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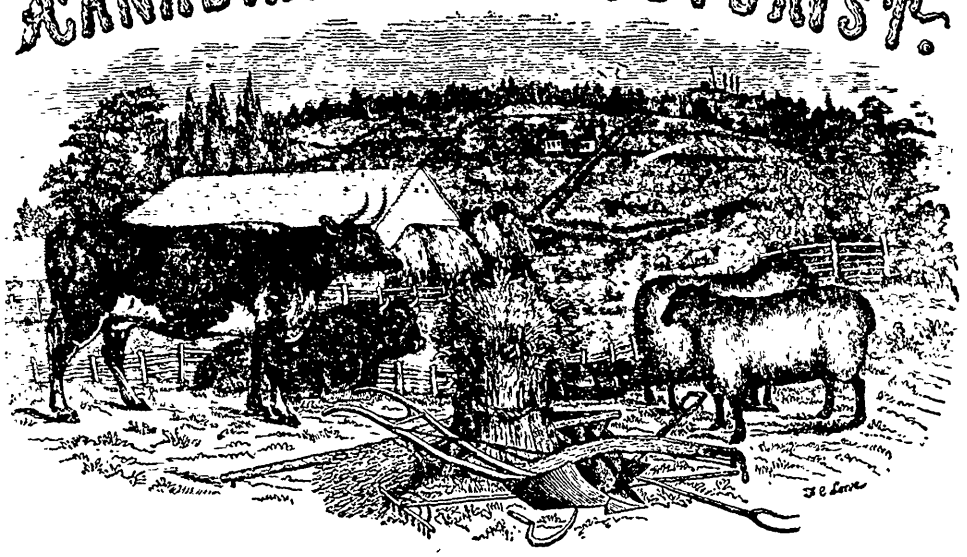

"The profit of the earth is for all; the King himself is served by the field."—Eccles. 5, ix.

GEORGE BUCKLAND, WILLIAM McDOUGALL, } Editors and Proprietors.

Vol. I. TORONTO, APRIL 2, 1849. No. 4.

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THE

CANADIAN AGRICULTURIST.

VOL. I. TORONTO, APRIL 2, 1849. No. 4.

THE CULTIVATION OF FORAGE CROPS.

In a country like Canada, where the winters are not only long, but oftentimes excessively severe, it is a matter of the first importance that the farmer should amply provide himself with the best kinds of provender for sustaining his cattle in a comfortable and thriving condition through that rigorous season. But in order to do this, it is necessary that like the bee, he should make timely provision. The neglect of a few weeks, or even days, in spring, involves the loss of a whole year. And this is particularly the case in our climate; spring being but of short duration, the period for sowing is necessarily restricted within very narrow limits. Hence the necessity of making timely preparation to facilitate the important operations of that season, which to the husbandman is pregnant with interest and hope. In the present paper we propose throwing together a few hints and observations on the culture of the principal forage crops, reserving for future occasions more minute and systematic descriptions of each particular kind.

1. THE TURNIP.—Foremost among root crops, stands the *Swedish turnip*, a vegetable which no farmer ought to be without. Although this plant is subject to severe casualties, arising from the depredation of insects and the influence of the seasons, yet the observance of the following simple rules will be generally found successful.

In preparing the soil for turnips and root crops generally, it is highly desirable to give a deep clean ploughing in the fall, and to make a sufficient number of furrows in the proper directions to take off readily the water arising from the melting of the snow and heavy rains of spring. When farm yard dung is intended as a dressing for these kinds of crops, it is generally preferable to plough it in at this time, particularly if it is what is called long or rough,—that is, in an undecomposed state. The manure thus becomes more readily mixed with the soil, and by the repeated ploughing and harrowing in the spring it is brought into a condition adapted to the wants of the young plant, an object, particularly in a dry season, of very great importance. In more advanced countries than ours, artificial manures are commonly applied to turnips, such as guano, rape, bone dust, &c. Such dressings are invariably applied in spring, generally in drills with the seed, but not in actual contact with it. As to the precise time and *manner* of sowing, something must always be left to the character of the season, the state of the land; and we may add, in respect to the latter condition, what is often lost sight of by mere theoretical writers, the means and other varying circumstances of the farmer. As we cannot now enter upon particulars, let it suffice to say, that plants cultivated for their roots should be sown as soon as the soil can be properly prepared, that is a deep and fine tilth obtained, and the growing season about fairly commencing. In most northern climates that is a period admitting of considerable variation.—There is danger in being too early in sowing the *Swedish turnip*, since the leaves are liable in particular states of the atmosphere, to become mildewed, and the bulb consequently suffers both in size and nutritive quality. Indeed, the climate of this country is frequently too dry and parching for turnips of any variety, and consequently such soils should be selected for their culture as possess a porous, moist subsoil, containing calcareous and organic matter.

Sowing plenty of good seed in drills from 20 to 24 inches apart, is upon the whole the best mode, as it allows the use of the horse-hoe in keeping the ground free from weeds, and by occasionally stirring the soil the power of capillary attraction is increased, fertilizing gaseous matters are evolved, and as a consequence the growth of the plant is more rapidly advanced. There have been several remedies proposed against the destructive effects of the turnip fly, none of which can in all seasons be depended upon. Thick sowing and the application of quick lime to the plants as soon as the smooth leaves begin to appear, will generally prove successful. Care should be exercised in setting out the turnips in the row about nine or ten inches asunder, when the plants have attained a moderate size, leaving such only to stand as are strong and healthy.

2. MANGEL-WURZEL.—This plant ranks next to

the Swedish turnip in its economical value to the farmer, and being less liable to depredations by insects, its culture is more certain. It has the property of retaining its nutritive qualities for a great length of time when properly preserved; and is an excellent root in spring for cows and young stock, and even for sheep in smaller quantity. Indeed, during the lambing season, mangel-wurzel, owing to the great juiciness of its root and the large amount of saccharine matter it contains, is superior to the Swedish turnip; milk, and not fat, being then required by the ewe for the nourishment of her young. Beet, like cabbage, seems better adapted to the heavier soils than turnips, but the mode of preparation and treatment is very similar. The rows should be at least two feet apart, and the plants set out 12 to 15 inches asunder. On rich soils and in growing seasons these distances would be too small. Frequent culture by horse and hand is required through the period of growth. Earthing up of the plants by means of the double mould-board plough as formerly practised, is not now approved. It has been found in all tap roots rising above the surface of the ground, that earth laid against them causes the growth of lateral fibres, which occasions a bitter taste and deteriorates the nutritive qualities of the root.

3. Carrots.—This plant is richly deserving cultivation by every man that has only a few acres of ground. The white Belgian variety is recommended for field culture, the tops and roots being much larger than the Orange and Altringham kinds; and on good land under proper cultivation will yield upwards of 20 tons per acre. It is of essential importance in cultivating carrots and other long, fusiform roots, that the soil should be deeply ploughed; in fact it ought be subsoiled to the depth at least of sixteen inches. This operation should be done in the fall, when the dung should be well incorporated with the soil; since with the carrot it has been found, that if the manure in a fresh state come into contact with the root of the plant, a large growth of lateral fibres and a profusion of leaves are sure to be produced. Carrots delight to grow in deep, warm, light loams, resting on a dry and porous subsoil. As the plant is not of very quick growth, it requires to be sown as early as the season and the state of the land will admit. Drills 18 or 20 inches wide will be found sufficient to admit a light horse-hoe; and as soon as the plants are about three inches high, they should be thinned out by hand to the distance of six inches from each other. Carrots are adapted to all kinds of live stock; they are excellent for horses, particularly in early spring before any green forage is ready; they are found to promote a healthy state of the blood and animal system: and horses having had carrots frequently mixed with their dry food, have seldom been known to go broken winded.

4. Parsnips.—What has been said of the cultivation of the carrot, will also apply to the parsnip. The latter, perhaps, will flourish better on a stronger soil than the former; but in either case the ground must be deeply pulverised, and kept clear of weeds. The highly saccharine juice of parsnips renders them very nutritious for all kinds of animals: some exceptions have been urged with regard to horses, but, we think, without any sufficient evidence. For pigs and milch cows they are excellent, giving to the flesh of the former a white colour and fine taste, and to the milk of the latter a peculiar richness, free from any unpleasant flavour, and yielding abundance of the finest butter. It is of importance to observe, that with parsnips in particular, none but *new* seed should be sown, since it frequently happens that old seed will not vegetate. This is one among the many causes of failure in root culture.

