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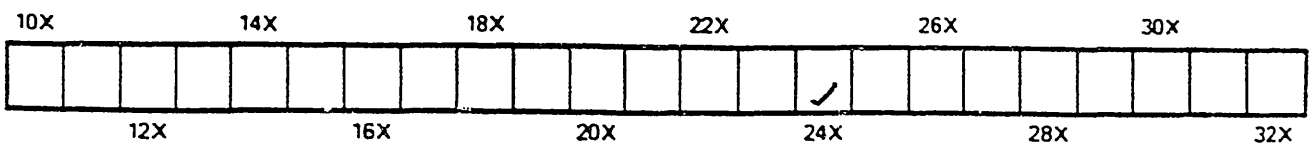

AGRICULTURAL JOURNAL,

AND

TRANSACTIONS

OF THE

Lower Canada Agricultural Society.

VOL. 2. MONTREAL, JANUARY, 1840. NO. 1

The intelligence of the age we live in, and the rapid improvement s perceptible in the sciences, arts and manufactures, compared with the present state of agricultural knowledge in Canada generally, presents a most extraordinary contrast. As men, farmers are not naturally more devoid of intellect than any other class of this community, yet, whilst every art and science has been rapidly advancing, by the attainment of useful and practical knowledge, Agriculture, that is of such vast importance to the whole population, has, generally speaking, made very little progress in improvement, and our agriculture is at this moment an exception on the list of improvements with which these times so fruitfully abound. There must be some cause for this, and there is no subject of more importance, or more deserving the serious consideration, not only of farmers, but of every class of the community. The country is in that particular state at present, that all the improvements that have been introduced in our cities, water communications, rail-roads, &c., will be valueless, or nearly so, unless our Agriculture is improved, and its products augmented, and this can only be accomplished by providing suitable means of education, and practical instruction, in the science and art of agriculture, and also, giving encouragement to the employment of sufficient capital in farming. We have no doubt, that if good husbandry was better understood, and generally introduced, farm labourers would understand their work, and be more efficient, and this would be some guarantee that capital might be safely employed in our agriculture to produce profit. It is only a good and judicious system of farming that can give profitable results, and ensure the safety of capital employed in agriculture. Capital will be safely employed in the hands of the skilful agriculturist, but skill is useless without capital, as the latter will not be safely employed in unskilful hands. There may be some exceptions to this general rule, and capital may be acquired, and accumulated by skill and industry, but if we desire to see this country flourishing and prosperous, we shall have to apply skill and capital in something like the same proportion they do in Britain. We have the example of Ireland before us, where there has been a manifest deficiency of skill and capital employed in agriculture, and if we now compare the condition of that country with Britain, where there has been abundance of skill and capital employed in husbandry, the contrast is indeed most strikingly in favour of the latter country, and this is generally attributed to her successful agriculture, and the immense produce annually created by it, which puts into active and healthy motion her manufactures and commerce. We cannot expect to gather an abundant and valuable harvest, if we do not cultivate, sow, and plant in a proper manner. Hence it would appear, that our future prospects are, in a great measure, in our own hands. If we are resolved to provide no establishments for affording practical instruction in the science and art of agriculture, to our youth or to our farmers, and employ all our disposable capital

in any business, rather than in argicultural production, we may be assured that our agriculture will not exhibit any tokens of improvement or prosperity—and we believe we are justified in stating further, that capital employed here, in any other way, will be as unprofitable and unsafe as in agriculture, if the latter is allowed to remain in an unimproved and languishing condition—producing very little more than a scanty subsistence to those employed in it. The present depressed state of Canada, has no chance whatever, of improvement, but by what she may derive from the augmented produce created from her own soil. All hopes from other sources will end in disappointment if this does not go first.

Much of the wheat in Eastern Canada has been injured the last year by becoming scrawled or root fallen, just as it came into ear, which prevented the ear from filling perfectly, and also produced rust in the straw. We have no doubt, that want of lime in the soil is one cause for the weakness of the straw, and that, another cause is in not observing a judicious rotation in cropping, and particularly, introducing the cultivation of beans, peas, and red clover, previous to wheat, instead of constantly sowing wheat, oats, and barley on the same soil. Wheat is, undoubtedly, the most profitable crop when it succeeds well, but if sown on unsuitable soil, or repeated too often on the same soil, it frequently proves much less profitable than a crop of barley or oats would be, if sown in place of wheat Above all crops wheat is of little value if it becomes laid, or beaten down at almost any stage of its growth. The farmer should, therefore, be careful only to sow it, where he is certain the soil is suitable for it, and the crop likely to succeed. On stiff soils, properly cultivated, and in judicious rotation, wheat will succeed best, but as we before observed, when its cultivation is attempted under unfavourable circumstances, either as regards the nature of the soil, or the manner in which the land is prepared for receiving it, no crop is more liable to disappoint the farmer. It should, therefore, be constantly kept in mind, that a full crop of barley, oats, or peas, will be far more productive of profit, than a foul or a light crop of wheat. We copy the following estimate of the produce of wheat from an interesting little work on Agriculture.

8 One ounce of wheat, of the best quality, contains on the average 550 grains, and one statute acre contains 43,560 square feet. The produce, therefore, of an acre with one plant to each square foot, supposing each plant to spread upon the average so as to produce fifteen stems, and each stem sixty grains, would be eight quarters, six bushels, and forty-five pounds.

Supposing each plant to be in rows or drills, twelve inches apart, and six inches from plant to plant, and each plant to throw ten stems, and each stem fifty grains, the produce *per* acre would be nine quarters, six bushels, and thirty-six pounds.

Supposing again the rows or drills to be the same distances from each other, and plants in them four inches from plant to plant, and that *each root had six stems, and each stem fifty* grains, the produce *per* acre would be eight quarters, six bushels, and forty-five pounds.

Lastly, supposing the plants to be three inches apart, and the rows as before twelve inches, and that each root had three stems, and each stem fifty grains, the produce *per* acre would be five quarters, seven bushels, and nine pounds.

The following method of draining with small stones is an excellent one, and would require only a small quantity of stones for the parallel drains, and we have no doubt would answer a good purpose. We perceive that in Ireland, tiles are furnished for draining, with soles for them—2½ inches wide, at 10s, and 3½ inches at 15s the thousand. Pipe tiles, however, are considered the best; the price is very moderate.

Thorough draining need not be so expensive as is generally imagined, provided small stones can be conveniently had. We are convinced that in strong clay soil, drains cut 3 feet deep, four inches wide at the bottom, and twenty inches wide at the top, and filled with small or broken stone, such as are prepared for macadamized roads, for ten inch deep, and then covered with some straw, small branches, or the turf taken off the surface, with the grass side next

the small stones, would answer an excellent purpose, provided there was sufficient fall, the drains 18 to 24 feet apart, with good leading drains to drain off the water from these small drains, which should be constructed of larger dimensions, and have a regular opening made after the plan described to be adopted at the Industrial school at Fincurry. These small drains would only require a square yard of broken stone to fill eighteen or twenty yards, or about from thirty to forty square yards to the arpent, according to the distance which the drains would be apart, and any kind of stone would answer for breaking. We do not say that draining in this way would be the best that could be adopted, but we know it would be a cheap mode, if stone could be had conveniently, and we believe, if properly executed, it would answer an excellent purpose.

The drains are run parallel, 24 feet apart, 20 inches wide at top, 40 inches deep, and 3 inches wide at bottom, filled with stones, broken large, as those used in repairing public roads, to the depth of 10 inches, over which sods of the green sward lightly pared off are laid, overlapping each other; on the sods is thrown down the material raised in sinking the drains.

"The main drain at the lower end of the field is sunk to the depth of forty-six inches, in a direction transverse to the parallels, and secured in the following manner.—Flags are laid on the edge in an upright position, on one side of the bottom of the drain; next, flags are laid on the opposite side, in an inclined direction; the under edges of the last laid flags press against that side of the drain by which they are laid; the opposite edges rest on the upper edges of the upright laid flags. leaving sufficient space for the water from the parallels to pass between. A vacuum occurs between the inclined flags, and that side of the drain against which their lower edges press, which is filled with round stones, serving the double purpose of admitting the water, and keeping the flags in their places; a light covering of broken stones is then laid over; next a sod of green sward is laid over the earth thrown down, as in the parallels.

Oval tiles of three or four inches would answer best for the main drains, when small stones would be made use of for the parallel drains; and we have seen excellent tiles made here of several sizes, by a machine imported by Major Campbell, Civil Secretary. The tiles are the square bottomed which is considered the best shape. We may form some idea of the extent to which drainage is carried on in England, when we hear of one manufacturer in Yorkshire, disposing of 140 tile machines in a short time.

The following is part of an article on that first of all agricultural improvements—"Draining":—

Another authority for deep draining is Mr. Spencer, of Wrotham, Kent, who, in a letter to the Royal Agricultural Society, details some experiments made in five feet drains, showing that if shallow drains are placed near these, the water will be drained from them to the others. His mode of executing the work he has described as follows:—The drain, 4 feet deep, is made about two feet wide at the top, and the width of the tile at the bottom. The first three feet are to be taken out with a common spade or three tine fork, the bottom with a narrow spade made for the purpose, and a curved hoe to take out the crumbs. Four men should be employed in one drain, each taking a foot deep: the last man lays the tile, filling it up with the soil that is taken out, which is to be well trodden down on the tile. Many people imagine the water runs along the top of the land to the drain, and then descends to the tile. This is not the case. The water enters at the bottom of the drain. If the bottom water be taken away, the top water will surely follow. This may be seen if two drains are cut in a field, four feet deep, when the land is wet The water will be perceived coming in at the bottom; and by taking that away will penetrate through the soil, leaving the top perfectly dry. This will be the case even on land not subsoiled.

In the Royal Agricultural Journal, vol. 3, there is an able article by Mr. Parkes on the quantity of water discharged from drains, and which gives a number of experiments to show that deep draining is not only the most effectual but the cheapest mode that can be adopted. I will now mention, he states, an experiment which every farmer is competent to make, and which cannot fail to throw light on the action and effect of his drains, and on the relative condition of different pieces of land as to porosity, or filtrating activity. I allude to the simple ascertainment by measure, of the quantity of water discharged from different drains, after rain, in the same time. In reply to numerous enquiries on this subject, I have only succeeded in obtaining sufficiently exact information from Mr. Hammond, whose intelligence had led him to make the experiment without any suggestion from me. He states, I found after the late rains (February 17, 1844) that a drain, 4 feet deep, ran 8 pints of water in the same time that another 3 feet deep ran 5 pints, although placed at equal distances. It would appear, then,

either that the deeper drain had the power of drawing water from a horizontal distance greater by the ratio of 8 to 5 than the shallower drain; or that the perpendicular descent of the water was more rapid into the 4 feet drain. In stiff loams and clays, a free ingress and egress to rain water can only take place after the establishment of that thorough net-work of cracks or fissures, which is occasioned in them by the shrinkage of the mass from the joint action of drains and superficial evaporation. These fissures seem to stand in the stead of porosity in such soils, and serve to conduct water to drains rapidly after it has trickled through the worked bed; it is possible, too, that in deeply drained clays of a certain texture the fissures may be wider or more numerous, in consequence of the contraction of a greater bulk of earth than when such soil is drained to a less depth.

The question of distance between drains is important on the score of expense, and it will be wise to err on the right side, but insufficiency of depth can only be remedied by a new outlay. It is well worthy of remark, that in Kent experiment and experience have rapidly induced the adoption of a system of parallel drains, considerably deeper, and less frequent, than those advocated by professed drainers, or in common use. I gave several instances of this practice in Kent, in the report of last year, already alluded to, and it is rapidly extending. Mr. Hammond stated, (Journal vol. 4, p. 47.) that he drained "stiff clay two feet deep, and twenty-four feet between the drains, at £3 4s. 3d. per acre," and "porous soils, three feet deep, thirty-three and a half feet asunder, at £2 5s. 2d. per acre." I now find him continuing his drainage at four feet deep, whenever he can obtain the out-fall, from a conviction, founded on the experience of a cautious progressive practice, as to depth and distance, that depth consists with economy of outlay as well as with superior effect. He has found four feet drains to be efficient at fifty feet asunder, in soils of varied texture, not uniform clays, and executed them at a cost of about £2. 5s. per acre, being 18s. 4d. for 871 pipes, and £1 6s. 6d. for 53 roods of digging. The above strengthens the observation, that many agriculturists have, a second time, drained their fields to a greater depth; it may, however, be doubted, whether any one has taken up deep drains, and placed them nearer the surface. Mr. Hammond, when draining tenacious clays, chooses the month of February for the work, when he lays his pipes, (just covering them with clay to prevent crumbs getting in,) and leaving the trenches open through March, if it be drying weather, by which means he finds the cracking of the soil much accelerated, and the complete action of the drains advanced a full season.

A difference of opinion as to the depth of drains exists with Mr. Smith, of Deanston, which, coming from so great a name, must have much weight. In a paper addressed to the Royal Agricultural Society of Ireland, he says, "as to the distances of drains, you can take the range of limit as it is, or you may fix a more confined limit to suit your circumstances; but too wide a limit may lead to expense on the one hand or inefficiency on the other. From 18 to 21 feet is a safe range of limit, yet I dare say you must allow the full range in the first instance. There is a practice going abroad of deeper draining and wider distances, but that system I have proved thirty years ago, and thirty times over, to be insufficient, and it will never be sanctioned by men of science and experience in the matter."

The Vegetable Marrow.—I have been trying various experiments this Autumn, with ripe vegetable marrows, and I find they contain a rich, sugary, and farinaceous matter, and my taste, as well as that of those to whom I have sent them, very much approves of them, if cooked after the following manner:—Cut the marrows, into manageable lengths, take out the pith and seeds, and boil them in plenty of water, with salt; when well done, scrape out all the marrow, put it between two dishes, and squeeze out all the water, then mash it well, and add salt, pepper, a little butter, and a little milk; it is a dish fit for a queen. But my object is to recommend the vegetable for fattening pigs. We will suppose that early potatoes are grown, for to grow late ones any longer is a waste of land, and starving of the population, until better seasons come; the early sorts having been taken great care of during the Winter, and treated as recommended in my pamphlet, will be off the ground early. The seeds of the marrows may be sown about the 1st of May, in the open ground, in any warm corner. When transplanting time comes, the potatoes will not be near ripe, but proceed thus: lift a root of potatoes every five or six feet apart in the row, leaving six or eight rows of potatoes between the rows of marrows, and so on. I find, that with moderately rich land, I can grow twenty tons to the acre easily. When ripe, they can be stowed away anywhere, and may be boiled along with other food for pigs, for all pigs' food ought to be boiled. Wherever we find the cottagers to boil the food, they always have the best pigs, which are sooner fit for home consumption or for the market. The cottager may grow marrows where other things will not grow, such as on walls, trellises, poles, and over his cottage The trouble of training will not be much, and would occupy his time in the evening. Landlords and farmers might also, perhaps, be induced to give prizes for the best produce, in the shape of a load or two of dung. There is no mistake about ripe marrows being first-rate food for pigs, and they form good human food. I have eaten half a pound dressed as above every day for these six days, and I like them much better than the dear and half-rotten potatoes we now buy.—*James Cuthill, Florist, Camberwell, in Gardeners' Chronicle.*

A VALUABLE HINT FOR FARMERS.

