. The flax, in particular, has lately attracted much attention, and is likely to gain ground even among the English farmers. *Though long cultivated in Ireland, it has* been clearly demonstrated by the Belfast Flax Improvement Society, that the system of management so long followed there was extremely defective, notwithstanding the existence of a public Board in that country more than a century, with an annual grant of upwards of £20,000 from the public purse, and having for its object the encouragement of the linen manufactures. The revival of the cultivation of the flax crop in Ireland has also attracted some attention in this country, and having had more than ordinary opportunities of forming an opinion as to the value of that crop, we have no hesitation in recommending it to the farmers of Great Britain, feeling assured that its occasional cultivation *will afford much larger returns than any* other crop.

J. S.

March 17th, 1844.

Superior Dutch Cheese.—Take sour loppered milk, skim off the cream, then set it over the fire in an *iron pot* —brass is poisonous. Let it remain until the curd rises, which will be when the whey is scalding hot at the bottom of the pot; there is a difference in the heat of the whey at top and bottom. Skim the curd into a basket which is best; let it remain six or eight hours to drain, then break the curd, (on a table,) as fine as possible; after which put the curd lightly in a stone jar, salting it to taste. Let it remain in the jar, stirring it twice a day with a wooden or round stick, keep it loose and light until it becomes palatable to the taste of the maker. The cheese acquires a disagreeable flavour if kept too long in the jar. Make the cheeses into small balls, and set them in a cellar. It should not be eaten the first few days, and is best flavoured from one week to two weeks old.

Prolific Ewe of the Leicester Breed.—Mr. Thomas Bell, farmer, of Randle Holme Hall, has at this time a ewe, seven years of age, that has had 19 lambs, which are all living and doing well. She brought them forth as follows: —At one year old she had 2 lambs; at two, she had 2; at three, 3; at four, 3; at five, 4; at six, 2; at seven, 3.

Guano and Turnips.—On reading in your last paper the statement made by John Henry Vivian, Esq., M. P., president of the Swansea Farmer's Club, respecting the failure of his turnip crop that had been manured with guano, it reminded me of a similar occurrence, which happened to a friend of mine in this neighborhood, and of which I was an eye witness. Hearing so much about the wonderful effects of guano as a manure, induced him to make a trial of it for part of his turnip crop; and not knowing any thing of its natnre, or of the mode of using it, he thought the best plan he could adopt was to sow the guano and turnip-seed together, as when bones are used. He accordingly did so; and after waiting for some time, *he wondered* why no turnips made their appearance, as they did in other parts of the field. On examing the drills, he was surprised to find that *some of the seeds* had chipped, and made an effort to grow, but had afterwards shriveled up. Others again, looked as if they had been kiln-dried, and lost their vegetative power. As a matter of course, the guano was blamed as the cause of the failure, and most heartily was it and every other new kind of manure abused. Nothing in his opinion would ever surpass good old farm-yard manure, and any body might have his share of guano, for what he cared about it. Happening to ride past at the time my friend had made this unfortunate discovery, I recommended him to have the part of the the field harrowed afresh and sown again, by way of experiment—for I ought to observe, he had applied the guano at the rate of rather more than 3 cwt. per. acre. *He adopted* my suggestion, and singular enough, in the course of some days, the turnips which had been sown broadcast, made their appearance from one end of the field to the other,

marking as distinctly as possible, the lines where the drill had deposited the guano in the first sowing. In due time, the intermediate spaces were horse-hoed, and the turnip-rows properly thinned. Nothing could exceed their luxuriance. Although sown three weeks later than the main crop, they soon overtook them, and became far superior in every respect– so much so, indeed as to be the subject of general remark in the parish. Hence I think it may be safely laid down as an axiom in the use of guano, and which has already been mentioned in the Gardener's Chronicle, *that it should never be applied in contact with seeds*, as it kills the embryo in germination.—*London Gardiner's Chronicle.*

The Canadian Agricultural Journal.

MONTREAL, JUNE 1, 1844.

We have constantly advocated the necessity and expediency of reasonable protection for Canadian agriculture, situated as we are on the frontier of a foreign nation, whose agricultural productions have scarcely any limits, and who could supply without difficulty, Canada with food for all her population, though they should not cultivate an acre of land. The question, however, is —should Canadians rather be encouraged to cultivate these necessaries for themselves, when they possess the most ample means to do so, and means that would be neglected and wasted if not applied to this purpose? There is another important question, how would the people provide the necessary cash to purchase foreign agricultural produce, if they produced nothing of their own? If the people of the United States were to remove all restrictions, allow a free interchange of commodities between that country and this, the farmers would never offer any objections; but until they do this, Canadian farmers will not cease to demand reasonable protection for their interests, and they will expect these interests shall not be sacrificed to aggrandize a few individuals who might profit by a partial trade with foreigners, to the ruin of the vast mass of the Canadian population. Undoubtedly there is danger of smuggling, and a breach of the law, and by farmers along the frontier, for whose benefit the law was passed; but this abuse might be prevented; and it ought to be checked, and the law enforced. The loss Canada has sustained in not having one American team pass through Chatham, this year, though 350 passed through the same place in 1843, is not so great as might be supposed. Not one of these teams come to Canada for any other purpose than to advance their own interests, or for their convenience or pleasure. They most probably come to sell produce in Canada, and take back cash for it, as their tariff is so excessively high that it would not admit of their taking any of our produce or British manufacture, unless they took them as smugglers. If production was encouraged in Canada, we should be able to produce more than double what we do at present, and that would more than equal all that has ever been imported from the United States in a year. If Canada is rendered productive in corn and cattle, as she is capable of, her people will not feel their neighbours' visits any loss should they discontinue to cross the lines at all points, as in Chatham this year. We are not opposed to commercial intercourse, established on a fair and equitable principle of reciprocity, but we are opposed to it on any other principle. Canada will never become rich by any other productions than her own. No other country, however favourably disposed towards her, will give her any gift without paying for it, and she must have wherewith to pay or she cannot purchase. We cannot by any tariff that will be established here, raise agricultural produce to exorbitant prices, but a properly proportioned tariff will have the effect of giving some degree of steady demand and prices in our markets—what the farmers so much required hitherto. The protection farmers have by the present tariff is very trifling, but it is *something*, and will assure a more steady market for our cattle in particular, and this was very necessary. Cattle when prepared for market, if not sold at once, are a great loss to the owner; and under former circumstances, when cattle from a foreign country might be imported to any extent, it frequently happened that the market became so glutted it was impossible to sell at a fair value. This state of things was not favourable to any class of the community. A reasonable price and steady demand is what will encourage the farmer, and will not injure any other interest. Extremely low prices for provisions are not by any means a proof of the prosperity of a country or of the comfort and happiness of the labouring class. Provisions are dearer in England than in any other country on earth, and in no country do the employed labourers receive so high wages, and are better clothed, lodged, and fed. The following table will show the miserable wages paid in other countries to labourers, where provisions are very low:—