Cabbage.—There are a great many varieties of the genus *Brassica*, but only two or three have been considered adapted to field culture. As the cabbage cannot be so conveniently stored away and preserved as turnips, carrots, potatoes, &c., its cultivation for cattle in a climate like that of Canada must necessarily continue very restricted. Notwithstanding, a small plot of land, well managed, in cabbage, will always be found useful, and may be made remunerative. The best kinds suited to field cultivation, are the large Scottish or Yorkshire, the drumhead, and a variety called the American. These produce large leaves, which in the course of growth collapse, and form an immense dense head. A very hardy variety is cultivated in Germany and the north of Europe, called Kohl-rabi, which, while it produces a root like a turnip, sends forth a large number of stems, bearing leaves like a cabbage. Although the root is far less nutritious than the Swedish turnip, yet, as the plant will resist severe frosts, and bear storing much better than the common cabbage, its cultivation in Canada is well worth a fair trial. All the hardier varieties of the cabbage family, flourish best in soils abounding in clay; but then the ground must be deeply cultivated and well prepared and manured to ensure a heavy crop. Care should be taken to allow sufficient room for the growth of the larger kinds of cabbage; the drills should be from 3 to 3½ feet apart, and the plants 2½ feet asunder: we have seen soils in which these distances might, in favourable seasons, be beneficially increased. The frequent working of the ground, particularly in dry weather, is one of the principal secrets of success, not only in cultivating cabbages, but all kinds of root crops.

6. Vetches.—*Vicia sativa*, or the common tare,

in a moderate climate like that of the British Islands, ranks amongst the foremost of the forage crops. It is adapted to the heavier class of soils; and being generally cultivated for soiling, it is not allowed to ripen its seed, and is consequently less exhausting to the land than most other crops. The spring and winter varieties of this plant have evidently been produced by the different periods of sowing, since the seed of both kinds seems perfectly alike. We strongly recommend, however, that in this country the spring variety only should be used, and that the ground should be thoroughly prepared by ploughing harrowing, &c., that all weeds may be eradicated, and the seed sown as early as possible. If the season be favourable, with proper management, tares will be ready for cutting before clover; and will be found most serviceable, especially for horses and cows. A liberal application of seed is to be recommended; from 2½ to 3½ bushels per acre may be considered ample. It is of importance that the plants should thoroughly cover the ground, that moisture may be retained during the dry season, and weeds prevented from springing up. A thin, patchy crop of tares is one of the greatest misfortunes that could happen to the soil; while a heavy crop is highly ameliorating, by keeping the land clean and restoring back again a large amount of rich manure. Vetches may be made into excellent hay.

7. Lucerne.—This plant, which has been cultivated from remote antiquity both in Europe and Asia, is richly deserving a sufficient number of experimental trials, with a view to test its adaptation to this country. A dry, deep soil should be selected, thoroughly ploughed and subsoiled, with a liberal dressing of well-rotted dung and lime. As early in spring as the weather and the state of the soil will admit, sow in rows about 18 or 20 inches apart, 10 lbs. of seed to the acre. Carefully keep down all weeds. The crop may be mown as soon as in flower and afterwards kept down by sheep, care being taken not to stock hard or tread the ground when in a wet state. Early in the following spring, the intervals between the rows must be horse or hand hoed, and two or perhaps three light crops may be mown during the summer. It will take three years for the plant to arrive at full perfection. The principal thing to be observed in the cultivation of lucerne is to keep the ground clear of grass and weeds, by occasional hoeings, with an annual top dressing of well-rotted dung, and the application of lime every few years. Treated in this manner, on suitable soils, the plant will continue to flourish for several years, and produce an immense amount of provender.

8. Sainfoin.—Whether this plant, so extensively cultivated on the chalk downs and dry sands of England and France, could be profitably adopted in this country, carefully conducted experiments only can decide. It is a plant peculiarly adapted to calcareous soils; its roots deeply penetrate the earth; in rocky soils they extend a prodigious depth among the crevices and open strata in quest of food and moisture. It may be sown like clover, with a crop of grain, 3 or 4 bushels per acre, and it will take two or three years before it arrives at full maturity. Sainfoin makes excellent hay, and affords nutritious pasturage for all kinds of stock. It will not bear such frequent cutting as lucerne. Some prefer mixing white clover with it when sown, as that valuable plant does not interfere with the progress of the sanfoin, and gives a good bottom growth. It would be useless attempting to cultivate sainfoin upon thin wet soils, resting on clay; but on a dry limestone, it is well deserving a trial.

There are several other kinds of plants cultivated in Europe for forage, which our limits will not allow us even to enumerate. Among them may be mentioned *rape*, *artichokes*, *succory*, and the family of *trefoils*—all of which are worth an experimental trial in this country. Since the potato can no longer be depended upon as an article of human food, or for live stock, it becomes most important to ascertain what other roots can be raised as its substitute. Clover and timothy, which are naturally so well adapted to the soil and climate of this country, will no doubt continue to constitute the principal food of horses and cattle; yet it must be acknowledged, that to increase the variety as well as the annual bulk of provender, would be a most desirable and valuable acquisition. We would caution individuals against making experiments on a large scale, and against drawing general conclusions from single cases either of failure or success. Truth can be elicited only by repeated trials, performed under all the various conditions of soil and climate. The neglect of this simple rule has occasioned many false and hasty conclusions. We strongly recommend this subject to the best consideration of our agricultural societies, and shall always be happy to open our pages for communicating results.

PLANTING HOPS.

We submit the following directions for making a hop-garden to an agricultural correspondent who signs himself "*A Canadian*," in the hope that they may be useful not only to him, but to others also, who contemplate the cultivation of that plant. We may on some future occasion treat of the natural history of the hop, its varieties, expense, and modes of culture, &c., as practised in England. The cultivation of hops in Canada must necessarily continue restricted, since the demand is small, and the requisite

number of hands for gathering them can only be obtained in particular localities. This country, however, ought at least to supply its own wants, instead of importing large quantities, as has been hitherto the case, from the United States. Whether the British market will offer sufficient inducement for our farmers to raise hops for exportation, is a matter at present purely problematical. The contemplated extinction of the excise laws and duty would probably place hops in the same category as corn—open to a free competition with all nations; yet the low prices that have been obtained of late years in England for this article, seem to warrant no encouraging expectation of our being able to engage in a profitable exportation.

The soils best adapted to the growth of hops are such as are deep and rich in organic matter, resting on moist porous subsoils; yet they must not be wet, as that is a condition the most unfriendly to this plant. The hop delights in a soil containing a large per centage of lime—usually termed calcareous—on a dry alluvium, where the subsoil is kept cool and moist by a running stream, the hop will luxuriate. It is of importance that land intended for hops should be deeply cultivated and cleared of weeds previous to planting. It would be useless to attempt to grow hops on exhausted land without the best cultivation and heavy dressings of rich farm yard manure.

Having properly prepared the land by repeated ploughing and harrowing, the next thing is to mark out correctly at regular distances the hills or spaces where the cuttings are to be planted. This is a matter of considerable importance, as when hops are planted in straight rows at right angles with each other, not only is the cultivation by the plough or horse-hoe, rendered more easy and effective, but what is also of equal or even of greater moment—a regular supply of light and air is enabled to reach the growing plants. The hills should be from 6 to 7 feet apart. To mark out these spots accurately take a long line made of strong string and at every six or seven feet, according to the distance determined on, fasten a feather or a piece of coloured worsted. When the line is stretched out, short sticks are to be inserted in the ground under these marks, which thus denote the exact place in which the plants are to be placed. It is difficult to give precise verbal directions as to the "setting out" as it is termed, but stretching the line in opposite directions near the centre of the field a square consisting of a number of sticks may be formed, and by careful attention, the whole of the field may be then marked out before beginning to plant. From ten to twelve hundred hills will stand upon an acre.