The celebrated Mr. Robert Bakewell, of Dishly, Leicestershire, and the founder of New Leicester sheep, used to tell an anecdote, with exceeding high glee, of a farmer, not only of the olden school, but of the golden times. The farmer, who owned and occupied 1,000 acres of land, had three daughters. When his eldest daughter married, he gave her one quarter of his land for her portion, but no money; and he found, by a little more speed and a little better management, the produce of his farm did not decrease. When his second daughter married, he gave her one-third of the remaining land for her portion, but no money. He then set to work, and began to grub up his furze and fern, and ploughed up what he called his poor, dry, furze land, even when the furze covered, in some closes, nearly half the land. After giving half his land away to two of his daughters, to his great surprise he found that the produce increased; he made more money because his new broken-up furze land brought excessive crops, and at the same time he farmed the whole of his land better, for he employed three times more labourers upon it; he rose two hours sooner in the morning; had no more dead fallows once in three years; instead of which he got two green crops in one year, and ate them upon the land. A garden never requires a dead fallow. But the great advantage was, that he had got the same money to manage 500 acres as he had to manage 1,000 acres; therefore, he laid out double the money upon the land. When his third and last daughter married, he gave her 250 acres, or half what remained, for her portion, and no money. He then found that he had the same money to farm one quarter of the land as he had at first to farm the whole. He began to ask himself a few questions, and set his wits to work how he was to make as much of 250 as he had done of 1,000 acres. He then paid off his bailiff, who weighed 20 stone! rose with the larks in the long days, and went to bed with the lamb; he got as much more work done for his money; he made his servants, labourers, and horses, move faster; broke them from their snail's pace; and found that the eye of the master quickened the pace of the servant. He saw the beginning and ending of everything; and to his servants and labourers, instead of saying, "Go and do it," he said to them, "Let us go, my boys, and do it." Between come and go he soon found out a great difference. He grubbed up the whole of his furze and ferns, and then ploughed the whole of his poor, grass land up, and converted a great deal of corn into meat for the sake of the manure, and he preserved his black water (the essence of manure); cut his hedges down, which had not been plashed for forty or fifty years; straightened his zig-zag fences; cut his water-courses straight, and gained a deal of land by doing so; made dams and sluices, and irrigated all the land he could: he grubbed up many of his hedges and borders covered with bushes, in some places from 10 to 14 yards in width, some more in his small closes, some not wider than streets; and threw three, four, five, and six closes into one. He found out that instead of growing white-thorn hedges and haws to feed foreign birds in the winter, he could grow food for man instead of migratory birds. After all this improvement, he grew more, and made more of 250 acres than he did from 1,000: at the same time he found out that half of England at that time was not cultivated, from the want of means to cultivate it with. I let him rams, and sold him long-horned bulls (said Mr. Bakewell) and told him the real value of labour, both indoors and out, and what ought to be done with a certain number of men, oxen, and horses, within a given time. I taught him to sow less and plough better; that there were limits and measures to all things; and that the husbandman ought to be stronger than the farmer. I told him how to make hot land colder, and cold land hotter, light land stiffer, and stiff land lighter. I soon caused him to shake off all his old deep-rooted prejudices, and I grafted new ones in their places. I told him not to breed inferior cattle, sheep, or horses, but the best of each kind, for the best consumed no more than the worst. My friend became a new man is his old age, and died rich.—*Gardener's Chronicle.*

IRISH POOR LAW COMMISSIONERS.

"The Commissioners for administering the laws for relief of the poor in Ireland, having addressed a letter, dated 13th October, No. 56225, to the Clogheen Board of Guardians, requesting a detailed statement of their plan of operations in instructing the boys in agriculture and cultivating the land at Fincurry, it was referred to the Visiting Committee, who have prepared the following reply.

"About the commencement of the present year, the Clogheen Board of Guardians took the additional workhouse at Fincurry, for the double purpose of employing the boys in cultivating 12 Irish acres of land attached thereto, and affording additional workhouse accommodation, which it is capable of doing, to the extent of about 600 persons.

"The present agricultural teacher was engaged on the 10th of April, and since then the farm operations have been performed exclusively by the boys.

"On the 7th of July an assistant teacher was appointed, when the boys were formed into two equal divisions. The boys in one division attend school with the literary teachers in the forenoon, and go out to work in the afternoon; those in the other division work in the forenoon and attend school in the afternoon—each division exchanging hours with the other every alternate week. By

this arrangement more attention can be paid to the boys who are at work, and the school-room is not so crowded. Both divisions work before breakfast when the weather is fine.

"The hour for breakfast is nine, for dinner one, and for supper five, after which the boys are allowed to amuse themselves playing ball, or with any other harmless means within their reach. Each boy who has attended school and worked diligently during the day, gets 4 oz. of extra brea in the evening as a reward for good conduct, which is found a great inducement to industry, and renders even young boys anxious to be placed on the working list.

"This list is kept by the agricultural teacher, and every day a mark is placed opposite the name of each boy who has earned extra bread, which serves as a check to the amount charged extra in the master's provision account.

"A similar system is observed with those girls who are employed washing, cooking, and scouring the floors, except that their extra allowance is only 2 oz. of bread, which is not extended to those who are employed making or mending their clothes, or knitting.

"The officers of the establishment consist of a wardmaster and matron, schoolmaster, or agriculturist and assistant, schoolmistress, and assistant chaplain, porter, doctor and nurse—the two latter having been found necessary in consequence of the distance from the workhouse being too great to allow of children being removed there on becoming sick, as was first intended.

"The number of adult paupers in the establishment is six men and nine women, who are employed as follows:—

2 Tailors,	3 Women assisting in hospital
1 Shoemaker,	1 Superintending in laundry,
1 Mason or whitewasher,	1 Ditto in store,
1 Assistant do.	1 Ditto in kitchen,
1 Watchman at night,	1 Ditto scouring rooms,
	2 Ditto washing children, &c.
Total 6 Men.	9 Women.

"The present number of children is 436—viz., 225 boys, 211 girls, of whom 31 are in hospital, and 79 are under 9 years of age

"The agricultural teacher bestows much attention to the instruction of the boys in the proper manner of performing manual labour, the result of which is, that although many of the boys were bred in town, and those from the country were for the most part brought up in idleness, most of them can already work handily, and some can perform the operations described in the accompanying detail, of what they have done on the land without an instructor, and will soon be able to direct others.

"There is also a very great improvement in the conduct of the boys; and although the premises are only enclosed by a ditch, they rarely evince a disposition to abscond.

"It should be observed that the guardians have avoided any outlay of money, and no expense has been incurred beyond what was necessary to render the building fit for an auxiliary workhouse, except a donkey and cart, a few dozen spades, and other tools, a heap of manure which happened to be on the premises, seed and the extra bread allowed to the boys. Nor do the guardians contemplate the purchase of cattle, unless the quantity of land be considerably increased, because it is expected that, by a proper management of the sewers, an abundance of manure will be collected on the premises, and that all the grain and root crops which can be produced will be required for the use of the inmates.

"Were a different course followed, and a greater outlay permitted, a more approved system of farming might be followed.

"Signed on behalf of the Visiting Committee,
"Samuel and William Barton.
"Fincurry, October 30, 1848."

LIVE AND DEAD WEIGHT OF SHEEP.

Sir—I observe in this day's *Gazette*, that in reply to a query from "W. C." of Cork, you give it as your opinion, that the proportion between the live and dead weight of fat sheep may be estimated as 13 to 9. Having some years ago kept an accurate account of the live and dead weights of several sheep, which were killed for home consumption, I must say, that I think your estimate of the dead weight too high. The average result which I obtained, gave only 8 to 14. As well as I recollect, the sheep were two and three year old wethers, and were in good condition, but not over-fed Some of the best of them, made 11lb. per quarter more than the above proportion, but none exceeded this. According to this rule, a sheep weighing 10 stones live weight, will weigh 80 lb., or 20 lb. per quarter; if 12 stones, 96 lb. or 24lb. a quarter; if 13 stone, 104 lb. or 26 lb a quarter; and this gives a most simple rule in practice, namely, to allow 2 lb. per quarter for each stone of live weight. I have frequently been guided by this rule in selling sheep, but I never yet met a butcher willing to allow the weight of a lot of sheep to come up to my calculation. I remember, on one occasion, having a considerable difference of opinion about the weight of some sheep I was selling in Smithfield, when the salemaster proposed that I should sell them by weight, to which I agreed, and in company with the salemaster, I saw the whole lot weighed the next morning, and found that they did not make what I expected; as they had travelled 30 miles after I had weighed them, I attributed the deficiency to loss of weight from travelling.—Yours, &c., John George Coddington, *Flurrybridge, Nov.* 4, 1848.

Experience.—See that experience is not like the light of a ship hung a-stern, illumining only the track you have passed.

LIMESTONE,

AND OF THE BURNING AND USE OF LIME.

What does limestone consist of?—Limestone consists of lime (*quick*-lime) in combination with carbonic acid.

What name is given to limestone by chemists?—It is called by chemists *carbonate of lime.*

Are there not many varieties of limestone?—Yes. Some soft, such as chalk,—some hard, such as our common limestones,—some of a yellow colour, like the magnesia limestones, which contain magnesia,—some pure white, like the statuary marble,—some black, like the Derbyshire black marble, and so on.

What is marl?—Marl is the same thing as limestone, namely, carbonate of lime, only it is often in the state of a fine powder, and often also mixed with earthy matter.

What is shell sand?—Shell sand or broken sea-shells is also the same thing almost exactly as common limestone.

Can these marls and shell sands be applied with advantage to the land?—Yes. Either as a top-dressing to grass lands, and especially to sour, coarse, and mossy grass,—or they may be ploughed or harrowed in upon arable fields,—and especially they may be applied with advantage and in large quantity to peaty soils.

Can they not be used also in making composts?—Yes. When mixed with earth and vegetable matter, or with animal matter, such as fish refuse, whale blubber, &c.; and even with farm-yard dung they will often produce very good effects.

How would you ascertain the presence of lime in a soil or in a substance supposed to be marl?—By putting a little of it in a glass and pouring upon it either vinegar or weak spirit of salt (muriatic acid.) If any bubbling up (effervescence) appeared, I should say that lime was present.

To what would this bubbling up be owing?—It would be owing to the escape of carbonic acid from the carbonate of lime which the soil or marl contained.

What takes place when limestone (carbonate of lime) is burned in the kiln?—The carbonic acid is driven off from the limestone by the heat, and the lime alone remains.

What is the lime called in this state?—It is called burnt lime, quick-lime, caustic lime, hot lime, lime shells, &c.

What weight of quick-lime or lime-shells is obtained from a ton of limestone?—A ton of limestone yields about 11¼ cwts. of quick-lime.

What takes place when water is poured upon quick-lime?—The quick-lime drinks in the water, becomes very hot, swells up, and gradually falls to powder.

What is this pouring of water upon lime, so as to make it fall, usually called?—It is usually called slacking the lime, and the lime is called slaked or slacked lime.

Does the quick-lime increase in weight when slaked?—Yes. One ton of pure quick-lime becomes 25 cwts. of slaked lime.

Does quick-lime fall to powder of itself when left exposed to the air?—Yes. It absorbs water from the air, and gradually falls to powder.

Does quick-lime drink in (absord) anything else from the air?—Yes. It gradually drinks in carbonic acid from the air, and returns at length to the state of carbonate.

When it has thus returned to the state of carbonate, is it better for the land than before it was burned?—Yes. It is in the state of a far finer powder than could be got by any other means, and can thus be more thoroughly mixed with the soil.

What is it usually called when it has thus returned to the state of a carbonate?—It is usually called mild lime, to distinguish it from the quick or caustic lime.

Does quick-lime act in a different way upon the land from mild lime?—It acts very much in the same way, but more quickly.

How do they both act?—They act by supplying the lime which all plants require as part of their food,—by combining with acids in the soil, so as to remove the sourness of the land,—and by converting the vegetable matter into the food of plants.

Would you bury lime deep, or would you keep it near the surface?—I would always keep it near the surface, as it has a natural tendency to sink.

To what land would you apply quick-lime rather than mild lime?—I would apply quick-lime to peaty soils, to heavy clay soils, to arable lands which are very sour, and to such as contain a great deal of vegetable matter.

In what state is slaked lime found to produce the best permanent effect on hill pasture?—It is said to produce a better and more lasting effect, when it has become wet—or *dabby*, as it is called—by exposure to the air and rain, than when put on in a dry and newly slaked state.

Will the same quantity of lime produce as great an effect upon wet as upon dry or drained land?—No. The same quantity will produce a greater effect upon drained or naturally dry land, than upon wet land.

What quantity of quick-lime is usually added to arable land in this country?—It is usually added at the rate of 8 or 10 bushels a-year to an imperial acre.

Is it added every year?—No. It is added every *rotation*, or every second rotation, or sometimes only once in the nineteen years.

Would you rather apply the lime in large doses at long intervals, or in small doses at shorter intervals?—If I applied a large dose of lime at the beginning of my lease, I would apply smaller doses at the end of each *rotation*, or at the end of every second rotation, to keep up the quantity of lime in the land.

Why does lime require to be repeated?—Chiefly for three reasons; *first*, because the crops

eat up and carry off a portion of the lime; *second*, because a portion of it sinks into the subsoil; and *thirdly*, because the rains are always washing a portion of it out of the land.

AN ESSAY ON THE APPLICATION OF ANATOMY, PHYSIOLOGY, AND CHEMISTRY TO THE SCIENCE OF AGRICULTURE.

BY DR. H. W. DEWHURST, F.R.A.S.

So far is the physiology of man (as an omnivorous) and the carnivorous animals fully explained. I shall now consider the subject of the herbivorous quadrupeds, as they more particularly interest the practical agriculturist. In them we find a very great difference from the former. It is the starch, gum, and sugar which the vegetable contains that supply the carbon to the lungs for the generation and consequent evolution of animal heat. The fatty elements which their food contains is, to a certain extent, deposited in the form of pure fat, in various parts of the body; and this easily solves the problem, why the herbivorous animals are so much fatter than the carnivorous. But, whenever it happens that the amount of starch there found contained is insufficient for the purposes of respiration, it is then that the fat supplies carbon to the lungs, exactly in the manner as is done in the carnivora, as the sugar, starch, and gum, speedily become converted into carbonic acid gas and watery vapour, in the economy of the animal, which it rapidly consumes; and if the amount of carbon is insufficient for the purposes nature desires it, then it is that she has a recourse to the fat which the body has stored up in various parts, and, finally, the organic tissues themselves are drained upon for a supply when nature cannot get it elsewhere, and the result is, that the poor animal becomes thin and emaciated, and death ultimately takes place from starvation.

Two new theories have, during the last few years, been promulgated respecting the secretion of fat, which have not only occasioned much controversy by the promoters, but also by their disciples in the physiological and chemical republics, the heads of the respective contending parties being M. Dumas, the celebrated French chemist, and Baron Liebig of the University of Giessen, in Germany. The first philosopher maintains that the vegetable food which the animal ultimately possesses, contains already in its composition all the elements which are absolutely necessary for the formation of fat in the animal system, just in the same way as we find that gluten is therein contained, that muscular flesh may be formed, phosphate of lime, and other saline particles for the secretion of bone; consequently, according to this hypothesis, the fat contained in the vegetable is destined to form that required for the general economy of the animal. On the other hand, Baron Liebig contends that if the non-nitrogenous component parts of the food are duly supplied to the animal, such as the gum, starch, and sugar, in greater quantities than is required for the proper supply of animal heat, then fat is formed of these elements for the purposes of the animal itself. I do myself, and I am inclined to believe that most of our physiological chemists think, that the simple and beautiful theory of M. Dumas is far preferable to that of Liebig; and when we view the creature in its original state, its condition cannot, for a moment, be questioned.