	Wages.	Hours.
England	11s. 0d.	69
France	5s. 8d.	72 to 84
Switzerland	4s. 5d.	78 to 84
Tyrol	4s.	72 to 80
Saxony	3s. 6d.	72
Prussia	2s. 6d.	94

From this it appears that in Prussia, where provisions are the cheapest, the hire of a man for a whole week, working fourteen hours in each day, is not more than the hire of one man for twelve hours in Canada, and often not even this, as men get over that wages here. In Prussia provisions are not low in proportion to wages.

In conclusion, we would observe, that all who are acquainted with this country admit that agriculture must form the basis of her wealth and prosperity, and it must be equally manifest that her agriculture is now in a most languishing state, requiring a better system of management to be introduced. The soil and climate are most favourable, and notwithstanding all these facts before us, objection is constantly made to granting the smallest degree of protection and encouragement

to agriculture, though it is the only means by which it can be rendered prosperous and improving. The farmers of Canada cannot compete with foreigners of the United States, who bring produce here to procure cash, which they cannot sell it for it in their own country. Such a competition would be unequal, unjust and ruinous to our agriculture, and must check all improvement.

It would, we conceive, be a very equitable law if a regulation could be established that would allow any Canadian merchant who would export from Canada to the United States the produce of Canada or of British manufactures and dispose of them there, that such merchant should be allowed to import from the United States into this country an equal amount of value of the produce of the United States whatever it might be. This would be some approach to trade on an equitable principle of reciprocity. We shall advert to this subject again.

We have seen a notice of a report respecting banking in Ireland by which it appears that the banks established in that country are totally inadequate to afford legitimate banking accommodation to the people. The whole amount of paid-up capital, or money engaged in banking purposes in Ireland is only about £1 18s. 6d. a head, on the entire population, while in Scotland the banking accommodation amounts to about £16 per head for the population of that country. This is a vast difference indeed, and the consequences are perfectly apparent in the prosperity of the latter country compared with Ireland. Perhaps the paid-up capital, or money engaged in banking in this province, would afford a greater amount a head on the entire population than in Ireland, but though it may exceed that of Ireland, we are convinced it is very inadequate for the purposes of the Canadian people to give them any favourable chance of advancing in prosperity as they might do had they the means to improve the advantages which this fine country offers them. England and Scotland has the largest amount of banking accommodation of actual paid-up capital of any country on earth, and the improvement and prosperity of both countries is proportionably greater than that of any other country. The great principle necessary for insuring the general prosperity of Canada is, command of capital and its skilful application and employment in permanent improvements that will reproduce the money employed. This, we take upon us to say, can in no way be so certainly effectual as in the judicious improvement of our lands and agriculture. The improvement of our cities and towns will not reproduce capital, as the cultivation of our lands would do. It may be a profitable investment of capital to those who expend it in building houses, but it is not so for the general interests of such a country as this. The profits that pay rent in the city must be derived from the productions of the country or chiefly so—and therefore capital that is employed in augmenting the valuable productions of the country is much the most useful application of it for the general benefit of this community. This is a proposition that is not likely to be admitted by those who have power over the capital that is in the country—but it is true nevertheless. In no way can capital be employed so beneficially as when it creates a new produce that was not previously in existence. It thus gives means of subsistence to persons who are occupied in producing, and is advantageous in many ways. In Canada, above all countries, the capital that is applied to the employment of labour on land is the most certain to be productive of general good, when we have a constant supply of labourers brought here annually who have no other means of support except the wages for their services—and connected as we are with England, that would require all the spare produce we could raise from our lands and labour, and pay us back our capital by a higher price for this produce than we could obtain for it in any other market on earth.

In Canada it is in the farmer's power to make as good butter as in any part of the world, and as good cheese as in any part of North America. We say this advisedly, and from experience. Of course our cattle must be selected judiciously, our pastures good, our dairies of proper temperature, and furnished with suitable utensils, that will be kept perfectly and constantly clean—and the management of the milk, the cheese, and butter making, must be conducted with skill by persons who have practical experience in such matters. All these circumstances are necessary to the making good butter and cheese, and the most essential requisites are a good dairy and suitable utensils—without these we cannot have a good article. We believe that in Canada, there are very few farmers that have good dairies and suitable utensils, and this is a chief cause that we have not a larger quantity of first rate butter and cheese. The climate is not so hot here as in the United States, where they make good cheese—but our climate is so hot as to require that our dairies should be so constructed that a regular temperature might be constantly kept up in them, and in the room where the cheese is dried and stored. In all dairies there should be two sets of dishes or pans for milk, in order that one set might be prepared by boiling or scalding while the other would be filled with milk. This would give time for the vessels to cool and be aired before using.

We shall in our next number give a list of all the utensils that are generally to be seen in a well furnished English dairy. This furnishing would cost something in the commencement, but they would continue good for a long time, provided they were kept clean and as they should be. It is discreditable, and unprofitable to our farmers that we should not be able to export from this country as good cheese and butter as any exported from the United States. We can also have abundance of beef and pork to export if we employ the means in our power. The country may be

rich in productions if we put it to the uses for which it is adapted. Agriculture is left to shift for itself, and while it is so we need not expect it will be in the most improving and prosperous state of productiveness. It is matter of astonishment to us that the improvement of agriculture should not be more interesting to all who aught to understand its vast importance to this country. We have constantly urged the true friends of this province to interest themselves in promoting the improvement of agriculture amongst those who are most ignorant of the art. It is not the farmers of the old country who settle here that require much instruction, but the French Canadian farmers who had not the same opportunities to learn the art of agriculture that emigrants from the British Isles have had. We again recommend this subject to the consideration of the friends of Canada.