Planting should be done as early in spring as the season will admit. Cuttings should be obtained from young plantations, and each cutting ought to have two joints of buds, and should be planted in as fresh a state as possible. Three or four cuttings should be planted by means of a dibble in each hill, within the circumference of 12 or 15 inches, the earth well pressed against the plants. The application of dung, unless thoroughly mixed with the soil, is not to be recommended for planting in, as in dry weather it would tend to retard rather than promote the vital energies of the plant.

As soon as the bines (vines) get about two feet high, they must be tied to short poles previously fixed in the ground by means of a sharp iron crow bar. In the second year poles of a larger size will be required—two or three to a hill. It is frequently found injurious to the strength of young hops to use too large poles the first and second years.—The circumference of poles, as well as their length, should be considered in adapting them to the *strength and capabilities of the soil and plant*. In this country, cedar, in point of form and quality, is the best wood for hop-poles, which may be cut from 14 to 16 or 17 feet long, according to circumstances. It is most desirable to use poles of a pretty uniform length in the same plantation, otherwise some plants will be shaded by others and the demand upon the roots will be unequal.

In case of springs or stagnant water, under-draining to a sufficient depth to dry the land is in hop grounds absolutely essential. Water furrows should be made on the surface before winter sets in, which will very much facilitate the exit of water in spring. Hops require frequent manuring, farm yard-dung being the most available kind in this country.—Lime applied occasionally to soils not naturally rich in that mineral will be found highly beneficial. It is a principle in hop-culture, as in all row crops that the ground be frequently stirred during the period of growth, and kept perfectly clear of weeds.

ON THE APPLICATION OF SCIENCE TO AGRICULTURE.

NO. IV.

COMPOSITION OF SOILS.

It was stated in a previous paper, that soils generally have been formed from the abrasion of the rocks on which they repose. This is the case in regard to the *earthy* matter of soils, which has been produced by the action of water, air, frost, &c., upon the subjacent rocks, causing a disintegration or crumbling down of previously existing materials. Extensive accumulations, however, called *drifts*, are frequently found on the earth's surface, bearing evident marks of having been washed down or other-

wise transported by water or other agents from great distances. Large fragments of rock or boulders frequently occur among the finer particles of such soils, which will generally enable the careful observer to determine the direction from which the drifted materials have come, and the very formations from which they were disintegrated. These considerations throw considerable light on the causes which have produced such great variety in the *inorganic* constituents or mineralogical character of soils.

The *organic* matter which is found in variable quantities in all fertile soils, has been derived from vegetable and animal substances—more particularly the former—which, undergoing decomposition after life has become extinct, are intimately mixed with the soil, and constitute the principal cause of its productiveness. A due proportion, however, of the organic and inorganic constituents is necessary in all soils, to adapt them to different crops, and to raise them to the highest state of fertility. From one to sixty or seventy per cent. of organic matter is to be found in most cultivated soils. The latter is an excess formed on boggy or peaty soils, which require the admixture of marl, clay and other inorganic substances, before they can be profitably cultivated. With less than one per cent. of organic matter, a healthy vegetation could not be sustained. It has been calculated that oats and rye will grow and produce a scanty crop on a soil containing one or one and a half per cent. of organic matter—barley, when two or three per cent. is present; but it may be stated that in general a good yielding soil for most kinds of grain crops, particularly for wheat, must contain from eight to ten per cent. of decayed animal and vegetable matter. It should be remembered, however, that it is not any definite amount of mere organic matter in a soil which *alone* constitutes its fertility.

The *inorganic* constituents of soils deserve particular attention, as they perform an essential part in the economy of vegetation. We shall notice more fully hereafter the nature of these substances. All soils may be readily separated into three principal parts. 1. That which consists of coarse gravel and sand, comprising fragments of flint, limestone, &c., with an occasional and variable amount of undecomposed vegetable matter. 2. Finely comminuted sand, denominated by chemists, silex. 3. A portion consisting of very fine powder, hence called "impalpable matter," and consisting generally of the following substances, in variable proportions: (1). Aluminous earth, or clay in a state of admixture with other earthy materials, a substance that gives to soils their tenacity and capability of holding water, and constitutes the chief value of clay for the purposes of pottery. (2). All decomposed *organic* matter, whether of vegetable or animal origin: chemists have given to this substance the name of *humus*, which, combining with oxygen, forms humic acid, which, again uniting with lime and other earths, forms what are designated humates;—these latter compounds are supposed to perform an important part in the economy of vegetation, yielding up their carbon to supply the wants of the growing plant, although there is good reason to believe that the principal supply of carbon is derived from the atmosphere. (3). *Silica*, which is a compound earthy substance, formed by the union of an element, silicon with oxygen. It occurs in a pure form in quartz rock. The difference between the silica of the impalpable matter, and the silex or sand, previously mentioned, is simply that the one is crystalised and the other not. Silica occurs in nature under different forms, thus adapting itself to the different purposes of the living plant. United with potash, it forms that important and useful compound, the silicate of potash, which gives strength and smoothness to the cuticle of the stem of wheat and other cereals—a fact which every intelligent practical farmer will understand and appreciate. (4). A variety of salts, of which the principal are the following: Carbonates of lime (chalk, common limestones, marl, &c.), magnesia, potash, soda, muriate of soda (common salt), and sulphate of lime or gypsum. All these ingredients are more or less found in the ashes of plants, as well as in soils; and they perform important purposes in the nutrition of animals, whose chief support is derived from the vegetable kingdom. For instance, lime is necessary to form bone in the animal, and to give hardness and strength to the shell of an egg; while soda and potash promote bile, and the muriate of soda, that nourishing substance, milk. There are a few other substances not enumerated above, that sometimes occur in soils in small quantities. Oxide of iron, which is an essential element in the blood of animals, is found in variable proportions; and animal matter, so rich in nitrogen, occurs in all surface soils that are not absolutely sterile.

Most cultivated soils contain from 90 to 96 per cent. of their whole weight, when free from water, of inorganic materials. In peat, and the rich forest soils of this continent, the organic matter of course bears a much higher proportion. Now, this earthy part consists principally of three ingredients. 1. *Silica*, or sand and gravel, of various degrees of fineness. 2. *Alumina*, or clay, occurring generally in shaly or slaty masses, more or less indurated and intermingled with the soil. 3. *Lime*, occurring as a carbonate, sulphate, or phosphate, in the various rocks and marls that are found near the surface.

of the ground. In proportion to the preponderance of any one of these three substances, a soil is said to be light, stiff or calcareous.

It is of importance to observe, that by a clay soil is not meant a *pure* clay, since no such soils occur in nature. Even the *porcelain clays*, which are the richest in alumina, and occur merely in small patches, contain only from 42 to 48 per cent. of that earth: the remainder consisting of silica. Soils containing 25 or 30 per cent. of alumina, are found generally too heavy for profitable cultivation, and are best adapted to the purposes of pasturage. It may be further observed, that soils contain the three substances above mentioned, in a state of *mechanical mixture*. With silica and lime, this is always the case, but in the clays, which principally consist of silica and alumina, these materials are united by *chemical combination*. On a knowledge of these proportions, the following classification and nomenclature are founded, as given by Professor Johnston. We have had frequent opportunities of testing the advantages and correctness of this arrangement for practical purposes.

1. *Pure clay* (pipe-clay) is composed of about 60 of silica and 40 of alumina and oxide of iron, chiefly in a state of chemical combination. Such soils rarely occur but in small patches, and are wholly unfit for agricultural purposes.

2. *Strongest clay soil*, consists of pure clay mixed with 5 to 20 per cent. of a siliceous sand, which readily separates by boiling and decantation. This soil is of a very unctuous nature, exceedingly stubborn, and affords a good material for making tiles.

