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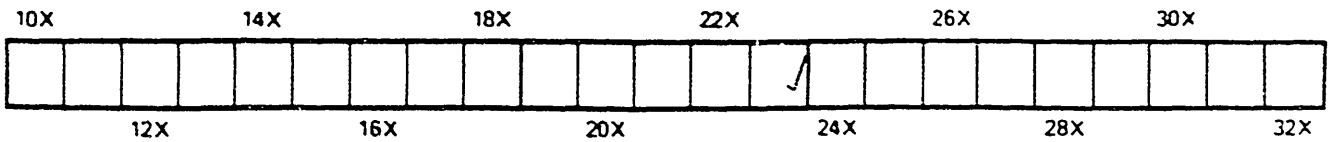

AGRICULTURAL JOURNAL,

AND

TRANSACTIONS

OF THE

Lower Canada Agricultural Society.

VOL. 5 MONTREAL: AUGUST, 1852. No. 8

AGRICULTURAL INSTRUCTION.

This is a subject that is of great importance to the Canadian community of every profession. It is of importance to those who may always reside in the town, as well as to the farmer who always resides in the country; both are deeply interested in the abundant and excellent production of the land, and it would be the interest of all, that those employed in the cultivation of the land should be perfectly well instructed in the science and art of agriculture, so that they would obtain from the soil the largest possible production, at the lowest expense of capital and labor. We do not wish to be understood as stating that a large and profitable produce could be obtained at a small expense of labor and capital, we only say that labor and capital *judiciously and skillfully* employed will produce larger and more profitable returns, than the same amount of both would do if not skillfully and judiciously employed. Indeed in numerous instances the same amount of labor and capital now employed in agriculture would yield, perhaps, double the produce if employed more skillfully. There is therefore the most urgent necessity to provide suitable means of instruction for agriculturists. Agricultural Schools with Model Farms attached, and placed under good regulations and competent superintendence, would, we humbly conceive, be an excellent mode of instruction; also, the plan lately adopted in Ireland, of sending well qualified visitors to every part of the country to give lectures and instruction to the farmers in their own fields, to point out the defects in their system, and recommend the improvement that would be necessary to adopt. Few farmers would reject good advice, when the defects in their management would be clearly demonstrated to them, and when they perceive that there could not be any unworthy design in giving advice but solely for their own advantage. Whatever may be said or thought to the contrary, we believe if proper means were adopted, the Canadian farmer would not be slow to introduce improvements that could be demonstrated to them to be such. There are many of the settlers who come to this country that are by no means very good farmers, and who require instruction as well as French Canadian farmers, though unquestionably there are some settlers who are excellent agriculturists, and the continued immigration of this class of settlers, is of infinite use to the country. It is no discredit to immigrants that they should not all be good farmers; many of them who settle on land here had, perhaps, very little previous knowledge of husbandry, and it could not be expected that they would understand the art of agriculture by mere instinct. Instruction is therefore required for other agriculturists as well as Canadian farmers, and any institutions that may be established should be open to all our population. There are many excellent farms in the country and under the best system of management, but these will not answer all the purposes of Model Farms, and there will ever be some objections raised to them as example farms. But even though there should not be this objection they would not answer for training of youth, nor could farmers be induced to intrude uninvited to these private establishments for information and instruction. So long as pattern farms remain

the private property of individuals, they will not be generally useful as Model Farms.

CONTINENTAL STATEMENTS ON BEET CULTIVATION.

Boussingault (1851).—In France, it is estimated that the average amount of white sugar obtained from the beet is only about 4½ per cent., while the composition of that root shows so much larger a proportion of saccharine matter. This considerable loss is chiefly attributed to the action of the salts of potash contained in the juice of the beet, as well as in that of the sugar-cane, salts that are again found in large proportion in the molasses obtained from each of those juices. To this undoubted cause of the alteration of the sugar during boiling must be added another, more powerful, perhaps, and of which the effects are manifest in the juice immediately after its extraction by the press. This destructive action proceeds from the circumstance of the albuminous matter modifying itself in contact with the air into a real fermentative substance, which renders the sugar uncrystallizable. In the opinion of M. Melsens, who has successfully devoted his attention to the study of the causes of changes taking place in saccharine matter, it is sufficient, for the purpose of opposing the formation of destructive ferments, to exclude all intervention of air. In setting out from this principle, M. Melsens has applied himself to the discovery of a body very absorptive of oxygen, without action on the sugar, without danger to the health, and easy to be prepared. The bi-sulphite of lime has appeared to him to satisfy these various conditions. This salt effects the coagulation of albumen, of casein, and of white of egg, at the temperature of boiling water. The bi-sulphite of lime possesses all the properties of a clarifier, as it removes all the nitrogenous matter from the juice of the sugar-cane and that of the beet; it acts, too, as a decolourizer, or bleaching agent; it substitutes for the fixed acids in the juice an acid that is gaseous and inert—namely, the sulphurous acid. M. Melsens having made a great number of experiments on this subject, is so fully persuaded of the preservative properties of the bi-sulphite of lime, that he believes that it will become possible, in tropical regions, where the juice of the cane turns sour so rapidly, to extract the sugar from it by the sole employment of the sun's heat, evaporating the juice in the open air in the same manner as the salt water is dried up in marshes near the sea. Without participating in all the expectations of M. Melsens on this subject, I am inclined to think that the bi-sulphite of lime will find an useful application in the treatment of the "begasse" (cane-trash or sugar-cane stalks that have passed through the mill, and are used only for lighting fires), the residuary sugar of which is destroyed with astonishing rapidity. The employment of the bi-sulphite would allow of the beet roots being gra ted in advance, and of their pulp being kept o hand, to be pressed at convenient leisure, afte undergoing successive macerations. The juic would furn sh limpid and colorless decanta tions, no longer requiring the employment of an imal charcoal. Concentrated in evaporatin vessels to the density of 1.30, it would then b removed to the crystallizing chamber. Th method would much simplify the extraction o sugar; and even supposing that it were no adopted on a large scale, it would be the mea of bringing the manufacture of beet sugar wit in the range of farmers. All, indeed, that woul be required, as M. Melsens himself remark would be a rootcutter, a few casks, a boiling co per, and some earthenware pans, to extract a once from a ton of beet roots a whiter sugar tha any of the finest sugars of commerce. During close investigation of the juice of the beet, M Bracconnot has ascertained that the nitrogenou principle—albumen—that it contains, does no become coagulated by the action of heat, eve on continuing the boiling of the liquid or co centrating it by evaporation. He attributes th non-coagulation of the albumen to the absenc of salts of lime in the beet juice; for he foun that if a small quantity of a calcareous salt, suc for instance as the chloride of calcium, th acetate of lime, or even sulphate of lime i powder, was mixed with the juice, and hea then applied, the whole of the albuminous ma ter would be instantly precipitated in the form bulky floccules. By this simple addition of salt of lime, a liquor was obtained quite as lim pid and colorless as that resulting from th beet-juice when clarified by means of quick lime. This liquor, evaporated conveniently and removed to the drying room, yielded a ma of crystallized sugar almost completely fr from treacle. M. Bracconnot concludes his re searches by remarking that sulphate of lim in powder will probably be found advantageou ly to replace quicklime in the clarification beet-juice, without presenting any inconve ence of that caustic alkaline earth. From th whole of M. Peligot's experiments, it resul that the average composition of the beet ma be assumed to be constituted of 87 per cent. water, 8 per cent. of substances soluble in wa ter, chiefly sugar, and of 5 per cent. of insol ble woody matter; and, as only about 4½ pe cent. of sugar is extracted from the juice, it obvious how great a loss of sugar is experie ced in the manufacture. It occurs, however, this case as in that of the sugar cane, that a pa of such loss is occasioned by saccharine mat being left behind in the plan after the juice h been pressed out of it. Thus, with the press now in use, only from 60 to 70 lbs. of juice a obtained from 100 lbs of grated beet roots, whic at the same time, perhaps, contain very near 95 lbs. of that liquid. We cannot, therefo reckon on there being subjected to the proce of sugar extraction more than the average weig

of 65 lbs. of juice, containing, according to the mean result of the analyses, 5¼ lbs. of sugar. The real loss of sugar, therefore, sustained, when we obtain only 4¼ lbs. of it from 100 lbs. of beet root, may be stated as about one fifth. This loss, great as it appears, is often estimated to be still greater when the roots contain from 10 to 11 per cent. of crystallizable sugar. In sugar-cane works, the saccharine matter left in the begasse or pressed canes, is completely lost, being either burnt with the wood or destroyed by fermentation. In this respect the beet root has an advantage over the sugar-cane, which is, that the sugar of the pressed pulpy matter may serve as food for cattle. This pulp cake, indeed, is ungrated beet; and if as cattle-food a little inferior to the entire root, it arises only from containing a large proportion of woody matter which belonged to the juice extracted by the press. We may even estimate approximatively the composition of the pulp relatively to that of the rest; for, according to the average constitution we have already assigned to the beet root, and supposing that it has yielded 65 per cent. of juice, and 35 per cent. of pulp, it is obvious that 100 parts by weight of pulp will give 79 of water, 7 of sugar and albumen, and 14 of woody matter. One of the causes which have, perhaps, the greatest influence in diminishing the amount of saccharine yielded by the beet, is the difficulty of preserving its root when it has attained its maturity. The crop being taken up at the end of autumn, the bulbs are as liable to injury from the severity of winter as from too mild an atmosphere. The frost destroys their organization, while mild winters promote their vegetative tendency at the expense of the sugar they contain. As beet contains saccharine matter at every stage of its growth, it might, perhaps, be advisable to prevent its attaining its full development by taking it up earlier. By sowing also more thickly, and commencing the extraction of the sugar before the full time of the crop, we should probably be enabled to compensate the difference that would result, as one of the consequences of this innovation, from the less size and weight of the bulbs. Should this view of M. Peligot be realized, even to a certain extent only, in practice, the cultivation of the beet would recur more nearly to that of the sugar-cane, in allowing to the manufacture of beet sugar a routine that would be found to diminish the inconveniences attending the preservation of the root.

Pabst (1851).—Beet roots are, from autumn to spring, a wholesome food, promoting at the same time both the milk and the flesh of an animal. They are more watery than potatoes, and on the average 3lbs. beet root may be reckoned for 2lbs potatoes; but as they are neither purgative nor flatulent, when obtained in good condition and given with the necessary addition of dry fodder, beet roots in a raw state may be given in a considerably greater quantity than potatoes can. When the beet is of really good quality, as for instance of the yellow globe Obendorf, or the white Silesian, sugar beet varieties, 275 lbs. will be found equal to 200 lbs. of potatoes, or 100 lbs. of good sound hay. I found, during the course of some experiments on fodder made by me at Hohenheim, in 1825, that a fodder composed of one-fourth potatoes, one-fourth beet root, and one-half hay and straw, was quite as valuable for dairy stock as 250 lbs. of beet and 200 of potatoes. There is, indeed, no reason whatever for giving beet root to cattle in any other than its raw state, as its value for fodder would not be increased by boiling or steaming. When good stacks of beet are made, and a portion also is put away in the store-house, it will keep fit for use until May, provided it be guarded from the injury of frost on the one hand, and from the influence of too warm an atmosphere on the other, for this root loses much of its value as soon as it begins to sprout. In every case the sugar beets are more easily wintered than the other varieties; and their value on that account is essentially increased.

Wolff (1851).—Sugar occurs in the vegetable kingdom of two essentially different kinds—namely, as raw sugar, and as grape or fruit sugar. The first kind is well known as being present in the sugar-cane, as well as predominating in the juice of the beet root and of the maple tree; it differs from the second kind in external condition by the perfect facility with which it crystallizes, and chemically, by the less proportion of water it contains. Raw sugar contains rather less oxygen and hydrogen (in the proportions forming water) than the starch or dextrine (starch-gum), out of which sugar is in every case formed; while grape sugar, on the other hand, contains rather a greater amount of those two elements of water. Raw sugar is easily converted into grape sugar during the process of fermentation, by the action of the peculiar substance diastase, and by means of diluted acid; so that it is probable that, on the abstraction of water in the vegetable organism, raw sugar first arises out of dextrine, and is again, on the resumption of a certain portion of water, further changed into grape sugar—namely, into a kind of sugar which occurs far more frequently in the vegetable world than raw sugar does. Sugar is formed in large quantities in different plants and particular portions of them at certain seasons of the year; in fruits at their time of ripening, in many roots at the end of summer, in trees in the spring, in all young plants during the first period of their growth. We cannot regard any particular organ, not even in the case of one and the same plant, as the seat of sugar-formation: for even saccharine matter, like all matter universally diffused in the vegetable kingdom, is produced in the most widely different portions of plants; the formation of dextrine, however, always precedes that of sugar. It has been observed, for instance, that in spring the juice of the birch-tree is richer in sugar, in proportion as the part from which it is

drawn is further removed from the root; a circumstance arising from the dextrine being in greater amount in the lower vessels of the tree, and becoming converted into sugar, as its transition upwards is effected through a greater number of cells. Sugar can obviously be transformed into starch, as the accumulation of starch in the seeds of the grasses, particularly in the grain of the cerealia, clearly proves. In their yearly growth, these and many other plants are rich in saccharine matter, which, as in the cases of the Indian-corn stalk, disappears when the grain attains its perfection, and is converted, as it would seem, into the great quantity of starch which those grains are found to contain. Whether the formation of sugar always precedes that of starch, is not generally to be ascertained; that it is often, however, the case is certain. Starch, like woody fibre, may, it appears probable, be formed immediately from dextrine, in the same manner as dextrine, on the other hand, may be easily produced from starch. Sugar also, under certain circumstances, undergoes a clear reconversion into woody fibre and cellular matter, as may be observed in the case of sweet fruits, which sometimes lose their sweetness in consequence of their sugar being in a great degree converted into cellular substance. It is impossible to point out the causes of all these progressive and retrograde formations; we must content ourselves with knowing that they do actually take place, and that they possess in themselves some instruction for our guidance, since all these substances display so great a similarity in their chemical composition, while at the same time, by the simple assumption or rejection of water, they are often, beyond the range of vegetable organism, transformed into each other, and always contain oxygen and hydrogen in the same quantitative proportions as they exist in the composition of water.

Payen and Richard (1851).—There are very few agriculturists of the present day, who are not perfectly acquainted with the advantages attending the cultivation of the beet or mangel-wurzel; it is, in fact, one of the most important plants in good husbandry. Its roots give, in nearly every soil, a large amount of crop, and serve both as a food for cattle, and for the extraction of a sugar, which, when well refined, is equal in every respect to that which, in hot climates, is produced by the sugar-cane. These roots also, when properly cooked, furnish a tolerably agreeable vegetable, which serves to vary the food of man during the winter season, when there are so seldom fresh vegetables for the table. The breadth, however, of its cultivation in France, is only 142,500 English acres, being much less than that of the potato. The departments in which beet culture is carried on to the greatest extent are those of the north, of the Pas-de-Calais, of the Somme, of the Aisne, &c., which furnish the greater part of the roots required for the sugar manufactories. The beet is an indigenous plant; it came originally from the southern countries of Europe, but can be cultivated with equal facility in the north or the south. The following are its principal varieties:—1. Field-beet: long, rose color, growing above the earth; fleshy part veined with rose color. It offers two sub-varieties: the one flat-bulbed, short, and half sunk into the earth; the other long, and growing more above the ground. This variety of beet contains in general less nutritive principles than the other varieties, and especially less saccharine matter. In deep, wet land the crop is very abundant; it can, therefore, be only grown as food for cattle. A sub-variety has, however, been found, by M. Payen, and M. Vilmorin, to yield greater proportions of sugar and other proximate principles than even white varieties grown on the same soil. 2. The sugar beet; white, short, growing in the earth; flesh white. Two sub-varieties have been distinguished; the one with the neck green, is the Silesian beet; the other, with the neck of a rose color, is in general richer in sugar. 3. The yellow German beet; long, yellow, grows above ground; flesh white, or lightly veined with yellow. 4. The yellow globe beet: round shape, growing almost completely out of the earth; flesh white, or lightly veined with yellow, contains only a small proportion of sugar 5. White-yellow beet: middle length grows in the earth, flesh white, skin of a pale yellow color. 6. The long or great yellow beet of Castlenaudary: long, grows much out of the ground; flesh and leaf-stalks deep yellow. This is the variety especially cultivated in the neighbourhood of Paris. 7. The great red beet, long: grows much out of the soil; flesh and leaf-stalks red. In general, even for the food of animals, we should less consider the bulb of the roots, or even the quantity of their produce, than the amount of nutritive matter that they contain. There is obviously every advantage in cultivating a variety, which in the same bulb will contain more nutritive principles. On this account the generality of farmers agree in giving the preference to the Silesian beet, which contains more sugar and less foreign matter than the field beet; and has also the great advantage of being one of those varieties that best resist the action of frost. If all rearers of stock are agreed as to the nutritive qualities of the beet, they are not equally so to the influence it exercises on the production of milk in dairy cows. According to some authors, beet favors the secretion of milk; while others, on the contrary, think it is very unfavorable for that purpose. Schweiz considered that feeding for two days only on this root was sufficient to diminish the amount of milk in a very striking degree. It maintained animals in flesh, and good condition, a circumstance highly favorable in severe seasons. Potatoes and turnips forced the milk, and beet the flesh; the latter being more favorable for fattening stock than potatoes and war turnips are.