I should remark, however, that the great quantities of fat which are allowed to accumulate in stall-fed cattle and sheep, originate from an abnormal condition of their systems, and which are produced by the artificial state wherein the animal is situated; consequently, the addition to the quantity of fatty matter which is already formed, according to the theory of M. Dumas, is in the vegetable itself, yet the animal possesses the power of secreting a still greater amount of fat from the food which it consumes. During the last few years, it has become the fashion among agriculturists to fatten their cattle, sheep, pigs, &c., to a most inordinate, and, I may not improperly add, to a disgusting degree; and to speak professionally as a physician, and I am well persuaded that every medical man will agree with me, I may remark, that, in the human subject, an inordinate state of *obesity* is considered to be a diseased state of the system, and has, consequently, its attendant evils. Assuming, therefore, the same kind of reasoning, it is not unphilosophical to suppose, that animals in this condition of undue fatness, cannot be otherwise than in a morbid state. In August, 1846, at the Yorkshire Agricultural Society's Exhibition, at Wakefield, and at the Smithfield Cattle Show of same year, I saw pigs entirely deprived of the powers of locomotion, and some which gained a prize, belonging to his Royal Highness Prince Albert, were unable to lift up their heads for the purpose of feeding, and a man was employed for that object. Surely this state of things ought not to exist; and I have no hesitation in denouncing such animals as wholly unfit for the purposes of human food. It is the simple duty of the farmer to fatten his animals so that they can be eaten by mankind in a state of health, and not to supply him with a mass of animal food in a condition of disease. He can improve their breed by crossing, make both their flesh and fat firmer and better, by a sound system of good, cheap, and wholesome diet, and this is all which his fellow-countrymen require of him.

The following table will give the reader an idea of the average proportions of organic and inorganic matter which are contained in the various species of vegetables which constitute the food of domestic cattle, sheep, pigs, &c.:—

THE AVERAGE CONSTITUENTS OF CROPS.*

About 1000 parts of	Water.	Woody fibre.	Starch, gum, and sugar.	Gluten and albumen.	Fatty matter.	Saline or inorganic matter.
Wheat contains..	160	160	550	100to150	20 to 40	20
Barley	150	150	600	120	20 to 50	20
Oats	160	200	500	140	30 to 60	30.50
Beans.....	160	100	400	250	20	3
Peas	130	80	500	240	30	20.80
Potatoes.....	750	50	120	20	30	10
Turnips.....	850	30	100	10	?	1
Carrots.....	850	30	100	20	40	1
Parsnips.....	793	51	96	23	?	12
Mangel-wurzel ..	788	54	93	26	?	18
Meadow hay.....	140	300	400	70	20 to 50	50 to 100
Clover hay.....	140	250	400	90	30	90
Pea straw.....	120	250	450	120	1.80	30
Oat straw.....	120	450	350	130	.80	60
Wheat straw.....	140	500	300	130	.50	50
Barley straw.....	140	500	300	130	.80	50
Buckwheat.....	180	180	450	100	20 60	20.36
Maize.....	130	160	510	100	60.60	20.50
Rice dust.....	140	(270)		20	30 20	20.20
Linseed (good)...	100	(770)		220	36	40
Oil-cake.....	150to	150to	300to	120 to	50 to	50 to 100
Sainfoin.....	200	240	500	220	140	16 8
Lucerne.....	750	..	..	..	..	25
White clover....	800	115	60	30	?	10
Field beet.....	873	50	70	25	?	12
Cabbage.....	800	10	176	52	?	7

The reader will perceive, by viewing the above table, that 1,000 parts of the different species of vegetables vary considerably in their respective proportions as to the amount of solid food they possess, and that, consequently, it is necessary that the animal, in order to receive the same equivalent of dry fodder which 100 lbs. of good meadow hay will furnish, should consume upwards of 600 lbs. of carrots, mangel-wurzel, or Swede turnips, or about 340 lbs. of potatoes; but of this dry vegetable matter, the composition, and the manner in which it is given to the animal, exert a very considerable influence in its value as an article of food.

In my preliminary remarks I detailed the manner in which the caseine, gluten, and albumen inherents in the vegetable become eliminated and converted into the blood and flesh of the animal; it, therefore, follows, as a matter of course, that those young animals which are well supplied with food, which possesses the muscle-forming elements, will grow, and their parts naturally develop themselves with a great degree of rapidity, especially their muscular apparatus; yet it is to be remembered that unless the food given them also contains a liberal supply of starch, sugar, and gum, in order that the proper quantity of animal heat may be preserved, although the animal may exhibit a fine degree of muscularity; yet it is not fit to be killed for human food. In many parts of the country, especially in large towns or near them; it is very common for butchers to feed their pigs with the refuse of the slaughter-house—such as the blood and intestines of the slaughtered animals, &c.—while horse-flesh constitutes the common food of some hundreds, perhaps thousands of pigs in France, and the result is, that in consequence of the nitrogenous nature of this species of food, a great degree of muscularity is created; but the French breeders or this order of animals have found out, from pecuniary experience, that, unless they also give them, in combination, a copious supply of barley-meal, potatoes, &c., no fatness is produced, and ill-health is the result.

I have also stated the phenomena that take place in the formation of animal heat through the medium of the gum, sugar, and starch; and as this heat never varies during health in every degree of the temperature of the atmosphere or apartment wherein the animal may be placed, it necessarily follows, as a matter of course, that the lower the temperature may be the greater is the amount of carbon which is consumed in the body, and this is particularly to be observed in the winter season. What is the cause of this? I reply, that there is a much greater proportion of oxygen in the atmosphere during the cold season of the year, which is by respiration introduced into the animal system, and whenever the temperature of the weather approaches nearer to that of the animal itself. This circumstance will account for the reason why animals generally have a better appetite, and consume a much greater quantity of food during the winter than what they do in the summer season, and those which are exposed to the chilling blast more than those which are kept in comfortable, sheltered places; for it is to be borne in mind that the old proverb, which says "that warmth is equivalent to a certain quantity of food," is perfectly and philosophically accurate. This being the case, we cease to be astonished at the Greenlander and other natives of the higher degrees of latitude being in the constant habit of consuming large quantities of train-oil and fat, while in the East Indies and those countries lying about the equator and between the tropics of Cancer and Capricorn, enjoy a diet of fruits and light farinaceous substances. In the former case we find that the frigidity of the atmosphere itself is continually depriving the system of its proper quantity of animal heat; whilst in the latter, from the great amount of caloric imparted by the rays of an almost vertical sun, the atmospheric temperature is quite or nearly the same as that in the body; consequently, in order that it should be thus duly preserved, but little heat need be added, through the medium of diet, for that purpose.

*From analysis by M Crome, Dr. Sprengel, Boussingault, and Hermbstadt.

Dutch Prosperity.—We have examined thoroughly the causes of wealth in this state, and find them to be no other than persevering industry in the pursuit of gain, continued by each individual during life, and transmitted by each to his successor; and the most extraordinary frugality in the manner of living—joined to the universally prevailing maxim among the Dutch, that it is a disgrace not to live upon much less than one's income.—*Holland and her Colonies.*

CHULMLEIGH AGRICULTURAL ASSOCIATION.

Mr. Turner, after some complimentary remarks, said it was impossible for him to remain silent, when the toast of "Prosperity to the Royal Agricultural Society" had been so cordially drunk. The more they knew the merits of that Society, the more would they wish to give it their favourable consideration. He was happy to tell them that there was some chance of the Society visiting this part of the country in the year 1850; the call for subscriptions to guarantee the expense had been freely responded to, and money was flowing in from all parts of the country. For proof of the good which had emanated from that Society he referred them to what had taken place during the last ten years since its formation. He referred to it with the more satisfaction, because he was one of the first hundred who had joined it. If they contrasted the state of agriculture throughout England ten years ago, with its position at the present moment, they would find that greater improvement had taken place since the formation of the Royal Agricultural Society, than in any previous twenty years. It had associated men together, when every other consideration had failed to do so, and he (Mr. Turner) had the pleasure of seeing at its meetings men of every grade—Whigs, Tories, Conservatives, and Radicals—assembled for one great object—to provide more food, more raiment, more happiness, and more comfort, for the great mass of mankind (cheers). He trusted they would, in a short period, be able to judge for themselves, when they would see congregated in the Society's yard, the finest specimens of cattle of all descriptions, and of every breed, and all kinds of implements, new and rare, brought together for the good of the county in which the exhibition takes place. If they could not find some mechanical heads to take advantage of such a collection of implements for the purpose of amending what was defective among them now, he should have but a poor opinion of the mechanical skill of the country. The Chairman had alluded to his (Mr Turner's) practical agriculture; he acknowledged that he ought to be a practical agriculturist, brought up as he had been in its lap, and the first lesson he had learnt being, that he must depend for support on the culture of the soil. He should have been an inapt scholar if he had failed to carry out the intentions of the bright example it had pleased Providence to place before him. As he had been complimented on his success, he would tell them what had contributed to it, not that he would be thought to teach the farmers around him, he came there to be instructed by their experience; but he might tell the young farmers, that when he first commenced farming, he had heard that there was no limit to the productiveness of the soil, and he knew full well that great improvements could take place, and that the land was not made the best of. He began to think that if his predecessor grew 18 bushels of wheat per acre, there was no reason why he should not produce 25; and if he kept 200 sheep on the estate, he had the vanity to think that he (the speaker) could keep 300.

Then came the question, what class of sheep should they keep? He (Mr. Turner) would not recommend a great long mis-shapen shammicking animal, for every mis-shapen animal must be an unprofitable one, as a certain quantity of food must go to feed the mis-shape. Unless they had a compact well-formed animal, they could not ensure a good constitution, and it would not be profitable; the sheep should have a good neck, full, expanded ribs, good loins, and good legs of mutton, and then it would be likely to stand the wind-blast of winter and the heats of summer. They must know full well what belonged to animals He would appeal to their excellent Chairman whether a mis-shapen one was as valuable as one clean and well shapen? whether he did not eat more and do less work? and what held good with one description of animals held good with others. It was the same with cattle. He would not advise them to keep bigger cattle than were good, nor keep them too small to be breedy; but to get middle-sized animals, which would answer their purpose.

He had never a secret in farming in his life, and never would. His farm was open to any man who might wish to see it; and the knowledge he had acquired he was ready to communicate. He always had done so; he had found it to answer; and he should continue to do so to the end of the chapter. He trusted that prosperity would attend this Society and every other. He subscribed to about ten of them, because their prosperity was of the greatest consequence, and they had almost been the salvation of the country. He had a numerous and a growing family, but he did not believe they would have occasion hereafter to look back and curse their father for the £10 or £15 per year which he subscribed towards these meetings. He would again impress on them the necessity of a liberal outlay, not to mind a guinea or two in stock or manures, and he was sure hereafter they would say George Turner had told them right.

Excellencies of Knowledge.—There are in knowledge these two excellencies—first, that it offers to every man, the most selfish and the most exalted, his peculiar inducement to good. It says to the former, 'Serve mankind, and you serve yourself;' to the latter, 'in choosing the best means to secure your own happines, you will have the sublime inducement of promoting the happiness of mankind.' The second excellence of knowledge is, that even the selfish man, when he has once begun to love virtue from little motives, loses the motive as he increases the love, and at last worships the deity, where before he only counted gold upon its altar.—*Bulwer.*

ADDRESS OF THE HON. JOSIAH QUINCY,

AT THE MEETING OF THE NEW YORK STATE AGRICULTURAL SOCIETY.

I cannot satisfy my imagination with the hard working man, who, after toiling through the day, has no thought at its close, but to satisfy his animal nature and to sleep. No, the man who cannot find some time for the cultivation of his intellect, is in a wrong position; and does not improve, as he might, the situation in which he is placed. This it is that spiritualizes his labour, and raises him above the brute that labours for him. I do not expect him to be learned on subjects for which he has no occasion; but, if he enjoys the priceless boon of health, let him know something of that most wonderful instrument, his own body,—that, if that "harp of thousand strings" should fail, he may, with some intelligence repair the evil. Let him know something of the phyisology of the vegetable world: and every blade of grass, and ear of corn, will speak to him of the benevolence and skill of the Great Contriver. Let him not enjoy the sunshine without some knowledge of the laws of light, or see his field drinking in the dew, without understanding its adaptation to the purposes of nutrition. It is in the power of every man to reserve some portion of his time for those pursuits; and he will find, that every addition to his stock of knowledge will make his walks the pleasanter, the flowers the sweeter, and every thing more full of interest and meaning.

But there is something superior to intellectual pleasure; and can a sphere be better adapted to progress in the moral qualities than the one he occupies? Every situation must be a scene of trial. Yet different states have different temptations. The difficulty of entering the narrow path is not, in every case, likened to the passing of a camel through a needle's eye. Agricultural life has few temptations—no risks are run in its pursuit—no deception is used in its progress—no concealment is required for its success—it is open, manly, straight-forward. It depends on no one's favour; it rests on no one's promise, excepting His, who has said, that, "While the world endureth, seed time and harvest, Summer and Winter, shall not cease." And, while free from temptation, such a life gives ample scope for the exercise of all those duties that elevate man, while benefitting his race. It is not required of many men in a generation to do some great thing for themselves or for their country. It is the little every day duties and habits that mark the character. It was not in the shouts of multitudes, that the old patriarchal farmer delighted But it was, "when the eye saw him, then it blessed him; and when the ear heard him, then it bore witness of him." Then opportunities of exercising the elevated virtues are ever present to the independent farmer. Like the patriarchs of old, he stands at the head of his family. Like them, he should rule his household after him—instructing, consoling, supporting.

And there are others dependent upon him, who owe their comfort and well-being to his care; and whose dependence may be the means of awakening sentiments, that even religion has not overlooked. When the great lawgiver of the Jews led them from the house of bondage, and by Divine command, established them as an agricultural people, his laws recognized the advantages of such a life for the formation of character. To remember and love the Giver, and rejoice before Him, in the spring-time and in the harvest, on the anniversary of their deliverance, and on festal days, was the first and great commandment, and the second was like unto it. Love and kindness to the neighbour, to the stranger, to the widow, to the fatherless, were enjoined as congenial duties. But the directions stopped not here. The brute creation of every kind shared in his remembrance. The Sabbath was to be observed, "that thy ox and thy ass may rest." And when the harvest was gathered in, the mute and patient labourer was not to be forgotten: he should share the grain for which he had toiled, and the command, "thou shalt not muzzle thy ox when he treadeth out the corn," secured to him at least a portion.

But freedom from temptations, and opportunities of exercising the virtues, are not the only facilities that an agricultural life offers for the formation of an elevated character. The scenes that surround it, the unceasing regularity of cold and heat, summer and winter, seed-time and harvest, cannot but lead the observing mind up to their author. In no crowded workshop his time is spent. The broad fields and the high mountains, and the running streams, diffuse health and cheerfulness around. No smoky lamp sheds a doubtful glimmer over his task; the glorious sun sends his rays for millions of miles to warm, and enlighten, and gladden his path. The religious sentiment is nowhere so naturally developed, as among rural scenery,

But some one, smarting under ills that are common to every lot, may say, in description, a farmer's life may be poetic and delightful; but we want to be rich; we want to be powerful; we want to look down upon others. That is happiness; that is the usefulness to which we aspire. I am ambitious, and avaricious, and envious. I have no scope here: I can never be happy as a farmer. And in what position can you be happy? Where do these feelings produce aught but misery? An ambitious, avaricious, envious farmer cannot be happy on his farm, for it is a law of man's nature, that no outward situation shall satisfy a disordered mind. And of agricultural pursuits no more can be said, than is alleged of godliness by the apostle, "with contentment is great gain."