Great efforts are being made in Britain to improve roots and grain by a choice of the best descriptions of seeds of every species. This is a matter of great importance in agriculture and very much neglected in Canada. Grain and other seeds are frequently mixed with seeds of weeds, and also different varieties of the same species are mixed. We have seen as much as five or six varieties of wheat growing mixed in the same field. It must deteriorate the sample, and lessen the value of the crop to the farmer to have it thus mixed. The "*Mark Lane Express*" of the 8th April has the following observations on the subject; they are very much to the purpose:

Numerous recorded experiments prove, not only that some particular kinds of crops, both grain and roots, are better adapted to one description of soil than another, but also that a very great difference exists in the prolific qualities of grain, and root seeds, in which there is not a sufficient distinction between others of the same kind as to warrant their being styled different varieties. In fact, if quality and quantity be considered, there will be found to be a vast difference between the produce of two different samples of seed or grain, in which there is no perceptible difference to the eye. This admitted, and it will not be denied by practical farmers, how vastly important, not only to the inexperienced, but to the experienced agriculturist, to be enabled to rely with confidence on the parties from whom he purchases his seeds! We believe there is no department connected with agriculture in which so much charlatanism is practised as in the puffing off and sale of every description; not even in horse-jockeying.

It is in vain to clear the land in preparing it for a crop, if we sow the seeds of weeds with the grain we wish to cultivate. There is nothing more unprofitable, and discreditable to Canadian agriculture, than the weeds that are allowed to prevail to so great an extent, in crops, in pastures, and in waste places. Weeds may, no doubt, be converted into manure, but so might other plants that would grow instead of weeds. If what the earth produces was returned to it again, after it has served for food to man and other animals, the lands might be kept in a state of constant fertility. The Creator has so ordered things as to have it in the power of man to keep up the fertility of the land from its own productions, if judiciously managed. Land will not of course bear to be robbed of all its produce year after year, without making adequate returns to it in the shape of manure, summer fallow, or rest. The earth is bountiful of her gifts, but she cannot be always giving without receiving. We believe a farm under good management—a due proportion in tillage, meadow, pasture, and a proper rotation of crops established upon it, might be maintained in sufficient, fertility and be constantly improving, provided a due proportion of stock was kept upon it. A great help of manure may be obtained by forming compost heaps for top-dressing grain and meadow. Top-dressing grain, or harrowing in short manure with the seed, is a good plan, but it is not always possible to cart manure upon the soil at the particular time it is required in spring. We believe a load of short manure, or compost, will produce more good applied as top-dressing, to a young crop of grain, or meadow than it would in any other way. It is put near the roots of the plants, and is washed into the surface of the soil, where it appears it is most suitably placed to supply nutriment to the plants. It is by practical experience that we can ascertain the best mode of applying manure. For the permanent improvement of land it is best to plough in manure, but for a crop of grain and the succeeding crop of hay, top-dressing will produce the greatest amount of effect.

The following letter is one of a series which is now being published in the *Mark Lane Express*, and we shall occasionally copy those which we conceive would be interesting to the Canadian farmer. Communications of this nature are very useful to the agriculturist, as they are sure to dispose them to think of matters connected with their business, which they might otherwise give very little attention to, though it might be of much consequence to them and have a great influence upon their success, and amount of their profits.

OBSERVATIONS ON THE MANAGEMENT AND APPLICATION OF MANURES.

BY A PRACTICAL FARMER.

Whatever difference of opinion may exist among scientific men as to the exact proportion of each of the organic elements derived from the atmosphere, from the soil, and from water, the origin of the fixed or inorganic portion of plants does not admit of doubt. When, for instance, lime appears in combination with carbonic acid or sulphuric acid in the ash of plants, we are at no loss for its source. Plants are indebted to the soil for all the inorganic matters they contain; and an important point, on the part of the farmer, to be attended to, is to secure the presence of those ingredients which have already been seen to be essential in the vegetable economy. Attention to the absence or presence of the necessary ingredients for particular crops would prevent much disappointment and loss, and do away with the indiscriminate application of substances as manures to our cultivated crops, without any consideration as to the precise substances really required to effect the object in view.

The inorganic matters of plants are composed chiefly of the following elementary substances in combination with acids:—*Calcium*, *Magnesium*, *aluminum*, *sodium*, and *potassium*; which, combined with oxygen, form

lime, magnesia, alumina, soda, and potash, so well known in the arts; also *chlorine, phosphorus, sulphur, silicon, and iron.* Other elementary bodies occasionally present themselves in small quantity, but they do not appear to be essential constituents of plants. Nor are they, with perhaps the exception of sulphur, any where found in their elementary or uncombined state. The relative proportions in which the several compounds thus formed exist, is of more importance to be ascertained than that of the elements from which they are derived. The following table exhibits the proportion in which they are present in a few of the cultivated crops, 1,000 parts of each being taken.

	Wheat.		Barley.		Oats.		Turnips.	Carrots.	Potatos.	Rye-Grass.	Beans.	Peas.
	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.				Hay.		
Potash	2.25	0.20	2.78	1.80	1.50	8.70	23.86	35.33	40.28	8.81	4.15	8.10
Soda	2.40	0.20	2.00	0.48	1.32	0.02	10.48	9.22	23.34	3.94	8.16	7.39
Lime	0.06	2.40	1.06	5.54	0.86	1.52	7.52	6.57	3.31	7.34	1.65	0.58
Magnesia	0.00	0.32	1.80	0.75	0.67	0.22	2.54	3.84	3.24	0.90	1.58	1.36
Alumina	0.26	0.90	0.25	1.46	0.14	0.06	0.36	0.39	0.50	0.31	0.34	0.20
Oxide of iron	—	—	—	0.14	0.40	0.02	0.32	0.33	0.32	—	—	0.10
Oxide of Manganese	—	—	—	0.20	—	0.02	—	0.60	—	—	—	—
Silica	4.00	28.70	11.82	38.56	19.76	45.88	3.88	1.37	0.84	27.72	1.26	4.10
Sulphuric acid	0.50	0.37	0.59	1.18	0.35	0.79	8.01	2.70	6.40	3.53	0.39	0.53
Phosphoric acid	0.40	1.70	2.10	1.60	0.70	0.12	3.67	5.14	4.01	0.25	2.92	1.90
Chlorine	0.10	0.30	0.19	0.70	0.10	0.05	2.39	0.70	1.60	0.06	0.41	0.38
Total inorganic matter in 1,000 parts	11.70	35.18	23.49	32.42	25.80	57.40	63.03	66.19	82.83	52.86	21.36	24.64

The difference in constitution between the grain-crops and root-crops is manifest by glancing over the foregoing table, and will in some degree account for the different effects produced by each of these classes of crops on the soil. Some idea of the constitution of plants has been also afforded, and the inquiring farmer will not fail to see the necessity which exists to become likewise acquainted with the composition of the soils on which they are to be produced. The ingredients to be applied as manures then become apparent, and hence the foundation of a rational and economical system of manuring—rational, as supplying the particular matters required, and economical, inasmuch as those only are supplied.