3. *A clay loam* contains from 30 to 40 per cent. of fine sand, which may be separated by washing. This admixture renders such a soil more open and friable, and consequently more easily cultivated. When from 40 to 70 per cent. of sand can be separated by mechanical washing, it is called a *loamy soil;* from 70 to 90 per cent. of sand, it is termed a *sandy loam;* and when no more than 10 per cent. of pure clay remains, it is considered a *sandy soil.*

"The mode of examining, with the view of naming soils as above, is very simple. It is only necessary to spread a weighed quantity of the soil in a thin layer upon writing-paper, and to dry it for an hour or two in an oven or upon a hot plate, the heat of which is not sufficient to discolour the paper—the loss of weight gives the water it contained. While this is drying, a second weighed portion may be boiled or otherwise thoroughly incorporated with water, and the whole then poured into a vessel, in which the heavy sandy parts are allowed to subside until the fine clay is beginning to settle also. This point must be carefully watched, the liquid then poured off, the sand collected, dried as before upon paper, and again weighed. This weight is the quantity of sand in the known weight of *moist* soil, which by the previous experiment has been found to contain a certain quantity of water."

Hitherto we have considered only the clay and sand contained in a soil, while lime is found more or less in all soils that will pay for cultivation—hence we have

4. *Marly soils*, which when dried are found to contain from 5 to 20 per cent of lime. The mechanical properties of the marl depend upon the relative amount of silica and alumina it contains. Hence we have a sandy, loamy or clay marl. The value of marl as a fertilizer, does not wholly depend on its per centage of lime; if it abounds in alumina, it would be beneficial on a loose sandy soil, independent of the lime as a mere *mechanical mixture;* while sandy marl would in the same manner be serviceable to heavy clays.

5. *Calcareous soils* are so denominated in consequence of having upwards of 20 per cent. of lime. When they contain a sufficient amount of clay to render them what is technically called "good holding land," they constitute the best soils for most agricultural purposes. Professor Johnston gives the following simple directions for determining the amount of lime in a soil, when it exceeds 5 per cent:

"To 100 grains of the *dry* soil diffused through half a pint of cold water, add half a wine glass full of muriatic acid (spirit of salt), stir it occasionally during the day, and let it stand over night to settle. Pour off the clear liquor in the morning, and fill up the vessel with water, to wash away the excess of acid. When the water is again clear pour it off, dry the soil and weigh it; the loss will amount generally to about one per cent. more than the quantity of lime present. The result will be sufficiently near, however, for the purposes of classification. If the loss exceed 5 grains from 100 of the dry soil, it may be classed among the marls, if more than 20 grains, among the calcareous soils."

6. *Vegetable moulds*, which vary much in their texture and composition—from the rich garden mould, containing 8 to 12 per cent. of organic matter, to the peaty soils, having 58 to 70 per cent. together with very different proportions of clay and sand. To determine the amount of vegetable matter in these soils, for the purposes of classification, is a very simple process. First dry the soil in an oven, and weigh it; then heat it gradually to a dull redness over a lamp or fire, till all the combustible matter is consumed. Again weigh it; the loss will be the amount of organic matter.

SHORT-HORNS IN CANADA.

We have been favored with the particulars of weight, &c., of the Hon. Adam Fergusson's splendid short-horn heifer, *Blossom*, which was purchased and slaughtered last Christmas, by Mr. Philip Armstrong of this city. It will be recollected by seve-

ral of our readers, that *Blossom* was intended for exhibition at the last Provincial Show, at Cobourg; but in consequence of the injuries she received in the boat coming from Hamilton, arising from the extreme roughness of the weather, it was deemed inexpedient to take her any farther. *Blossom* was bred and fed by Mr. Fergusson, of Woodhill, who has been so honourably distinguished for a great number of years for his zealous and successful exertions in improving the live stock of this Province, and the advancement of its agriculture. When we look at what has been done and what is doing by an enterprising farmer scattered here and there, we fondly cherish the hope that the time is fast drawing nigh, when Upper Canada will be awakened to a perception of her great natural capabilities. The subjoined facts will show that among many other advantages, our country is well adapted to the improved breeds of stock:—

Marketable beef, - - - - - - - -	1,249 lbs.
Tallow, - - - - - - - - - -	215 "
Hide, - - - - - - - - - - -	95 "
Blossom's total weight, - - -	1,559 "

Or 111 stone 5 lbs., at 14 lbs. per stone.

We will only observe, in addition to the subjoined extract from the *American Herd Book*, that the quality of the meat was unanimously pronounced by Mr. Armstrong's customers, to be of the finest description.

"*Blossom.*—White, bred by and the property of Hon. Adam Fergusson, Woodhill, near Watertown, Canada West; calved 16th August, 1843; got by Strathmore out of Beauty, by Snowball (2647), by Lawnsleeves (365), by Mr. Mason's Charles (127)."

NEW SETTLEMENTS.

LIFE IN THE BUSH.

GENTLEMEN,—I enclose the sum of 5*s.* as my subscription for the *Canadian Agriculturist*, during the current year.

This portion of Canada is of comparatively recent settlement, and the progress of practical agriculture has hardly extended beyond the first rude efforts to clear land for the purpose solely of sustaining animal life. Nevertheless, there are instances—and not a few—where an economical expenditure of labour has been succeeded by the most gratifying result.

During the month of December last, when in the discharge of the duties of my office, I inspected four lots of land, adjoining each other, in the township of Glenelg, which were located by Mr. J. Leadingham and his three sons. They commenced operations in the spring of 1847, and at the time referred to they had upwards of fifty acres under crop and well fenced. Their barn—considering the almost total failure of spring wheat—was well replenished. Their stock of cattle, which was very considerable, had comfortable shelter. Their dwelling—a rude shanty—was clean, well-ordered, and each article of furniture was a specimen of the mechanism of the back-woods; and their table, in addition to substantials, was supplied with jellies and preserves. The chief—the most interesting feature in the subject matter of this reference, is the fact, that these things were the products, under providential arrangements, of their own labour, expended in converting the forest into a fruitful field. Labour is necessary to human enjoyment.

Yours respectfully,
GEORGE JACKSON.

Bentinck, March, 1849.

FENCE-MAKING—A NEW PLAN.

MESSRS. EDITORS—I beg to offer a few suggestions with reference to the construction of a cheap and durable kind of fence. In most parts of Canada where timber is plenty, the common zig-zag rail fence answers the settler for a few years, but as is already the case in some districts where timber has become scarce, some other mode of fencing our farms may be resorted to with advantage.

Where the soil is of stiff clay, the following plan possesses some advantages on account of its durability and cheapness. It consists merely of two parallel ditches, with a ridge of earth piled between them: small posts, (usually cedar,) five feet long and from six to eight inches in diameter, are set about six inches in the ground and ten feet apart, in a line where the ridge is intended to be raised; the ditches are then dug about two feet deep and three feet apart, the sides of which are of such a slope as to be capable of producing a tolerably stiff sod from being sown with grass seed. The ridge, which is raised about 2½ feet high, should, like the ditches, be sloped on each side, so as to admit either of a covering of sods directly or of being produced by seeding. It may be remarked here, that it is important that the work be performed in the spring of the year, when it can not only be done cheaper but rendered less liable to sustain injury from the frosts of the ensuing winter, than if accomplished at a later period. On the posts, which will remain uncovered about two feet, are nailed two boards, one on the top and the other on one side, when the fence will be complete. The advantages of this kind of fence over a board fence are considerable. First, it effects a great saving of timber; secondly, in low or wet land it answers the double purpose of a fence and drain: finally, it is more permanent, as the posts are less liable to be raised by the frost than those of an ordinary board fence, the earth in which they stand being kept comparatively dry by the ditches, and placed around them in an oval form, will naturally incline from them as the frost works its way under the surface.

I am aware that some farmers will say that "It appears all very well on paper," but I can assure such that fences of this description have been in use in this District for the last four or five years, and thus far show strong evidence of their ultimate utility.

I have not as yet had any constructed on my own farm, and cannot therefore say from experience what would be the expence of such a fence, but am credibly informed that it need not exceed two shillings per rod. But this fence, like many other things that are well adapted to the requirements of

some farms, might prove worse than useless to others. The farmer, before adopting it extensively, had better try it on a small scale—construct it with care and judgment, so that the trial may be a *fair one.* The slope of the ditches should depend in a great measure on the stiffness of the soil of which it is composed, and of course their depth and the height of the ridge will be greater or less as they are more or less slanting.