What, then, is the conclusion of this whole:

matter? The agricultural life is one eminently calculated for human happiness, and human virtue. But let no other calling or pursuit of honest industry be despised or envied. One cannot say unto another, "I have no need of thee;" and to every one there are compensations made that render all, in a great degree, satisfied with their lot. Envy not the wealth of the merchant; it has been won by anxieties that you never knew, and is held by so frail a tenure as to deprive its possessor of perfect security and perfect peace. While your slumbers have been sound, his have been disturbed by calculating chances, by fearful anticipations, by uncertainty of results. The reward of your labour is sure. He feels that an hour may strip him of his possessions, and turn him and his family on the world in debt and penury.

Envy not the learning of the student. The hue on his cheek testifies of the vigils by which it has been attained. He has grown pale over the midnight lamp. He has been shut up from the prospect of nature, while sound sleep and refreshing breezes have been your portion and your health.

Envy not the successful statesman. His name may be in every one's mouth. His reputation may be the property of his country; but envy and detraction have marked him. His plans are thwarted, his principles attacked, his ends misrepresented: And if he attain to the highest station, it is to feel that his power only enables him to make one ungrateful, and hundreds his enemies, for every favour he can bestow.

Envy no one. The situation of an independent farmer stands among the first, for happiness and virtue. It is the one to which statesmen and warriors have retired, to find, in the contemplation of the works of nature, that serenity which more conspicuous situations could not impart. It is the situation in which God placed his peculiar people in the land of Judea, and to which all the laws and institutions of his great lawgiver had immediate reference. And, when in fulness of time, the privileges of the chosen seed were to be extended to all his children, it was to shepherds, abiding in the fields, that the glad tidings of great joy were first announced. Health of body, serenity of mind, and competence of estate, wait upon this honourable calling; and in giving these, it gives all that the present life can bestow, while it opens, through its influence, the path to Heaven.—*Transactions of the New York Agricultural Society.*

No plant flourishes unless the air can penetrate thoroughly to its roots, and this is one of the causes of subsoil ploughing and trenching ground being so extremely beneficial to the crops grown upon it. This is now being carried out extensively in practice, but it was long since suggested by the experiments of Du Hamel. He remarked, 'that the lateral roots of plants are always vigorous in proportion to their vicinity to the soil's surface." The same acute physiologist observed, "that tap roots never thrive so well, other circumstances being the same, in a stiff and wet soil as in one that is dry and friable," (*Phys. des Arbres*, i. c. 5,) and this led to experiments demonstrating that the roots of plants are benefited by the application to them of oxygen gas, one of the principal constituents of the atmosphere. Loosening the soil necessarily facilitates its admission, but it also promotes the access of moisture. This abounds in the atmosphere most during the hottest months, and it is absorbed and retained most abundantly by a soil which is in the most friable state. Professor Schluber found, that 1000 grains of stiff clay absorbed in 24 hours only 36 grains of moisture from the air; whilst garden mould absorbed in the same time 45 grains; and fine magnesia 76 grains. Then, again, pulverizing the soil enables it to retain the moisture absorbed better. This I demonstrated some years since, and the reason is obviously because a hard soil becomes heated by the sun's rays much more rapidly than one with a loosened texture. The latter is better permeated by the air, which is one of the worst conductors of heat. I am glad to find my opinions confirmed by so practical and so intelligent a man as Mr. Barnes, Gardener to Lady Rolle, at Bicton Gardens, Devonshire. He says, (*Gard. Mag, Sept.* 1848,) "I do not agree with those who tell us, one good weeding is worth two hoeings; I say, never weed in which a hoe can be got between the plants; not so much for the sake of destroying the weeds and vermin, which must necessarily be the case, if hoeing be done well, as for increasing the porosity of the soil, to allow the water and air to penetrate freely through it. I am well convinced, by long and close practice, that oftentimes there is more benefit derived by crops from keeping them well hoed, than there is from the manure applied. Weeds, or no weeds, still I keep stirring the soil; well knowing, from practice, the very beneficial effect which it has."

"Raking the surface fine, I have almost wholly dispensed with in every department. By hoeing with judgement and foresight, the surface can be left even, wholesome, and porous; and three hoeings can be accomplished to one hoeing and raking. Much injury is done by raking the surface so very much. It is not only the means of binding and caking the surface, but it clears the stones off as well. The earth, in its natural state, has stones, &c., to keep it open and porous, &c. If the earth if sufficiently drained either naturally or otherwise, and the surface kept open, there is no fear of suffering either from drought or moisture." After all that I have written on the subject, I need scarcely add that I entirely agree with Mr. Barnes in thinking the hoe one of the gardener's best friends; and, as it always must be a more frequently used implement than any other, what is the best form of its construction deserves some consideration. The *handles* should never be made of heavy wood, for this wearies the hand,

and is altogether a uselessly heavy weight thrown upon the workman. It is merely the lever, and every ounce needlessly given to this, diminishes, without any necessity, the available moving power. The best woods for handles are birch or deal.

For earthing up plants, broad blades to hoe are very admissible, and they may, without objection, have a breadth of nine inches; but this permission of breadth does not extend to hoes required for loosening the soil and destroying weeds. These should never extend to beyond a breadth of six inches, and the work will be done best with one two inches narrower. The iron plates of which they are formed should be well steeled, and not more than one-sixteenth of an inch thick. The weight necessary should be thrown by the workman's arm and body upon the handle, and the thicker the blade, the greater is the pressure requred to make it penetrate the soil. It should be set on the handle at an angle of 68° as this brings its edge when used at good cutting angle with the surface of the soil, and the workman soon learns at what point most effectively to throw his weight, and holds the handle further from, or nearer to the blade, accordingly as he is a tall or short man. Mr. Barnes, of Bicton Gardens, whose opinions relative to hoeing. I have already quoted, has paid considerable attention to the formation of this implement, and has favoured me with a letter upon the subject, from which I will now give some extracts.

He employs nine sized hoes, the smallest having a blade not more than one fourth of an inch broad, and the largest ten inches. The smallest are used for potted plants and seed-beds, and those from two inches and a half to four inches wide are used for thinning and hoeing among crops generally. These have all handles varying in length from eight inches and a half to eighteen inches, all the neck or upper part formed of iron, for the smaller sizes not thicker than a large pencil, and that part which has to be grasped by the workman is only six inches long, and "formed either of willow or some other soft light wood, which is best to the feel of the hand; for hard heavy wood is cumbersome, harsh, and tiring." Each labourer works "with one in each hand, to cut right and left." The blade is made thin, and with a little foresight and activity it is astonishing how much ground can be got over in a short time."

Mr. Barnes has all his hoes made with a crane neck. "The crane neck allows the blade to pass freely and kindly under the foliage of any crop where the earth requires loosening: and the blade works itself clean, allowing the earth to pass through, as there is no place for it to lodge, and clog up as in the old-fashioned hoe, to clean which, when used of a dewy morning, causes the loss of much time in scraping and cleaning."

True Greatness.—What is great is not always good, but what is good *is* always great.

FARMERS SHOULD WRITE FOR AGRICULTURAL JOURNALS.

As the season has arrived for the renewal of subscriptions to your journal, I would give, through your columns, some reasons why agricultural papers are not better patronized, with some of the leading objections urged against them.

The first, and probably one of the strongest objections, is, that a large proportion of farmers are averse to innovations, new plans, and systems, or in other words, to "new-fangled notions." The manufacturer and mechanic are ever on the alert, and ready to avail themselves of any improvements, inventions, or discoveries, that are made by ingenious men and learned professors. Talk to these farmers of the benefit that they may derive from the aid of science, they will look at you with an incredulous smile, and ask—What do scientific men know about plowing, sowing, raising stock, &c.? Point out to them the advantages of a different mode of applying their manure, or a different system of rotation of crops, they probably will admit that it looks reasonable and right, but the "old system," the "system of their fathers," is good enough and has always supported them. Thus we have hundreds of honest, hard-working farmers, who *be* and *are* willing to trudge on in the old way. These men cannot be induced to take an agricultural paper. They say that they have not time to read; for, during the day, they are busy at work, and in the evenings, they are tired and sleepy; and if they read it, they say that they cannot understand the "high-flown talk" about carbon, oxygen, &c.

The second class of farmers who object to taking agricultural papers, are men who learned the art of farming in their youth—"it is their trade and they understand it thoroughly"—and they "wonder that editors of newspapers attempt to teach farmers farming." Happy souls! How enviable their condition.

We have a third class, who object, on the ground that the contributors are mainly scientific and theoretical men, or retired merchants who are known as "gentlemen farmers," without practical knowledge or experience, who support their farms, instead of their farms supporting them. Their knowledge of farming, they say, is gained by reading, and occasionally riding or walking over their farms, and they publish accounts of overgrown cattle, fine sheep, and immense crops, raised at the cost of double their value, with whom the real farmers are neither willing nor able to compete. "Such farming will not answer for them, nor benefit them in any way." They have to get a living from their farms, and have no other resources to rely upon.

The first class of objectors are only to be overcome by the example of their more intelligent and enterprising neighbors. The second class of these modern Solomons and oracles of wisdom, who can learn nothing more, must be "left alone in their glory," until time and the march of improvement leaves them so far in rear that they are willing to

confess their ignorance and call for light. As to the third class, the remedy is within their reach. They have the privilege equally with the amateur farmers, of contributing to agricultural journals. Then, practical farmers, at once avail yourselves of this privilege. Give us the result of your experience, and correct the evils that you complain of; if you have made any discoveries or improvements in preserving and applying manures, in raising crops, in rearing and managing stock, write out a statement and send it to Mr. Allen, or some other editor, and I doubt not, it will be thankfully received and published. Would that be book farming? All theory and no practice? To all such objectors, I say, write yourselves, and make the papers what they should be—practical journals of agriculture. No system that is not based on practical results, will ever be regarded as valuable by intelligent men. The observation and experience of many intelligent practical farmers who have hitherto remained silent, would be a valuable addition to our agricultural literature, and of incalculable benefit to their co-laborers. To such farmers I say, do not withhold your contributions because you are not skilled in grammar. It is not fine writing that we want, but facts and ideas conveyed in an intelligible manner. Farmers should learn, that, by an interchange of experience and opinion through the medium of agricultural journals, they can confer mutual benefits upon each other. They should also remember that these journals are published for the dissemination of a knowledge of the best modes of making, preserving, and applying, manures to different crops; the best and cheapest methods of preparing the soil; the best and most economical manner and time of seeding and harvesting particular crops; the best kinds of crops for a particular soil or climate; and the best breeds, and the best manner of feeding or managing any particular kind of stock, &c. &c.

No man can fail to perceive that these results can be best attained by educated, intelligent and practical farmers, aided by the almost daily discoveries, by means of science. G. P. Lewis.

Huntingdon, L. I., October, 1848.

—*Am. Ag. Journal.*

The last substance, ever present in the atmosphere in considerable proportions, and which bears a very important relation to the prosperity of the farmer's crop, is the aqueous vapour, without whose unvaried presence no commonly cultivated plant could flourish, and few exist at all. Providence, therefore, has ordained that this should be ever ready to meet the demands of vegetable life, and that its quantity should vary with the temperature, increase with the warmth when its presence is most needed by the plant, and diminish as the air becomes cooler; thus, at a temperature of 50°, supposing it to have a free communication with water, the atmosphere contains about 1-75th of its weight of vapour; but when its temperature is increased to 100°, then its proportion of water is increased to 1-12 of its weight. And this is the more important, and the more beautiful arrangement in the economy of nature, as Davy well observed, because in very intense heats, and when the soil is dry, the life of plants is mainly if not entirely preserved by this absorbent power of their leaves and the earth in which they grow: and, happily, this watery vapour is most abundant in the atmosphere when it is most needed for the purposes of life.

The cultivator will derive many advantages from a careful investigation of the support yielded by the vapour of the atmosphere to his plants, he will perceive that its unvaried presence affords an additional reason why the air should be allowed to circulate freely through the well-pulverized and loosened soil to the roots of all growing crops; and let him carefully avoid the very common, yet erroneous conclusion, that the atmosphere is ever *dry;* that it no longer contains watery vapour; for he will find that the fact is the very opposite to the common vulgar conclusion. The chemist's laborious investigations have clearly demonstrated that, though the watery vapour varies in amount, yet it is never absent from the atmosphere, and that if it is unable to penetrate to the roots of the farmer's corn, the fault is not in the wise economy of nature, but in the inattention of the cultivator, who is either too inattentive to see the advantages which he might thus freely derive, or too indolent to loosen the case-hardened soil, which prevents the entrance of the requisite supply of moisture. One of the causes of the unproductiveness of the cold clayey adhesive soils, as Davy well remarked, is that the seed sown upon them becomes coated with matter not readily permeable by the air.

The farmer can convince himself of these facts by the simplest experiment. Let him merely use his rake or his hoe on a portion of a bed of wheat, or turnips, or lettuces, or any other kind of crop, and let him in the driest weather merely keep this portion of soil loose by this gentle stirring, and he will find that instead of prejudicing his crop by *letting out the moisture*, as is often ignorantly supposed, something is evidently let into the soil: for the portion thus tilled will be soon visibly increased in luxuriance by the mere manual labour thus bestowed; and in this experiment, which I have often tried, I am supposing that both the portions of the ground are equally free from weeds; that in every other respect the treatment of both the tilled and undisturbed portions of the experimental plot is exactly the same.