This opinion on the but little favorable influence of beet on lactation is not participated in by all farmers. The Baron Crud remarks:—"After an experiment which I have conducted with the greatest care, and after the inferences which I have deduced from the results I have obtained in the employment of this root for the food of cattle, and particularly for that of dairy stock, I consider it to be wholesome, fattening, and milk-secreting; the milk given by the cows, partly fed upon it, being of an agreeable taste and flavor." We might here cite other parties in favor of the milk-yielding properties of the beet, of whose roots the rearers of stock, who may be regarded as excellent judges on this point, require an enormous supply for consumption by the dairy stock which they rear. Horses in particular appear to be the animals to which the diet of the beet is most favorable. There are districts, as in the Palatinate, for instance, where the horses are fed almost exclusively on this root during seven or eight months of the year, and are maintained by it in a perfect condition, even while employed in the roughest kind of work.

Doebereiner (1852).—The manufacture of crystallized sugar out of the white sugar beet has assumed in Europe, and particularly in Germany, so important an extension, that a considerable competition has arisen between this article of commerce and the Indian sugar, derived from the sugar-cane. The returns obtained in consequence from field husbandry and cattle feeding have essentially increased, while corn growing, on the other hand, has ceased in some of the most fertile of our districts. The white Silesian sugar beet is the variety best adapted for the extraction of the largest amount of sugar; and it requires for its cultivation an adequately deep, fertile, sandy loam, and in dry seasons a clay soil; on either of which kinds of soil the beet may be raised several years in succession, but never with fresh manuring matter. The crop is stored for future use in pits, two feet deep, in which the roots are heaped four feet high, and covered with a sufficient layer of earth. The stock must, however, from time to time be examined, in order that in necessary cases it may be immediately brought into use.

ON GRAZING.

BY A PRACTICAL FARMER.

"The profit of the earth is for all; the king himself is served by the field."—Eccles. v. 9.

That department of farm practice connected with the management of cattle, sheep, horses, &c., commonly called "live stock," during their consumption of the products of the farm, is denominated "grazing." It includes the management of the grass lands and other pasturage in the farm; and also fallow crops, so far as their consumption is concerned—this is winter grazing. We, however, in this article intend to confine ourselves to the stocking and depasturage grass lands and other pasturage during the summer, *i. e., summer grazing.*

Summer Grazing.—The Pastures.—Grass Lands.—Clover and other seeds ought invariably to be cleared of stock and "laid in" "at perfect rest" on or before the month of February, otherwise the trampling of the stock will seriously injure as well as retard the growth of the grasses and herbage, which at this period is just in that state most likely to receive injury from the treading of stock and the floods peculiar to the month. It is of essential importance to promote the early growth of the grasses; nothing should be allowed to check them, especially in their early stages. A vigorous start in the spring will generally secure a good pasture, which under ordinary care may be preserved throughout the summer. A good grazier will not stock his land till the pasturage is plentiful; otherwise, the stock having to pass to and fro so frequently in search of their daily food, tread down and destroy much young herbage, and the continued cropping of the young grass prevents it getting sufficient lead to insure a free and rapid growth. Secure a good pasture, and stock it lightly; the stock will then gently and pleasantly take their food, and lay themselves quietly down to rest; there is no unnecessary trampling of the grass—it has consequently a far better chance of improvement—the pasture soon abounds and becomes luxuriant—the grazier crowds in more stock—the pasture keeps its lead—the stock thrive—the grazier is contented. On the other hand, by stocking a bare pasture it is always kept bare—the stock, as we have said, are continually on foot, looking out for every blade of grass, apparently bent upon preventing their growth—they become restless and lose their condition, and nearly a whole summer is lost before they regain it. No plant can thrive under continued cropping of its leaves, much less so if it be those it first throws out; but let it gain a fair, if not a vigorous shoot, and it will bear much. Just so with field grasses; if they are continually cropped in their earliest stages, a most unsatisfactory summer pasture is certain to be the result; and, of course, the grazier's profit equally so. On clay lands, good spring pastures are indispensable before they are stocked, else the draught of summer and heat of the sun cause the herbage to burn up; whereas, a good pasture, carefully preserved, will last the whole summer: the land being covered with grass prevents by its shade the penetrating rays of the sun from absorbing too much moisture from the subsoil; a refreshing influence is kept up; the pasture retains its luxuriance, and the quality of the grass is very nutritious and fattening, quite equalling that on the better loams; and in moist seasons, accompanied by heat they are better, being less laxative: fine loams grow too fast.

Cattle Grazing.—The Stocking of Pasture Lands.—This depends upon the quality of the land to be grazed. The *best lands* are commonly known as "bullock lands," and are those capable of fatting cattle from the richness of their grasses: these *best lands* are generally appropriated to the grazing of cattle. These lands are "laid in" in the early part of the winter. As soon as a good pasture is obtained, which will be about the close of April or the beginning of May, the bullocks are put thereon—the number depending upon the state of the pasture and geniality of the season. Fatting cattle must have good pasturage, and every care must be taken to keep the pasture in what is called a feeding state. As the grass increases more cattle may be put on it; and in luxuriant seasons horses may be put on, at the rate of about one to seven acres; but stocking with sheep conjointly, on the "best bullock lands," should be avoided: the sheep picking out much of the fine growing grass, leaving of course the coarser for the cattle, but the horses more generally feed upon the short bare places, roadways, footways, and the like. They are not considered detrimental in a fatting pasture in the early part of the season, but should be removed soon after midsummer or whenever the pasture begins to fall off. It has become a common practice in many districts to give fatting cattle an allowance of *four pounds* of linseed cake upon their pastures: it is either given in small tubs, or the dust or small pieces are sifted out, and the larger ones are thrown upon the ground, from which they are readily gathered, and without waste. This allowance of cake is, we think, highly advantageous, and in two ways—it will give that peculiar quality or hand to the animal which is so desirable, and the pasture upon the average will carry or fatten one head of cattle more upon every seven acres. The writer of this paper has for several years witnessed the good effects of this system upon two fields of ten acres each, and has practised it on others. These fields, prior to the introduction of the plan of giving cattle *cake upon grass*, were usually stocked with ten cattle (large oxen) in each field, or one per acre; now, each field will fatten with greater rapidity twelve, by having the above allowance of cake—thus making a difference of one bullock to five acres. We believe this mode well worth adoption, and give it our most unqualified recommendation; it is a most effective way to improve grazing lands—the cattle thrive much faster, and are soon ready to give place to others.

In stocking these "best lands," much attention should be given to the proper choice of the stock to be depastured upon them. It is most advantageous to choose animals of a good fattening quality, suited in size and weight according to the fertility of the land, and in good and thriving condition; indeed, almost fat—these will speedily be fit for the butcher. On being sold off, the land should be very heavily stocked with store cattle and store sheep, so as to feed the whole off in the shortest time possible, and then to be again "laid in" for a sufficient time to obtain pasturage preparatory to a renewed stocking. In this way "two runs" of cattle may be fatted of every summer. Many graziers, however, prefer easing other pastures by taking off store or lean stock, and leaving them thereon for more rapid improvement. The droppings of the cattle ought to be repeatedly knocked and spread, and it is a good practice to mow some portions of the rough places every day, in order to their being eaten more readily. This will keep the pasture more even, and materially improve the herbage of these places, and in what are called "grass" years (highly productive years) the cattle will be benefited by eating the partially dried herbage, for which they manifest frequently a decided preference. Those animals affected with purging will resort to it, and be benefited in this respect. If these rough places are left uneaten during a whole summer, they become a large tussac of grass, which nothing will eat afterwards; they destroy the finer herbage or grass near them, and are finally rotted down in the ensuing winter. In stocking pastures on the lands not known as the "best lands," but still good enough to fatten cattle of medium size and quality, and which are known as second-rate "bullock lands," the same course may be advantageously pursued—the great difference will be in the choice of the animals. The best lands will fatten oxen of great weight; and their value is thus commonly estimated:—"That field will fatten an ox of a hundred stones weight—this one of seventy stones." If we come below seventy stones, it is then considered to be in the class of second-rate bullock lands. These lands are generally stocked with cattle of less weight, or, if stocked with large cattle, they ought to have an allowance of cake daily. The more common mode is to stock them with the smaller Scotch or Welsh cattle, small Devons, and the like; indeed, any breed not likely to exceed fifty or sixty imperial stones in weight. Heifers, drape cows, and two year old steers, thrive very fast on such lands; the former are much sought after by the grazier for this purpose. Lands of moderate fertility will advantageously graze stock, though put on in low condition, if it is allowed time to get a lead. The old adage says, "Twenty-four hours for the sheep, twelve days for the ox:" this adage may be satisfactorily explained on studying the process "of rumination—the herbage should be sufficientlylong to be easily gathered by the ox—he will then soon lay down, and the process of rumination immediately proceeds." One of the modern improvements in summer grazing is the fattening of cattle in byres, hovels, or fold-yards. This introduction has materially lessened the annual value of the best summer-fed bullock lands, inasmuch as it provides a substitute. It is but a very few years since that the meat markets were supplied, dur-

ing the months of June, July, and August, almost exclusively from these lands, and, consequently, the price of meat was proportionately higher in these months; this led to the adoption of the above mode of fattening cattle. It is now very generally practised by a great number of our best farmers, and with extraordinary benefit, not only derived from the fattening of the cattle, but in providing an immense store of valuable manure. This system is more beneficial to poor soils than others, because a crop of clover and other artificial grasses is thus made to produce as large a quantity of meat as the rich pasture lands, and also large supplies of manure to be applied in raising the corn crops. We say that it thus produces as large a quantity of meat as the richer soils—the assertion, we think, is correct. It is an indisputable fact, that if any herb or root is left to grow undisturbed, to throw out its leaves and stalks to catch every favourable influence, atmospheric or otherwise, it will yield a larger plant, and a greater amount of herbage; just so with the artificial grasses—they must be left till they are ready for the scythe; they are then cut and carried into the fold-yard. Besides, in this partly matured state they are better and more substantial food than the young natural grasses fresh from the field, at a few hours, growth. We desire to guard ourselves and readers here: the quality and nutritive value of the grasses depend mainly upon the fertility of the soil upon which they are grown. We therefore mean, that upon these poor soils the grasses requisite to fatten cattle must be of a highly nutritive quality, and as poor soils will not naturally produce such, they must be aided by artificial means, and which is now universally the case. The common mode of management is to stock the hovels, byres, or fold-yards, with cattle in high condition, mow and give to them daily such quantity of food as they require, and in addition to supply them with meal or cake. We think that meal (by which we mean bean or pea meal), in this mode of fattening, is preferable; it can be administered economically in the crib, and is an excellent corrective against strong succulent food. About six pounds of meal given in chaff is a good allowance, and should be given in two feeds, morning and evening.

We cannot stay now to argue the point as to the universal adoption of this measure; but we will, by the way, just say that our opinion is decidedly in favor of it. We believe the "best lands," if so applied, would produce an astonishing quantity of most valuable herbage, and could be made, *under artificial grass culture*, to fatten a much larger amount of cattle than in the present system of ordinary grazing on natural grass pasture. Perhaps at some future time we may give our views upon this point.

Having hastily noticed some of the modes of stocking lands for the fattening of cattle, we must now say a word or two relative to summer grazing *Store Stock*, and as our limit is nearly filled up, we must leave *Sheep Grazing* for another paper. By "store stock" we mean all those cattle, young and old, not intended for fattening at this season *i. e.*, cows, breeding and suckling cows and heifers, young steers and heifers, calves, and working oxen. Milch cows certainly must have good pastures, but put on good "bullock lands" they will incline to make themselves fat rather than yield much *creamy* milk. We prefer putting them thinly on the best sheep lands, taking care to keep a full pasture. Breeding and suckling cows and heifers should have the next advantage in the distribution of our pasturage. These we run thinly over our sheep-breeding pastures, and on these should be turned the working oxen, because coming hungry from their work, they lay greedily hold of such pasturage as the more lazy and fastidious animals may leave. The young steers and heifers we place next in the distribution of our pasturage, and run them on lands amongst young sheep, on the inferior pastures. We also make use of them, along with the sheep, "mobbing" up our "bullock pastures," prior to relaying them in a second time; indeed, this kind of stock we place just where we have room, and change them about to ease or stay our pastures as we deem requisite. The calves we take great care of—they are put upon the "sweetest" and most healthy pasture we have, and are carefully watched and changed according to circumstances; even a day lost, through inattention while a calf is scouring, may cost its life. Cows are very subject to purgative affections: when this is the case, a change of pasture and dry food should immediately be resorted to. We shut them up a day or two to hay, and give but little water. We had two cows the other day violently affected, so much so as to fall off full three-fourths in their milk. They were shut up in a warm hovel two days, to hay or clover hay, and then turned out recovered. In every great change of weather, in heavy thunder storms or continued rains, much care is required in overlooking the whole herd: "The eye of the master grazeth the ox:" it is indeed upon his business-like judgment that success must depend; and in variable seasons it must and will be in constant exercise. We say the great characteristic in the mind of a farmer and grazier ought to be judgment: it is brought into requisition under every change and circumstance of his business, but more particularly so in the disposition and management of his live stock.

OBSERVATIONS ON SEEDS.

In my former paper on this subject, printed in the *Herald* for April, I noticed that all sub-varieties of plants were very liable to "degenerate," as it is called, that is, to approach nearer and nearer to the hardier, coarser, and less productive varieties peculiar to, or suitable to the soil and climate; and I also stated

that perpetual care was required in the producer of seeds, to keep up as long as possible the effects which his skill had originally developed.

I shall now proceed in taking a few examples from cultivated plants.

1. TURNIP SEED.—This, as it is requisite to select roots of a fine shape and good size, to produce seeds from which similar perfect roots shall spring, and from the necessity (to prevent hybridizing) that they should be grown at a distance from any sub-varieties, or indeed any of the Brassica tribe, is a branch that can only be well carried on on a farm. As I have seen it practised, the soil on which they are sown must be in a perfectly clean state, and of good quality, as during its progress the seed exhausts the land considerably. The ground is dug all over to a considerable depth, and the bulbs deposited during the process. No similar plants are allowed to flower near them; and even charlock is extirpated from the vicinity. It is allowed to ripen *perfectly*—(and here I must remark, that this is necessary to perfecting all seeds.—Nature herself proves it, for she does not distribute her unripened, immature seeds, possessing but half the proper vitality)—cut down carefully by hand, to avoid shedding the seed, and has besides to be well watched while ripening, and after it is cut, till dry enough to stack if to be kept for some time, or to thrash out directly, if this method is preferred. From this it will be seen that there are very great expenses attaching to seed of this kind, and that it cannot be produced *cheaply*: more especially when we recollect that this constant transplanting gradually improves the turnips, by diminishing the size of the tap root and of the *top*, and consequently renders it less productive of seed. Now, in competition with this good seed, comes others grown in counties where either the business is not understood, or not thought worth while troubling about.

Here it often happens that an acre or two of late-sown inferior Swedes is kept back for this purpose, *because* of its inferiority, and just hurdled off from the rest of the field. It is probably broadcast, and thickly overspread with charlocks, with here and there a plant of rape; but so much the better, thinks the grower, it increases the quantity of seed. Then, to lessen the expense of bird-keepers, and to prevent shedding the seed, it is *mown* in an immature state, and gathered together and thrashed as soon as possible. Now this inferior rubbishy stuff costs the grower so little, that it can be afforded at any price: 2d. a lb. would pay them better than 8d. does the honorable grower—but if 10s. were given with every lb. to the *sower*, he would be a loser. Then the buyer of this bad seed complains of the unkindness of his soil for turnips, and yet finds (which is very extraordinary, as the plants are of a similar tribe) that it is remarkably subject to charlock.

II. CABBAGE SEED.—This being similarly subject to hybridize, is more proper for cultivation by persons who hold land of sufficient extent to allow of a wide space between other plants of a like class, than by gardeners, who, on a small plot, grow perhaps four or five different kinds in close contact, or if they try to grow them pure are prevented by their neighbours, —and it would be more profitable than turnip seed, as bearing a far higher price. Thus it is considered to be impossible to grow true Brussels sprouts except from imported seed, because this is the prevalent variety where exported from, and therefore not so liable be hybridized, while here our more prevalent varieties completely hybridize and alter its character; but a farmer growing it far apart from any other of the Brassica tribe, could produce as pure as the Belgian; and by selecting superior plants for the production of seed (by drawing out the inferior for eating, and filling up the blank intervals thus left with carrots or potatoes,) could produce a better quality.

As an example of the power of hybridizing, I knew a cottager who reserved a fine cabbage for seed near a plot of seed turnips, which so completely changed the quality, that the cabbage seed produced a *valuable* new variety, with a turnip head and a cabbage root; had it been just the contrary, which is I think a possibility, by reversing the manner of hybridizing, there would have been something gained to the gardening world.

III.—The cereal seeds come next: and here those who improve existing varieties, or produce new ones deserve greater encouragement than they obtain; as it is, cereals being articles of food, the competition is too great to allow of great expense in producing them to perfection for seed only, as a light shrivelled sample, hardly fit for food, is often a successful competitor (on account of its lower price) with that of purest quality, most carefully grown and selected.