Near the village of Oshawa may be seen some of the fences alluded to, which have given such general satisfaction that they are becoming more generally adopted in that section of country: the soil is clay with a slight mixture of gravel. Very light or sandy soils would be ill adapted to such a purpose.

Yours, &c.

PRACTICE.

Whitby, March, 1849.

EXTRACT FROM L. F. ALLEN'S VALEDICTORY ADDRESS BEFORE NEW YORK AGRICULTURAL SOCIETY, JAN. 10th, 1849.—Among the benefits arising from well directed Agricultural education, aside from spreading the requisite learning and intelligence applicable to the chief pursuit of our people, deep and broad among them, the retention of that portion of active capital, acquired by the industry of our Agricultural population, among themselves, would be one important consequence. In place of the prevailing and mistaken notion that monied capital invested in agriculture is either unproductive, or less so than in other pursuits, our farmers would be taught that, coupled with the knowledge to direct it, no branch of our national industry is so steadily remunerating as that connected with the soil—a fact now practically disbelieved; or why would such amounts of monied capital be continually drawn from the agricultural districts to your commercial cities, to be embarked in hazardous enterprises, or doubtful investments? The merchant, or the speculator may fail—and fail he does, very often—and in his downfall is often buried the toils of a long life of patient industry. But who ever knew a good farmer, of prudent habits to fail? Nay, who did not, with an exemption from extraordinary ills in life, ultimately grow rich, and discharge meantime, all the duties of a good citizen? I concede to you the many prominent cases which exist, of wealth rapidly accumulated by bold and successful speculation; of fortunate, perhaps accidental adventure; of hoards heaped up by a long course of perseverance in trade, directed by that intuitive sagacity of which but few among us all are endowed, and which so dazzlingly invite our imitation. Yet these are but a few glaring instances, standing out in bold relief among the many who have sunk in the same career, perhaps with a ruined peace; happy afterwards to retire, were it in their power, upon the limited possession which they had thrown away, to commence their wasting strife upon the broad sea of adventure.

A second advantage would be, that it would invite, annually, a large class of educated men of capital from our cities, to invest a portion of their wealth in our farms, convinced by the knowledge acquired in a course of agricultural education, that Husbandry was a good business, and intending to pursue it as the occupation of their lives, it would cause a reflux of that capital and population which had been drawn away from agriculture. Nor would such associations among us detract from the industrious habits of our farmers by their example. They, by the possession of larger estates than we enjoy, might give more of their time to leisure than we are accustomed to spend; but they must, if good farmers, attend to the daily routine of their affairs, as well as we. They would diffuse intelligence among us; *introduce improved implements,* seeds, and stock; and in time, surely exalt the character of our husbandry. They might not, indeed, work at the muck heap, nor guide the plow with their own hands; but they must be capable, from education, to *direct the labor of both*; for we must not forget that the merchant who, from his luxurious counting room, plans his voyages, and directs the course of his ships; or the engineer who projects the rail-way, or the ocean steamer, once performed the duties of a shop boy, or hammered at the anvil. And thus with the farmer: he should be capable of directing the cultivation of the soil to its greatest possible extent of production; and he will find that, in achieving such result, all the powers of his mind, and the knowledge with which it is stored, will be required.

This thought will bear a little examination. The farmer is apt to think that the professional man, or the merchant, lives an easy and luxurious life. In many instances their families may do so; but with the eminent and successful man of law, or science—the artizan, or merchant himself, *such supposition is a great* mistake. There are not, under heaven, a more laborious class of men than these. Labor of body, and of mind is theirs—and that incessant. See them early, late; in season, and out of season—their whole energies devoted to their several callings, without rest, or intermission—and far too frequently, to the premature wasting of life itself. It is no wonder that such industry, directed by good education, (and by this term I mean the entire training of the boy to manhood in its most extended sense,) and stimulated by laudable ambition, should lead to success. Yet with all these appliances, the labors of such men are often disastrous; and if not so, after a life of anxiety, their toils too frequently end with but the means of a slender support.—Compared with these, the toils of the farmer are light. Physical labor he endures, it is true, and often times severe labor, but his mind is easy. He enjoys sound rest, and high health. He has much leisure; in many cases more than is for his good. He has abundant time to discuss politics, law, religion—everything, in fact, but what relates to his own *profession,* on which subject, I lament to say, his mind seems less exercised than on almost any other. Now, let the same early education be given to the young farmer of an equally acute intellect that is given to him who chooses *professional, mechanical, or mercantile pursuits*—education each in his own line. Let them start fair. Apply the same thought, investigation, energy, and toil, each in his particular sphere, and beyond all question agriculture will, in the aggregate, have the advantage—and for this reason, if no other: there are few contingencies connected with agriculture. Its basis is the solid earth, stamped with the Divine promise, that while it remains, seed-time and harvest shall continue; while commerce, and trade; mechanics, and arts are liable to extraordinary and continual accident. Look at the devastations by flood, and fire—of ship, and cargo, upon ocean, lake, and sea, and river; conflagrations in your towns and cities; and the thousand other casualties which almost daily occur—all which are a dead sink upon labor and capital not agricultural, and the risks of the husbandman are scarce one to ten, in the comparison. Rely upon it, Farmers, you are on the safe side.

But, I hear some one remark, "Why, if agriculture, through the improved education proposed, holds out *such alluring advantages, all our young men will rush* into it, and competition will destroy it." Not the slightest danger. Our young men are already running into the other trades and professions, where competition is ruinous; and all we ask, is the opportunity to

get a share of them back again. Besides, there is no fear that the other avenues of industry will not be filled; for, in the constitution of our natures, there will always be enough unquiet spirits born into the world which the farm cannot hold, to keep the bustling part of it in motion.

Another, and a prominent advantage which we should receive from good agricultural education, would be, that of more stability of character in our farming population. It is proverbial among traveled foreigners in this country, and it would be a subject of wonder among our staid people at home—if an American could wonder at anything—that we are the most changing people in the world. We, as a population, have few, scarce any, local attachments. This, to an extent, is a true, although a severe censure. It arises, no doubt—and naturally enough, too—from the wide extent of national domain of which we are the possessors, and from the natural sterility of much of the soil in our older communities, which cause an effort, and a laudable one, too, to better their condition in our rural population. But more, I imagine, from the low standard of agricultural improvement, and a mistaken estimate of the value of the soil, and its application to the products which properly belong to it. But, no matter what the cause. The fact is so, and it is a defect in our national character. How many among us but will, with a slight tempting offer, sell his homestead without remorse, break up the cherished associations of his life—turn his back upon the graves of his kindred, and his children—his birth-spot—the old hearth-stones of his boyhood—his family altar, and even the brave old trees, which have, life-long, waved their branches over his childish sports, and shawdowed his innocent slumbers when weary of his play, all—all, pass out of his hands, like a plaything of yesterday, unwept and unregretted, for the fancied advantage of a fresh spot in a strange and a newer land.

REPORT OF WILLIAM HAWKES, ESQUIRE, ON MAKING AND SAVING MANURE.

Black River, October 11th, 1848.

To the President of the St. John Agricultural Society.

Sir,—As your Society has offered a premium for the best report on making and saving manure, I will tell you my own experience in the matter, not to get the premium, but for the purpose of assisting you in your efforts for the improvement of farming among us, of which, I must say, there is great need. I have often been filled with pain at seeing the poor cattle shivering in their stalls, in barns where they are exposed to every wind that blew, and the manure thrown out of a hole in the wall, there to lie, and have all the good washed out of it, not only by the rain, but by the dripping from the roof; and this, I am sorry to say, is a true picture of nine out of ten of all the barns in the country which I have seen.

Now, I will venture to say, that no farmer, however humble his circumstances, but might keep his cattle on far less feed, and double the value of his manure, by merely placing the cattle with their heads inwards, on the south side of his barn, with close boarding before and over them, and then, throwing over the manure a shed, ten feet wide, covered with slabs, or spruce bark, if shingles cannot be afforded.