To a very considerable extent some of the best of the English farmers have long found out these facts, and have acted upon the discovery. The horse hoe of the east and south of England in the driest days of summer may be seen at work in the large sandy turnip fields of Norfolk and Suffolk, with great regularity, not for the mere destruction of weeds, for these are not the abounding tenants of such skilful farmers' lands, but for the

chief and highly beneficial purpose of increasing the circulation of the gases and vapour of the air. "The longer I keep stirring the soil between my turnip rows in dry weather the better they grow," observed the late excellent Lord Leicester to me some years since.—*Agricultural Chemistry.*

Every farmer, as well as others, who have to obtain a livelihood by their exertions in agricultural pursuits, should always keep in mind that "labour is the root of wealth." The great advantage to be derived from adopting a regular system in agriculture is, that each work would be distinct and separate, so that one could not interrupt or intefere with another. By due arrangement, it is evident that labour can be so applied as not to be in the least degree wasted or lost, by *two* or *three* going across each other, to do what ought to be done in its regular time by *one*. Industry, with a proper system, upon a farm of moderate size, will secure for a farmer a livelihood. Every spot ought to be in demand for some crop. The produce of one square yard, if it be worth only one halfpenny, will be at the rate of 10*l.* 1*s.* 8*d.* the acre. And if the produce of one square yard amounts to one pound, that will be at the rate of 2 tons, 3 cwt. 24 lbs. the acre. There is scarcely one farmer in five hundred that can estimate the loss sustained from a want of attention, and carelessness, in trifling matters, especially in what appertains to manure. The dung heap may be often seen placed in such a situation, as if purposely fixed upon, merely for the sake of having all its juices and fertilizing qualities effectually washed away; and the urine and oozings from cattle and horses utterly wasted and lost, by being suffered to run into some brook or river, instead of there being a suitable place constructed to receive every drop of so valuable a manure. A moderate sized full grown beast will, upon an average, void four gallons of urine in the twenty-four hours; which would be at the rate of 1460 gallons, or 5 tons, 4 cwt., in the year. Besides this, the washings, &c. from the house are constantly thrown away into some sink or gutter, instead of being carefully added to the dung heap. That such waste ought to be avoided will appear evident to all who are aware that an adult will void about two quarts of urine every twenty-four hours or above 13 cwt. a-year. These matters, and the results depending upon them, either for profit or for loss, are deserving of serious attention from every farmer and landed proprietor, and demonstrate the great importance, indeed, the absolute necessity, of constructing all farm buildings, offices, and conveniences, with a view to the comfort and cleanliness of the animals; and, at the same time, with a view to increase the quantity of manure, as well by having proper receptacles for saving all the oozings from them, as by having those receptacles adapted for the conversion into manure of all green weeds, and other kind of refuse that may be thrown into them. There is one thing always to be kept in mind, as being of the utmost consequence with regard to manure, that is, to prevent, as far as possible, its being exposed to the effects of rain or water, excepting only the moisture that comes from the cattle or the washings, &c. that may be thrown upon it from the house and out-offices. There is nothing more detrimental to manure, especially animal manure, than for it to be left exposed to the effects of rain and running water. By being kept in a heap, without any moisture but what has proceeded from the cattle, house-washings, &c., as before mentioned, the dung will ferment, and various kinds of salts will be generated; these salts constitute the very essence upon which its fertilizing qualities depend, and are all soluble in water; if, therefore, dung be exposed to its action all the saline parts which constitute the fertilizing qualities of the manure, will, as is too often the case, have been dissolved and washed away before it shall have been placed as nutriment to feed those plants and vegetables which are to constitute the crops about to be raised from the soil. The soil near the buildings where nitre or saltpetre is manufactured, is a very valuable manure, on account of the salts with which it is impregnated. In Italy, and other places on the continent, the floors and walls of buildings in which horses and cattle are kept, are every year picked by the manufacturers of saltpetre, because their surfaces are impregnated with this salt, which is obtained from the pickings by washing them in water, which is subsequently evaporated by boiling, until the saline matter deposits itself in the vessels. It will be clear from this that the fertilizing elements of manure may be greatly increased, by taking advantage of a process so plainly pointed out by nature, and guarding against the salts, which are soluble, being carried away by rain or other water. Though it be of the utmost importance to have the dung heap secured from the effects of rain and water, yet it should be as much as possible exposed to the action of the atmospheric air, which is the great and active agent in producing and increasing its fertilizing qualities, by generating saline particles.

The strength of manure depends upon the quantity and the quality of the different salts contained in it; but before manure can become available as nutriment for the delicate and tender roots of plants, the salts it contains require to be dissolved and fully diluted with water. For want of solution and proper dilution, land is said, from the effect of manure, to have been burnt, by having had too much, and so rendered for a time unfitted for supporting vegetation, and made incapable of yielding any produce. It requires great care in planning every farm building and office to guard, as far as possible, against the effects of rain and water upon the dung heaps; landers should be placed under the eaves, as well as every other appropriate means adopted for that pur-

pose; in a word, no exertion should be spared to increase the quantity, and to improve the quality, of manure. It is upon industry, and a due attention to the dung heap, that the prosperity of the farmer mainly depends; with these, if he has health and a sufficient allowance of intelligence to pursue a regular system in their application, and his farm tolerably well stocked, he cannot fail to pay his way, make a livelihood, and bring up a family.

Agricultural Journal

AND

TRANSACTIONS

OF THE

LOWER CANADA AGRICULTURAL SOCIETY.

MONTREAL, JANUARY, 1849.

Mr. Bravenden, in his Prize Essay on "Natural Indications of Barrenness and Fertility," observes:—"High farming, however, embracing the best modes of cultivation, is found to ameliorate the severity of the climate, and to place us, as it were, in well cultivated districts, several degrees nearer the equator, and reduce the highest of our cultivated hills several hundred feet." The above would be a good text for us, in recommending high farming, or rather judicious cultivation and improvement of the soil. We have no doubt that, by sufficient draining, and a proper system of cultivation and rotation of crops; we should be able to ameliorate very considerably our climate for agriculture. Well drained soil can be worked and sown early, and at a time when that which is not sufficiently drained, cannot be touched. The crops grown upon dry soil are not so liable to be injured by early or late frosts, as those grown upon damp soil. They come sooner to maturity, and will be superior in every respect. By keeping the soil in a proper state of fertility, together with its being well drained, the temperature of the soil is greatly raised, and becomes much warmer. Cold, damp, and poor pastures, are only fit to starve cattle upon them—while pastures that are dry and fertile, will keep cattle in good condition, and make them productive in milk, or beef and tallow. The common mode of keeping cattle and sheep in Canada is, to pasture them (if it can be called pasture,) upon land that has been in tillage the year previous, and laid down without any description of clover or grass-seed, or upon wild land, fit for no other purpose—and in winter to feed those animals chiefly upon straw. By adopting a better system of husbandry, we should not have cause to complain much of the rigour of our climate, the scantiness of our crops, and the unprofitableness of our cattle. We believe it to be quite possible to improve our lands, so that it should not require much more land to support an animal properly, and profitably here, during the year, including our long winters, that it would in Britain. This proposition may be doubted, but we are convinced that an experiment would prove its perfect correctness. Let us treat our pastures as they do in England, and cultivate our lands in the same way, and we shall answer for it, that a given quantity of our land, in ordinary seasons, will yield very nearly as much food for stock, as the same quantity of land would do in the former country. Pastures in some situations, may suffer here certainly in very dry summers, more than they do in England, but we need not make pasture of very dry or strong soil. We cannot raise turnips so abundantly as in Britain, but we can raise other root crops, and as regards hay and clover, we can have both equal to any country. We can also raise Indian corn in very large crops, for the feeding of cattle, which they cannot do in the mother country. We therefore will not admit that Canada is unsuitable in any respect for a perfect system of Agriculture, including, of course, the keeping of a due proportion of cattle, without which, a perfect system would be impossible. We never have considered our winters unfavourable for the country, but on the contrary, we have always rejoiced to see the land covered with snow from the 1st December, to the end of March. The working seasons in the fields may be short, compared with the

British Isles, but our working season is more steadily fine than in these countries. Taken altogether, we decidedly give the preference to the climate of Canada for Agricultural purposes compared with the climate of the British Isles. As to the soil, our land is naturally superior to the lands of these countries, and if they are not in such an improved state of productiveness, it is our own fault, because we have taken all we could out of them, without giving them back a due proportion of manure. We have cultivated our lands as if they should produce to us forever, without giving them anything in return. We have also greatly neglected the cleaning of the soil, except barely that part cultivated in potatoes, and that is a small proportion of our arable lands, which is now likely to be much less. Hence we have suffered our cultivated land to produce weeds instead of useful plants, as every soil must do that is constantly cropped with grain, without being thoroughly cleaned by green crops or summer fallow. Were we to make an exact estimate of the cost to farmers, of growing weeds, we should astonish them by the large amount of drawback it would show from our annual production. If the land is not cleaned properly, a large quantity of weeds will be sure to grow in the crop, and in every way we consider this, it is a serious loss, because the attentive farmer is at great expense by endeavouring to take them out, and those who do not so, allow them to rob the crop of a large proportion of its nutriment and productiveness. In any perfect system of husbandry, draining and cleaning the land are necessary above all things, and without these, we need not expect to make farming profitable. Manuring and preserving the soil in a due state of fertility, is the first thing to be attended to, and by adopting all these means of improvement, we shall not find much cause of dissatisfaction at the produce of our crops. Doubtless, to do all this, will require capital, and perhaps the present state of Canada would induce the employment of capital, in agriculture, rather than in our building up cities. Capital may have been lost in agriculture, but, nevertheless, we have no hesitation in saying that, if judiciously, and not extravagantly applied on land, it would be almost certain to be a safe and more profitable investment, than building houses, or speculating on foreign agricultural produce. Farmers have, very frequently, to till their land in an imperfect manner, for want of means to employ sufficient labour, and manure. The different results that would be obtained from well drained, and well cultivated land, above that which is not so, would pay more than all the expense of cultivation. It should always be borne in mind that capital judiciously employed in production, is sure to be refunded under ordinary circumstances, and that is by no means so sure to be the case when employed in any other way. The returns from agriculture cannot be reckoned upon in less than a year, and in some cases, it may exceed this time, but we conceive that there is at this moment much of the capital of the country that could not be realized for many years, and may yield a very trifling return in the interval. We wish it was in our power to convince our readers, that it is in the country capital can be most advantageously employed, in the first instance—for the benefit and support of the town as well as the country. A city cannot thrive and prosper, surrounded by an unproductive country, or one that does not produce a large surplus over what is necessary to support the agricultural class, employed in its production.

Before quitting this subject, we are bound in justice to Canadian farmers to observe, that from the period this country was first settled, up to 1834, when the wheat fly first appeared here, the raising of wheat was the principal object of the farmer, who did not think it necessary to pay any great attention to cultivating other crops, except for his own use. Wheat was the staple produce, for which the soil and climate were favourable, and a never failing market for its sale. The sale of this article

afforded the generality of farmers a sufficient supply of cash to meet their very frugal wants and expenditure, and they were not ambitious for more, and we believe they enjoyed a much larger degree of real happiness than is possible at present. This will account for the backward state of agriculture—while the lands were new and fertile, and in great abundance in proportion to our population, there was no difficulty in raising large crops of wheat, and the farmers did not keep many cattle more than were necessary to help him to cultivate his land, and give him milk and butter. He kept sheep in the same proportion to give him wool for his clothing. Hence all his stock were kept rather with a view to furnish necessaries for himself and family, than to fatten them in large numbers for sale, and consequently he only sold an animal he had to spare occasionally. Circumstances have materially changed his position. The wheat fly has rendered wheat a most precarious crop, and we have no doubt that Lower Canada has lost by this insect more than eight million pounds currency. The population has also greatly augmented in the old settled parts of the country, and made the loss of the wheat crop more severely felt, in such a system of agriculture as we have described. In fact, the loss of the wheat had very much the same effect upon this country, that the loss of potatoes had in Ireland, only that our farmers were in better circumstances to meet the evil than the poor of Ireland, who have exclusively depended on potatoes. This extraordinary change, together with the potatoe disease also, renders it actually necessary, to introduce a new system of husbandry, so that farmers may have other resources than any one species of crop to be chiefly dependent upon. Our cities and towns have vastly increased in extent and population, requiring a large supply of food, and we are called upon to provide this food as well for our own advantage, as the obligation we are under to cultivate our lands if we attempt to occupy them. We cannot discuss this subject so fully as we would wish, but we have endeavoured to account for the present backward state of our agriculture. The Canadian farmers, under the circumstances we have stated, were able, heretofore, to live comfortably, though frugally, and so far as regards their houses, barns, stables, and fences, they were certainly exceedingly well kept, generally. The care and management of their cattle was the most defective part of their system—chiefly because they appear not to have kept them for profit. An entirely new system of husbandry cannot be introduced without suitable education and instruction, and we are satisfied that any one who will take the trouble to consider seriously our present position, will see the urgent necessity for the adoption of such measures as will provide an agricultural education and instruction for all those who desire to become good farmers.

AGRICULTURAL REPORT FOR DECEMBER.

The month of December, up to the 21st, was one of the most moderate we have had for many years; and although we had slight frosts and occasional showers of snow, cattle might graze on the fields almost constantly, and the St. Lawrence was as free from ice as in summer. This state of the weather, we conceive, is by no means favorable to this country. A Canadian winter of frost and snow, from the first of December to the end of March, will answer best for us, as we cannot work in the fields during that period, and we lose the advantage of beautiful roads on snow and ice in all directions throughout the country when we have open weather such as this, and all communication is nearly suspended in consequence of the bad state of our roads. It is the opinion of some that the climate is becoming more moderate: but we have our doubts of this, as the country is not cleared, drained, and cultivated, to such an extent as would make any material change in our climate, though we think that the clearing, draining, and cultivating of the country generally, will, at a future period, greatly ameliorate our climate. Whether this

change will be favourable for farmers when it does come, is more than we would pretend to say, but we confess we do not consider any great change desirable, and would be perfectly content with the climate as it has been heretofore. A covering of snow on our lands during winter must ever be preferable to having the lands exposed to very hard frost without any covering. Grass land in particular is much the better for being deeply covered with snow during winter. It is not by any means a good objection to Canada as an agricultural country, that we have four or five months of severe winter. The only disadvantage we see in long winters is, that it gives us a shorter time to do our farm work, but the active and intelligent farmer will be able to execute all his work in good time, if his land is well drained and fit to work, and he will also not find the winter too long to do all the work of that season. Every season has its own work, and if we had a due proportion of cattle, kept as they should be in winter, farmers would have abundant employment in this, thrashing, disposing of produce, collect manures, providing fence and firewood; stones might be collected and broken for draining, or small hemlock branches where stone or tile cannot be had. We hear many complaints of the yield of wheat from the thrashing floor, and not without cause, we believe; but to encourage thorough draining, we have been told that the produce from drained land this year has been about 25 bushels the arpent. This surplus over the generality of crops this season, would nearly pay all the cost of draining. A large portion of the sample is poor, and proves that the produce must be short. Barley, although better than last year, is not so good as we expected, and the price is very low. It appears strange that, however low the prices of barley, the beer made from it maintains the usual rates. Oats was the best of our crops this year, and does not dissappoint the farmer in produce. The price is low, but we would imagine that it would be a good speculation to manufacture largely into oatmeal, provided the article was made and packed as it should be. Peas of good quality should command a fair price for exportation in the spring, as the price in England is rather high, and likely to continue so. We are not sufficiently aware of the extent to which beans have been raised this year to say anything of the crop, except that we fear the season was not favorable for maturing or harvesting them. We have frequently recommended that the tops of beans should be cut off in the latter end of July or beginning of August, to check their growth, and as a means of hastening their maturity; but we have not known any farmer adopting the plan. Beans would be an excellent crop to cultivate, if properly managed, and it is known to be the best preparation for wheat. Indian corn has generally proved a good crop, and we hope it has been properly harvested, as the season was very moist, and this must have rendered the harvesting of this grain very difficult. Potatoes, we have been told, are not more liable to rot in the root-house this year than last, and we believe that those that were sound when stored have kept very well. It was previous to the crop being taken up that the desease had been very destructive. In planting next year, we would strongly recommend that no farm-yard manure should be applied, but rather to make use of lime, salt, charcoal, soot and ashes. One of the most useful of these substances—soot—is the most neglected and wasted manures in the country, and scarcely ever preserved, but thrown upon the street, the road or the river. Potatoes in store should, if possible, be preserved from sprouting, by constantly moving and turning them. It is a great defect in storing roots to have the temperature too high, as it should seldom exceed 33°. Storing turnips or carrots together in large quantities is very injurious to them. For any farmer who will raise roots in large quantities, it is necessary he should have ample space in root-houses or cellars, where the temperature would not be too high, and having good ventilation. With this accommodation, the roots might be piled up in