Cereals for seeds ought, in my opinion, to be grown on good soil, either drilled at wide intervals from a very small quantity of seed, or dibbled: and this to induce a large ear and much tillering; and when the individual plants so treated get this habit of growth, they will retain it for a few years even when sown thickly in narrow drills, and thus a large crop be the result under *common* treatment, from sowing seed thus artificially prepared. But the small difference in price between seed and other wheat will not allow of this. Besides, a person might sell perhaps only one-third of this wheat for seed at a slightly increased price, while the other two thirds would be decreased in value for the miller: as tillering would produce an uneven sample the small quantity of seed sown risk a short crop per acre, and the perfect ripening required, besides the risk of loss in harvesting, make the grain appear coarser and more branny than when cut in a greener state.

As to seeds themselves, it is well known they vary in size considerably, and it is probable that the largest ones, and those soonest ripe, possess greater vitality, and are more likely to produce fine plants than the others. In the cereals, as is well known, the grains at the top of the ears are the smallest, and when they tiller the main stems produce the largest ears. In carrots and parsnips the heads on the main stems ripen first, and are the largest. In turnips and cabbages the capsules on the bottom of the stalks are the finest and ripen first; therefore when a few only are grown, and it is particularly wished to procure fine plants, the earliest ripened and largest heads of the carrots are kept apart, and the ends of the turnip plant clipped off; this is also supposed to hasten the ripening of the lower capsules. In the cereals, owing to the great improvements in dressing machines, all the small grains can be separated; and so indeed they can in turnips, and all other seeds except carrots, the adhesive nature of which prevents such division.

I am aware that the opinion that the largest and best ripened seeds are most proper for producing good crops, is opposed by the practice of some farmers in clay districts, preferring thin and shrivelled Fen wheat; but then they get change of soil and climate, which in itself is an advantage; they too often

judge by the thicker and greener appearance of the wheat in its young state, forgetting that there are nearly double the number of grains in an equal measure of thin as compared with a bold fine sample, and when dibbled in a wet soil and season, plump grains are more apt to rot than shrivelled ones.

Taking potatoes, again—Small unripe tubers from Fen land were formerly preferred in Scotland, as preventing the "curl," although, in my opinion, plenty of room in all directions, a good quantity of manure, and the use of large potatoes for seed, would be the proper means of increasing productiveness. Our varieties gradually deteriorate from using for seed those not large enough for table purposes.

The points of consideration in my next paper will be,—what are the limits of productiveness in the cereal and other crops? and an examination of the idea that, as in mechanics, what we gain in time we lose in power, and *vice versâ*: so in agriculture, what we gain in productiveness we lose in time—or in other words, that quickness of growth and early maturity are incompatible with large crops.—*W., June 25th.*

ON THE MANUFACTURE, PRESERVATION, AND APPLICATION OF FARM-YARD MANURE FOR ROOT CROPS, AND THE BEST ARTIFICIAL SUBSTITUTES, OR AUXILIARIES.

Farm-yard manure, or natural dung, has been and is held in great estimation by good husbandmen of all civilized nations. Some soils are so rich naturally as to require little or no manure; but the greatest part of the surface of the globe seems incapable of yielding repeated good crops without it. The necessity of manure, is, then, quite a settled point. But it is a question of great difficulty to say how the supply of fertilising matter is to be obtained at the least cost. The general introduction of such enormous quantities of artificial manure now imported and manufactured in this country, with the ever fluctuating value of the produce resulting from their application, renders it impossible to assign any exact value to either a ton of guano or a ton of dung. We know the cost of artificial manures, and in many cases their worth has been pretty clearly defined. We may readily learn that if £10 worth of manure produces corn worth £12, that there is a profit by it; but if £10 worth of manure only yield a crop worth half that sum, there is a loss by its use. In other words, if the cost price of manure is not covered, either directly or indirectly, over a short space, or over a few years, the price has been too high; it was not worth what it cost. If a ton of dung was worth 5s. when wheat made 10s. a bushel, it appears evident that dung should cost less now than then. There is a great deal of corroborative evidence to show the comparative commercial value of the best known manures. It appears, then, that in an average of trials five cwt. of the best guano produced as good crops through two rotations as twenty tons of common dung. That twenty bushels of fine bone-dust are equal to either twenty tons of dung or five cwt. of guano. Dung, guano, and bones, are almost the only kinds of manure which contain every thing required for our common crops. They are the only kinds of manure to be wholly depended upon, or the mixture of others which jointly contain substances similar to them in composition. Bone-dust has now stood the test of practical trial for many years—the crops have continued to improve by it over a period of twenty five years, to our own personal knowledge. Bone dust or superphosphate, is the safest artificial manure which is used. Guano is comparatively cheaper, but more dangerous to apply in the hands of the careless or inexperienced. It is astonishing that at the present day there are many so ignorant of the effects of guano as to place it in close contact with the seed or close beside the roots of tender plants. It is remarkable to think that guano is yet frequently sowed in lumps as it comes in the bags that the whole pounds are dropped down by the head, which kills everything where it falls. It is frequently sown on bare pasture in dry, hot weather, where its best qualities are dissipated in the air. No wonder, then, that guano has been more frequently condemned than any other standard manure, since so many faults are committed by its mis-application. Good guano, properly applied, can never fail to improve all kinds of crops which dung would be useful for. But more of the application of manures by and by. Our first consideration is how to make dung.

The most universal method of making dung is to feed cattle upon hay, straw, and roots, and to litter the beasts with straw to receive the excrements. Where straw is plentiful, and cannot be sold at what is considered remunerating price, the principle object in making dung is to tread as much straw as possible into a state ready for decomposition. A good quantity of water is considered a benefit rather than an objection for the manufacture of dung on some farms. It is advisable to have a tank attached to every yard, or at least so that any excess of water passing through the dung, in the name of liquid manure, might be saved in the tank, either for applying near the premises, or for being pumped up over the dung in very dry seasons or times of the year. In almost every yard where dung is made, there are as many tons of rain water fall in it throughout the season as there are tons of dung carted from it in six months. It will seldom pay to cart liquid manure a quarter of a mile. A hundred tons of dark looking water very often do not contain one ton of solid matter, so that in carting a hundred tons of liquid manure a quarter of a mile, there are 25 miles each way out and in, or 50 miles to walk a man and horse, for perhaps 5s. worth of goods. That is not always so: but frequently there are more costly cases of liquid manuring to be met with than that. It is scarcely possible to say whether it is most wasteful to allow the oozings of the dung to run into the nearest pond, or to run a hundred miles away with it, because it is a pity to lose anything. If dung is manufactured in open yards, the less water which is allowed to fall or pass from it the better. That is evident if quality be wanted. There is no loss, or very little, by making dung in the open air, when it is trod down well. There is nothing lost but water by evaporation until fermentation takes place. There is a great loss when dung is thrown up in heaps in the yard, and allowed to ferment strongly. The outsides of the heaps are dried up; the most forcing part of the manure is carried away by the atmosphere. Dung thrown up in March into heaps, either in the yards or road-sides, and allowed to lie for some months exposed to every pernicious influence, loses enormously in many cases. Dung carted out and laid down in loads in a loose manner, in odd corners, suffers a waste very frequently from a variety of causes, and the owner also suffers a

loss in a variety of ways by such management, or rather mismanagement. Who has not seen a thin layer of dung spread along a green lane, almost rotted away to nothing, with a lot of starved cows poaching about it, the liquid portion running in black streams into the drinking place, and to finish the picture, a magnificent crop of thistles, living riotously off the dung, and spreading their seeds far and near? Few would attempt to uphold that as a system, yet how common is it? As dung affords nourishment to growing plants, only after decay, long dung applied to the land does not act at first. If long dung is applied to the land it should always be some months before the crop is sown, so that it may have time to decay. It is a good practice to apply long dung in autumn upon clean, dry clay land. There is a saving of the substance of the manure; nothing is lost. There is economy of labor; the dung is only to fill once. There is economy of labor in the spring, and economy of moisture, which is so desirable in the turnip lands of dry climates. Green dung, nor, indeed, any kind of manure, should be applied to very light sandy soils, long before the crop is sown. The mechanical state of the soil does not retain the products of the manure until the plants require sustenance. When dung cannot be applied in autumn to lands intended for root crops, it should be carted out in heaps, the heaps should be well levelled, and covered over with a coating of clay, or any soil containing clay. Clays and loams have the power of retaining the gaseous products of dung as it decomposes, ferments, or decays, as we might say. This is of vast importance in the economy of dung, as it was doubtful at one time whether the earth laid upon the top of a dunghill did any good or not. Salt, gypsum, and dilute sulphuric acid, have all been recommended by scientific men to prevent the escape of ammonia from dung and fermenting liquid manure. Now, it is known that salt will not retain ammonia, and gypsum only to a limited extent. Sulphuric again is only too dear to repay the cost of application. Yet how beautiful is the provision, that we have almost in all parts a cheap and effectual means of preventing waste from our dunghills, by simply a covering of common earth.

After thus far treating of the manufacture, preservation, and application of common yard dung, there is another most important question involved, that is, the cost of dung made by fattening beasts, on bought food or on such food as might be sold. It has been asserted by cattle feeders that the value of the dung compensates for any loss that may arise between the cost price of the animals fed and all expenses, and the price at which the beasts are sold. Theory and practice have both clearly shown that dung, so called, is extremely variable in character, at least nine tenths of the dung on open yards is no better than wet straw or straw and water. Beasts, especially young ones, living upon straw and water, make the poorest dung of all. A ton of straw or cavings passed through the stomach of an animal is of less value as manure than before. It is more concentrated, and in a readier state for acting as a manure, but not so valuable as a ton of straw would be half-rotted with clean water. The same reason holds good with all kinds of food which animals consume. Ten tons of oilcake, or barley meal, are worth more as a manure applied to the land at once, than after being consumed by cattle; very much more, too. A field of turnips ploughed in improve the manurial condition of the land much more than if the same was consumed upon it; that is, of course, when the sheep or what receive no other food at the same time. But this is not strictly to our text, although intended to show the value of manure by the consumption of food of various kinds One load of dung made under cover by full-grown beasts, fed on rich food, has produced more effect than three loads of common straw dung. As a rule, one ton of manure made under cover—where rain water is excluded, and where all the excrements are preserved—is generally worth two tons of farm-yard manure manufactured in the open yard. Need we then feel surprised at the various results, reported from the application of equal weights of dung, applied under even similar circumstances. Moreover, we frequently hear of dung being computed by loads—so many loads applied to such and such a crop. A cart load in some districts of well made dung weighs a ton or upwards. A cart-load in some cases, where the dung is light and long, and the cart small, only weighs from six to ten cwt. We have seen many loads weighed, of fair average size, only amounting to eight cwt It is clear, therefore, that taking into account the variation of cart-loads, and the variation of the qualities of dung itself, that there is not the slightest reliance to be placed upon any experiment which is reported as having been tried with a certain number of cart-loads to the acre or what not. First should come the quality of the article, and next the weight, and not a matter of numbers. Ten heavy loads of good dung is worth more than forty loads of poor stuff. Taking everything into account we should value the best dung at 6s. per ton and common farm-yard at 2s. 6d. per ton This data is taken from the result of many comparative trials made with artificial manure against dung. Indeed 4 cwt. of guano has almost invariably beaten ten tons of the best manure, and twenty tons of inferior stuff. The effects of the dung has lasted rather longer than guano in some cases, but not in all, as the succeeding crops of corn were as good after the artificial as the natural manure. But to give the advantage to the dung, say five cwt. of guano, or 50s. worth is of equal value to 60s. worth of dung. We see then that guano is a good substitute for dung, and a good auxiliary, if both are used. But dung changes the texture of land if laid on green or stiff soils. Guano does not do this to such an extent, although even clay soils well dressed with guano have been mechanically changed also. Dung is always to be depended upon; its value may be known if made at home. Guano may be adulterated—it may be mis-applied—it does not act well in dry seasons. It is no wonder then that guano, although the cheapest manure yet known on the whole, should be rejected by some as unsafe. Every one who buys guano by mere chance, and will not have it analysed, may deserve to be victimised. Every one is within reach of a reliable analysis now at a small charge. Guano contains double the quantity of fertilizing matter—of ammonia and phosphate—weight for weight with bones. A ton of good guano contains four times the weight of ammonia alone to a ton of bones. The best guano may be had in almost all parts now at £10 per ton. Bones, in the form of dust, cost from £6 to £7 per ton. Unbroken bones can be bought at from £3 10s. to £4 per ton. Coprolites can be had, dissolved in acid, at from £4 to £5 per ton. Coprolites is the cheapest manure to be had for supplying bone earth, They contain 50 per cent. of bone earth, and cost at the pit £1 10s. only per ton. The

principal tests for estimating all kinds of manures are, first, how much water, or sand, or other entirely useless matter do they contain; secondly, how much ammonia; thirdly, how much phosphate; and fourthly, how much potash. These last three substances are the most valuable. Ammonia costs about 6d. per lb in guano, phosphate of lime, 1d. per lb salts of potash 1d. per lb Common dung contains from 80 to 90 per cent. of mere water, and only ½ per cent. of substances capable of yielding ammonia. Guano contains but about 10 per cent. of water, and 17 per cent. of ammonia. Bone dust contains about 10 per cent. of water, and about 4 per cent. of ammonia. Coprolites contain about 2 per cent. of water only. Coprolites or fossil bones, are the remains of cetaceous animals, marine animals of the whale tribe. The bones may have been imbedded in creeks adjoining the sea for millions of ages. They have scarcely any organic matter—nothing to yield ammonia, and are not sufficient of themselves to act as a manure. We have seen them act equally well, however, against bone-dust and guano, value for value of each kind of manure employed. The most economical method of using coprolites is by mixing them with guano; one part of guano and three parts of coprolites is the best proportion for making both the best and cheapest manure yet offered to the public. The guano supplies all the necessary nitrogenous matter—the coprolites the bone earth. The acid employed in dissolving the coprolite powder fixes upon the ammonia in the guano, and neutralises it for a time, or changes it into sulphate of ammonia, which cannot escape from the land by hot weather, &c. This, then, is of much value as obviating one of the greatest objections against guano—that it is so volatile, and apt to scorch young plants in dry hot weather A mixture of coprolites and guano can be made in quantity at £5 10s. per ton. A ton is worth more than a ton of superphosphate at £7. This is the best substitute for farm-yard manure we know: its application is safe, too; it does not burn the seed unless in large quantity near it. * * * There is much diversity of opinion regarding the mode of applying of artificial manures. Some say they should be concentrated and placed just under the plant. Others say they should be well distributed From all we have seen, a strong dose of manure should not be placed immediately under the turnip plant; it forces them too much for a time, and frequently makes them tender; it surfeits the tender plant, feeds it too well on strong food when young, so that when it grows larger it finds a difficulty, in all probability, in getting suitable food. It is unnatural to force vegetation too much, and to suppose that a turnip, rushed up in its early stages, can withstand the changes of weather, &c., so well as a root of slower growth. We think the young plant should be fostered in its fiirst stage by some manure, to get it ready for the hoe, but that afterwards the bulk of its food should be procured from all parts of the soil. The roots of turnips, when once fairly started, will find out the manure, wherever placed in the soil. There is no fear of that. Where much manure is to be applied, it is advisable to harrow some of it into the land previous to the seed being drilled, and then drill a portion only contiguous to the seed. We have seen this answer well. Guano should never, of course, be applied near, that is to say, in contact with the seed. Bone-dust may be mixed with the seed if that is all. We think we hear some one say, there is nothing like *dung* after all. Well, all agree that it is, a most excellent thing; but even an excellent thing may be bought too dear, and this again brings us to inquire the cost of dung made by fattening beasts By information collected from personal experience and the experience of many others, we have learned that a fattening beast, of from three to four years old makes about ten pounds of beef weekly on an average, according, of course, to many minor circumstances which affect the quantity of flesh formed in a given time.

In the proceedings of the Seneca County Agricultural Society is an interesting lecture by Professor Norton, of Yale College, on "*The Wheat Plant, its structure, chemical composition, and cultivation.*" The Professor remarks:—

This is a wheat county, and it is of much importance that the yield of that crop be increased, in place of continuing to decrease, as it has certainly done on many farms. I think that some light may be thrown on the cause of this decrease, and on the nature of the crop, by a brief account of the wheat plant in regard to the structure of its several parts and their chemical composition, finally bringing the information thus collected to a practical bearing upon various questions connected with its cultivation. I will first devote a few words to the structure of the plant, and of its various parts.