I followed the fashion of the country when I first began farming, but found that my cattle took the horn distemper, and would not thrive as I thought they should. My manure was also mixed in winter with layers of snow, and all the substance was washed out of it in Spring, so I did not perceive the land to be much the better for it. I tired of this, and saw that I must either change my plan, or give up farming.

I therefore built a barn on the following plan. It measures 36 by 26 feet, and fronts to the South, with large doors at both ends, and a passage running along the south side. On that side the land falls away, so I brought the roof close down to the ground. By doing this I got breadth enough for a cow-house, and a manure-house behind. The cows stand with their heads to the barn, and I feed them from the thrashing floor. I sank the floor of the manure-house considerably, and left it open at each end, so that I can drive a team right through. My manure never freezes now, and my cattle being made comfortable, thrive in a way they never did before.

As I have found that turnips and carrots can be raised to advantage in this country, I intend to make a root-cellar in the middle of my barn, about five feet deep. I think the turnips will keep there, if well covered with straw, and they will be at hand for feeding the cattle.

I have this year a compost heap of the following dimensions—fifty-six feet long, thirty-three feet broad, and five feet high. It is composed of 136 loads of green seaweed, with about the same quantity of black bog-earth, and as much good vegetable mould; the two last mentioned I mixed together. I placed this and the seaweed, in alternate layers, of eighteen inches, and find that it heated, until the whole became one mass of very beneficial manure.

Wishing the Society the success it so well deserves;

I am Your Obedient Servant,

William Hawkes.

Potato Disease.—The potato disease being a subject of such universal and paramount importance, it is nothing more than right that any little experiments which may have been tried upon the suggestions, from the failure in the crops of preceeding years, should be publicly communicated. It was presumed by many last year, that the failure might be owing to a degeneracy in the vegetable life of the fruit, from its being continually replanted from year to year: and by some theorists this circumstance was stated to be the cause of the disease, and they recommended as an obviating mean, that the *seed* in the apple of the potato should be planted, so as to rear a fresh stock. This suggestion has been submitted to an experiment by a gentleman in Coleford this year, and the result is as follows:—In April he sowed the seed, it grew and the haulm looked perfectly healthy, and flourished well, until about the latter end of August, when considerable symptoms of the disease appeared, and all at once the haulms went perfectly dead and rotten; on digging up the potatoes every one was in a pulp of putrescence. So much for sowing the seed. Last year the same gentleman amalgamated salt with the soil and planted the potatoes in it, the result was a plentiful crop, but small in size, *this* year he adopted the same plan, and a total failure in the produce has been the consequence. He also last year set off a portion of ground where he well mixed in lime and soot, a good average was then reared in a healthy condition—and this year, from the same process, all were diseased. I have read from the accounts this year that in well manured land the disease has proved to be greater than in a less rich soil—this does not hold good here, for I have known several patches of meadow land that have been fresh dug up this year and planted without having been manured at all, and a general failure in the crops has been the result—and *vice versa*. Now from all these conflicting circumstances, no definite conclusion can possibly be derived. We see the same soil rearing a tolerable crop one year, and failing in the next—rich soil and poor soil at equal disadvantages. About a month after the potatoes were planted this year, a week of excessive hot weather came in, then much rain and a considera-

ble lower temperature, then followed again a few hot days, and shortly after the disease was observed in the haulm, herein I think lies the secret.—*Atmospheric change* is the potatoe de-*Vastator*. It is with deep regret we announce that the later crops of potatoes here have turned out on an average, to be only about half good. It is a singular fact that the potatoe should be the only bulbous rooted vegetable afflicted, we find the artichoke, turnip, carrot, and parsnip, and the roots of the dahlia and other globular rooted flowers appear to be sound and healty in structure, and remarkably fine this year.—*English Paper.*

MR. INGLEDEW'S REPORT ON TURNIP CULTIVATION.—The mode which I adopt in the cultivation of turnips is as follows:—I take land from which I had previously taken a crop of oats, without manure, from sward; this I plough over in the Fall. In Spring, I plough across, and harrow thoroughly. I then run out drills two feet apart, into which I put thirty double horse-loads of barn manure to the acre; this I cover about two inches by opening new drills. On the top of these drills, after being a little flattened, I sow about 1½ lbs. of seed per acre, with a seed sower,—if by hand, a small opening must be made for the seed with a hoe. The seed should be sown when the land is dry, and shortly before rain, if possible. I have found the best time of sowing to be from 5th to 20th June. The best remedy I have found for the fly is thick sowing, although I understand that if bran be sown on the young turnips when wet with dew, they will suffer less. So soon as weeds appear I pass a cultivator between each drill. When the plants put forth the rough leaf, which is generally about the tenth day after sowing, I pass along the drills with a hoe, striking out all but two plants in each six inches. About ten days after, I thin out to six inches, filling up vacancies with the plants thus drawn. *On the last thinning depends much of the future growth.* It is done with both hoe and hand, the tops of the drills being nearly levelled, and the soil being well cleared away from the plant leaving the tap-root only in the ground. If the earth was not well cleared away from the turnip, it would not attain half its size, besides being more liable to be injured by grubs and worms. After this operation, the young plants will fall down and appear to wilt, but the inexperienced need not be discouraged, as in a few days they will start again with fresh vigour.

They may now be left to themselves for some weeks, until they begin to crowd, when they should be thinned to twelve inches apart—the drawn turnips affording an excellent food for cows, hogs, &c., as well as for market purposes. The hoe should then be drawn through between every plant and the cultivator passed up the drills. A light furrow might also be opened with a plough to carry off the water. They will seldom require more.

The expense of cultivating an acre of turnips after this mode, may be summed up thus:

Ploughing, Harrowing, and Drilling—			
4 days, at 15s.....	£3	0	0
Manure, carting & spreading,	9	0	0
Cultivation, one day in all,...	0	10	0
Hoeing and weeding,.....	0	15	0
	£13	5	0
I estimate the turnips as worth, on the ground, 1s. per bushel, which is, 640 bushels,.....	£32	0	0
—leaving nett profit,.....	£18	15	0

—besides having two months' valuable feeding from the drawn turnips and tops.

Carrots are cultivated much after the same manner, with the exception that the land ought to have another ploughing, and about ten loads more of manure. The hand is also to be used instead of the hoe in weeding and thinning.—*From the St. John Agricultural Society's Report for* 1848.

SMALL LOTS.—The editor of the Haverhill Gazette gives a very good and *profitable* account of a quarter of an acre of land, and says:

"We are great friends to manufacturers, that we may have something to send abroad to purchase the produce of the South and West; but after all we consider our own agriculture to be the solid foundation of our prosperity, and a few people are so much engaged in other employments that they cannot do something to increase the sum total of agricultural produce. A good garden does much to supply the wants of a family.

An orchard is an ornament—its fruit is a great luxury, and affords a great deal of nourishing food, and few enterprises and more profitable than cultivating fruit trees. Every traveller from here to Newburyport may see an orchard of a *quartee of an acre* by the side of the road, for which two hundred dollars have been offered and refused, and for the fruit of which at a single harvest, as it hung upon the trees, sixty dollars have been paid. We can show the lot of one-fourth of an acre, which affords space for a comfortable cottage, an abundance of garden vegetables, eight or ten bushels of potatoes, and six bushels of Indian corn for a year's crop."

BENEFITS OF AGRICULTURAL SOCIETIES.—We have often remarked, says the Albany Cultivator, that the great benefit of agricultural associations, is the opportunity they afford for bringing together the people, with their animals, articles and products, by which all may be compared and the particular improvements possessed by each may be seen and adopted. Mr. Fletcher, in his address before the Windsor (Vt.) Agricultural Society, in speaking of their exhibitions says:—"It is very desirable that every improvement in husbandry, and the most successful systems of agriculture, which are known to but a *few* comparatively, should be generally known and universally adopted.—Here, the best agricultural products are exhibited, as an example and incitement. Here, we have an opportunity of viewing and comparing, the best of our flocks, and herds, of different breeds, to ascertain their *relative* value; and here, are exhibited, the most improved, the best specimens of agricultural implements. There, we see the rapid improvement in the mechanic arts, the handmaid of agriculture. Here, we may see the difference between the limb of a tree for a plow beam, with a knot to it for a coulter and share, and the fine plow of the present day. Here, we may learn from the modern implements how to save time and strength, and accomplish a greater amount of work. Here, the farmers of the county assemble once a year; become acquainted, promote kindly feelings; converse freely with each other, on those subjects most interesting to them. What can be better calculated to teach us to do well?"