separate rows, with alleys between, so that they would have sufficient air and be prevented from heating. These matters require great attention, and if farmers go to the expense of raising root crops without suitable storage for them when taken up, the roots are frequently lost or rendered useless by heating. When this occurs, it will be sure to act as a general discouragement to cultivating root crops to any extent, as the farmer may only feel the loss of the crop, without considering that it was his own fault in attempting to raise roots without providing store for keeping them safe. We have heard it asserted that roots would not suffer much by frost here, but we are convinced that roots, if once thoroughly frozen, lose the greatest part of their value. Under barns, cellars might be constructed that would be kept sufficiently warm, even though they should not be altogether below the surface of the land. Root crops are necessary to cultivate, and the farmer must of course see an equal necessity to provide suitable storage for them, and this would not be so expensive as might be supposed. In a future number we shall submit a plan, that may answer, if no better is suggested to the farmer's own mind. This is a most favourable time for stall-feeding cattle, the food for them being at a very moderate price, and no better food can be employed than ground oats, or barley, with good hay. From one gallon and a half to three gallons daily, according to the size of the animal, and given as a mash three times in the day. An animal put up in fair condition, and regularly attended to, and kept clean, in a stable well ventilated, may be fattened in three months with ground oats or barley, and sufficient of good hay. If the farmer has roots, they should be cooked or steamed, and may be given mixed with the oats or barley, diminishing either of the latter in proportion to the quantity of roots substituted. We alluded to this subject in our last number, but think it no harm to bring the matter again to farmers' attention. We have recommended frequently the augmentation of our meadow and pasture land, and this becomes every day more necessary, in order that we may convert all our straw to manure, for our lands, that are becoming every year more exhausted. By the improvement of our pastures and meadows, we shall be able to turn our attention to the improvement of our cattle and sheep, with some reasonable prospect of success and profit—and it would be absurd in us to attempt it before we have made provision for sufficient food for improved stock. Improved pasture with sufficient meadow to grow hay cannot fail to produce a great amelioration in our cattle and sheep, by a due degree of attention on our part to selection and breeding. This is the only certain means we can adopt to improve our stock to advantage. Without cattle, we cannot have crops on land long, under cultivation, as the settled part of Lower Canada—so long producing crops of grain chiefly, without any regular system of manuring or rotation. The most inexperienced farmer in the country is sensible that there is an actual necessity now, to introduce a better and improved system of husbandry on all the long cultivated and exhausted farms of Eastern Canada; and the sooner we commence the better. The meat market is well supplied and prices moderate. There appears to be a good market in England now, both for beef and pork, but we fear there has not been much sent by us this fall, to meet this demand. Both these articles, as well as butter and cheese, should be staple articles of our products and in abundance, for exportation. We shall state further, that under judicious management, all these articles may be profitably raised. Canadian farmers, with the native cattle, by the common necessary attention to their feeding and breeding, and proper manufacture of the milk of the cows, might make them very profitable, notwithstanding our six months of winter. We have been more anxious in this Report to submit what we conceive useful suggestions for the future, than to confine ourselves simply to the return from the crops of the year. This has been constantly our

plan in Agricultural Reports, and we trust subscribers to the Journal may have no objection to it. We may be in error in many of our ideas, but we can assure our readers that we have no desire to mislead men, but on the contrary, to be useful to them if possible.

December 28, 1848.

We have seen a report of prizes awarded in November last by the Dublin Royal Society, at their Agricultural Museum—and the largest produce raised of the long red mangel-wurtzel, was by Mrs. Evans, of Portrane, cultivated in ridges, with 50 tons of farm-yard manure, the after culture all done with the spade and hoe—and produce over 80 tons to the Irish acre. The same lady got the first prize for the yellow globe mangel, cultivated in the same way, and having the same produce. Both were sown the second week in May. She also obtained the first prize for carrots, of which the produce was over 60 tons to the Irish acre: manure, 3 cwt. of guano to the acre; cultivation, beds in rows 12 inches apart, plants 5 inches apart—sown 2nd May. Crop tilled exclusively with the spade, and the report states, "the crops on the head lands which would be waste if the plough was used, would remunerate for the entire labour employed." The lady took four prizes (all that were offered) for very great crops of beans and peas, which is a very good estimate of what a lady can do in the way of farming, and against such competitors as the Duke of Leinster, the Earls of Clarendont and of Meath, and many others of high rank. We give these results and modes of cultivation to show what may be done, and by persons who do not themselves hold the plough. We forgot to mention field cabbages: 50 tons farm-yard manure—sown 40 inches apart, 20th April—produced 95 tons to the Irish acre. Oats—sown after old pasture, in March—produced about 110 bushels to the Irish acre, as near as we can estimate from the number of barrels, 22 of 14 stone. Red wheat over 80, and white wheat nearly 80 bushels to the Irish acre. These are very large returns, but we would observe that the Canadian arpent is only about five-eighths of an Irish acre.

Farmers have a great advantage in the British Isles from the able and practical lectures that are delivered there on agricultural subjects. It would be very desirable that we should have similar advantages, but the difficulty is to find men here capable of giving us such lectures. We do not conceive that any man can lecture profitably on agriculture, that is not perfectly acquainted with the practice of husbandry in all its branches, so far as knowing how every work should be executed. It is not every man who would be competent to this task, and those who might be, would perhaps have an objection to deliver lectures. Above all other subjects, lectures on agriculture in this country to produce any good, must explain the practical part, in the plainest terms—because it would be those who understood only plain terms, that required to be instructed. When competent lecturers can be found, it would greatly conduce to agricultural improvement here, to induce such men to deliver lectures on the subject throughout the country.

We have observed in the Irish *Farmer's Gazette*, a suggestion which might be well to adopt here in sowing turnips, to preserve them from the ravages of the fly. The plan proposed is—to sow in drills, in Spring, upon the land intended for turnips, either wheat, rye or oats, and to sow the turnips in drills between the rows of grain at the proper time, and when the turnips are at that stage of their growth, to be safe from the fly, the rows of grain might be pulled as green food for cattle. It is said that the shade of the plants of grain and the agitation of their leaves will prevent the fly from damaging the young turnip plants. The remedy is so simple and easy that it is deserving of a trial. The more advanced the drills of grain would be previous to sowing the turnips, the better. Perhaps it might be possible to allow the grain

to come to maturity between the turnips, provided the drills were not too close and sown early—but this must be left to the farmer's own judgment.

The Quarterly Meeting of the Directors of the Lower Canada Agricultural Society took place at their Rooms in this City, on Tuesday the 12th day of December last—pursuant to notice in the Agricultural Journal, and letters addressed to the Members by the Secretary.

Present.—The President of the Society, Hon. A. N. Morin, Hon. A. Ferrie, Major Campbell, Alfred Pinsonnault, J. O. A. Turgeon, John Yule, T. Bouthillier, J. E. Guilbault, and the Secretary. The President having taken the chair, the Secretary submitted several matters to the consideration of the Board, together with the letters received since the last Meeting.

The following Resolutions were then proposed and adopted unanimously.

Resolved,—That the thanks of the Society are due to H. L. Langevin, Esq., for the trouble and attention he has given, (during the past year,) to the publication of the French part of the Agricultural Journal, and that the Society regretting that the collections from Subscribers have not been sufficient to meet what is due to him, will use their utmost endeavours to cause a settlement to be made with him at an early period.

Resolved,—That until the Society has ascertained what may be the future prospects, and what help may be obtained from the Legislature, it is not expedient to continue the publication of the French Agricultural Journal on the present footing—but that it is expedient to publish a French Translation of the English Agricultural Journal; the first number to be published as soon as possible, during the month of January next, and that Mr. Langevin have the preference, if he thinks fit, for the printing at the former rate, and for the translation on such reasonable terms as may be agreed upon—that in case no agreement is made with Mr. Langevin in this matter, the President and Secretary be authorized to make the necessary arrangements to carry the wishes of the Society on this subject into effect.

Resolved,—That means be taken to settle as soon as possible with Messrs. Lovell & Gibson, printers of the English Agricultural Journal, who have up to this time, liberally given credit to the Society, for the greater part of their account.

Resolved,—That the Society have to express their thanks to their Secretary, William Evans, Esq., for his zealous services, both as editor of the English Agricultural Journal, and as manager of the affairs of the Society, generally, and that notwithstanding Mr. Evans' disposition to bestow his services gratuitously, the Society hereby take the engagement to make an adequate compensation to him, as soon as their means will allow.

Resolved,—That by correspondence with the Agents and the Subscribers in the country, means be taken to ascertain the actual paying subscribers to the Journals, and Members who may be reckoned upon.

Resolved,—That thanks be given to Mr. George Shepherd, the seedsman of the Society, for the liberal offers made by him to sell agricultural seeds at cost prices, and to establish a Corn Exchange for samples of grain, &c., in his establishment, and that the advertisement, now proposed by him, be published under the sanction of the Society.

Some valuable suggestions on the organization and future operations of the Society, were offered by John Dougall, Esq., to be considered at the subsequent meetings.

By order,

WILLIAM EVANS,
Secy. Lower Canada Agricultural Society.

Montreal, *12th Dec.*, 1848.

PARSNIPS.—A friend, upon whose word we could perfectly rely, has informed us, that he raised in his garden last year, (soil a stiff fertile clay,) parsnips of great size, one of them measuring fifteen inches in circumference, and three and a half feet in length, and many of them eleven inches in circumference. This will prove how well adapted the soil and climate of Canada are to the production of root-crops in perfection.

We believe it is well understood that seed grown in a warm climate and sown in one that is not so warm, will mature a crop much sooner than seed raised in the cool climate and sown there again. This circumstance might be taken advantage of and prove very beneficial in some of the crops we cultivate by our importing seeds from a warmer climate.—Change of seed will seldom fail to be advantageous to the farmer.

Mr. George Shepherd, seedsman to the Lower Canada Agricultural Society, has imported a large quantity of European clover, and lucerne, for the Society, which has been admitted free of duty, and will be disposed of at cost price to members of the Society, and to County Agricultural Societies, who may apply in time. We believe it will be found that European clover will answer better in Canada than any other, as it takes a longer time to become perfectly ripe than clover which is raised from American seed, and therefore foreign clover will be the most profitable to sow with timothy seed. Clover intended for hay, if allowed to become too ripe before it is cut, is not of much value, and clover grown from European seed will not be ripe before the timothy growing with it is fit to cut. We would recommend every farmer who has his land fit for clover to sow some by all means in spring. Lucerne requires that the soil should be in excellent condition for it, and it must be subsequently kept perfectly clear of all grass and weeds. Mr. Shepherd has appropriated a part of his store for the purpose of receiving samples of agricultural seeds or other produce, on the plan of a Corn Exchange, where members of the Society will have the privilege of showing samples of produce they may have to dispose of. The samples of grain to consist of one quart each, accompanied with the name of the variety, the weight per bushel, the quality of the soil on which it has been grown, and any other information that may be considered interesting. This will be a very convenient mode of showing samples and of purchasing grain for seed or any other purpose, and such accommodation is much wanted in Montreal. Any one having a good sample of grain to dispose of, by placing it at Mr. Shepherd's, will be almost certain to obtain a customer for it, and any person requiring to buy any particular species or variety of seed, will find it at once, and ascertain the description of soil on which it has been grown, a most essential information.

The Society has imported several little works on the science and art of Agriculture, with a view of having them published in a cheap form, and circulated in the country, and at the schools, in order to give our youth a taste for farming, as well as to instruct them. It is only in consequence of the deficiency of their funds that they have been obliged to postpone these publications, as well as other measures which they proposed for the amelioration of agriculture. Until the Society are able to do more, we shall endeavour to make this Journal as useful as we can, and we trust our readers will not reject any useful information or suggestions we may offer them, because it should come to them in the form of Book-Farming.

At the Meeting of the York Farmer's Club, a Lecture on Draining was delivered by a Mr. Charnock, from which we beg to submit the following extract, the correctness of which will be seen, at once, by every intelligent farmer,

and is further proof of the actual necessity of draining all lands which we expect to farm profitably:—

Notwithstanding all the progress, however, which certainly has been made, how frequently do we see work being executed without any regard to system, and at a cost which, skilfully applied, would realize the desired object, but which, as it is, much exceeds the limit for which really effective and permanent work can be completed, whilst in both these essentials it promises disappointment! I have on several occasions endeavoured to show in what really effective drainage consists; and with this view have pointed out the standard of suitable dryness with which nature has supplied us, for our imitation, in those fine turnip and barley soils which are the envy of clay land occupiers. It is essential to all perfection, that the operator possess a clear and definite knowledge of the object he aims at attaining, and it will be self-evident that, in such an operation as drainage, the more closely we can arrive by artificial means to that mechanical condition of the soil which nature has shown to be the best, the more certainly shall we attain that effectiveness which should be our object. Some difference of opinion seems to exist as to the interval which should elapse after rain before the drains produce this suitable dryness. Some contend that if land is workable in forty-eight hours after a soaking rain, that is sufficient; but I maintain this is not effective drainage—and particularly for arable land; and I do so because, as I have said, nature shows us that a twelve hours' interval is nearer what it should be. I never yet heard any one complain that his land had been rendered too dry by artificial drainage, but I have repeatedly heard the converse—that it was not yet dry enough. What poor economy is it then, for a temporary saving of a few shillings per acre, to hazard that completeness which we know is attainable! That it is a great improvement on its natural condition to secure the working of strong land in forty-eight hours after rain, no one will question; but it is only the comparative degree of effect, and not that perfect measure which may be secured. In grass land more license may certainly be taken without inconvenience, and especially if, from situation and other circumstances, there is a tolerable certainty of its not being ploughed out: in ordinary cases, however, I believe perfect filtration is desirable, and particularly in the tenacious clay subsoils. It conduces to the earlier growth of a more sweet and nutritious herbage.

That drainage exercises a marked influence over meteorological effects cannot be doubted: take, as an instance, the almost complete expulsion of ague from those districts which have been operated upon so effectively. How constantly, too, may we observe the strong line of demarcation in the mass of dew floating at sun set over the lower grounds, wherever, as is often the case, a dry gravelly soil adjoins. The fact is, the dew in reality falls (or rises, as some suppose) upon both lands equally as the sun declines; but the low marshy land, being already full to repletion, can imbibe no more, whilst the dry land, being always in a healthy mechanical condition for the reception of moisture, drinks it in as fast as it falls; hence over the one dry and effectively drained land, being, as I have already said, in a state to adapt its temperature to that of the atmosphere—to be highest during the sun's heat, and to decline, with it, to the cooler degrees of evening; the fall of dew is more regularly promoted upon it, and as gratefully received. But not so in the wet and undrained soils. Referring the meeting to a table of some meteorological experiments, the results from which presented some curious facts for consideration, Mr. Charnock said: You will observe how much greater the evaporation is from water than from land, and in fact that the column showing the amount evaporated from the soil when saturated with water, so as to represent undrained land, differs but little from that of water itself when exposed to both sun and wind; hence it follows that the wetter the land the greater the amount of evaporation, and consequent excess of coldness.

Pork.—In England, mess or table pork, or that for the London market, is generally cured near the principal sea-ports, and along the sea-coast, from whence it can easily be shipped to the metropolis. If the object of breeding hogs is for pork and hams only, it is evident that pork from a hog of twenty-five to thirty-five stone (eight pounds to the stone) is by far more profitable than those from thirty-five to fifty stone; in which case a cross between the Chinese and Essex will be found to answer very well, as the progeny come to early maturity.—(*Baxter.*) The middle-sized hogs, such as the Northumberland, the Berkshire, the Suffolk and Oxford breeds, are those generally preferred for this purpose, and their ordinary weight will be from eight to ten or twelve imperial stone. For delicate pork for family use, the smaller kindly-feeding pigs are chosen. The Berkshire and Suffolk breeds, when not large, will be the best for this purpose. The Chinese will answer well at six or eight months old, when it will weigh four to eight imperial stones. By higher feeding it may be made, when a little older, to attain to double this weight; but the meat will then be found coarse. Weanlings are generally fatted in a very short period. A pig of five or six months old will fatten, if in good condition, in eight or ten weeks.