The advantages of such a system being generally acted upon must be evident to every thinking mind; and the rapid progress in the path of improvement in this department of agriculture which has lately taken place, encourages the hope that the advent of such a system is more closely at hand than could have been anticipated some time ago. The physiology of vegetables is not now mere matter of speculation, as in times past; the component ingredients of the different classes of vegetables with the source from which each is derived have also been ascertained, at least so far as is necessary for practical purposes. The various kinds of manures, too, which are applied for the purpose of increasing their growth have often formed the subject of analysis; but in regard to them the same degree of precision cannot be acquired, the same substance being very different in quality, under different circumstances; and hence the impropriety of arriving at general conclusions with regard to the composition of manures from isolated cases of analysis. In the case of soils the variation in quality is still greater than in that of manures. In their analysis, moreover, the greatest accuracy is required, in order that any conclusions of practical value may be deduced from them. The quantity of some of the inorganic ingredients of plants is so small, though their presence is not the less essential, that a due supply might be contained in the soil, and still not be found in any appreciable quantity in a specimen submitted to investigation. While, therefore, chemical analysis is calculated to do so much for the farmer in this department, it must be recollected that before such analysis can be of any value, they must be strictly accurate, otherwise the deductions from them will be calculated to mislead. It is, indeed, no difficult matter to perform an analysis, in the ordinary acceptation of the term, which is merely directed to the discovery of the predominating ingredients; but it is frequently the absence or presence of those contained in small quantity only which it is most important to ascertain. The fertility of soils being dependent on the facility with which they can supply certain constituents of plants, it is only the most refined analysis that, in many cases, is capable of determining whether they are present or not; much less of explaining to what their peculiar excellencies or defects may be owing, what ought to be added to render them productive, or why, in short, certain remarkable effects are produced by the addition to them of organic or inorganic matters.

This subject admits of illustration by a familiar example. Gypsum is well known to be essential for the production of red clover in luxuriance; but such a small quantity as 2 cwt. to the acre is found to be amply sufficient for the purpose. Now supposing this quantity to be equally distributed through every part of the soil to the depth of twelve inches, the proportion found in a pound weight of soil would be about half a grain; and in one hundred grains (a very common quantity of soil to submit to analysis) the quantity of gypsum present would not be more than one seven-thousandth part of a grain—a proportion which only the most careful conducted analysis would be able to detect, and yet the detection of it would be of the utmost importance were it desired to know whether gypsum should be applied to that particular soil. While, therefore, chemistry is calculated to do much for agriculture, it is important that the farmer should know in what way it is likely to serve him. A very slight acquaintance

with the first principles of that science will often enable him to obtain results of practical value; still it has been seen that such knowledge will not always avail him. The "chemistry for farmers," may emphatically be termed the chemistry of nature," a knowledge of which may be acquired without much difficulty.

Before concluding these general remarks, and entering on the consideration of the various manures which are applied to the soil, a few words of application will not be out of place. It has been seen that plants are in a great degree dependant on water and the atmosphere for their support, and they should teach the farmer the necessity of securing a due supply of them to his crops. It is especially important that the individual plants should stand at such a distance from each other as to admit the air freely to every part of the foliage. The soil too should be pulverized to as great a depth as possible, in order that the air may permeate it, and further to enable the fibres of the roots to extend themselves. The same arrangements secure a due supply of moisture, and also guard against its detention longer or in greater quantity than is required for the purpose, as minute pulverization is equally favourable to evaporation and absorption. The dependance of plants on the atmosphere for their support was well known upwards of a century ago to the celebrated Jethro Tull, the father of drill-husbandry; but that he did not entertain very correct ideas on the subject is apparent from the fact of his conceiving that pulverization only was necessary in cultivation, to admit freely air and moisture. He persevered in this practice for a length of time, and brought his system of drill-husbandry to great perfection; but, as in every case in which general conclusions are drawn from a limited observation of facts, Tull was obliged to abandon his theory.* The husbandman at the present day, however, would do well to follow his example, in securing a due supply of air to his crops. On looking over the crops of the country, especially drill crops, which usually have a large system of leaves they are generally found growing so close together, from a mistaken idea that an increased produce will, in this manner, be obtained, as to exclude the free admission of air from among them; and also effectually prevent the free introduction of the implements of tillage, the action of which is essential to loosen the soil about their roots. Could farmers be induced to pay so much attention to the subject as to compare the produce of equal portions of their crops, where a proper system of tillage and a due application of manure had been given, the one standing, say in the case of turnips or potatoes, at intervals of ten or twelve inches apart, and the other at the more common distance of six or seven inches, a marked change in the cultivation of their crops in this respect would soon be apparent; while they are not warranted in going the whole length with Tull, who considered the direct application of manures unnecessary, the preceding observations would tend to show that to secure a due supply of those elementary substances which form so large a portion of the vegetable structure, is no less important than the direct application of matters which are contained in plants in so much smaller quantity.

Liberty is not a paper that we see stuck up at the corner of a street. It is a living power which we feel within us and around us, the protecting genius of the domestic hearth, the guarantee of social rights.—*De la Mennais.*

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* The reader is referred for further information on this subject to an Essay in the "Quarterly Journal of Agriculture."