That part to which our attention is first naturally directed is the seed. Viewed externally, this is merely a small brownish, or whitish oblong mass, presenting a white interior when broken. If kept perfectly dry it will remain unchanged for a thousand years, but when exposed to moisture and warmth, a change speedily occurs. The seed swells and soons opens its outer covering to permit the root and stem to shoot forth. This is all very simple in description, but it is only after years of study that we have arrived at an even imperfect knowledge of what really takes place at this time. I do not purpose to go at length into a scientific account of germination, but will mention in a few words the changes that occur. The seed, in its natural state, contains a dry, white substance, which is for the greater part insoluble in water; this is mostly starch. Now the young shoot, until it reaches above the surface of the earth, and until its leaves begin to expand, must draw its nourishment from the seed, but since the principal part of the seed is insoluble, how is this done? It is found that at the time of germination, a substance called diastase, is formed, which has the power of rapidly converting the starch into a species of sugar, or a species of gum. Both of these are soluble in water, and, consequently, go immediately to nourish the young plant. Now this change will not take place properly, save under certain conditions. The soil must be moist, and not very cold, and the seed must be buried at such a depth as to be accessible to air. If there is no communication with the air, the seed will not germinate, even though the earth be warm and moist. Without air, the change by means of diastase, of the starch into sugar or gum, will not occur. This fact is often illustrated when we bring up earth from a distance beneath the surface, if thrown upon one side in the middle of a grass or grain field for instance, it will soon be seen covered with plants, and these in many cases entirely different from any growing in the immediate neighbourhood. There seems no way in which we can explain many curious

occurrences of this kind, except upon the supposition that these seeds may have lain in the ground buried deep, and, consequently, only grow when brought near the surface; warmth, air, and moisture, are thus seen to be necessary adjuncts to successful germination; but if we bring the seed immediately upon the surface, even upon these conditions, it will not grow, thus showing a fourth requisite—the absence of light. Unless the position of the seed is such as to ensure all four of these conditions, it will not produce a healthy plant, and usually will not grow at all. This explains to us why so small a portion of the seed sown ever comes to anything.

It has been shown by some authors from actual counting of the seeds in a bushel of wheat, and by comparison with the yield obtained when a given quantity is sown, that when the greatest crops known are obtained, little more than half of the seed sown vegetates. In the case of ordinary crops, the produce is not more than ought to be afforded by about one-third of the seed sown: the remaining two-thirds are lost, some buried too deep, some not covered at all, some destroyed by insects. One great advantage of the drill machine for sowing is, that the seeds are all deposited at an equal depth, and at equal distances part; the growth is, consequently, regular, and the plants are much less liable to be luxuriant in some spots, and scanty in others. Covering with the cultivator, or gang plough, produces something of the same effect. A considerably reduced quantity of seed will thus answer the same purpose, as none of it is lost. The saving of half a bushel or a bushel of wheat per acre becomes of immense importance when we consider the number of acres sown in any one year.

When the young shoot has reached the surface of the ground, and has begun to expand its leaves, it is no longer dependent for food on the parent seed. Its roots have by this time begun to collect food from the earth, and there is a constant flow of sap upward through them. In good soils these roots will go down for several feet, and of course in penetrating so great a distance are much more able to draw abundant supplies for the plant, this shows the importance of artificially deepening the soil, when the subsoil is not naturally mellow, and of draining when this portion is constantly filled with water. In either of these cases the plant might almost as well endeavor to extract food from a pavement, as from the subsoil, until it is improved. But if the plant finds a soil of proper depth, and well supplied with its requisite food, its growth is rapid, and opening its leaves it begins to receive food through the pores, with which a microscope shows their surface to be covered. These, during the day, draw in certain kinds of air, which, in the interior of the plant, are converted into solid portions of its substance. That this is the fact, has been proved by numerous experiments. The part of the plant which thus comes from the air, is of course a clear gain to the farmer, as it does not exhaust his soil at all; and here is an advantage which the good cultivator obtains over the poor one; his plants find a rich soil well prepared for the supply of their wants, and shooting vigorously up, are able to spread out broad luxuriant leaves in the atmosphere, drawing in far more food from this source than the small yellow leaves of a poor crop could possibly absorb. The very air, then, is more bountiful to the man who treats his soil liberally.

With all the appearances visible in the external growth of the wheat, every one is familiar. There are many points that have been ascertained, relative to the internal changes which occur in the stalk at different periods, and also during the formation of the grain, which time will not permit me to notice now. While the grain is ripening, the materials for its composition gradually leave the stalk, and that part loses by degrees its nourishing properties, until finally, nearly all of the nutriment is concentrated in the grain.

It now becomes necessary that we should enquire particularly into the composition of the grain. If, in the first place, we burn it, we shall find that nearly all of it disappears, so that from one hundred pounds of wheat there will not remain more than about 2 lbs. of ash. This ash has evidently all come from the soil; the other portion which has burned away was originally air, drawn in mostly from the leaves, in the manner that I have before mentioned, but also in part through the roots. This combustible matter being far the largest part of the whole weight, we will attend to it first. By means of various chemical processes, the substances composing this part of the grain may be separated from each other, and with a tolerable degree of accuracy.

The following analysis is an instance of the proportions in which they are found to exist in wheat:—

COMPOSITION OF THE GRAIN AND STRAW OF WHEAT.

Organic part of grain.		Ash. Grain.	Straw.
Starch	62.29	Potash	23,72	12.44
Gluten	13.00	Soda	9,05	0,16
Gum	1,21	Lime	2,81	6,70
Oil	1,02	Magnesia	12.03	3.82
Sugar, &c.	6.40	Oxide of iron	0.67	1 30
Epidermis	7.20	Phosphoric acid	49.31	3.07
Water	9.79	Sulphuric acid	0 24	5.82
		Chlorine	...	1.09
	100.91	Silica	1.27	65.38
			99.50	99.78

The first analysis is from Dr. Emmons' Agricultural Report, and agrees pretty well with most of the examinations made by other chemists. Starch, it will be perceived, is the leading substance, and next by this is gluten. The latter is the only body in the grain that contains nitrogen, and is consequently the source of muscle in animals that live on wheat. Take away this constituent of the grain, and feed an animal exclusively upon what is left, and it cannot thrive, cannot increase, or even maintain the bulk of its muscle in its body; its strength will gradually decrease. Whenever we find any food which contains, according to chemical examinations, much of substances like this gluten, it may be asserted without fear, that such food is eminently nutritious.

The other substances, the starch, impure sugar, gum, and oil, are of use in forming the fat of the animal, and also in keeping up respiration. This is one of the most curious and important facts discovered by modern chemists, and physiologists. At every respiration a portion of the starch, gum, &c., of the food is consumed in the lungs, and in the blood vessels of the extremities, for the purpose of keeping up the animal heat.

Every one is familiar with the fact, that if he labors hard, especially in cold weather, he requires more food than with the same amount of exertion in warm weather, and that if he is hungry at such a time, and deprived of food, he soon begins to suffer,

from cold; this is because he needs a fresh supply of material to burn in the lung for the purpose of keeping up his vital warmth. Every farmer knows, or ought to know, that if his animals in winter are kept warm, and sheltered, they do better than those that are exposed in the open air to the cold. This is because in the latter case a large part of the food which would otherwise have gone towards fattening the animal, is used up in the increased respiration necessary to keep him warm.

It is worthy of notice, that in this grain, which is taken in fair marketable condition, there is, according to the table, about ten pounds of water to each one hundred of grain. New wheat frequently contains from twelve to sixteen pounds in one hundred.

I may here say a few words, as to the various practices which are followed in cutting wheat. If allowed to become dead ripe in the field, a considerable portion of its starch and sugar is changed to epidermis, or woody fibre, that is the skin. The grain will then yield more bran, and less fine flour, than it would have done if cut ten days or a fortnight earlier. The result of many careful experiments has shown that when cut at about the above time before entire ripeness, the grain is heavier, more plump, and actually measures a greater bulk. The skin is thinner than it would have been if allowed to stand, for the causes mentioned above, and therefore more fine flour is obtained to the bushel.

The same reasoning applies to the straw. It is well known that if wheat be mown and fed to stock while green, even with heads cut off, it is an excellent fodder; and it is equally well known that if allowed to stand in the field till the grain is ripe, the straw consists of little but dry indigestible woody fibre. Now the same change takes place, to a certain extent, in the straw, as in the grain; it also contains some gum, sugar, &c., and is therefore nutritious while green, but as it ripens, nearly all of these are converted into woody fibre, in the manner that has been mentioned.

By cutting the grain then, before it is quite ripe, a double object is gained; its own quality is improved, and the straw, when cut up with hay, &c., is readily eaten by stock, and has really some nutritive properties.

I will now call your attention to the columns representing the composition of the ash in one hundred pounds.

The most important point, and that which I particularly ask you to remember, is the large quantity of phosphoric acid in the ash of the grain. The above analysis is the average of six or eight, by eminent chemists, and is given by Johnston in his lectures. Phosphoric acid, it will be seen, constitutes about half of the whole ash. If we look at the ash of the straw, we see that it contains but three pounds in one hundred. The cause of this difference becomes beautifully apparent, when we consider that the grain is the part more especially designed for food. This same substance, phosphoric acid, constitutes the leading body in, and gives their peculiar properties to, the bones of animals; hence the necessity that it should be concentrated in the grain, which is the part peculiarly intended for food, along with the gluten which is to clothe the bones with muscle.

I do not attempt to explain here the precise nature of the substances to which I refer, as it would prevent my presenting an entire view of this subject, without wearying my audience. Those who do not know what they are I must ask to believe that they do not exist, and to take my word for their properties and effects, until they can obtain access to some book or some other means of studying them out for themselves.

Other important substances in the ash of the grain, are potash and soda; they amount commonly to about one-third of its whole weight, and are valuable, as also necessary for the animal, being always found largely in the flesh and blood; thus we see that the grain in all its constitution, seems to have been especially adapted to serve as an appropriate food for the animal; each little seed contains within itself its proportion of material for the formation of the bones, the muscle, the blood, the fat of the body, and also for maintaining its warmth.

In examining the constitution of the ash from the straw, we find that the leading substances there are called silica; this is that which constitutes the common flint, common granite, chrystals, agates, &c. Although so hard and insoluble in acids, yet plants have the power of dissolving it, and are thus able to make use of it for their own purposes. Silica gives the hardness and the glaze to the outer part of the straw, and is supposed to be principally in use in strengthening it, and enabling it to uphold its load of grain.

When a particular piece of land fails for years in succession, to produce a straw that will stand, it is generally found, on examining the ash of this straw, that there is a deficiency of silica. The column referred to presents an average of six or eight analyses, and the proportion of the silica given by it, is about two-thirds of the whole ash. Sulphuric acid (oil of vitriol), is usually present in considerable quantity in the straw ash, while there is little in the grain ash. Potash and soda are greatly reduced in quantity. There is a curious fact here indicated, relative to the lime and magnesia. In the grain magnesia, and in the straw lime, is most abundant; this is almost invariably the case, but we have as yet no clue to the reason.

It is at once perceptible, from a glance at the above columns, that each of these parts has a composition of its own as to its ash, and the differences are of a very important nature. This point will be referred to again.

I have said that one hundred pounds of grain yield but about two pounds of ash, oftener less than more. If we burn one hundred pounds of straw, the ash will weigh from six to ten pounds, sometimes even as high as sixteen. There is thus a great difference in the quantity as well as the quality of ash in these two parts; the straw from an acre will of course contain more ash than the grain.

EXPERIMENTS WITH BURNED CLAY—WHAT ARE THE QUALITIES WHICH FIT A CLAY FOR BURNING.

Burned clay has by many been recommended as a usefui application to the land; and, in numerous instances, it has been a source of profit to those who have employed it. Mr. Woodward states, that it renders the soil more friable, so that it can be worked with less labor, and especially aids the culture of green crops. On a crop of wheat grown upon drained Oxford clay

Mr. Pusey states that, in 1845, it added eight bushels to the produce of grain yielded by one of his fields.

	bushels per acre.
No manure gave....	37¼ "
80 yards burned clay (cost 45s.)	45½ "
80 do., and sheep folded ...	47½ "

This clay possessed the quality so often seen in the Oxford clay, of being like bird-lime in wet weather, and in dry summers like a stone, requiring a pick-axe to break it.

But there are three things, in regard to burned clay, which are far from being cleared up.

1. Are all clays equally efficacious when burned in a similar way?

2. If not equally efficacious, in what respect do the good differ from the bad clays, and by what qualities or charaters are they to be distinguished?

3. How do they act in improving the soil or the crops?

I shall briefly consider each of these questions.

1. *Are all clays equally efficacious when burned in a similar way?* I believe the correct answer to this question is, that they are not It is true, that similar clays, in the same neighbourhood, often produce very different effects, according as they are well or ill burned; but experience appears to indicate that, with the most skiiful treatment, there are many clays which cannot be profitably burned by the practical man.

The practice of paring and burning the surface, or of burning, in various ways, the scourings of ditches and refuse vegetable matter of different kinds, is not to be confounded with that of true clay-burning. Both practices, however, have these things in common—that the heaps or kilns must contain, or must be supplied with, a sufficient quantity of vegetable matter, to enable them to burn thoroughly—that the burning should be slowly conducted, and with little access of air, a method which is well described by the epithet of *stifle* burning—and that the heat should not be permitted to become so great as to produce what is called *over-burning*. But in regard to stiff clays—

2. *In what respects, physical or chemical, do the good differ from the bad*—those which are improved by burning from those which are not? These points have not as yet been sufficiently investigated or described. In general, I believe that such as burn most profitably are very impervious to water and air, are exceedingly tenacious, and harden very much under the influence of the sun. I am myself, however, unfamiliar with the physical characters of these clays on the large scale, though very many samples have been sent to me from a distance, and have been examined in my laboratory. As to their chemical composition, it has not been made out, by analysis, in what respect the good clays differ from the bad. This arises from the circumstance, that it is difficult to obtain specimens which can be ascertained, from practical men, to belong to each of the classes, in order that a comparative examination, of such as exhibit opposite effects in practice, might be simultaneously made.

Clays may differ not only in the proportions of alumina, silica, lime, and alkaline and organic matters, which they respectively contain, but also as regards the state of chemical combination in which these substances exist in the clay. When my attention was first drawn to this subject, I was inclined to look upon the proportion of lime in a clay as likely to exercise an important influence upon its comparative value for the purpose of burning. On this supposition the Oxford clay, in which I have found from fifteen to thirty per cent. of carbonate of lime, ought to possess very superior advantages for burning. I am not certain, however, that such is really the case, as clays have been sent to me which were described to be well adapted for this process of improvement, and to be extensively employed for the purpose, in which the proportion of lime did not exceed two or three per cent. It is probable, however, that the relative proportions of the several constituents of a clay do affect not only the absolute value of a clay for burning, but also the method by which it may best be burned, and the way in which it acts when it is afterwards laid upon the land.

The state of chemical combination in which its several constituents exist in a clay has, however, quite as much to do with the good effect of burning upon them, and with their more useful action when afterwards spread upon the land. A diversity in this respect may possibly also be a cause of difference in the fitness of clays for the burning process, though in reference to this point, chemical inquiries have not as yet been made.—*Johnston's Experimental Agriculture.*

ON BELGIAN AGRICULTURE, AS APPLICABLE TO IRELAND.

During my sojourn in this country, where my time has been devoted to agricultural pursuits, and in the course of my intercourse with all classes connected with this great source of industry, I have heard the following remark repeatedly made: "Unless the Flemish farmers be more or less conversant with agricultural chemistry it is difficult to see from what their agricultural success can arise."

Although one may form an idea of the working of an agricultural system by sojourning for a certain time in a foreign country, I venture to state, from minute and varied experience, that of all the agricultural systems existing, that of Flanders, although effective in its operation, is the most difficult to become thoroughly acquainted with, even a to Belgian, unless his whole attention has been long devoted to the subject in its different operations.

The farmers of Flanders have for generations studied the improved culture by which their fields yield a return of remunerative crops by suitable manure adapted to the peculiar soil. They keep to that kind of soil which their forefathers, by degrees, have

learned to farm properly, and any farmer who should attempt to till any other specimen would be looked upon as pursuing a very unwise course. In Flanders, too, the best cultivated and most productive fields are in the hands of *small holders;* and, considering that nearly every crop requires fertilizing, it is worthy of inquiry, whence are all these enriching ingredients obtained? I answer, precisely from those crops considered to be the most exhausting. I mean oleaginous plants; those oleaginous plants being flax, hemp, cameline or gold of pleasure, poppy, and though last, the most important—rape. Without entering into the merits of each of these plants and crops, as established by scientific authority, it is practically admitted in Flanders that each of them after extraction of the oil possesses fertilizing ingredients, one acre of which is equal to enrich two succeeding crops. But how comes such crops to yield so large quantities of remunerating oil, and at the same time such enriching manures? Bouseingalt, the eminent French chemist, has proved by experiment that all plants provided with large leaves receive the greater amount of their food from the atmosphere, which may explain the value of the rape crop. Thus the Flanders cultivator obtains all those rich materials proper to fertilize his soil, by care and industry, in cleaning and liquid manuring his crop, aided by the constant and chemical action of the atmosphere; and having pursued that course for centuries, the fields of Flanders are not in so exhausted a state at present as those countries in which vast capital is laid out for imported manure, while their own soils, at present lying unimproved, would be capable with proper management, to furnish all the cake and manures required, and that remuneratively. Such has been the past history not only of Ireland, but of England and Scotland also.