The fat of the hog is neither mixed with the flesh nor collected at its extremities, but covers the animal all over, and forms a thick distinct, and continued layer beneath the integuments, and in this respect may be said to resemble the whale and other cetaceous animals. It is termed lard,

and differs in chemical composition and properties from the fat of the ruminating animals. It more readily inbibes salt than any other kind of fat; and the same property being possessed by the flesh, there is no animal food better suited than pork for perservation by salting. (*Farmer's Encyclopædia.*)

Bacon.,—In Great Britain the curing of bacon, as an article of commerce, prevails most in the counties of York, Hants, Cumberland, Northampton, Dumfries, Galloway, and the northern and other ports of Ireland.

For bacon flitches, the larger breeds, such as will weigh when killed from eighteen to twenty-two *imperial* stone, are always preferred, from being the most profitable to the farm and readily taking the market. In selecting pigs for this purpose, the sow should be of a large deep carcass; head long, with deep ears, straight chine, and of equal symmetry from the shoulders to the tail; of fine skin, which shows an aptitude to fatten: and the boar should be of a thicker and closer make than the sow.

Small hogs for bacon will be ready for the knife in twelve weeks, and the larger from sixteen to twenty weeks. The girth of fat bacon hogs is about as follows;—When ten score, 4 feet 1 inch; twelve score, 4 feet 4 inches; fourteen score, 4 feet 7 inches; sixteen score, 4 feet 11 inches; eighteen score, 3 feet 3 inches; twenty score, 5 feet 7 inches.—(*Hillyard Prac. Farm.*)

"In Hampshire, and some adjoining counties, after the hog is killed, they first swale him, or singe off the hairs, by kindling a fire around him, which is far preferable to scraping off the bristles with warm water, as the latter mode softens the rind, and injures the firmness of the flesh. He is then cut into flitches, which are well rubbed with common salt and saltpetre mixed, and are laid in a trough, where they continue for three weeks or a month, according to size, and are often turned. They are then taken out, suspended in a chimney over a wood or turf fire, or in regular curing-houses, till they are quite dried. In Kent they are dried before a slack fire, which requires a similar method of time to that employed in salting. They are hung up or deposited on racks for use. Somersetshire or Wiltshire bacon, which is the best in England, is cured as follows:—The sides of the hogs are laid in large wooden troughs, sprinkled with bay salt, and left unmoved for twenty-four hours, to drain off the blood and juices. They are taken out and wiped quite dry, and some bay salt, previously heated in an iron frying-pan, is rubbed into the flesh, till enough of it is absorded. This is continued for four successive days, during which the flitches are turned every second day. With large hogs, the flitches must be kept in brine for three weeks, and must be turned every other day, after which they are dried as usual. In these methods the hide or skin is left on; but in some counties there is a different practice, which has been recommended abroad as preferable, because it affords an opportunity of converting the skin into leather, while the meat takes the salt and is cured as well as in the former mode. Where the consumption of bacon is very rapid, the last mentioned practice may be adopted; but it is certain that bacon will in a short time become rusty, and consequent loss be incurred, if it be not cured with the rind, and kept in a dry room. The hides of swine have long been made into shoes in China."—(*The Complete Grazier.*)

On Fattening Pigs.—In fattening pigs, I have always found a mixture of barley and peasmeal, moistened with milk in sufficient quantity to make it of a drinkable nature, to be the best; the pigs must be rung to make them lie quiet; the sty should be warm and airy, and the sun not suffered to scorch their backs, as thin-skined while pigs are blistered by it, which not only renders them of an unsightly appearance, but retards their thriving. They should be protected from cold winds, cold rains, sleet, and snow—a subject not sufficiently attended to by many farmers, who allow them to lie in heaps, shivering with cold, in which case it is utterly impossible that they can thrive. On the other hand, when they are kept in a close, pestilential atmosphere, their constitution becomes undermined, they look very delicate and sickly, like consumptive subjects, and never arrive at any size or weight for their age. These extremes must be carefully avoided, and the sty should have an open barred door, permitting a current of fresh air to incessantly sit in and purify the place, conducing to the animals acquiring a vigorous habit, and a doubly increased size. Too much cleanliness cannot be observed, for nothing tends more to their well-doing than dry feet, a dry bed, and sweet air. It is true that in summer they wallow in the mud, to get a coat to shield them from the sun and flies, but this only proves that they require protection from excessive heat and the teasing of flies; and all who wish their pigs to thrive will provide shelter. Pigs intended to fatten should never be allowed to run about, as no food they can get by prowling about will compensate for the loss of flesh sustained by the continual state of motion. In a farm it may be very well to have some running about to pick up dropped offall, but where the pigs are regularly fed with a sufficient supply, it is a thriftless plan to waste by exercise, the flesh that by a state of rest would make a good return for the food consumed, and the expense of attendance. The strong food above mentioned is chiefly recommended to fatten hogs to a larger size, but does not exactly suit quarter porkers, it is too heating, and produces pimples which give a diseased appearance; therefore, for quarter pork, (or small pork) use either fine middlings with milk or pure water, or reduce the strength of the barley or

peasemeal by adding an equal quantity of pollards; wash or pot-liquor is unpalatable to pigs during the process of fattening on meal. If from change of weather or other cause, my pigs get costive and are off this food, I supply them with a little green food, according to the season of the year, as a few cabbage leaves, lettuces, or potato-tops, or with potatoes and mangel-wurzel if, on the other hand, they are purged I have a sod dug from the road side and given them; or, which I sometimes think is better, I let them into a yard where there are cinders, mould, brick, and chalk, or mortar rubbish. I think very little of garden-stuff as a means of keeping a pig in a good growing condition; it is no help further that satisfying occasionally the cravings of hunger; sows will do on it or on grass, if there can be added daily a feed or two from the slop-tub. Sows, during the time of gestation, should have their diet restricted to articles that will not produce obesity; for sows, as well as cows, are apt to be attacked with what is called the milk-fever; and, besides unweildly sows, have not that command over their movements, that sows with a less proportion of flesh have, and are very likely to crush many of their young ones. For the first fortnight, the sow should be fed in such a manner as to leave off with a good appetite, and no better or more forcing food be given than fine pollard or coarse middlings, but as soon as all fever has disappeared, and the pigs can take the milk as fast as the sow can supply it, the finest middlings or oatmeal, or sometimes boiled rice, if it can be procured at about 8s. the cwt., may be given three times a day—the little pigs are cut when five or six weeks old. In choosing a pig, look out for one with a wide open chest, well filled up from the ears to the tail, small-toed, and with meat in the fore-arm down to the knee, and in the ham, down to the hock; a fine and short tail, with a small spread of hair at the end. Let the breed be more inclined to make flesh than fat, and fine in the grain, and the preference should be given to a breed famed for broad backs, and small intrails, for large-bellied pigs do not pull down the scale.—*Farmer's Friend.*

Experiments with specific manures and the conclusions arrived at.

1st. Every description of crop requires an ingredient essential to its production, and without it such crop cannot be raised in perfection.

2nd. If a soil does not contain in itself what is essential to the growth of the plant upon it, it must be supplied through the medium of one or other of the specific manures.

3rd. The essential substance necessary to be added to the soil, may be discovered by consulting the nature and property of the plant to be raised.

4th. Nitrate and ammoniacal substances, except in the production of straw, grass, or potatoes, and turnip tops, without an equivalent production of grain or bulbs; so these substances should not be applied alone, but in combination with others containing phosphates. This is illustrated by the fact that saltpetre refuse and nitrate of soda, applied with guano or prepared night soil and animal charcoal, improve their individual production, either in quantity or weight, or in both.

5th. Salts which are sulphates produce grain in larger proportions to their straw, than other salts which are nitrate or ammoniacal.

6th. Bone manure, though dissolved in sulphuric acid, may be greatly enhanced in value by the addition of ammoniacal substances; hence it is inferred, that substances capable of imparting additional luxuriance to the foilage of plants, largely administer to their necessities, and, combined with phosphates, are highly advantageous.

7th. Sulphuric acid is eminently beneficial to the potato crop, and in a recorded experiment on that crop it has proved itself a preventative of the disease called "cure," having produced a healthy crop, when, from the same seed, and otherwise treated in the same manner the other plants of the field were much infected with that disease.

I am aware that some of these conclusions are mere repetitions of ascertained facts, but truth is never injured by repetition. Perhaps I should have added to the list of my conclusions, this one, that farm manure and guano, combined in the proportion of 15 tons of the former to 3 cwt. of the latter, in the proportion in which I have found these substances to succeed best; and as regards night-soil, the best proportion is, 25 tons of the former to 1½ cwt. of the latter. This last result, however, may be greatly improved upon, and therefore should not be taken as a just criterion, either for the purpose of estimating the value of the night soil, or determining the best mode of applying it.

Bone dust was applied nine years ago as manure for a turnip crop, in a field of medium soil, and this field was ploughed this year and sown with oats. The land where the bones had been put gave 7 bushels oats, and 50 stones more of straw, than the land to which farm-yard manure had been applied at the same time to the turnip crop, besides the grain having been 2 lb. per bushel heavier; and, during the time this field lay in grass, the portion manured with bones could be pointed out from the rest by a darker colour and greater luxuriance of pasture.—*Farmer's Friend.*

Sanitary Improvements.—Several parties interested in Sanitary Reform, including Lord Lyttleton and the Rev. C. Girdlestone, attended, on Wednesday, Oct, 18, at the residence of Mr. H. Giles, Surgeon, of Stourbridge, to witness experiments with various deodorants, with a view to ascertain their relative efficiency. The fluids prepared by Messrs. Ellerman, and by Sir J. Bur-

nett, both pure and diluted with water, and also charcoal prepared from peat, on the plan patented by Mr. Jasper Rogers, and adopted by the Irish Amelioration Society, were successively applied, each to three kinds of offensive refuse, that from a stable, that from a pig-stye, and night-soil. On applying Messrs. Ellerman's fluid undiluted, there was a copious disengagement of a disagreeable sweetish smelling gas in each instance, the natural smell of the substances being considerably abated; but all present thought the resulting odour not much less offensive than the original one. A similar result followed on experimenting with the same fluid (that of Messrs. Ellerman) diluted; but the resulting odour was not quite so pungent. With Sir. J. Burnett's liquid a slight effervescence took place, and the offensive smell of the substances to which it was applied was undoubtedly lessened, both with the pure fluid and with the same diluted; still there was a great amount of the original smell remaining. But with the peat charcoal the result was perfectly satisfactory, it instantly and entirely neutralized and destroyed the whole of the offensive odour in each substance. It also deodorized the compound of manure and Ellerman's liquid, destroying with the like facility this pungent chemical smell, mixed with a fetid odour. On re-examination the next morning, and again two days subsequently Mr. Giles, the substances to which Ellerman's fluid had been applied had lost a good deal of their mingled odour, but still were not inodorous. Those to which Sir J Burnett's fluid had been applied still retained some, though less of their natural smell. Whilst those mingled with the charcoal remained perfectly inodorous. The peat charcoal was kindly supplied from Dane's Moss, near Macclesfield; where it is manufactured from the extensive beds of peat in that neighbourhood for the use of the Union Workhouse.—*Macclesfield Paper.*

Small Profits.—The advantages pointed out by physiology on farming produce may be objected to as scarcely appreciable, and therefore of no moment. All natural processes are of this kind. The mass is made out of minims. And if manufacturing prosperity consists of vast returns resulting from small profits, why should not agricultural prosperity be built upon a similar basis? Produce must be increased in every possible way, and that produce secured to the most profitable end; so that he who guides the loom in the manufactory, to produce fabrics of the most subtle texture with the most consummate skill, ekes out his recompense from farthings and half-farthings accumulating by thousands, and he who guides the never-tiring loom of nature, must pursue the self-same plan, and out of the secret processes of the same, which meet not the eye of the looker on, find his reward in the vast aggregation of every small advantages. If we mean to farm well, we must employ our capital in encouraging produce to extend itself in every minute particle taking care that not even the minute particle value be lost to us as the producers, nor to the community as consumers.—*Mr. Just in Memoirs of Manchester Philosophical Society.*

TABLE TEACHING HOW TO SOW GUANO.

Cwts. to the English acre.	Weight of Guano per bushel.	Breadth of Drill.				
	lbs.	inch				
2	56	27	1	gallon* should sow	201 yards along	1 drill.
3	"	"	1	do.	134½	do.
4	"	"	1	do.	100¾	do.
2	58	27	1	do.	208	do.
3	"	"	1	do.	140	do.
4	"	"	1	do.	104	do.
2	60	27	1	do.	215	do.
3	"	"	1	do.	143½	do.
4	"	"	1	do.	107¾	do.
2	62	27	1	do.	222½	do.
3	"	"	1	do.	148	do.
4	"	"	1	do.	111	do.
2	64	27	1	do.	236½	do.
3	"	"	1	do.	153¾	do.
4	"	"	1	do.	115	do.
2	66	27	1	do.	238	do.
3	"	"	1	do.	159	do.
4	"	"	1	do.	119	do.
2	68	27	1	do.	245	do.
3	"	"	1	do.	163½	do.
4	"	"	1	do.	123	do.
2	70	27	1	do.	250½	do.
3	"	"	1	do.	167¾	do.
4	"	"	1	do.	125	do.

* Eight gallons to the bushel.

—*Gardener's Chronicle.*

SQUARE MEASURE.

Inches.	Feet.	Yards.	Poles, Rods, or Perches.	Roods.	Acre
144	1				
1,296	9	1			
39.204	272¼	30¼	1		
1,568,160	10,890	1210	40	1	
6,272,640	43,560	4840	160	4	1

30 Acres are..... 1 Yard of Land.
100 " " ..... 1 Hide of Land.
640 " " ..... 1 Square Mile.

SOOT.

Every Gardener knows the value of Soot as a manure, especially to Onions, and the reason for its value is apparent from the subjoined analysis by Mr. Solly. The combustible matter is charcoal, and every one of the other constituents enters largely into the composition of plants, and are presented in soot in the minutest form.

Combustible matter	371
Salts of Ammonia	426
——— Potash and Soda	24
Oxide of Iron	50
Silica	65
Alumina	31
Sulphate of Lime	31
Carbonate of Magnesia	2
	1000

MANAGEMENT OF STABLES.