The following is a part of an article which appeared lately in the *Morning Chronicle*, in reference to the probable results to be expected from the completion of the improvements now being made on the line of the St. Lawrence, from Montreal upwards. That this grand water communication, when finished, will have employment to a great extent, there cannot exist a doubt, and if to the extent contemplated by the *Morning Chronicle*, it will yield an ample revenue for the expenditure. At all events, we would not be worthy of the country if the water communication now in progress was not completed. It will open up an immense extent of most fertile country to settlement and production, and it will encourage and extend an interchange of native produce and British manufactures, that must be beneficial both to this country and to the British Isles. It must also bring a considerable portion of foreign commerce this way, as the cheapest and most easy to a sea-port, from the back States of the Union. Canada possesses within herself a boundless extent of fertile soil that would be able to produce a great amount of value for exportation. Easy means of communication to all parts of the country, by rivers, canals, rail-roads, and other roads, will greatly encourage a better system of agriculture, by diminishing the cost of transporting the produce to market, and affording the farmer what he may have to purchase at a cheaper rate:—

Mr. Ryan estimated the probable income of the canal at 394,937 dollars, and calculates the annual increase at 10 per cent. Messrs. Davis and Swift do not adopt his conclusions, but suppose the following estimate of the second year after the completion of the canal not to be extravagant:—

ITEMS.	TOLLS.
Lumber, in value 334,720 dollars, equal to 33,472,000	dollars. 33,472 00
Salt, 207,700 barrels	37,386·00
Flour, 400,000 barrels	60,000·00
Wheat, 2,237,000 bushels	100,650·00
Sugar, molasses, and tobacco, 8,625 hhds.	10,781·25
Merchandise, 38,298 tons	76,576 00
All other articles	45,000·00
	363,865·25

—*Morning Chronicle.*

There are ample means in the power of most farmers to increase vastly the quantity of manure, if they would only take advantage of the means at their disposal, and make composts, by mixing soils, ashes, &c, which answer all the purposes of farm-yard manure in the production of crops, if judiciously applied. Of course the compost intended for one description of soil must be different from that which would be suitable for another. The sort fit to be applied to moss soil would not be the best for clay, or sand, but this the skilful farmer will understand. We give the following from "Dana's Prize Essay, on Manures," which we recommend to the attention of the farmers. No doubt the quantity of ashes mixed in the compost to be applied to one acre would, if, applied alone

produce a great improvement in any soil, but mixed with any other substance, directed by Dr. Dana, it must be much better suited to produce improvement. Moss soil made into compost will be suitable for all soils that are not moss, and sand or clay, will answer for compost intended for moss land:—

And so among your first attempts at improving your worn-out lands, always supposing you have not a barn-cellar, hogs, and swamp-muck, so aptly called by one of your own self-made practical men, the "farmer's locomotive," I presume you may like to know the proportions in which you may mix swamp-muck and alkali. You can hardly go wrong here by using too much; the great danger is, you will use too little alkali. But calculating on the proportion of mould in fresh-dug swamp-muck, or peat, it may be stated as a rule, grounded on the quantity of quickening power in a cord or stable manure, that every cord of swamp-muck requires eight bushels of common ashes, or thirty pounds of common potash, or twenty pounds of white or soda ash, to convert it into manure equal, cord for cord, to that from your stable. Dig up your peat in the fall, let it lay over winter to fall to powder, calculate your quantity when fresh dug, and allow nothing for shrinking in the spring; when your alkali is to be well mixed in with the mould, and, after shovelling over for a few weeks, use it as you would stable manure.

These quantities of ashes and alkali are the lowest which may be advised. Three four times this amount may be used with advantage, but both the quantity of alkali, and the number of loads per acre, must and will be determined by each for himself. It is a question of ways and means, rather than of practice. But supposing the smallest quantity of ashes or of alkali to be used which we have advised, then at least five cords of the compost should be used per acre. This may be applied to any soil, light or heavy. But there is another form of this same swamp-muck and alkali, which should be used only on light, loamy, sandy soils, to produce its greatest benefit, though even on heavy soils, if not very wet, it may be used with great advantage. This is a compost of one cord of spent ashes to three cords of swamp-muck. This is decidedly the best mixture which has yet been tried. We have in this all that mixture of various salts and mould which plants want, and both by the action of the mould and by that of the air, the alkali of the spent ashes, which no leaching would extract, is soon let loose, and produces all the effects of so much clear potash or soda.

I have thus, reader, given you a few of the ways by which you may convert your peat bogs and swamps into manure, when you have neither cattle nor hogs. I have not thought it worth while to go into this subject further, and give you directions for lime and salt, or other matters which might be used. I have given you the most common, and those well known and at hand. All you want, then, to apply these principles of forming composts, is to give them that little attention which will enable you to understand them. And the rest must be left to your practical common sense, without some share of which, farming, like every thing else, would be vanity and vexation of spirit.

I would here take my leave of you, and in the hope that we may again meet to have another talk. There are a great many other points relating to manure, which can be understood only after we have made ourselves somewhat acquainted with the chemistry of soil. Then, having explained that, before the full action of manure can be understood, we must proceed a step further, and consider what changes take place in growing crops, and the effects of these growing crops upon soil and manure. The quantity and kind of salts they extract, and how soil is exhausted. This would lead to the consideration of the quantity and kind of manure to be applied to different soils, and the value of different manures. But there is one other very important thing belonging to our subject. Crops exhaust land but fatten animals. Now this last properly belongs to that part of our subject relating to the changes occurring in vegetables and their power of exhausting the soil. It will be seen, therefore, that the whole covers the ground called Agricultural Chemistry. This essay is only its first part. If it meets your acceptance, I trust it may encourage its author to draw up its second part on soils, and its third part on the effect of crops on soil, and their value as food for animals.

ON FERTILIZERS.

By Cuthbert W. Johnson, Esq., F.R.S., Editor of the "Farmer's Almanac and Calendar," the "Farmer's Encyclopædia," &c.

London: J. Ridgway, Piccadilly. 1844. Second Edition.

Our object in calling the attention of our readers to this admirable volume, will be at once perceived by all who are interested in the cultivation of land, particularly by those who are aware that a manual such as this before us, which treats of each *fertilizer* separately, and in a truly comprehensive manner, was much wanted in the present day. We do not wish to depreciate any of the works on chemistry, as applied to agriculture, or as applied to the manures for the earth; many are deserving the highest praise for industrial research, and their developement of new powers for the improvement of vegetation; but many—very many—were too complicated, and required a knowledge of chemistry to be as requisite to understand them as it requires a knowledge of good farming to produce rent-paying crops.