Let us now for a moment consider the manufacture of those oleaginous plants in Flanders, and whether the same operations could be adopted and successfully carried on in Ireland. In Flanders, neither of these crops can be raised without manuring the field; farther, we find nearly in every village a crushing milll, attached to an ordinary corn mill; the owner of any quantity of seed has the choice of either, first, selling his seed to the crusher, or, secondly, exchanging a portion of seed or grain for a fair portion of cake or cake meal; or, thirdly, of having his seed crushed, at a stated rate per measure, with return of both oil and cake, or leaving the oil to the crusher to be disposed of and accounted for. This plan may not give universal satisfaction to the producer, as all fraud is impossible, but the returned oil and meal ought to equal the delivered seed; and as to adulterating the meal, the Flemish farmers cannot be far deceived on that score.

Journal of the Royal Agricultural Society of Ireland.

The Use of Tar in Road-making.—To your information respecting the use of tar for road-making, be pleased to add the following, from the report of the Sanitary Committee of Nottingham, October 4, 1849: —"The use of a mixture of gas tar with solid materials has been found an excellent substance for improving the Macadamized approaches to the town, and still more for courts, inns, and stable yards, and other confined spaces in the midst of dwellings, when applied to which it presents a perfectly even surface; it also dries as rapidly as stone slabs, and its use is highly to be commended for sanitary purposes. An extensive surface is covered with this material in various parts of Nottingham."—The platforms of Newark and Burton upon Trent, and many other railway stations, have been made in the same manner. It has also been extensively used for carriage drives and walks, terraces, stable and court-yards, by noblemen and gentlemen, a list of whom, containing 42 names, I have in my possession, and to whom references might be made. In the new harbour in Nottingham, which was opened last month (May 11), nearly 12,000 yards have been made in the same manner, and the Royal Hotel yard in Norwich also. Now, if this can be done so extensively in Nottingham and elsewhere, how is it that so little is done in our own country? We have the requisite material, and which no doubt can be obtained at the various gas works and in the soil, at little cost. I take the liberty to ask any gentleman who may be travelling in Nottingham, or some public body, to depute a person to examine the roads, and make the requisite inquiry, for the purpose of having the same plan tried in this county. I shall be happy to give the address of the road surveyor and inventor to any person who may apply for it, and show the list of names before referred to.—*Samuel Bartlett, in Maidstone Gazette.*

Wonderful Cures of Hydrophobia.—M. Buisson has written to the Paris Academy of Sciences to claim as his a small treatise on Hydrophobia, addressed to the Academy as far back as 1835, and signed with a single initial. The case referred to in that treatise was his own. He had been called to visit a woman, who, for three days, was said to be suffering under the disease. She had the usual symptoms, constructions of the throat, inability to swallow, abundant secretion of saliva, and foaming at the mouth. Her neighbours said she had been bit by a mad dog about forty days before. At her own urgent entreaties she was bled, and died a few hours after, as was expected. M. Buisson, who had his hands covered with blood, incautiously cleansed them with a towel, which had been used to wipe the mouth of the patient. He had then an ulceration on his fingers, yet thought it sufficient to wipe off the saliva that adhered with a little water. The ninth day after, being in his cabriolet, he was suddenly seized with a pain in his throat, and one still greater his eyes. The saliva was continually pouring into his mouth; the impression of a current of air, the sight of brilliant bodies, gave a painful sensation; his body appeared to him so light, that he felt he could leap a prodigious height. He experienced, he said, a wish to run and bite, not man but animals and inanimate bodies. Finally, he drank with difficulty, and the sight of water was still more distressing to him than the pain in his throat. These symptoms recurred every five minutes, and it appeared to him as though the pain commenced in the affected finger, and extended thence to the shoulder. From the whole of the symptoms, he judged himself affected with hydrophobia, and resolved to terminate his life by stifling himself in a vapour bath. Having entered one for the purpose he caused the heat to be raised to 107 deg. 36 sec. Fah., when he was equally surprised and delighted to find himself free from all complaint. He left the bathing room well, dined heartily, and drank more than usual. Since that time, he says, he has treated in the same manner more than eighty persons bitten, in four of whom symptoms had declared themselves: and in no case has he failed, except in that of one child, seven years old, who died in the bath.—*Galignani's Messenger.*

Agricultural Journal,

AND

TRANSACTIONS

OF THE

LOWER CANADA AGRICULTURAL SOCIETY.

MONTREAL: AUGUST, 1852.

The Monthly Meeting of the Directors of the Lower Canada Agricultural Society took place this day at 11 o'clock.

GENTLEMEN PRESENT:—Major Campbell, Rev. M. Desaulniers, P. E. Leclere, M. Valois, M. P. P., F. A. LaRocque, David Laurent, G.E. Guilbault, John Drummond, L. A. H. Latour, J. Hurteau, and Wm. Evans, Esquires. The President of the Society, P. E. Leclere, Esq., having taken the Chair, the Secretary stated that he had addressed written notices to each of the Directors, reminding them of the Meeting, and had also given notice in the Agricultural Journal.

The first subject brought before the Meeting was the letter of the Minister of Agriculture, the Hon. Malcolm Cameron, addressed to the President of the Society, P. E. Leclere, Esq., in French, a duplicate of which, in English, was addressed to the Secretary of the Society, and was read before the Meeting.

The Act referred to in the Minister's letter was also submitted. The Secretary stated, that in the Report of the Lower Canada Agricultural Society to the Legislature in 1851 they had recommended the principle of this Act, so far as regards the County Agricultural Societies reporting annually to this Society, and that this Society should be the channel of communication between them and the Legislature; there was not then a Minister of Agriculture. The Report was submitted to the Meeting, and the suggestion in question as contained in the eleventh paragraph.

It was then proposed by Major Campbell, seconded by F.A. LaRocque, Esq., and adopted unanimously,—

That the President be requested to reply to the Minister of Agriculture, informing him that the Lower Canada Agricultural Society adopt the principle of the Act forwarded in his letter, as regards a Provincial Association to receive Reports from the County Societies, and to be the channel of communication between them and the Minister of Agriculture.

And the President was requested to transmit with his letter, a printed copy of the Report of the Lower Canada Agricultural Society to the Legislature for the year 1851, and a copy of the foregoing Resolution. The Report of the Visitors to the Model Farm at La Tortue was then submitted and read, but being in French, it was ordered to be translated into English, and submitted for further consideration at the next Monthly Meeting of the Directors.

Proposed by L. A. H. Latour, Esq., seconded by J. Drummond, and adopted unanimously,—

That the Rev. J. Desaulniers, A.M., Professor of moral philosophy and chemistry in the College of St. Hyacinthe, one of the Directors of the Lower Canada Agricultural Society, be requested, in the name and on behalf of this Society, to visit the Model Farms and Agricultural Schools, which he may pass on his proposed journey through Europe; and that the gentlemen at the head of the different establishments there be requested to give Mr. Desaulniers any information which they may think this Society ought to be made acquainted with.

Proposed by L. A. H. Latour, Esq., seconded by the Rev. Mr. Morrin:

That Mr. Payen, Permanent Secretary of the National Central Agricultural Society of Paris, be elected honorary member of the Lower Canada Agricultural Society.

The President, P. E. Leclere, and F. A. LaRocque, Esquires, were named visitors to the Model Farm for the present month of July.

There was no other business brought before the Meeting, and it separated.

By order,

WM. EVANS,

Secretary & Treasurer.

L. C. A. S

Agricultural Rooms,
14th July, 1852.

AGRICULTURAL OFFICE,
Quebec, 5th July, 1852.

SIR,—I have the honor to enclose a copy of the Act 14 and 15 Vict: cap. 127, which provides for the organization of Agricultural Societies in Canada West.

This organization has been found to work well, and with some amendments to be proposed at the ensuing session of Parliament, will, I believe, be very satisfactory.

As the Government has established this Office with a view to condense and arrange for practical use all the Statistics of Agriculture, to the Agricultural interest in the Executive and Legislative bodies, and to aid by every possible means its full development, I am most anxious to have such an organization of the Agricultural Societies of Canada, as will enable me to correspond with one central Association in each section of the Province, which shall be in constant communication with every part of that section, and prepared and authorized to make such recommendations to this Office as it may deem best on behalf of the Agricultural interest.

I therefore have the honor respectfully to suggest, that you submit to the Lower Canada Agricultural Society the Act now forwarded, with a view to the adoption of the principle in this part of the Province, and if such should be resolved upon, I will be glad to hear from you at your earliest convenience, so as to enable me to prepare such measures as may be necessary, before the middle of August next, when Parliament is likely to meet.

I have the honor to be, Sir,
Your most obt. servant,
MAILCOLM CAMERON.

P. E. Leclaire, Esq., President
Lower Canada Agricultural Society,
St. Hyacinthe.

BLACK SEA SEED WHEAT.

It is very necessary that a new supply of this wheat should be imported direct from where it is grown. To attempt to import it through British or Canadian merchants would be useless, unless they were to engage to ship it at some port of the Black Sea, and to purchase there ectly from the growers. We know a gentlema here, an agriculturist, who speaks of going to E pe this fall, and who would proceed to the Black and purchase upon the spot a cargo or two o genuine variety of wheat we require, provided he was assured there would be purchasers for the whole of it on arrival next spring. If the several County Agricultural Societies were to communicate to the Office of the Lower Canada Agricultural Society what quantity they would take of this wheat, we have no doubt the gentleman we refer to would make arrangements to procure the wheat upon the spot, and under his own inspection, so as to have it all right, and out here early in May. This is a matter that is of some consequence to Canadian agriculturists, and we would recommend them to come to some decision at once, as to whether they desire to have the wheat, and what quantity would be required. The gentleman who is going home, will see that all will be right, and procure upon the proper certificates of the distinct variety and quality of the wheat. At all events, if on arrival here, the wheat is not found to be the proper sort, according to the vouchers that will be produced from where it has been grown, parties will not be bound to take it. We shall be glad to receive communications from Agricultural Societies, and from private parties, in order that the gentleman whom we allude to may be able to make his arrangements in time, if he finds encouragement to import the seed wheat.

DRUMMOND PATENT CHURN.

We have had one of these excellent Churns imported, and its operation in making butter is superior to any churn we have ever seen worked. As a farmer's churn, there is not any in North America to equal it. It is made of the very best materials of wood and iron, and its construction simple, though perfect in every part. We have witnessed it in operation; it is easy to work, and if the cream or milk is in a fit state to churn, we are convinced it will bring the butter in less time than any other churn we have ever seen. Our object in importing it was to introduce the most improved model of a churn at present in use, as we have never seen at Exhibitions, either in the United States or in Canada, what we considered a good churn for a farmer. Alfred Pinsoneault, Esq., of La Tortue, had a very good churn constructed under his own superintendence, but it is not in many respects equal to the Drummond Churn.

We consider it a matter of considerable importance that dairy implements, and all other implements, should be of the best description, and well adapted to their respective uses. Good implements are an encouragement to execute work in a proper manner, and bad implements are an excuse to those who use them for bad work. It is not necessary that farmers should purchase numerous implements, or every implement that is puffed by a vender who is utterly incapable of estimating their value in actual operation in the field. We constantly see agricultural and dairy implements painted and polished to please the eye, but the farmer does not so much require paint and polish as strong and perfect implements to work with. The paint and polish soon wear off, but the best working tools are much more profitable in the field than the most highly polished and painted tools, if they are not the best to work with. We have frequently an opportunity of seeing painted and polished agricultural implements, idle and useless lumber in the farmer's premises, not in use, nor likely to be in use. The purchase of this useless trash is injurious to farmers, who should invariably prove implements before they would give their money for them. The Drummond churn has no paint or polish about it, to cover its defects, and recommend it to the inexperienced. It is plain and solid, and any one of practical experience will see at once that it is perfectly constructed for its uses.

On a former occasion, we were so incautious as to notice favorably in this Journal a churn, upon the representations of other parties, before we had seen it in operation, and we shall take care never to do so again with any agricultural implement which we have not proved or seen worked before us. The Drummond Patent Churn we engage shall work satisfactorily. It shall be exhibited at the Rooms of the Lower Canada Agricultural Society on Wednesday the 11th of August instant, or can be seen at our residence at Côte St. Paul, near Montreal, at any time, by agriculturists who may call.

AGRICULTURE.

It requires a considerably greater amount of practical skill and sound judgment to conduct successfully a system of husbandry, where every branch of farming is carried on than where it is confined chiefly, as heretofore in Lower Canada, to growing wheat, barley, oats, peas, and potatoes, and keeping a few milk cows. The cultivation of green crops is now beginning to be introduced, but not to a great extent, or any thing near the due proportion. A mixed system of husbandry, consisting of tillage, grazing, meadow, pasture, and the dairy, in due proportion, requires practical skill and judgment to carry it on, or it will not be a profitable business. Almost any man, who is a good ploughman or can hire one, and can make or procure sufficient manure may grow good crops of wheat, barley, oats peas, potatoes, carrots, and beets, and also keep a few dairy cows, but this man would, perhaps, be very incapable of managing a large farming establishment, such as are to be seen in every county of Britain, where every branch of husbandry is carried on in the most scientific stile, and includes the breeding, rearing, and fattening of neat cattle, and sheep, the dairy, and every variety of crops cultivated. In this sort of farming, the greatest attention is devoted to meadows and pastures as the very basis upon which the success of the whole system depends, and in Canada, also, it is impossible to have a farming establishment that is worth seeing, unless there is a due proportion of fine meadows and good pastures upon it. As we before observed, there is no great difficulty in raising good cereal crops, and potatoes, if there is a good ploughman and sufficient manure. We have taken the first Premium for potatoes in the County of Montreal for three years in succession, against a very numerous competition of the best tillage farmers in the country; but we would not claim any credit for this success, if we had a good ploughman at the time, and abundance of manure, and any man who was a good ploughman, or could hire one, and had sufficient manure and suitable land,

could have done the same. What we should claim credit for would be, having a farm in good meadow and pasture, and any other crops cultivated upon it, that would be necessary to maintain this meadow and pasture in order, to be also good and clear. Of course these cultivated crops should include green crops, or summer fallow in due proportion to the cereals grown, and to the live stock kept upon the farm. We would further wish to see a farm having trees for ornament and shelter, either spared from the original forest, or planted. It may be objected that a farm chiefly under grass and live stock, is not the most useful employment of the land, but in this country there is abundance of land in proportion to the population, and we maintain that a farm cannot be more advantageously employed than in good meadow and pasture, as well for the owner as for the country generally, always providing that there is a reasonable proportion kept in tillage, to keep the meadow and pasture in good condition. If there is a farm under grass, and in good condition, it can be brought into cultivation at any moment, if it is necessary, and ... ... be sure to produce good and clean crops; if chiefly tillage it is not so easy to insure good crops, or to bring it soon into good meadow and pasture if it is desirable and profitable to do so. We may be in error, but had we to purchase a farm, we would greatly prefer one under good meadow and pasture to one chiefly in tillage, under the best cultivation in Canada, provided the soil was of equally good quality naturally. We would estimate the skill and judgment of a farmer by seeing his management of land, but we would decidedly give the preference in our estimate to him who would have his farm in good meadow and pasture, and who would have his land ornamented and sheltered with trees and well drained.

THE LATE GREAT FIRE IN MONTREAL.

This is a subject that may be considered out of place in an Agricultural Journal, but such an extensive calamity as that which occurred in Montreal within the last month, is a great public loss to the country as well as the city. The number of houses destroyed altogether is not, perhaps, less than one fifth, or one sixth of the whole city. This cannot fail to operate unfavorably upon the country as well as the town. We view this destruction of property as an occurrence that might have been prevented by ordinary precaution and a previous judicious organization of the firemen of the city, under the control and direction of competent parties. It is true that the fireman and five engines were upon the spot during that fire, but we certainly could not perceive any check given to the progress of the fire through their means; the fire appeared only to be stopped when there were no more houses to be consumed in the line of its progress. When it first commenced, had there been sufficient water and a well organized and directed company of firemen, we are persuaded the fire might have been prevented from spreading. Not only at this last great fire, but at all others that have occurred in Montreal, there have been the loudest complaints for the wants of a sufficient supply of water. This is indeed a most extraordinary circumstance, and the great river St. Lawrence washing the front of the city for more than three miles. The water might also be taken from the Lachine rapids to a reservoir that would command most of the city. It is truly most discreditable to see property destroyed to such a vast extent, time after time, for want of water to stop the fire. In this late instance, after so many warnings, it was ridiculous to see the fire engines depending chiefly for a supply of water carted to them from a distance in puncheons. An old woman might as well attempt to quench the most violent eruption of Mount Ætna with water from a tea-pot. A few fire engines in good order, well worked, with abundance of water to keep up a continual stream, would stop any fire if applied in time, but we believe the supply of water at the last fire was not at any time sufficient to keep the engines at work for many minutes together. We submit these few remarks not to give offence to any party, but in order to

unite with the Press generally in urging upon the citizens of Montreal the necessity for the immediate adoption of measures that will secure for the future a supply of water in case of fire, and an efficient force to apply the water if required. The example of the Troops, who worked the fine engine at the barracks at the last fire, would show what organization and proper control would be able to effect. It is a most culpable absurdity to see property constantly destroyed, without taking every precaution that is possible to prevent it. After so much property is destroyed, parties come forward to subscribe for the sufferers, but do they adopt measures of preventing a similar calamity occurring again? From what we saw at the late fire, we have very little doubt, that were a fire to commence again, of a windy day, in some of the suburbs it would make a most destructive progress before it would be checked, by the present means that are at the disposal of the city. We shall see what will be done.