ON THE PREPARATION OF CATTLE FOOD.—At the recent Smithfield Cattle Show, I promised to afford early and definite information relative to an experiment at Trimingham between eight Scots, one-half fed, with boiled linseed, the other with raw.

Assured that you will readily afford the medium of your paper, I beg to state, that the bullocks, after three months feeding, were submitted to public inspection at North Walsham, on Thursday last, and that the superiority was awarded to the raw feed, by a great majority of farmers.

But, admitting the fattening properties of both systems to be equal, the cold must possess the greater advantages:—1st, because firing is dispensed with,—

2nd'y, because the mixture does not turn sour,—and 3rd'y, because the cattle eat it without waste.

It is my intention to continue the experiment until the animals are ready for market, but with respect to the rest of my cattle, I shall substitute the cold for the hot food.

The object of either process is to form the linseed into gelatine, and to incorporate it with any substance, or fibrous material, that will act as a vehicle to the stomach, and as a reconveyance to the mouth for rumination.

Gelatine, proper for cattle feeding, is obtained either by boiling linseed reduced to fine meal 5 or 10 minutes; or by soaking it 25 or 30 hours in cold water.

The method of making the cold compound with which the bullocks in question are fed, is precisely the same as that described for hot in page 234 first edition of my book, and in 245 of the second, viz :—

The half of a large tub being conveniently placed, a bushel of pea-straw, &c., or hay and turnip-tops cut into chaff, is put in. Two or three hand-cups-full of jelly are poured upon it, and stirred up with a three-pronged fork. Another bushel of the turnip-tops, chaff, &c., is next added, and two or three cups of the gelatine as before; all of which are then expeditiously stirred and worked together with the fork, and a rammer. It is then pressed down as firmly as the nature of the mixture will allow, with the latter instrument, which completes the first layer. Similar quantities of the turnip-top-chaff, &c., are thrown into the tub, the jelly poured upon it, and so on till the copper or vessel in which the gelatine was formed, is emptied. The mass is lastly pressed down with a copper lid, and in a few hours, the chaff having absorbed the mucilage, the compound is given to the cattle three or four times in addition to as many turnips as they like to eat. The proportion, up to this date, has been one pail full of linseed meal to eight of water. Next month it will be one to seven, with about two pints of barley or pea-meal added by degrees while the compound is being made. Afterwards more linseed and barley will be used. By this means the present cost of eighteen-pence a head per week for the artificial ingredients, will be increased to about half-a-crown.

In adhering to these regulations, I have never failed to obtain ample remuneration for grazing, independent of the box manure, which is beyond price.

I exhibited also at North Walsham, a Dutch heifer that cost £8 10s. a short time before last Christmas. She was fed according to the above system, at the rate of two shillings and three-pence per week for linseed till June, when an unlimited quantity compounded with grass pulse, grain, or turnips, was daily placed before her. During this time, however, she consumed on the average only 30 pints of linseed, and 35 of barley or peas per week, the value of which was £4 16s. This sum added to £2 14s. for the previous six months compound, amounts altogether to £7 10s. for the year.

The heifer is considered to weigh about 70 stones of 14lbs. Three weeks since I refused £30 for her. On Thursday last £29 were only offered. Taking the latter sum as the criterion of value, and deducting the original cost, leaves £20 10s. for twelve months maintenance upon the exclusive produce of the farm, besides the manure, which I repeat, is beyond price.

To prevent misunderstandings, I think it right to state, that the heifer never had a calf, and that she was one of six purchased at £8 10s. each. They were equal as to size and breeding. One died, and the others were sold at the end of six months for £19 each. Therefore, had this heifer been then disposed of, she also would have repaid £10 10s., whereas by retaining her six months longer, her value only increased £10, though at an extra cost of £2 2s. for compounds.

It will be seen that the heifer required £2 12s. less for the last half year than for the former. We may, therefore, reasonably expect, that if kept another half-year, a proportional decrease would occur. Depending, however, upon the economy of the system, and believing that a net profit will be obtained from the present value of £29, I intend to exhibit her at Norwich during the meeting of the Royal Agricultural Society in July, as a powerful illustration of the advantages derived from "*fattening cattle with native, instead of foreign produce.*"

The weight of the heifer in June was estimated with the others, at 54 stone of 14lbs.—now at 70. Then the price was calculated at 7s.—now at 8s. 3d. per stone. Therefore, had not the worth of the meat been increased, loss, instead of gain must have been noted; and as the increase is only 15 stones or 10lbs. per week, some idea may be formed of the loss sustained in rearing and fattening cattle for Christmas shows, and prizes, at ten, fifteen, or twenty shillings per week, for oil-cake, &c. &c.

I have published many similar returns to the above, and know from experience that the quickest generally prove the most profitable. But in the present instance, I desire to shew, that foreigners possess cattle prone to fatten with our own :—that meat can be raised from linseed, compounds at one third less than the cost for cake; and that through the growth of linseed with summer and winter feeding in boxes, nearly all the expenditure throughout the country for artificial manure, and for cattle food, might be avoided.

It can scarcely be necessary to remind the British farmer of his position with respect to foreign competition; and of his sure destruction unless he strikes into new and improved paths. Lethargy, prejudice, and antiquated notions, must give way to a vigorous exercise of common sense. The requisites for rearing, feeding, and fattening cattle must be grown at home,—manure be economised,—and employment be afforded to the weaker portion of the population, which can all be mainly secured by the cultivation of flax, use of the seed, and summer, as well as winter feeding in boxes.

As further proof of the great utility of the system, I will just state that I sold lately a fat yearling heifer for £12, and sent two others equally so to the North Walsham exhibition, worth more than the average of three-year-old store stock.

If incentives were wanting to the adoption of my plan, the fact that 22,473,233qrs. of grain, 510,377 head of cattle, and 1,268,040 cwts. of provisions were imported from the 1st of January, 1846, to November 5th, 1848, ought to stimulate us at least to attempt to stem the approaching tide.—*John Warnes, Trimingham, Norfolk.—Farmer's Herald.*

Hints for April.—This is the month of activity. Commence plowing early, and do every thing well—put in barley, oats, and spring wheat without delay, and in the very best manner. Clear meadows and sow plaster early. Cart out all the manure, for corn, potatoes, ruta bagas, beets, and carrots. Mix manure well with the soil by repeated harrowings. Plow deep, and with straight, even, and very narrow slices, and the field will then look like a garden. Keep animals from pasture till it is grown—let cattle have plenty of roots. Repair fences, clear meadows of sticks, and stones, and save a week at the grindstone next haying—pulverize the scattered droppings of cattle over meadows and pastures. Give vigilant attention to sheep and young lambs—the latter, when chilled, may be dipped and rubbed in blood-warm water, rubbed dry, fed sparingly, and soon restored.

Uncover tender grapes, raspberries, strawberries, &c. Clean and dress asparagus beds, strawberry beds, and raspberries. Transplant strawberries. Put out

cuttings of grapes, gooseberries, currants, and quinces. Graft plums and cherries very early, etc. Examine peach trees, and kill the grub at the root.

Give good and regular attention to milch cows and young calves—see that the former are milked clean, and that the latter are regularly fed.

Milch cows which have sore teats, should have them washed regularly with cold water just before milking, which will soon cure them.

Repair farming tools, and get them ready for use—paint will protect them from the weather.

Examine cellars, and keep them clean and healthy—pick out rotting apples—see that vegetables are keeping properly.

STRAINS IN VARIOUS PARTS.—All horses are liable to these accidents, but they more frequently happen to those that are employed in field sports, such as hunting or coursing. The parts of the animal that are commonly affected are, the pastern, flexor or back tendon, and shoulder. In the hind leg, the fetlock, stifle, and round bone. I have devoted a considerable part of my time and study to these cases, and have always found inflammation to prevail or affect the parts less or more according to the severity of the strain; and am fully persuaded that reduction of blood, cooling physic, with fomentation and emollient preparations applied to the parts affected, prove the most effectual and expeditious mode of cure.