The great desideratum in a stable is ventilation. A horse requires air equally with his master; and as the latter requires a chimney to his sleeping apartment, so does the former. The chimney may be a mere outlet, opening through the ceiling, or it may be formed as a dome or cupola. It should not, of course, be open at the top, or rain will get in, but roofed over, and an opening at the sides by weather boards. Besides this, there should be openings in the wall, near the ground, but not in the stalls. This will produce a thorough air; it may be so placed as not to expose the horses to draught. The stable should not be less than 12 feet high, from floor to ceiling, and the former should be well paved, slope slightly backwards, and along the back of the stalls should run a gutter about a foot wide, and an inch or two deep. No stables should be less than eighteen feet deep, and each stall should be at least six feet clear; but if eight feet can be afforded so much the better. Although some horses will agree when kept together in one stall, it is far better to give each a stall to himself. The manger should be about sixteen inches deep, the same from front to back, narrower at bottom than at top, and two feet in length. The rack is best closed in front; the back part being an inclined plane of wood, sloping gradually towards the front, and terminating about two feet down. This rack effects a considerable saving in hay; for we need scarcely remind our readers that, in the common rack, much of the hay given is dragged down, and trampled in the litter. It also prevents the hay seed from falling into the horse's eyes, for the rack, such as we recommend, is on a level with the manger, and about three feet from the ground. Another advantage also gained by this rack is the facility with which it can be filled, thus obviating all necessity for a loft over the stable, and, consequently, admiting of a greater height of ceiling, as well as superior ventilation. The windows and doors should be at the opposite ends; this promotes ventilation; the former at the south-east extremity of the building: the latter should be divided transversely like an ordinary barn door, at the height of about four feet from the ground. The upper portion may thus be occasionally open. Whitewash is a bad dressing for the interior of a stable, as it causes too great a glare of light; paint of a leaden colour is best, and it can be washed from time to time with soap and water. There should be a bin, divided properly into partitions, for oats, beans, &c., and this is better at the back of the stable, and may be made to answer the purpose, both as regards utility and ornament, of a seat. A few buckets of water dashed over the floor of the stable, while the horses are at work, or, if hunters, at exercise, will keep all sweet. The litter should also be turned out to dry, and a bit of fresh straw spread for the horses to stand on. A shed placed beside the stable is a great advantage, on two accounts; it admits of the litter being dressed, and the horse dressed there in wet or stormy weather. A little powdered gypsum, strewn upon the stable floor, will also act by absorbing the ammonial gas, a frequent predisposing cause of ophthalmia. Should the ammonia, however, have accumulated in any quantity, the speediest and most efficacious remedy, as a disinfectant, is the laying down a plate, or dish, containing muriatic acid.—*Horses; their Variety, Breeding, and Management. By H. D. Richardson.*

CROSS-BREEDING OF CATTLE.

From the Rural Cyclopedia.

The cross of a short-horn with a Shetland cow has. with common feeding, attained the weight of forty-five stones, and possess such remarkably fine quality of beef as to command the highest price. The substance, symmetry, and weight of the native ox are greatly improved, and the proverbially fine quality of the beef not deteriorated. A cross with a North Highland cow, though much inferior to that with a Shetland. is a decided improvement. A cross with a Galloway cow, a Buchan doddie, or a large-horned Aberdeenshire cow, is improved at once in weight and substance, quality of beef, and fineness of appearance. An ox from a short-horned bull and a large Aberdeenshire cow obtained the first prize for fat, symmetry, and weight, at the Highland Society's Show at Aberdeen, in 1834, and weighed, when alive, 224 stones, and when dead 173¼ stones. A cross with a Fife cow loses the gaunt form of the native breed, and has a greatly-increased disposition to fatten. A cross with a West Highland cow is very nearly equal in substance and symmetry to the pure short-horn. A cross with an Ayrshire cow, in consequence of the exclusively dairy uses of the Ayrshire breed, is altogether unadvisable. A cross with a long-horned Irish

cow, of any of the midland or southern counties, is quickened in disposit on to fatten, and has its beef of a very fine quality, and thick upon the sirloin and back. A bullock from a short-horned bull and a Guernsey cow, and fed on distillery offals, yielded to the butcher 104 stones in his four quarters, and 22 stones of tallow. Mr. Dickson says, "I saw him when fat, and he was without exception the fattest bull I ever handled." A heifer from a short-horned bull and an Indian cow was exhibited at the Highland Society's Show at Kelso, in 1832, and admired by every person for fatness and extreme beauty, and her back and sirloin well covered with beef. The crossing of native ewes with Leicester rams has for a considerable time past been as generally practised for the improvement of sheep as the crossing of native cows with short-horn bulls for the improvement of cattle, and has been conducted with nearly the same want of discrimination, yet with much of the same preponderance of excellent result. Let it be strongly impressed on all improvers of cattle and sheep by crossing, that the use of cross-bred bulls or rams, particularly such as are of merely the first or second generation, is in all respects injudicious and often exceedingly disasterous. The use of a cross-bred bull or ram among even the race to which he belongs, or on the farm on which he has been bred, may more than counteract all the benefits of the original crossing, or may originate a progeny considerably more defective in aggregate character, than the uncrossed and unimproved race; and the use of a cross-bred bull or ram among a breed of different points and different situations than that of his own female ancestry, is simply to produce mongrels from mongrels, to destroy all distinctions of breed, probably to elicit an assemblage of motley and misshapen animals, and certainly to enact a burlesque upon the whole theory of crossing.

LABOUR.

Labour well applied is always productive of some profit, and those who spare it, act on a false principle of economy; but the best and most judicious method of employing labour and time is the most important of all subjects to real economy. Many persons learn this method by long experience; and it is true that the tact thus acquired is peculiarly just. But it may be acquired much more promptly and definitely by the observation of certain principles, from which a theory of action may be deduced, without serving a tedious and expensive apprenticeship to experience.

It is far more difficult to apply labor judiciously to agriculture than to apply it to the manufacture of fabrics, for the labor which is required for some particular kind of produce, lasts but a very short time and is then suspended for a much longer period during which the farmer depends upon the action of nature to bring this production to perfection, and await the proper season for gathering it. After each species of grain has been sown it requires very little or no attention for some time, whereas in the formation of any kind of fabric, the labour must be continued from the very commencement until the completion. In order, therefore, that the farmer may make the very best possible use of the powers which he has at his command, he should endeavour to arrange the succession of his crops in such a manner that every hour shall be devoted to some preparatory and necessary operation which he can acomaplish by means of the powers which he has at his disposal, or which are within his reach.

He must never undertake many extensive operations at once, or in places remote from each other. He should endeavour as much as possible to perform them one after another, and to employ upon them all the men he keeps from the beginning to the end; this will render the task of inspection easier, and may also tend to excite that emulation which frequently arises when many labourers work together under the same superintendence.

In great operations it is always better to have a man or a team too many than to have one less than is necessary. In smaller operations, on the contrary, it is well to avoid employing more labourers than are absolutely necessary; they only hinder one another, and are apt to think that the farmer believed the work would take more time than actually is required for the accomplishment.

A judicious estimate of the labour requisite for every operation is, therefore, of the greatest importance, and it will easily be acquired by carefully observing the time and labour applied to each separate portion, and to the whole.

There are some operations which require a certain degree of temperature and fine weather; the farmer must hold himself in readiness, to set about these as soon as the fitting time arrives, and must get them done as soon as pos-

sible. Should he be interrupted by change of weather it will be contrary to the rules laid down in the preceding section to pass to any other extensive operation, unless some particular motive, or an appearance of this change of weather being of long duration should seem to indicate such a course. In such intervals it is much better to set about some of the smaller operations which are in point of fact of equally as much consequence, and can be very soon completed; it ought to be held as a rule that no operation once taken in hand should be laid aside except in case of absolute necessity; and the farmer ought always to hold himself in readiness to resume that which was at first undertaken, as soon as the weather will admit.

No general estimate can be given of the expense of the keep of a man or maid servant on account of the numerous variations which are produced by locality or by different customs. The difference of expense in one country or in another is so great as frequently to increase or diminish by one half. In general, however it will be found, that where the servants are well kept and particularly where they receive an ample allowance of food, they are stronger, more capable of work, and more willing to assist in all kind of operations, so that the value of their labour is very little short of the actual cost of their keep. Accounts of the wages of many countries with regard to servants, and specifications of their expense in these places will be found in many treatises on agriculture and political economy. None of these calculations are, however, to be depended on.—*Thaer's Agriculture.*

DEEP AND SHALLOW DRAINING.

It is loss of time to discuss whether deep or shallow drains are best, till you know what kind of strata you are going to cut through. Both are good when the soil is adapted for them; and nothing but experience and great practical knowledge can tell what depth, what direction they should be cut in; and not then, till he sees what form the land is in, and what kind of strata lies under. There can be no uniform system for draining. The process must be entirely governed by the nature of the strata and how it lies.

In the length of my practice, which is upwards of forty years, I have drained almost all kinds of land, from 2 ft., and 2 ft. 6 in. to 3 ft. 6 in. and 4 ft. The different kinds of subsoil rule these, and what depth they lie, and whether they are porous above and retentive below, or retentive above and porous below. A man cannot tell which of these depths is best until he comes to execute the work. I have found all to answer when the strata is adapted for them. Respecting the distance, that depends upon the form the land lies in, and what kind of strata lie under. I cannot find anybody that can give a reason why drains should be cut 5 feet deep in stiff clay, and the clay put on the bare pipe or tile again. In the course of my practice I have seen one graft of clay put upon the brushwood which was put upon the tile, and which prevented the drain from having the desired effect. Every farmer that is a little acquainted with the spirit level, considers himself conpetent to the drainage of his land, without the assistance of a practical man; and in cases applying solely to clay and surface water the object is generally well effected; but where the land is springy, the strata varies, and the water breaks out at different levels, the spirit level must be used with great care, and with the aid of a practical man. In these cases I consider parallel draining of no use, as it would double the cost of the land, and not have the desired effect. But these things would require a practical man, and he must have the knowledge and use of the spirit level, or else he cannot make an estimate of what the draining of an acre of land will cost. In the course of my practice I made an estimate to the amount of £1,921 18s. 6d., and contracted for that sum before a drain was cut. Whenever I find it necessary to cut to any depth in clay, I always fill the drain up again with some kind of material that will admit of free access for the water to the tile, and spread the clay on the land. I have known a piece of land drained from three to four feet deep, and the clay put in again, and the land was none the better.—*Chester Chronicle.* Nov. 7.

Lock Jaw.—This hitherto fatal disease in animals has recently been cured by a new operation, whereby the animal obtains instantaneous relief. The muscles which were considered to be extensors are now found to be flexors. This important discovery was made by a person named Webb, of Balsham, Cambridgeshire, who has been operating upon a mare belonging to Mr. Addock, of Linton, which is now well, and going to work.

BOOK FARMIMG.

We had a fine example of hostility to book farming a few days since. One among the wealthy and respectable portion of our citizens, on being invited to subscribe for an agricultural paper, broke out into a most furious declamation against all attempts to improve the agriculture of the country, through the means of the diabolical art of printing. "He would have any man hung, drawn, and quartered, who would presume to attempt enlightening the public on agriculture through the means of the press, saving and excepting the present company. The farming of the present day, the crops, the soil, the orchards, animals, and indeed, whatever was connected with cultivation, was far behind what it was 30 years ago. Writing on agriculture, tended only to mislead; nobody but enthusiasts (knaves and idiots he meant), would write, and none but a similar class would read anything on the subject. Farming was to be learnt by example only; the old fashion was the best fashion, and nearest in accordance with common sense and sound judgment."

About half this tirade against this innovation upon the olden time, he believed; the other half he feigned; but he gave the lie to the whole of it in half an hour afterwards by purchasing a hundred dollars' worth of improved agricultural implements, which, but for the spirit awakened, and the knowledge developed by the agricultural information spread before the people of the present day, by our valuable periodicals devoted to this subject, would have remained where he thought the fruits and other matters connected with ancient agriculture, were, viz. in the noddels of a past generation.

The man who believes the agricultural press has done nothing for the cause in the present generation is to be pitied. The man who feigns to believe it, deserves worse. Both are burying or clogging the benefits of that talent, which they will be called upon to account for hereafter, with usury.—*Am. Ag. Journal.*

The Potato Crop in Ireland.—We are happy to state that most of the provincial papers which reached us during the past week fully confirm the statements we have from time to time made with regard to the potato crop. It now appears that, in many districts in which the outcry was too generally raised, that more than one-half of the potato crop was gone, not more than from one-twelfth to one-twentieth have suffered. In many instances, too, so prolific has the crop been that farmers have stated that, independent of those diseased, there has been little short of an acreable average.—*Banner of Ulster.*

The New Electric Light.—On Monday evening, the 13th of October, we visited the Hanover-square Concert Room, to behold this new light; and certainly were pleasingly amazed at this additional triumph of science. On entering the large room, we found it illuminated by a diffusive white light that showed to perfection the pictures on the ceiling, and also some which had been placed in the room to prove the intensity and power of the new light. This test, a severe one, was perfectly satisfactory, for the greys and the yellows were plainly perceptible, as also the flesh tints. A company, comprising scientific men of eminence, the directors of gas companies, the proprietors of patents relating to lights of every kind, and a multitude of highly intelligent and respectable persons had largely assembled. Mr. Straite and Mr. Petrie, the discoverers and patentees, were on the platform answering the eager questions of the scientific men; and after a short interval, Mr. Straite gave a brief outline of the most prominent characteristics of the new discovery, which was earnestly listened to and frequently elicited burts of genuine admiration. He stated that the problem of rendering the electric light permanent self-regulating, and economical, had been accomplished. Its advantages were, that not being combustible, it was perfectly harmless. That being without heat, it was not injurious to the eyes or the other senses. That it could be conveyed by wires as neatly as bell wires. It was economical, for the light of a hundred wax lights could be furnished for a penny an hour. The outer shade being removed, an elegant glass vase, about two feet in height, and six inches in diameter, of an arched shape, and on a metal plate, so that no air was admitted, was exposed to view. Wire, conveying the fluid, was all that was to be seen, and the light was turned on and off by Mr. Petrie, and the transition seemed from day to night, although there were several chandeliers alight in the room. The delicate human hand thus controlling the fierce and most appalling power that manifests itself in the tropical storm struck all present, and an involuntary burst of admiration manifested the almost awful interest with which this matchless triumph of human skill and science was appreciated. Mr Straite declared his intention of shortly giving a series of lectures on the subject. After answering numerous questions, the company separated, certainly impressed with amazement at the discovery, and admiration of the gentlemanly and modest bearing of the discoverers.—*Douglas Jerrold's Newspaper.*

POETRY.

THE ACRES AND THE HANDS.

BY DUGANNE.

"The Earth is the Lord's and the fulness thereof,"
Says God's most holy word:
The water hath fish, and land hath flesh,
And the air had many a bird;
And the soil is teeming o'er the earth,
And the earth hath numberless hands;
Yet millions of hands want acres,
While millions of acres want hands.

Sunlight and breeze, and gladsome flowers,
Are o'er the earth spread wide;
And the good God gave these gifts to men,
To men who on earth abide;
Yet thousands are toiling in poisonous gloom,
And shackled with iron bands,
While millions of hands want acres,
And millions of acres want hands.

Never a rood hath a poor man here,
To plant with a grain of corn—
And never a plot where his child may cull
Fresh flowers in dewy morn;
The soil lies fallow, the weeds grow rank,
Yet idle the poor man stands!
Ah! millions of hands want acres,
And millions of acres want hands.

ON LISTENING TO EVIL REPORTS.—The longer I live the more I feel the importance of adhering to the rule which I have laid down for myself in relation to such matters:—"1. To hear as little as possible whatever is to the prejudice of others. 2. To believe nothing of the kind till I am absolutely forced to it. 3. Never to drink in the spirit of one who circulates an ill report. 4. Always to moderate, as far as I can, the unkindness which is expressed toward others. 5. Always to believe that, if the other side was heard, a very different account would be given of the matter."
—*Carus's Life of Sir Jon.*

DIFFICULTY.—What is difficulty? Only a word indicating the degree of strength requisite for accomplishing particular objects; a mere notice of the necessity for exertion; a bugbear to children and fools; only a mere stimulus to men.—*Warren.*

HUMILITY.—A humble man is like a good tree, the fuller of fruit the lower the branches hang.

WORDS AND DEEDS.—A man's words may pass away, but his deeds will be remembered if they are worthy of record.

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