In publishing statements of the weight of fleeces of wool, we conceive it to be a great absurdity to give the unwashed weight, which, in numerous cases, may be four or five times as much as it would weigh if washed clean as it should be. We have seen statements lately published of Merino sheep, yielding *unwashed* fleeces that weighed over 22 lbs., and the average fleeces taken from a number of Merinos averaging near 20 lbs. each *unwashed.* We would be glad to be informed, what good object is expected to be obtained by publishing such statements, when we know that the average weight of Merino fleece, *washed clean,* is seldom more than a fourth or a fifth of this weight. Let us suppose that the live weight of a flock of Merino to average 100 lbs. each (though live weight is also an uncertain guide) what length of wool would it require to make a fleece weigh 5 lbs. of *clean* wool? The wool of Merino sheep is not generally washed in Spain until after it is shorn, but we only object to weighing fleeces that are unwashed, and giving the result as the weight of a fleece of wool, without stating what was the probable proportion of this weight, which was not wool. We cannot conceive what possible object there is in publishing the weights of fleeces of unwashed wool, unless to puff the stock of certain parties, and induce farmers to give a higher price for them, though they might not be any better sheep than those of their neighbours. It is only in America that we have ever heard of the weight of unwashed fleeces being given as a criterion of the comparative value of wool producing animals, and we warn those who have to purchase any particular breed of sheep, not to be influenced in the slightest degree by the puffing statements of the weights of unwashed fleeces which certain flocks are reported to have produced. We have seen it statedthat a Merino Ram produced a fleece of unwashed wool that weighed near 21 lbs., *besides having lost previously several lbs. of wool.* We submit to our readers, who know any thing of Merino sheep, how far this statement will go to recommend the flock of which this most extraordinary Ram is one, for purchase, though it may impose upon those who do not know this breed of sheep and their woll producing qualities.

RAILROADS, CANALS, TURNPIKE ROADS AND NAVIGABLE RIVERS.

As a means of promoting the profitable settlement of the waste lands of Canada, and of occupying to advantage those lands already settled, none would be better or more certain than the construction of railroads, Turnpike roads and canals, and making some of our rivers navigable where practicable, for a moderate expenditure. Any parties acquainted with the difficulty of communication in a new country must be convinced that it acts as a decided bar to successful settlement and improvement. Easy means of communication will in many cases double the value of the produce raised for sale, and perhaps more than double it. It also diminishes the cost of what farmers have to purchase. This proposition is so evident th-

it is scarcely necessary to attempt to offer further proof of it. They will therefore be the benefactors of their country who will endeavour to extend our railroads, turnpike roads, and canals, and who will remove obstructions to navigation in our large rivers, and give the country the full benefit of the numerous rivers that intersect this noble Province. The necessary expenditure for such works would be the objection, but the credit of Canada is good, as it is entitled to be, and the expenditure upon them would be a safe and profitable investment. We constantly hear countries extolled that have numerous railroads, and now that the rural population of Canada appear anxious to have railroads, there is opposition to them from parties who would accuse the rural population of being opposed to all improvements. There is one consolation for the true friends of Canada, that however the prosperity of the country may be retarded by parties who have their own views and interests to promote, it must, at no distant period become prosperous and great, and at this moment her position is such as her inhabitants may be justly proud of.

We have received the Premium List of the "New Brunswick Society for the encouragement of agriculture, Home Manufactures, and Commerce throughout the Province," for their "Great Exhibition, or Provincial Show and Fair" to be held at Fredericton on the 5th of October next, and the four following days. The amount offered in Premiums exceeds £500 currency, and the rules and conditions are very judicious. The Premiums classed in the following manner:—

Class 1. Mineral Kingdom, Section A.—Raw Materials, &c. Class 1. Section B.—Manufactures chiefly in Metal, Class 2, Vegetable Kingdom, Section A—Raw Materials, Class 2. Section B.—Manufactures chiefly in Wool, Class 2. Section C.—Manufactures from Grain, Fibre, &c. Class 3. Section A.—Live Stock, &c. Class 3. Section B.—Manufactures from parts of animals. Class 4, Fine Arts, &c., and a Ploughing Match, with Horses, and with Oxen. The Premium List altogether is creditable to the judgment of the Society, and we hope the Exhibition will be well attended, and a numerous competition for the Premiums offered in each class. The List can be seen at the office of the Lower Canada Agricultural Society.

We give insertion to the communication of "An Upper Canadian," on the subject of draining, which we recommend to the attention of farmers. We have constantly endeavoured to persuade farmers of the necessity and advantage of draining, and under draining, by all means, where there was sufficient capital to be expended. The strong clay lands of this country would be vastly improved by under draining, and the work would not cost so much as in generally imagined, unless where tiles were used, and they need not be made use of unless in very rare cases; as stone and wood might be substituted. There is not, however, any necessity that we should pay so high for tiles if we had the most approved tile machines for making them. We do not see why we should pay much more for them here than in England, if our machinery was equally perfect; and if there are perfect machines for the manufacture of tiles in England there is nothing to prevent us having them in Canada if we desire it.

We have received a communication from a gentleman in Upper Canada, who has an extensive and excellent farm, in good condition and well stocked, about 150 miles from Montreal, acquainting us that he would give the farm and stock on shares to a practical farmer who would have a family grown up to do the work of the farm. It would be a very favorable opportunity for a competent farmer, with a grown family, to get a farm in good order, with live stock and implements ready provided for him. The gentleman mentioned that a farmer who has been some time in the country would be preferred, although a newly arrived immigrant, of the necessary qualifications, would not be objected to. We

shall give the address to parties wishing for information; possession given on the 15th April next.

The Provincial Agricultural Association of Upper Canada have published their list of Premiums for their Exhibition, which is to take place at Toronto in September next, the 21st, 22nd, 23rd, and 24th. A great number of Premiums are offered, varying from 30 dollars to one dollar each. There is a separate class for exhibitors residing out of Upper Canada, for live stock and implements, but the Premiums are only from 12 dollars to one dollar each, except that a Premium of 20 dollars is offered for the best assortment of implements and edge tools. A Diploma is also to be awarded in several cases with the Premiums. We believe that this Exhibition will be well worth attending, and that there will be numerous specimens of the best animals and implements in Canada exhibited at this Show. The locality selected could not have been better chosen for such an occasion.

We expected that before this we should have had, for insertion in this Journal, many communications from Presidents of County Agricultural Societies, in reply to letters addressed to them by the Directors of the Lower Canada Agricultural Society, respectfully requesting their opinions and advice as to the best means to be adopted to promote the general improvement of Agriculture. It would greatly accelerate the progress of Agricultural improvement were all Agricultural Societies sincerely united, and in communication with each other constantly on the various matters that are considered injurious to Agriculture, as well as the remedies that would be proposed as a cure for these evils. The discussion of these subjects by Agricultural Societies, and the insertion of these discussions in this Journal, would bring the whole matter fully before the public, and could not fail to act beneficially for the interests of Agriculture. These Societies should be well qualified, by their local position, and connection with the rural population, to make the wants and wishes of Agriculturists known, and recommend useful measures. We cannot see any reasonable objection that could be offered to this mode of proceeding. The most prevalent and injurious defects that exist in our general systems of husbandry might be pointed out, and useful and necessary improvements suggested, and recommended to be introduced. If Presidents of Societies have any objection to take this trouble upon them, the Managing Committees might act in the matter for sake of the general interests of our agriculture. If such County Agricultural Societies would send a monthly Report to this Journal, (even during the summer months,) it would be interesting to the public, and it might give much instruction to the farmer. This would offer to parties an opportunity of publishing their own views and opinions on Agriculture, and in proportion to the correctness of these views and opinions would be their value to the Agricultural population.

We have received the annual Report of the Central Board of Agriculture, Halifax, Nova Scotia, for the last year, but must defer our observations to our next number.

The letter of "Observer" was too late for insertion, but will appear in our next.

The Directors of the Lower Canada Agricultural Society are respectfully reminded that their Monthly Meeting will take place at their rooms in Montreal, on the second Wednesday of August the 11th instant, at 11 o'clock A. M.

Wm. Evans, *Sec. &c.*

The following books have been taken from the Library of the Lower Canada Agricultural Society, and they are requested to be returned at once: "First Vol. Maison Rustic," "Low's principale of agriculture," "The Farmer's Friends, and some others that have been entered as borrowed.

SWEDE TURNIPS FOR COWS.—I have three winters given swedes to our cows without imparting the least unpleasant taste either to the cream or butter. In preparing the turnips for use, a boy cuts of the crown, which is put aside for the yearlings, and the remainder is given (uncooked) to the cows; I conclude, therefore, it is the crown only which imparts the disagreeable taste to the milk, &c.—*O. S., Sussex Express.*

AGRICULTURAL REPORT FOR JULY.

The month of July has been extremely favorable for the growing crops of every description, and they have made surprising progress within the last four weeks. There was a very high temperature with rain occasionally, that could not fail to produce rapid and healthy vegetation. We had also short intervals of cold, but not so cold as to injure crops, the meadows, however, are generally light and under an average crop. The grain crops look very healthy, though they have not in many places come up evenly, and will not ripen evenly. This is a great defect in a crop as it cannot produce a good sample of grain. In fall wheat the part that was uninjured by the winter came on rapidly, and was in ear previous to the appearance of the wheat fly, and consequently is quite safe from their ravages, but the part that was injured was not so early in ear, and has been very much damaged by the fly. Indeed we have seen some ears with not a grain of wheat left. The fly made its first appearance about the 1st of July this year, and this was later than usual. The fall wheat first in ear, is a most splendid crop, as regards the size and fulness of the ear. The early sown spring wheat is said to be greatly injured by the fly, and in fact, any spring wheat that came into ear previous to the 21st of July, must have suffered more or less damage from the same cause. We are sorry to have still to report that the fly is sure to damage any wheat that comes into ear during the usual period of its visit to our fields, which extends from the 25th June to nearly the same date of July, making about thirty days. The fly does not always continue so long, but there is danger to be apprehended during all that time. Stormy evenings and nights may check their ravages if they occur constantly for about a week, while a field may be coming into ear, but this is only a precarious chance of safety. We perceive by exchange papers that the fly is doing injury in Upper Canada and the United States, but in both countries they call it the weevil, which is an insect by no means so destructive as the wheat fly, and there is also means of destroying it which is not the case with the wheat fly. There cannot be any more distinct species of insect than the larvae of the wheat fly, which destroys the germ of the grain in the ear, and the weevil that destroys the wheat stored in the granary. The first cannot injure the grain of wheat after it attains to any degree of hardness, and the second never touches the wheat until thrashed and stored in the granary. It creates considerable confusion when things are not designated by their proper name, and particularly as in this instance, when a name is given to an insect that righly belongs to a different species of insect, different both in shape and habit, except, indeed, that both destroy wheat, and so do many other species of animals. The excessive heat has brought rapidly forward to maturity the barley and some of the fall wheat; we hope it may not act injuriously on other crops. Occasional showers are quite necessary in such great heat to prevent crops turning yellow, before they have attained perfect maturity We have frequently seen crops materially injured from this cause, but they have not suffered as yet from it this year. Potatoes look remarkably well and are likely to be a very abundant crop, if they escape the usual disease. We have remarked that the more luxuriant the tops or vines, the more liable they are to be attacked by this extraordinary malady. A moderately dry season is however the most favorable for the crop. Peas and beans look well, and Indian corn has made great progress since our last Report. Beets, carrots, and turnips, although uneven, in consequence of the seed not vegetating regularly in the very dry weather of May and June, may prove to be good crops. The hay harvest did not commence much before the 21st of July, and though some meadows have a good appearance, they do not produce hay in proportion when cut and gathered. The straw of grain crops will not be so long and abundant as last year, and we conceive that the whole quantity of provender for cattle, raised this year, will be considerably less than that of last year. So far, however,

hay has been well got in, and free from waste, which was not the case last season, and this will make up for some deficiency; but there cannot be any doubt that the crop is short of an average. We have seen an indication of rust in the straw of some of the grain crops, and about this time is the most dangerous of the season for producing this disease, that is so fatal to a crop if attacked by it before the grain is near maturity. There is scarcely a possibility of remedy for this disease, except by draining well and having the crops clean. Perhaps that drilling and hoeing the crops would also be a preventative. It is a remarkable fact, that on clay lands wheat is not so liable to rust or other disease, as on light or loamy soils. Clay soil is always the most certain for wheat, though occasionally good crops of this grain may be raised on other soils in favorable seasons. We have raised 33 bushels of wheat to the acre, on a sandy loam of good quality, but it was sown early in April, and previous to the infliction of the wheat fly. Weeds prevail to a considerable extent in the crops this year, and it is very hurtful to the farmer to allow them to do so without destroying them. We have observed smut in the oats this year, and suppose that if the seed had been washed, as the seed wheat, previous to sowing, it would prevent this disease. We do it with barley and wheat, and find it an effectual remedy against smut. Agriculturists should take the trouble to raise new specimens of grain, which might be done by selecting choice ears of wheat, barley, oats, peas, &c., sowing these carefully, and again sowing the produce of them, until a considerable quantity would be obtained for seed. It is in this manner that all new varieties have been propagated, and by a little care it might readily be done. Our next Report will, we hope, be favorable and interesting, as the fate of the year's crop will be decided by that time. The next five or six weeks will be regarded with deep interest by farmers, so much of their success will depend upon the weather for that period. Farmers may well be anxious about these matters, and may be so without having any distrust in the goodness of our Creator.—July 30, 1852.

To the Editor of the Agricultural Journal.

DRAINING.

Sir,—Seeing a communication in your last Number, seeking information about draining, induces me to communicate my own experience, in hopes it might suggest some hints that may be beneficial to parties similarly situated.

I have been for many years something of an amateur farmer. My *penchant* for that honorable and interesting pursuit led me to outlay considerable money in *supporting* my farm, but, within the last five years, I determined my farm should support me. But there stood in my way to improvement about 20 acres of *wet*, most forbidding cedar swamp—yet the best of my land. I began, "wrong end foremost," by availing myself of the winter; I removed off all the cedar and other valuable timber. Having then let the fire in, it burnt off all brush and rubbish *above water*, and left me with an army of black stumps that would frighten "Hercules." At the seasons I could spare my men and teams, it was so wet that neither could do any work to advantage. I made the discovery that *draining* was my first step, and that, too, to begin and drain my neighbour's land first, in order to secure a good outlet. Having no stones near me, the next consideration was what sort of drains could I make? In digging, I found, in sinking through black muck and other soils, I invariably came, in 2½ to 3 feet, to blue clay, and the water ran off beautifully. I found, then, that leaving my drains open would spoil my fields for tillage. With advice, I concluded to fill the bottom of the drains (about 15 inches wide) with small billets of cedar, about 3½ feet long; making the mouth with side blocks and a cross block, laying them along well fitted, and overlapping about a foot, covering carefully with brush and other rubbish above that, and neatly filling in, towering the drain about six inches above the level for sinking. In the following winter, I found they ran beautifully, the outlet of the drains never freezing, and smoking like a warm spring. In the spring of the year, not a *gill* of water lodged in any part of this field. (I was, of course, careful to follow the sinuosities of the lowest ground). I felt as elated with my success, as if I had been the first who had discovered the advantages of under-draining.

The next season, I stumped, cleaned, ploughed, fenced, and sowed my field, which is now invaluable. Following up my experience next season, and finding the blue clay stratum, in both swamp and cleared fields, I fell upon another plan, (borrowing the idea from an Irish laborer, who said that "pipes," as he called them, were covered with "sod" in Ireland.) I got a narrow spade bent round in the blade, about four inches wide in the bit, like a gouge, with which I cut a *groove* in the bottom of the drain, about 4 inches wide and 4 deep, leaving a good shoulder, at least 4 inches on each side; on this I laid a common saw-log slab, and, if narrow, two of them, the ends meeting square and close; then straw or brush to prevent the soil from falling into crevices until settled down; and this *groove*, after two years' experience, I find to answer admirably, running a stream of clear water summer and winter. *The winter draining is the whole secret.* The *groove*, of course, is only suitable in clay, but wood or stone is advantageous in any soil, and wood will last an *unknown* time under ground, particularly in clay.

Now, why would not this plan, or something similar, answer well in Lower Canada, where it is generally a clay bottom? Surely, stones, lumber, slabs, *boards*, or something can be had without very great expense. I have often observed your open drains in Lower Canada, which I consider the next thing to a nuisance, for, in many instances, they only dam the water on fields. I would not *now* have open drains if they were to cost me nothing, and, where I had them heretofore, I now dig them deep and groove and cover as above described. *Let me repeat again, the great secret is in winter draining below the frost!*

Now then, as to the expense. I find, on an average, that by cutting two drains across a field of 9 or 10 acres one way, and one cut across the other way (lowest ground always,) it will, on my land, drain sufficiently; drains, say about 2½ feet wide at top, 12 to 14 inches in bottom, and 3½ feet deep, this I find to cost me about 4 to 5 dollars an acre on the area of the field. By these means I bring land to cultivation which is fresh and vigorous, and without draining I could not cultivate at all; but not only that, but I believe, generally, (and my farmer is now beginning to be convinced of the fact) that I get back my outlay in most cases in the *first crop*—and certainly in the second. I may add, that I am now preparing to redeem a third additional field from the forest, but my first step, before I put in an axe, is *draining*, I can clear in less time and much less expense, but, of course, my bush draining is a little more expensive.