The application of science to the useful arts, in the great departments of chemistry, has been as close and untiring as its results have been extraordinary; but its terms have been a sealed book to the farmer for any useful purpose, unless he received the education of, or studied chemistry, and in the following passage which we quote from the first chapter (the "History of Manures,") our view will be borne out, as to those mysteries of chemistry which every one conceives he has discovered, but which, as yet, no person has been able satisfactorily to explain.

"These difficulties with regard to vegetable chemistry and the phenomena with which it abounds, are, in fact, not few in number: they meet us in every investigation, from the period when a seed first begins to germinate, through its growth, its ripening, its decay; and, finally, when the putrefactive fermentation, by reducing the whole mass of vegetable matter to its constituent earths and gases, puts an end to every trace of vegetable substance, we are still obliged often to content ourselves with examining and noting the phenomena we cannot chemically explain. These mysteries were observed at the very dawn of modern chemistry: that the same mass of earth, the same water, the same atmosphere, could, at the same time, produce the flour of the wheat, the opium of the poppy, the oxalic acid of the sorrel, the vegetable poisons of the hemlock and the nightshade, the sugar of the beet root, and the timber of the forest, none of which are contained in either the soil, the water, or the atmosphere, were matters of serious and undivided attention; and although the ablest chemical philosophers have investigated these vegetable mysteries, the harvest they have

reaped, though highly important, has hardly been worthy of the labourers."

In the present work of Mr. Johnson, the farmer is brought at once to the consideration and applicability of the manures necessary for the land: whether it be to the peat and peaty land and the wide fens in Lincolnshire, or the *weald* or *oak clay* of Sussex, Surrey, and Kent, each manure is treated of distinctly, and its best uses defined. Organic, earthy, and saline manures are explained in seporate sections; the permanent advantages, experiments, and analysis of each, are plainly brought to the simplest comprehension, and the entire wound up with the adaptation of manures for different soils; forming one of the most complete and valuable publications that has issued from the press for many years. We will take opportunities from time to time, of giving extracts from this important work. At present we will close with the following interesting particulars as regards irrigation and water meadows:—

"It is easy to see why it is that the impurities of river water are so nourishing to the meadow grasses.

For instance, if the water contains sulphate of lime (gypsum,) which it certainly does if the water is *hard*, it must, under ordinary circumstances, on this account alone, be highly fertilizing to the land it irrigates, since many of the best grasses contain this salt in very sensible proportions. Calculating that one part of sulphate of lime is contained in every two thousand parts of river water, and that every square yard of meadow absorbs only eight gallons of water (and this is a very moderate allowance, for many soils will absorb three or four times that quantity) then it will be found that by every flooding more than one hundred weight and a half of gypsum per acre is diffused through the soil by the water; a quantity equal to that generally employed by those who spread gypsum over their clover, lucern, and sainfoin, as manure, either in the state of powder or as it exists in ashes. And if we apply the same calculation to the organic substances, ever more or less contained in flood waters, and allow only twenty parts of animal and vegetable remains to be present in a thousand parts of river water, then we shall find, taking the same data, that every soaking with such water will add to the meadow nearly two tons per acre of animal and vegetable matters, which, allowing in the case of water-meadows, five floodings per annum, is equal to a yearly application of ten tons of organic matter."

We give the following extract from the *Mark Lane Express*, on the management and application of manures. We shall continue to copy from the same article occasionally as it is a subject of some importance:

The object in the application of manures being to increase the cultivated produce of the soil, it is important, before proceeding further, to ascertain how this is effected. Plants, during their growth, are dependant both on the soil and the atmosphere for their support, each furnishing a certain portion of the necessary ingredients for the purpose; and further, when subject to the test of analysis, plants are found to consist of a certain number of substances common to every vegetable production, and of certain others, some of which are peculiar to particular plants. Thus, the *elementary* or simple substances, *oxygen*, *hydrogen*, *carbon*, and *nitrogen*, are present in every case in different forms and various proportions, constituting the great bulk of the vegetable structure, so as to be denominated the bases of all *organic* matter.* In the process of combustion, these matters entirely disappear, although they form from 88 to 99 per cent. of the whole weight of plants, even after being dried. The quantity of ashes, or residuary matter after burning, which constitute the *inorganic* portion of plants, is therefore seen to be exceedingly small; in fact, so inconsiderable as to give rise to the opinion formerly entertained by physiologists that this inorganic or *fixed* portion was merely adventitous, and of trifling moment, but subsequent investigations have shown that the presence of this portion is quite as essential to the healthy development of the vegetable structure as those other matters which enter more largely into its composition.

A striking circumstance connected with this part of our investigation is that of the constancy of the precise proportion of the elementary substances before enumerated in the same species of plants. This proportion is invariably maintained, however distant the localities from which different plants of the same species may be obtained, provided they are healthy and fully developed. What is more remarkable still, these, with one exception, namely carbon, are known to us only in the form of gas, the first and last of which, oxygen and nitrogen united, form the air we breathe; and the first and second, oxygen and hydrogen combined in certain proportions, form the waters, which constitute so large a portion of the globe. At the ordinary temperature of the atmosphere, when separate, they form invisible kinds of air, each possessing very peculiar properties and distinguishing characteristics; but, as we have seen, in combination with each other, they form a very large proportion of the vegetable forms which surround us, from the oak of the forest which has braved the blasts of centuries, to the sensitive plant which recoils even from the slightest touch. In consequence of these substances not being appreciable to our senses, withou tthe aid of scientific investigation, little is known practically of their properties and effects in a separate state. This remark, however, does not apply to carbon, which, being a solid substance, and easily obtained in a tolerably pure state, many of its most important properties are familiar to every one. The diamond is well known to be the purest specimen of carbon, but it may be obtained in a tolerably pure state, by burning wood in a close vessel, or in a heap, covered so as to exclude the air. When the carbon or charcoal thus obtained is again burned in the open air, it disappears, with the exception of the *fixed* portion of the vegetable structure, to which allusion has been already made. It then in combination with the oxgen of the atmosphere, assumes the gaseous form and becomes an acid, being hence known by the name, carbonic acid gas.