It is needless, Mr. Editor, to tell you personally the advantages of draining, for I can testify to your zeal, for many years, in keeping the subject before your readers. In my own case, I can aver most truthfully, notwithstanding all I ever read on the subject, that the improvement is far beyond what I anticipated. Under such circumstances, is it not deeply to be regretted, that so many of our worthy, industrious Yeomen, and many who can well afford it, should still be in the dark with regard to the value of this fundamental principle in good farming, viz., *draining*.

Respectfully yours,

AN UPPER CANADIAN.

Bytown, July, 1852.

METEOROLOGICAL RESULTS FOR JUNE, 1852.

TAKEN AT ST. MARTIN, ISLE JESUS, BY CHARLES SMALLWOOD, M. D.

BAROMETER.	inches.
Mean Reading corrected and reduced to 32° F.	29·489
Highest Reading corrected and reduced to the 13th day	29·939
Lowest Reading corrected and reduced to the 9th day	28·727
Monthly Range	1·112
THERMOMETER.	
Mean Reading of the Standard Thermometer, F.	66·12
Highest do Maximum do the 15th d.	100·00
Lowest do do the 5th d.	28·00
Monthly Range	72·00
Mean of Humidity, Saturation begin, 1·00	·770
Amount of Evaporation, in inches	3·450
Amount of Rain in inches.	5·892
Rain fell on 15 days, and was accompained by Thunder and Lightning on 6 days.	
Most Prevalent Wind	W.
Least do	E.
Most Windy day, the 9th day, Mean Miles per hour.	31·540
Least do the 13th day, do	0·923

NATIONAL AGRICULTURAL SCHOOLS.

Education is the foundation of all social, political, and agricultural advancement in the great cause of progressive civilization; and we regret to perceive that it is so much neglected by the agricultural community.

In our perambulations amongst the rural districts of the country, and intercourse with small farmers and laborers, we have been surprised at the ignorance and destitution of the ordinary elements of instruction, which the children of the mechanic and laborer resident in our large towns and cities, have the means of obtaining.

It is acknowledged that many of the most gifted and talented statesmen, politicians, professors, engineers, merchants, and distinguished men of business, have had their origin amongst the industrious classes of the country: but it must be attributed to the fact that their minds being early trained in the rudiments of learning and general knowledge, that they have, by self culture and close application to study, elevated themselves to their present position in society.

We hope the period is not distant when the sons of the cultivators of the soil will have the same advantages of early education, and that the British farmer will not only be distinguished for his practical knowledge of his profession,—but also for his scientific attainments.

These observations have suggested themselves from the perusal of "*Notes of a Tour in France*," which appeared in *The Cultivator*, (Albany) and from which we give the following extract:—

The National Agricultural School of Grignon, being within a few miles of Wideville, where I was staying, I drove over one fine morning to see it. This is one of the most flourishing of the several government institutions that have been established, of late years, in France; and it is only within a comparatively short time that the importance of these schools has been acknowledged by the government; but no sooner was it fairly convinced of the fact, than, with the usual promptitude of royal proceedings, several of them were founded in the various departments, and liberally endowed. They have been conducted with entire success, and yearly send forth a number of scientific and practical farmers, to diffuse the information they have obtained throughout the land, besides contributing to the experimental and theoretical progress of the science itself. M. Bellat, the director of the establishment, is most admirably fitted for the important post he occupies. Being devotedly fond of the pursuit, his whole mind and energies are given to it, and the prosperous state of the school shows with what good result. He has travelled and studied the agriculture of foreign countries, and is thus enabled to adopt everything that is appropriate to his own. M. Bellat informed me that their graduates had already spread themselves over the four quarters of the globe —one was near Constantinople, overseeing an establishment of the Sultan's—another was in Asia Minor —two were in the United States, and M. Pichat, the able director of the Rambouillet flock, was, himself, a graduate. Such results were most gratifying proofs of the advantages of these institutions.

The farm consists of about three hundred acres, under very high cultivation, and was formerly an estate belonging to a noble family, and the Chateau or mansion house, a fine old building of the time of Louis XIII, is still standing, and contains the dormitories of the students, lecture rooms, &c. &c. I was told it needed repairs exceedingly, so much so that visitors were not now admitted. The farm buildings are very large and commodious, and directly adjoining the Chateau; the first of these was the cow stables, a long range of well ventilated stone buildings, with a row of wide stalls running the whole length of one side, and a broad alley behind them. About a hundred cows are kept for their milk, which is taken to Paris it sells at the stables for about seven cents a gallon. The cows are mostly of the dun Swiss breed, sometimes crossed with the Durham; they are very large, and generally yield abundance of milk, but must be great consumers; when dried off they feed kindly. Over each stall was a printed label, with the name and age of the cow, and the quantity of milk she gave per day. The half-dozen bulls I saw did not strike me as anything remarkable, and were decidedly deficient in handling.

The Director has great faith in Guenon's theory of "Escutcheons," as signs of the milking property, and told me that in selecting cows, he always had reference to it, and usually found it correct. This testimony, coming as it does from a man of such experience, enjoying such ample opportunity of testing it, should go far to give credit to a theory which, if it be correct, is all important to dairymen. My own experience and observation would decidedly favor the theory, not, perhaps, in all its minutia, or to the whole extent claimed by its author. I found that a careful register was kept of the course of breeding pursued, as well as of the various experiments in this little understood science, and an annual report drawn up.

We next went to the pig-sties, and found the swinish multitude in great force, of every breed and variety; numerous crosses had been tried, but without any striking results. The English breed appeared to be the favorites, and amongst these I observed some rather inferior looking Berkshires. The buildings and arrangements for them were convenient but without novelty.

I was more disappointed in the sheep than in any other of the stock; they are by no means worthy of the establishment; nor was I surprised when I found that the Director had been seized with the English mania, so prevalent here of late, and had been trying crosses of the South-Down, the Dishley, and the New-Kent breeds on the Merinoes, in nearly all cases using Merino Ewes; the results, in my opinion, are unsatisfactory. The characteristics of the two latter breeds especially, being so widely different from those of the Merino that they have not amalgamated well; the progeny is uneven, inclining decidedly to one side or other, and inferior to either parent; with the South Downs the cross was more successful; but I regretted to see so mixed a flock, where I had expected to find good specimens of the true French Merinos. M, Bellat said, in answer to my remarks, that fine wool was not paying well, and that the people wanted food rather than clothing. These considerations had led to the experiments with which he seemed satisfied and he still hoped to combine the excellencies of mutton sheep, with a sufficiently fine fleece to insure an almost double profit from the one animal.

The system pursued here of feeding and of registering consumption and production, was admirable; every animal, or set of animals, is numbered, and a separate account kept with each—(this is done by the students as part of their duty.) At the doors of the buildings are tables, giving the quantity, quality, and price of the food consumed per head daily, with averages, estimates, &c., and in the fattening houses the weekly and monthly increase in weight, was added. These tables are renewed and altered as often as changes are made. The calculations are very close, and probably as accurate as they will admit of. The many

difficulties of carrying out experiments of this kind are only to be known by actual trial

The root cellars were quite novel in their construction, being a series of tunnels excavated in a high bank of calcareous tufa, which, from its close texture, required no arching of masonry, they were about eight feet high, by as many broad, and fifty or sixty in depth; at the further end was a shaft or chimney ascending into the open air for ventilation; the floor was rammed hard and smooth, allowing carts easily to back in and readily unload; a space is always left above the roots, immediately under the roof, and in mild weather by opening the doors a current of air passes the whole length of the tunnel, giving a perfect ventilation through the chimneys, and thus making it easy to preserve the roots the required temperature. The crop of mangel wurzel is very large, as the cows are fed principally on them during the spring, for which purpose they are cut into slices by rather a rude machine. Indeed all their implements struck me as very coarse and ill made, and I was surprised to see such excellent work with such poor tools. The ploughs are very heavy, clumsy affairs, with a short beam inclined very much upwards, resting on a train of two wheels, with cumbrous machinery for adjusting the depth of the furrows, by raising or lowering the beam; yet I saw admirable work done by these ploughs, on even rough land. I will here remark that at Grignon they were trying an American side-hill plough, that had been sent out by Mr. Taintor, and its simplicity and effectiveness was much admired.

In the stables were about twenty-five strong Norman horses, mostly mares, these animals being used as breeders, besides performing the work of the farm; here, as in many parts of France, the stablemen, cowherds, and shepherds, always occupy a sort of birth or "bunk" in the houses of their respective charges, which are thus never left alone, and to this fact may be attributed, especially in sheep, the few losses by accidents, &c., that are so usual in large establishments where this precaution is not taken.

Belonging to this institution is an extensive and well stocked garden, in which horticulture is especially taught as a necessary adjunct to its sister science. A mulberry plantation and silk-house form part of the establishments, the culture of silks being included in the course of instruction, as in the southern parts of Faance it is an important branch of industry.

The great portion of the labor on this farm is done by the students, who have also to attend the regular lectures, recitations, and other instruction in the various and numerous sciences related to Agriculture. There were, at this time, about an hundred pupils, all wearing a sort of uniform (as is the invariable custom of schools in this military nation) of a short blue frock or "blouse," which is also the regular agricultural dress, even of the gentlemen farmers of that country. F. M. R. *Morris, Ostego co., N. Y., April 2, 1852.*

On the subject of agricultural education, our brethren on the other side of the Atlantic are given attention to it. In congress, Judge Newton, in an address to that assembly, in alluding to the efforts of other nations, observes:—

"Russia has in all, sixty-eight schools and colleges. She has an agricultural institution wrth forty college buildings, occupying three thousand acres of land, and attended by several thousand students. The agricultural society of St. Petersburgh was established by Queen Catherine. There are under the patronage of the French government, seventy school farms, besides five first class colleges, in which professors are employed to lecture on botany, zoology, chemistry, agriculture, and the treatment of diseases in cattle, in the culture of woods, forests, &c. These are supported throughout the country. National establishments for the improvement of breeds of stock, and colleges for the education of veterinary surgeons, and investigating the uses of all discoveries contemplated for agricultural improvement. The government expends in three vetinary schools a year for instruction. 724,200 francs; for instruction in agriculture, 2,731, 468 francs; for encouragement in agriculture, 700, 000 francs; for improvement in the breeds of horses, and the science connected with it alone, 1,776, 400 francs. The requirements for admission into these veterinary schools are as follows: the applicant be not less than seventeen yeas of age, and not over twenty-five, and have the following qualifications; to be able to forge a horse or ox shoe after two heatings—pass an examination in the French language, arithmetic, and geography, and after four years' study, is permitted to practice veterinary surgery, and receive a diploma. In Belgium great attention is paid to the subject. There are a hundred agricultural schools or colleges, established by the government—a high school of veterinary surgery. The science of agriculture is the most fashionable in the kingdom. They have their palaces furnished more or less with rare specimens of the product of the land, and are farmed like a garden. These facts I know, having travelled over a considerable part of that country. In Saxony they have five schools; in Bavaria thirty-five; in Wurtemburg seven; in Austria thirty-three; in Prussia thirty-two; in Italy two; in Scotland two; in Ireland sixty-three. The one at Glassnevin, near Dublin, I visited. It now consists of one hundred and twenty-eight acres of good land and convenient buildings; they are about to add to the farm and increase their buildings, so as to accommodate one hundred or more students. With the teacher, Mr. Donaghy, I became acquainted. He is an intelligent, practical man. With him I viewed the farm, and their farming and buildings, &c., and it is carried on very successfully. These schools are doing more for Ireland than any other attention the government is giving them."

PARLOUR FIRE, BRIGHT AND SMOKELESS, FROM WATER GAS.

Although there is no direct prospect of realizing the old proverb, "setting the Thames on fire," a portion of its water has been actually used for making a most cheerful and pleasant fire, in a common parlour chimney grate; and is patented by Desfries, the gas engineer, whose cooking, working, and warm-bath stoves were so conspicuous at the Great Exhibition. Instead of coals, the grate is filled (or rather fitted) with thin sheets of platinum, over-lapping each other like roof tiles; and the gas brought in at the back, and passing out between the plates, is set on fire; when the platinum becomes rapidly heated, giving a brighter and warmer radiation than a coal fire; and free from smoke, smell, or dust. And as it can be lighted instantly, so it may be lowered to any degree, or quite extinguished, while not actually wanted, by turning the cock, like a gas light. The platinum does not consume, though so bright-

ly heated, so that the same fitting will last many years, and may be made to shift from grate to grate with perfect ease. Coal gas will answer the purpose, but requires some chimney draught, or considerable ventilation; but water is not only comparatively free from carbon and sulphur—and burning, therefore, without smell or carbonic acid, but is expected to be produced cheaper—as low as 1s. per 1,000 cubic feet. Although giving little light of itself, it produces greater heat than coal gas; and will heat the platinum proportionably brighter. If, therefore, it can be produced for 2s. 6d. (not to say 1s.) per 1,000 cubic feet, and the consumption is equal to four argands—*i. e.*, 20 feet per hour — then 1,000 cubic feet will last 50 hours; or 3-5ths of a penny her hour cost. A coal fire was computed by Dr. Arnott, to consume about 8 times as much fuel as his stove, to produce equal warmth in the room; and taking a good Arnott to consume half a ton of coke in three winter months (day and night) at £1 per ton, 10s.; and a good coal fire 8 times as much, £4; or say £3 for eighteen hours a day, is £1 per month; 8d. a day; or 8-18ths= 4-9ths of a penny per hour; the gas would cost more than the coal in proportion of 3-5ths to 4-9ths, or 16 per cent.; and I suspect the estimate is too much against the coal; and that the difference would be above 20 per cent., with the gas at 2s. 6d. per 1,000 cubic feet. But the coal fire takes wood as well as time to light; makes smut and dust to clean; and requires attention to keep bright and steady; whilst the gas fire can be lighted as instantly, and regulated by the cock as easily and exactly as any other gas-light; and on these accounts, 9-10ths of my laboratory work is done with gas, though coal gas, and at 5s. per 1,000 cubic feet. The impediment is the first cost of the platinum, which will increase if such an additional demand becomes extensive. But a substitute will doubtless be found; perhaps in some alloy of gold, of which the recent supply is so fast overrunning the demand.—J. Prideaux, *in Mark-lane Express.*

The Battle of the Bees.—A curious circumstance occurred a few days back at Guilleville, Eure-et-Loire. A small farmer had in a field about 250 bechives, containing a vast number of bees. He sent a man with a cart, drawn by five horses, to remove some earth from the wall near which the hives were placed. The carter having occasion to go to the farm-house, tied the horses to a tree. Almost immediately after, a multitude of bees, either irritated at the shaking of their hives by the removal of the earth from the wall, or excited by the electricity with which the atmosphere happened to be charged, issued from their hives, as if in obedience to a given signal, and with great fury attacked the horses. In an instant the poor animals were entirely covered with bees from head to foot; even their nostrils were filled with them. When the carter returned he found one of the horses lying dead on the ground, and the others rolling about furiously. His cries attracted several persons; one of them attempted to driven away the bees, but they attacked him, and he had to plunge into a pond, and even to place his head under water for a few seconds, in order to escape from them. The curé of Guilleville also attempted to approach the horses, but he too was put to flight by the enraged insects. At length two fire engines were sent for, and by pumping on the bees a great number were killed on the horses, or put to flight. The horses, however, were so much injured that they died in an hour. The value of the bees destroyed was 1,500f., and of the horses 2,500f. A few days before bees from the same hives killed 17 goslings.

Picture of the Full Moon on the Retina.—If we look at the full moon, on a clear night, we perceive, with considerable distinctness, by the naked eye, the lineaments of light and shade which characterize its disk. Now, let us consider only for a moment what are the dimensions of the picture of the moon formed on the retina, from which alone we derive this distinct perception. The disk of the moon subtends a visual angle of half a degree, and consequently, according to what has been explained, the diameter of its picture on the retina is 1-230th part of an inch, and the entire superficial magnitude of the image from which we derive this distinct perception is only the 1-52900th part of a square inch; yet, within this minute space, we are able to distinguish a multiplicity of still more minute details. We perceive, for example, forms of light and shade, whose linear dimensions do not exceed one-tenth part of the apparent diameter of the moon, and which, therefore, occupy on the retida a space whose diameter does not exceed the 1-5000000 part of a square inch.—*Lardner's Handbook of Natural Philosophy.*

The Chinese and the last day of the year.—The last days of the year are ordinarily, with the Chinese, days of anger and of mutual annoyance; for, having at this period made up their accounts, they are vehemently engaged in getting them in; and every Chinese being at once creditor and debtor, every Chinese is just now hunting his debtors and hunted by his creditors. He who returns from his neighbour's house, which he has been throwing into utter confusion by his clamorous demands for what that neighbour owes him, finds his own house turned inside out by an uproarious creditor, and so the thing goes round. The whole town is a scene of vociferation, disputation, and fighting. On the last day of the year disorder attains its height; people rush in all directions with anything they can scratch together, to raise money upon, at the broker's or pawnbroker's, the shop of which tradespeople are absolutely besieged throughout the day with proffers of clothes, bedding, furniture, cooking utensils, and movables of every description. Those who have already cleared their houses in this way, and yet have not satisfied the demands upon them, post off to their relations and friends to borrow something or other, which they vow shall be returned immediately, but which immediately takes its way to the Tang-Pou or pawnbroker's. This species of anarchy continues till midnight; then calm resumes its sway. No one, after the twelfth hour has struck, can claim a debt, or even make the slightest allusion to it. You now only hear the words of peace and good-will; everybody fraternises with everybody. Those who were just on the point of twisting their neighbour's neck, now twine their friendly arms about it.—*Hue's Travels in Tartary, Thibet, and China.*

A venerable Nag.—A correspondent tells us he saw a mare belonging to Mr. Boyd of Mertinhall, near Newton Stewart, working in the plough on Monday last, whose age is forty-one years!

THE WONDERFUL PROVISION OF NATURE.—Although eels, notwithstanding their voracity, are not, perhaps, very destructive to salmon in their active state, their habits are such, that they would exterminate the species, were it not for a very wonderful provision of nature, which as we do not remember ever to have seen it dwelt upon or alluded to, it may be worth while to notice it passing. The history of their spawning is the converse of that of the salmon's, for whilst the latter is oviparous, and produces in fresh water, the former is viviparous, and produces in the sea; and it so happens that when the salmon is hurrying up towards the very sources of rivers on the same errand of generation, the eel is hurrying on the same errand to the depths of the ocean. Were the eel to remain in the river after the salmon roe is deposited and covered in, its voracity and habit of boring in loose gravel, and even under large stones, would disturb the bed, and lead to the annihilation of the whole salmon tribe. But at this critical time the two creatures are driven, by the same instinct, towards different poles; and before the eel reappears in fresh water, the salmon roe has undergone a series of changes, emerged from its subaqueous dormitory, and becomes a little fish, fragrile indeed, and tiny, but in the highest degree vigilant and nimble, not capable of confronting a single one of its numerous enemies in the open field, yet disconcerting and defying them all by the celerity of its flight. Is this an evidence of design, or is it a stroke of chance?—*Thoughts on the present scarcity of Salmon*; by the Rev. Dugald S. Williamson, Minister of Tongland.

SMALL BEGINNINGS OF GREAT INVENTIONS.—I like the story of the apple that fell on good Sir Isaac Newton's hose; of Doctor Franklin and his kite; of little Benjamin West inventing the camera obscura, in his darkened bedroom, when getting well of a fever, and little dreaming—mild young Quaker—that somebody else had invented it, two years before, on the other side of the Atlantic, 4,000 miles away! Most of all, do I affect the traditional anecdotes relative to painting and engraving. Touching the last, it is curious that nearly all the legends concerning it should be connected with that very humble adjunct to domestic economy, the wash-tub. A bundle of wet linen, thrown on a steel cuirass, which had been engraved in aniello, and on which a faint impression of the pattern came off, was the germ of plate engraving; the little *radiculum* from which the works of Woollet, and Landseer, and Cousins were to spring. A hard day's wash, souring the always somewhat acrid temper of Dame Alice, wife of Master Albert Durer, drove him for refuge to his woodblocks, and goaded him to the devising of that marvellous art of cross-hatching, in wood engraving, as lost and ignored, for centuries afterwards, as the cunning trick of staining ruby glass, or tempering poignard blades.—*Dickens' Household Words.*"

ANTHONY'S CHURN.—An American paper states as follows:—"We lately saw sweet milk converted into butter in four minutes. This wonderful effect was produced by one of the most perfect churning machines we ever saw. By this churn good butter may be made for breakfast, by any family, after the milkman has come in the morning, and the luxury of pure fresh butter enjoyed all the year round. While the cakes are baking, and the muffins toasting, the head of the family may be amusing himself by churning the butter to eat with them.—*Magazine of Science.*—[These churns are to be had of Burgess and Key.—*See Advertisement.*]

THE JAMAICA "LIFE PLANT."—About a hundred yards from Bluefield Gate there grows by the roadside a considerable bed of *Verea crenata*; a tall, rather handsome plant, with thick succulent leaves, notched in a fashion which heralds term engrailed, leaving rounded segments. It is now in blossom, throwing up a spike of greenish flowers to the height of three feet. It is considered a great curiosity by the Creoles, on account of its tenacity of the living principle, whence they call it the leaf of life, or the life plant. A single leaf is sometimes broken off, and suspended by a thread from the top of a window, when a number of delicate white rootlets are presently thrown out from the base, and the leaf forms a young plant. Some prefer to throw the leaf into a drawer or box, and to open it in a week or two, when the same results are found to have taken place. I found that even half a leaf, cut across, will root; and it is impossible to dry the plant in an herbarium, without first killing it with a hot iron, or by boiling water. This property, in a great or less degree, is common to many members of the order *crassulaceæ* to which the Verea belongs. Perhaps it is not indigenous, but is a truant from some garden,—*Gosse's Naturalist's Sojourn in Jamaica.*

AN EFFECTUAL MODE OF MAKING AN EARLY RISER.—The late Earl of Bristol (Bishop of Derry) was in the habit of taking a bath. He had given orders to his valet, an Irish giant, to call him in the morning for that purpose. One day, his lordship being very sleepy, could not be induced to rise, but feeling himself at breakfast unwell, and attributing it to his non-compliance with his usual custom, "Teddy," said he, "you know what benefit I have derived from bathing; and you know very well, that when a man is inclined to sleep, he'll sacrifice anything to enjoy his bed. Another morning, when you find me unwilling to rise, take me up in your arms—you are strong enough—and carry me to the bath!" "Very well, sir," said Teddy, "I'll remember it." The following morning, Jeddy, according to his instructions, came into the Earl's chamber, and awoke him to take the bath; but his matter was as little inclined to rise on this occasion as before, and moreover, felt displeased at being so hastily summoned from a beautiful pantomime that was performing in the playhouse of his brain. But Teddy was not to be put off or got rid of, and insisted on his getting up. "I tell you I shall not rise this morning, sir." said the Earl. "But you must rise." "Must! get out of the room, you rascal!" "By the powers! I'll do no such thing." "Am I not your master?" "Don't I now it is for your health?" "I commend you, sir! "but please your grace, you are either not awake now, or you're not sensible of what you're saying; and if I let you slape now, don't I know very well that at breakfast you'll be scolding me again, as you did yesterday! So come along, my lord, 'tis not your kicking and bawling; you must come and bathe yourself." Saying which, he quitely took the Earl up in his arms, as he would a lapdog, and carrying him to the tub, plunged him in it. The latter knowing it was no use to struggle in such a situation, when the shock was over called for soap and towel. At breakfast, the Earl was rather gloomy, and could not not acquaint his family with the cause, till Teddy came in, who, nodding his head and rubbing his hands with great glee, approached him and said, "Well, my lord, I managed to wake you this morning!" "At these words," related his lordship, "my features relaxed, and I could not deny the poor fellow the approbation he expected."

CUSTOMS OF THE RED-INDIANS.—BURIAL OF THE DEAD.—Formerly it was customary with Chippewas to bury many articles with the dead, such as would be useful on their journey to the land of spirits. Henry describes in a touching manner the interment of a young girl, with an axe, snow-shoes, a small kettle, several pairs of moccasins, her own ornaments, and strings of beads; and, because it was a female—destined, it seems, to toil and carry burthens in the other world as well as this—the *carrying-belt* and the paddle. The last act before the burial, performed by the poor mother, crying over the dead body of the child, was that of taking from it a lock of hair for a memorial. "While she did this," says Henry, "I endeavoured to console her by offering the usual arguments, that the child was happy in being released from the miseries of this life, and that she should forbear to grieve, because it would be restored to her in another world happy and everlasting. She answered, that she knew it well, and that by the lock of hair she should know her daughter in the other world, for she would *take it with her*—alluding to the time when this relic, with the carrying-belt and axe, would be placed in her own grave." This custom of burying property with the dead was formerly carried to excess from the piety and generosity of surviving friends, until a chief, greatly respected and admired among them for his bravery and talents, took an ingenious method of giving his people a lesson. He was seized with a fit of illness, and after a few days expired, or seemed to expire. But after lying in this death-trance for some hours, he came to life again, and recovering his voice and senses, he informed his friends that he had been half way to the land of spirits; that he found the road thither crowded with the souls of the dead, all so heavily laden with the guns, kettles, axes, blankets, and other articles buried with them, that their journey was retarded, and they complained grievously of the burthens which the love of their friends had laid on them. "I will tell you," said Gitchee Gauzinee, for that was his name, "our fathers have been wrong; they have buried too many things with the dead. It is too burthensome to them, and they have complained to me bitterly. There are many who, by reason of the heavy loads they bear, have not yet reached the land of spirits. Clothing will be very acceptable to the dead also his moccasins to travel in, and his pipe to refresh him on the way; but let his other possessions be divided among his relatives and friends."—*Sketches in Canada and Rambles among the Red Indians; by Mrs. Jameson.*

THE ART OF GROWING TREES FROM CUTTINGS.—Professor Delacroix, of Besancon, in France, has discovered a mode of propagating from cuttings, which is not only successful in cases of roses and plants easy to live, but apples, pears, plums, apricots, &c. Out of a hundred cuttings put out in June, not one but was thriving in the open air, without shade or extra care, except watering a few times soon after they are planted. His method is to put the whole cutting in the ground, bent in the form of a bow, with the centre part up, and just on a level with the surface, at which point there must be a good bud or shoot, which is the only part exposed to the air; the other being protected by the earth from drying up, supports and gives vigor to the bud, which starts directly into the leaf, and in its turn helps the cutting to form roots, and the whole even forms a thriving tree. The method of setting them is t form two drills about three inches apart, wit sharp ridge between, over which bend the cut ting, and stick an end in each drill, and cove up and press the earth firmly, and water freely Cuttings should be of the last year's growth fresh and vigorous.—*Scientific American.*

ENORMOUS PLANK.—On Tuesday there was at th Bridgewater Canal-yard, Chester-road Manchest an enormous plank, which had been brought fro Liverpool by the canal. Its dimensions are—lengt 144 feet; breadth, 20 inches, and thickness, 6 inche throughout. It is of a species of wood known as gur wood, or African oak, and was imported from Afric into Liverpool during last summer. The tree fro which this plank has been sawn must have been of gigantic height, probably not much less than 300 fee

WEEDS EXPENSIVE LUXURIES.—The comm groundsel ripens about 52 seeds in each head flowers; and produces about 40 heads, or 2,080 seed The dandelion ripens about 135 seeds in each head of which it produces about 20, or 2,700 seeds. Th sow-thistle ripens about 230 seeds in each head, an produces about 40, thus yielding 11,040 seeds per plan The annual spurges form about 180 seed-vessels, eac containing three seeds, and therefore produce abo 540 seeds per plant. These are, as we have sai very low averages. Now, according to this calcula tion:—1 groundsel, producing 2,080 plants; 1 dand lion, producing 2,700 plants; 1 sow-thistle, produc 11,040 plants; 1 spurge, producing 540 plants—in al 16,360 plants, which will cover *just about three acr and a half of land, at three feet apart.* To hoe la costs about, we will say, 6s. per acre: so that i allowing four such weeds to produce their seed ma involve an expense of a guinea. In other words, man throws away 5s. 3d. a time as often as he neglect to bend his back to pull up a young weed before begins to fulfil the first law of nature.

A WEATHERWISE PARAGRAPH.—If the dew lie plentifully on the grass after a fair day, it is a sign o another; if not, and there is no wind, rain must fo low. A red evening sky portends fine weather, bu if it spread too far upwards from the horizon in th evening, and especially morning, it foretells wind. o rain, or both. When the sky in rainy weather i tinged with sea green, the rain will increase; if wit deep blue it will be showery. When the clouds ar formed like fleeces, but dense in the middle and brigh towards the edges, with the sky bright, they are sign of frost, with hail, snow, or rain. Two currents o clouds always portend rain; and in summer, thunde If the moon looks pale and dim, expect rain; if re wind; and if her natural color, with a clear sky, fai weather.

Now.—"Now" is the constant syllable tick ing from the clock of time. "Now" is th watchword of the wise; "Now" is on the ban ner of the prudent. Let us keep this litt word always in our mind; and whenever any thing presents itself to us in the shape o work, whether mental or physical, we shoul do it with all our might, remembering tha "Now" is the only time for us. It is, indeed a sorry way to get through the world, by puttin off till to-morrow, saying—"Then" I will d it. No! this will never answer. "*Now*" i ours—"*then*" may never be.

THE SABBATH BELL.

BY ELIZA COOK.

Peal on, peal on—I love to hear
The old church ding-dong soft and clear!
The welcome sounds are doubly blest
With future hope and earthly rest.
Yet were no calling changes found
To spread their cheering echoes round,
There's not a place where man may dwell
But he can hear a Sabbath bell.

Go to the woods, when Winter's song
Howls like a famished wolf along,
Or when the south winds scarcely turn
The light leaves of the trembling fern—
Although no cloister chimes ring there,
The heart is called to faith and prayer:
For all Creation's voices tell
The tidings of the Sabbath bell.

Go to the billows, let them pour
In gentle calm, or headlong roar;
Let the vast ocean by thy home,
Thou'lt find a God upon the foam;
In rippling swell or stormy roll,
The crystal waves shall wake thy soul.
And thou shalt feel the hallowed spell
Of the wide water's Sabbath bell.

The lark upon his skyward way,
The robin on the hedge-row spray,
The bee within the wild thyme's bloom,
The owl amid the cypress gloom,
All sing in every varied tone
A vesper to the great Unknown;
Above—below—one chorus swells
Of God's unnumbered Sabbath bells.

THE OLD COTTAGE CLOCK.

BY CHARLES SWAIN.

Oh! the old, old clock, of the household stock,
Was the brightest thing and neatest;
Its hands, though old, had a touch of gold,
And its chime rang still the sweetest:
'Twas a monitor, too, though its words were few,
Yet they lived, though nations alter'd;
And its voice, still strong, warned old and young,
When the voice of Friendship falter'd;
Tick—tick! it said: quick, quick to bed;
For ten I've given warning;
Up, up—and go—or else, you know,
You'll never rise soon in the morning!

A friendly voice was that old, old Clock,
As it stood in the corner smiling,
And blessed the time, with a merry chime,
The wint'ry hours beguiling:
But a cross old voice was that tiresome clock
As it call'd at day-break boldly,
When the dawn look'd grey o'er the misty way,
And the early air blew coldly:
Tick-tick! it said: quick out bed,
For five I've given warning
You'll never have health, you'll never have wealth,
Unless you're up soon in the morning!

Still hourly the sound goes round and round,
With a tone that ceases never;
While tears are shed for the bright days fled,
And the old friends lost for ever!
Its heart beats on—though hearts are gone
That warmer beat and stronger;
Its hands still move—though hands we love
Are clasped on earth no longer!
Tick—tick! it said: to the churchyard bed;
The Grave hath given warning:
Then up and rise, and look to the skies,
And prepare for a heavenly morning.

"SEND THE LETTERS, UNCLE JOHN!"

BY H. G. ADAMS.

Uncle John is stout and sturdy,
Uncle John has gold in store;
Mighty fleets upon the ocean,
Merchandise upon the shore;
Lands and houses, sheep and oxen,
Corn in granaries and fields—
All that giveth ease or pleasure,
Or to man subsistence yields.

Uncle John has many children,
Scattered widely here and there,
And the language that he speaketh,
It is spoken everywhere.
Wheresoever foot hath trodden,
There the sons of Uncle John
Travel, trade, and preach the Gospel,
Earnest workers, every one.

Uncle's ships are ever passing,
And re-passing o'er the wave,
And our yearning hearts do ever
Tidings of the absent crave;
News of relatives who travel,
Or the friends afar who dwell,
We would know how feel, how fare they,
How they prosper, ill or well.

Greetings e'er should pass between us,
And the heart's fond interchange,
But, alas! we're poor, and, therefore,
Distance must our hearts estrange;
And the white-winged heralds, as they
O'er the Atlantic go and come,
To the watching waiting many,
Upon either shore are dumb.

Uncle John! do send the letters,
By your ships that go and come,
Friends abroad would fain be writing
Unto anxious friends at home,
We would wish the absent loved one,
In our joys and woes to share;
Send them *for a penny*, Uncle,
It is all we have to spare.

"WILL IT PAY? Why Uncle?
Can you doubt it? look at home,
See how, from all parts, your mail bags
Daily weightier become;
Hear how, from all parts, children bless you,
For the boon they were enjoy;
Oh, extend it o'er the waters,
And our eager hands employ.

"WILL IT PAY? Why fifty letters
Will be sent in place of one;
Fifty pence for *one* poor shilling,
Think of that, good Uncle John!
Think, too, how 'twill foster commerce,
And all friendly ties increase,
Binding nation unto nation,
In the bonds of LOVE and PEACE.

MONTREAL:—Printed by JOHN LOVELL, St. Nicholas Street.