Such then, are the substances forming the organic portions of the apparently simple but really complicated structure of vegetables. It is not necessary that we should enter more at length into their properties in this place, as we shall come to treat this subject more in detail in another series of papers on "the Application of Chemistry to Agriculture," to appear in future numbers of the *Express*. An important circumstance connected with this subject under consideration, must not, however, now be overlooked; namely, that the elementary substances just enumerated form also the basis of animal as well as vegetable matters, differing merely in the proportions in which they exist; nitrogen being much more abundant in the animal than in the vegetable structure. Hence the adaptation of each of these as food for the other. The different classes of vegetables on the surface of the earth serve, in the first place, as food for the various races of animals inhabiting the globe; and these, in their turn, contribute to the support of vegetable life, both by their excrement during their lives, and by the decomposition of their bodies after their death. What a wonderful provision of nature is here unfolded to our view! In the great laboratory of nature nothing is useless or allowed to go to waste; for no sooner are any of the component parts of the numerous wonderful forms which surround us disengaged from the state in which they previously existed than they instantaneously enter into new combinations, calculated in some manner to preserve that equilibrium so essential to to the existence of the almost innumerable classes of beings which people our globe. Thus the decomposing animal matters, which would otherwise prove an intolerable

* It may be here necessary to apprise the less scientific portion of our readers that the term *organic* is applied to all animal and vegetable substances, these being composed of pores, vessels, and fibres, which are the *organs* of life: From this explanation the signification of the term *inorganic* will be easily understood.

nuisance, are, by an admirable arrangement, employed in contributing to the growth of our cultivated crops, and thereby, indirectly, again to the means of our sustenance. This cycle of changes is therefore carried on in unceasing activity throughout the entire scale of living beings, each, in its turn, supplying the matters from which the food of the others is derived.

The elementary substances, oxygen, hydrogen, carbon, and nitrogen, have now been seen to comprise the greater part of all vegetable structures; but, as has been already remarked, the *inorganic* or *fixed* portion obtained from the residum, after burning, is not less essential to healthy vegetation. Existing in such small quantities in plants, it was long supposed to be of no essential or vital importance, and was rather accidentally present, being derived from the soil on which they grew; but further experience showed that in all cases in which the vegetation was healthy, the quantity of inorganic matter was remarkably constant in the same species of plants, even without regard to the constitution of the soil on which they were produced. If the required matters did not previously exist in the soil, no doubt they could not at all have been present in the plants grown on it, but then such would not have been *healthy* or fully matured plants. If adventitious, as had long been supposed, it might be considered that different plants on the same soil would each contain equal quantities of the inorganic matters peculiar to that soil, having had similar opportunities for absorbing it; but there is nothing now better ascertained within the whole range of physiological science than that different species growing even upon the same soil, will absorb various quantities of earthy matters, the precise proportion being constant in each; and differing most in the case of plants being most remote in their natural affinities; thus leaving it no longer doubtful that such matters really formed an esential part of the vegetable structure.

The mode of preparing manure, for which, we believe, a patent has been granted in the United States, may afford some useful information to farmers. We know that the quantity of manure might be vastly increased by forming compost heaps, and saving the urine, and drainings for the compost heap, and mixing it with it.

COPY OF BAER AND GOUILART'S PATENT.

To all whom it may concern: Be it known that we Charles Baer and John Gouilart, of the city of Baltimore, in the State of Maryland, have invented certain new and useful improvements in the manner of making manure, which has been for many years practiced in France, and has been there secured by letters patent, under the name of "La Methode Jauffret," and we do hereby declare that the following is a full and exact description thereof.

In the method of Mr. Jauffret, a pit or reservoir is prepared of sufficient size to contain the quantity of prepared lye which may be required by the nature of the establishment. This reservoir is intended to be saturated with decomposed animal and vegetable matters, and is further to receive the ingredients hereinafter named; such water is to be found on nearly every farm, and it may be augmented by the drainings of stables, by dish-water, suds, and other substances of a like nature.

Mr. Jauffret, however, finally prepares his lye, by which the fermentation of the articles to be converted into manure is to be promoted, in the following manner, under various modifications.

For the conversion of from one to two thousand pounds of vegetable matter into manure, he takes about

200 lbs. of night soil,
200 " calcined plaster in powder,
50 " wood soot,
20 " wood ashes unleached,
60 " quick lime,
1 lb. common salt,
1 " rough saltpetre,
150 " lye or ferment drainings from a Jauffret manure heap.

These ingredients are in many cases to be replaced by others: this lye to be prepared 10 or 15 days before use. The quantity of materials above named, for the conversion of from 1 to 2000 lbs. of straw or other dry vegetable stalks, will answer for about double that quantity of green vegetable matter.

In using this lye, the plan of Mr. Jauffret is to steep it in the vegetable fires, which are to be acted upon by throwing them into the vat or reservoir containing it, and removing it thence at great labor, so as to form a high heap in the vicinity of the vat, into which the drainings are allowed to run.

We have thus given a brief outline of the method of Mr. Jauffret, the same appearing necessary to the understanding of our improvements, which consist in our omitting altogether the excessive labor of steeping the materials to be acted upon in the lye, and elevating them from thence to the heap; and also in the preparation of a lye which is equally effective with that of Jauffret, at much less cost, and which can be used immediately on its being made, thereby saving the delay of 10 or 15 days, which "La Methode Jauffret" requires.

We prepare a reservoir to contain the lye as usual, and in the immediate vicinity of this, we make our stacks or heaps of vegetable matter, which is to be converted into manure.

We give to the ground where the heap or pile is to be made, an inclination towards the vat: if the ground is a firm clay, it may be merely sloped, and have shallow trenches dug on its surface to conduct the drainings back into the vat; or it may have a flooring of timber, brick or stone, as may be preferred, which may be so trenched as to conduct the whole towards a central drain. When our platform or flooring is of clay, we cover the trenches and whole surface of it with brushwood or rails, so as to form a temporary grating that will support the weight of the heap, and thus insure a drainage and the admission of air to the heap from below.

The materials to be converted into manure, we pile up on this prepared platform immediately as they are delivered by the carts, and this we sometimes continue to do until the heap has attained the whole height to be given to it, when by the use of a pump, buckets, or other suitable means, we raise the lye from the vat and pour it on to the heap, continuing so to do until the whole mass is saturated; we in general, however, raise the heap to a height of two, three, or four feet, more or less, and then pour on a portion of lye, repeating this as the height of the pile is increased: this procedure obviates the necessity of lifting the whole of the lye to the full height of the heap.

The materials which we employ in making the lye, may be limited to the following, namely: cow, horse or hogs' dung, or night soil, the urine draining from stables, and quick Lime. The ingredients used to be intimately mixed with a sufficient quantity of saturated water.

Two of the kinds of animal dung we have found to answer as well as a large number. A perfectly good lye will be made by taking one barrel each or two of the species of dung, two of the urinary drainings, one of quick lime, and about 50 barrels of saturated water, which is then to be used as above explained.

What we claim as our improvement on Jauffret's method of farming manure by the rapid fermentation of vegetable fibres, is, first, the forming of the said vegetable matter into piles or heaps, without its being first immersed in the prepared lye, and then subsequently saturating the same by the pouring out the lye in the manner set forth.

Witnesses.
Th. M. Abbett,
J. R. Abbett.

CHARLES BAER,
JOHN GOUILART.

(Patented June 24, 1843.

DUTCH BUTTER.—The Dutch butter is celebrated for its excellence. The following is said to be the mode in which it is prepared.

After having milked their cows, the Dutch leave their milk to get quite cold before they put it into the pans. When placed therein, they do not permit it to stand for the cream to rise more than about 4 hours. They then stir it together more intimately to combine the milk and cream and continue thus to do, two or three times a day. If it be agitated in this manner, as occasionally happens, till the whole be quite thick, the butter thus obtained is the more highly esteemed. As soon as it acquires the usual consistency, it is churned commonly about an hour, till the butter begins to form; cold water is then added, proportioned to the quantity of milk, for the purpose of facilitating the seperation of the buttermilk. The butter being properly come, it is taken from the churn, and repeatedly washed, and kneaded in fresh water, till the buttermilk is all expressed, and it no longer retains anything of white. By this simple mode, not only far more butter is obtained from the same quantity of milk, than in any other way; but the butter itself is firmer, sweeter, and continues longer fresh than the generality of butter; while the buttermilk is infinitely more agreeable to the palate.—*Boston. Mercantile Journal.*

INDUSTRY.—There is no art in science that is too difficult for industry to attain to; it is the gift of tongues, and makes a man understood and valued in all countries and to all nations; it is the philosophers stone, that turns all metals and even stones, into gold, and suffers not want to break into its dwelling; it is the north-west passage, that brings the merchant ship as soon to him as he can desire. In a word, it conquers all enemies, and makes fortune itself pay contribution.

MONTREAL MARKET PRICES.

CORRECTED BY THE CLERK OF THE MARKET.

New Market, May 31.

Wheat,.....per minot,.....	5/6 @ 6/3
Oats,..... do	1/3 @ 1/6
Barley,..... do	2/6 @ 2/9
Peas,..... do	2/6 @ 3/9
Buckwheat, do	2/0 @ 2/3
Rye,..... do	2/6 @ 3/0
Flaxseed,... do	4/6 @ 5/6
Potatoes,.... do	1/0 @ 1/6
Beans, American, per bushel,.....	4/0 @ 4/6
Do. Canada,.... do	6/0 @ 6/8
Honey, per lb,.....	0/4 @ 0/4½
Beef,... do	0/2½ @ 0/6
Mutton, per qr.	2/6 @ 8/9
Lamb,... do	2/0 @ 3/6
Veal,..... do	2/0 @ 10/
Pork,.....per lb,.....	0/3 @ 0/5
Butter, Fresh, do	0/7 @ 0/9
Do. Salt, do	0/6 @ 0/7
Cheese,..... do	0/3 @ 0/4½
Lard,..... do	0/5 @ 0/6
Maple Sugar, do	0/4 @ 0/5
Eggs, per dozen, fresh,.....	0/4 @ 0/4½
Turkeys, (old), per couple,.....	5/0 @ 6/0
Do. (young) do	3/0 @ 5/0
Geese,..... do	4/0 @ 6/0
Ducks,..... do	2/6 @ 2/9
Fowls,..... do	2/0 @ 3/0
Chickens,..... do	1/0 @ 1/8
Partridges,..... do	2/6 @ 3/0
Hares,..... do	1/0 @ 1/3
Apples, American, per barrel,.....	15/0 @ 20/
Do. Canada,... do	5/0 @ 12/6
Flour, per quintal,.....	12/6 @ 13/4
Beef, per 100 lbs.,.....	20/0 @ 30/
Pork, Fresh, do	22/6 @ 27/6
Hay, per 100 bundles,.....	20/0 @ 27/6
Straw, per 1200 lbs.,.....	12/6 @ 17/6

ROOKS.—If any one will carefully study the habits of the rook, he will cease to persecute him. Just watch him in a field of autumn-sown wheat, and he will be found digging at the root of the sickly plant, not for the seed, but the grub or the larvæ of some earth caterpillar. See him again examining the grass and clover fields for insects. "The farmer's busy time," says an author, "is their (the rooks') busy time; they feel that he (the farmer) is as necessary to their present profit as they are to his future: or they act as if they felt so, which, in effect, comes to the same thing. If he will not bring out his team, turn the soil, and expose the worms and grubs, they caw over his fields, and make the same lamentation that a hungry man does when he knows that there is meat in the house, but the careless servant has lost the key of the larder. But if the teams are a field by times, slicing the sward or the stubble, and turning up the fresh fragrant earth to be mellowed by the action of the sun, there is not a complaining note among all fieldward rooks. Gallantly they strut, and incessantly they peck up the larvæ and the worms, so that the returning plough cannot bury, and so preserve in the soil, a destructive thing." We have repeatedly seen rooks shot, and on examination, found their crops full of worms. During the period when the parents are feeding the young brood, the number of worms that a crow will carry to a nest at a time is almost incredible.

A FAMILY CONNEXION.—A negro passing along the street, was astonished at hearing a voice call out—'How dy'e do, Snowball ?' and on looking up observed it proceeded from a gilt cage.

'Aha! massa Parrot,' said blackee, 'you great man here; you live in gold house now, but me know your fadder very well, he lib in de bush.'

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