Strains proceed from an unusual or violent extension of the muscles, ligaments, and tendonous fibres that surround or cover the joint; consequently, whatever means are used, time and rest are indispensably necessary to complete the cure.

In whatever part or joint the strain may happen, take from two to four quarts of blood, according to the violence of the strain and strength of the animal, and give the after mentioned medicine:—

Barbadoes aloes, in powder, six drachms.
Rhubarb do. half an ounce.
Nitre, two ounces.
Tincture of ginger half an ounce.

The above should be divided into two parts. One part should be given in a little gruel immediately after the accident is discovered, and the other part should be given in six hours after. The animal should get bran mash and warm water, and be kept as quiet as possible, After the first medicine has done operating, one ounce of nitre and two ounces of cream of tartar should be given in a little gruel every day, for four or five days, to keep the bowels open. The part affected should be well rubbed with hog's lard, and the following bath laid on:—Take a considerable quantity of dried camomile flowers. Add as much boiling water as will swell them, but not more than the flowers can contain, that the juice or strength be not lost. Then mix a gill of vinegar to the bath, and apply it to the part affected as warm as the animal can bear it. This bath should be repeated every day for three or four days. A little warm water should be added occassionally, to keep the bath moist. If the accident should happen in a part where a bath cannot be applied, the part affected should be fomented frequently with camomile tea, with some vinegar and sugar of lead mixed in it. After the bath or fomentation has been used as long as it is thought necessary, or till the inflammation has apparently subsided, the following bracing mixture should be used:—

Spirit of sal ammoniac, two ounces.
Camphorated spirit of wine, two ounces.
Sugar of lead, two ounces.

The above ingredients should be mixed in a choppin of water, and the part affected should be well rubbed with the mixture twice a-day for several days and bandaged up middling tight. Observe to shake the mixture well every time it is used.

For a strain in the shoulder, I have found a rowel in the chest to prove very serviceable; or, if a horse should be strained in the stifle or in the round bone, I would recommend a rowel to be put in the thigh, and the other means used, as I have directed above. If any hard swelling remains after the inflammation has subsided, and the animal in the way of recovery, blistering will be the most effectual means of removing it.

In all cases of strains, the animal should be put into a roomy place, where he can step about at his own convenience or as he may feel himself able, as it is better to bring the affected parts gradually into action. For if the animal be forced on to exertion when he first begins to recover, it will almost to a certainty renew the complaint, and retard the progress of the cure probably three times as long as might otherwise be required. I could add a number of recipes for strains, which I have tried, but think it quite unnecessary, for the means which I have pointed out are easily obtained, and are what I have proved to be the most successful; but as I have before observed, whatever means are used, TIME and REST are indispensable.

Strains and hurts in the kidneys occasionally happen to farm horses, and are generally caused by extra exertion in drawing a loaded cart through a boggy place. The injury may be known by the following symptoms:—The animal will be very weak in the back, will yield to the pressure of the hand on his loins, feel difficulty in making water, the urine often dark coloured, and sometimes mixed with blood. This complaint is often attended with fever and loss of appetite. In this case I would recommend the following medicine to be given every day for four successive days. For each dose take—

Salt of tartar, one ounce.
Cream of tartar, two ounces.
Nitre, two ounces.

The above should be given in a bottle of camomile tea, with some honey or treacle in it; and strengthening plaster should be put on the loins. For which take common pitch and tar, an equal quantity of each, to be melted and mixed together, and applied over the loins, quite warm. A piece of woollen cloth should be put over it while warm, and make it adhere to the part. Let the animal get bran mash and warm water.—*Webb's Farmer's Guide.*

ON THE PIG.—By judicious care and good feeding, pigs can, in a comparatively small space of time, be fattened to an enormous size. Hogs have been made so fat that their skin was fifteen inches above the bone. In the *Worcester Journal*, May 6, 1841, Mr. Walker, of Malvern, is recorded to have killed a Hertford sow, weighing 61 stones 8lbs., measuring 7 feet 9 inches in length, and 6 feet 3 inches in girth behind the shoulders. She fattened so rapidly that she was killed in 14 weeks from the time that her young ones were taken from her. Dr. William Westmacott, in his "Scripture Herbal," says, "In most countries, as in the wood-lands of Worcestershire and other places, where hogs feed on acorns, the swine's flesh is rendered hard and sound. One peck of acorns, with a little bran per day, it is said, will augment a feeding hog one pound per day in weight for two months together. But it is good to macerate the acorns first in water, and if they be powdered or ground small, they will fatten pigeons, turkeys, peacocks, &c. Oak-mast exceeds all other mast of the forest; for the hams from Westphalia and other parts of Germany, are of those swine that feed on acorns; but it is best to give pigs a few peas after them."

In Wade's "British History" it is stated that, a gentleman in Norfolk put six pigs, of nearly equal weight, on the swine food and litter for seven weeks. Three of the lot were kept as clean as possible with curry comb and brush, and were found to consume in seven

weeks fewer peas by five bushels than the other three, yet weighed more when killed by two stones and four pounds upon the average,—a strong argument in favor of keeping pigs clean. From Mr. Boswell's experiments on the feeding of swine, we find, that during an equal space of time, the increase in the live weight of five pigs fed on steam-boiled food was 4 cwt. 2 qrs. 7lbs., at an expense of £6 19s. 4d., while the increase in the live weight of pigs fed on raw food was only 2 cwt. 2 qrs. 21 lbs., at an expence of £5 8s. 6d.—a result highly favorable to the practice of feeding swine on steamed food.

"In fattening pigs," says Mr. J. Steele, "I have always found a mixture of barley and peas-meal, moistened with milk in sufficient quantity to make it of a drinkable nature, to be the best; the pigs must be rung to make them lie quiet; the sty should be warm and airy, and the sun not suffered to scorch their backs, as thin skinned white pigs are blistered by it, which not only renders them of an unsightly appearance, but retards their thriving. They should be protected from exposure to cold winds, cold rains, sleet, or snow—a subject not sufficiently attended to on many farms, where they are allowed to lie in heaps, shivering with the cold, in which case it is utterly impossible they can thrive. On the other hand, when they are kept constantly in a close pestilential atmosphere, their constitution becomes undermined, they look delicate and siekly, like consumptive subjects, and never arrive at any size or weight for their age. These extremes should be carefully avoided, and they should have an open-barred door, permitting a current of fresh air incessantly to set in and purify the place, conducing to the animals acquiring a vigorous habit and a doubly-increased size. Too much cleanliness cannot be observed; for nothing tends more to their well-doing than dry feet, a dry bed, and sweet air."

The dung of swine is a cooling, rich manure for dry sandy ground, but from their eating numerous weeds, which pass too soon through their intestines to allow of their seeds being destroyed, this manure is not fit for arable lands, but is very good for the roots of fruit trees. Some time ago the Duke of Portland commenced strengthening and promoting the growth of trees in the grounds about Welbeck, by putting pigs in the plantations, and confining them within certain space till they had rooted up the ground at the foot of the trees, and of course manured the soil. They were then removed to the other parts of the plantation, and confined in the same way, and were fed meanwhile upon potatoes, large quantities of which were bought for that purpose. Mr. J. Hawkins tells us that a method has lately been adopted in some parts of the United States of procuring oil and spermaceti from pigs. They are killed and boiled altogether, to extract all their lard, which is then converted into *stearine* and *elain*. The oil thus procured is of a remarkably fine quality, and well adapted for lubricating machinery.—*Agriculturist Monthly Journal.*

EMPLOYMENT OF ARSENIC IN AGRICULTURE.—The following is the result of the investigation of a commission appointed at Rouen in Dec. 1842, having for its object to determine the best process of preventing the smut in wheat, and to ascertain whether other means less dangerous than arsenic and sulphate of copper (both of which are extensively employed in Great Britain). were productive of equally good results. The commission is of opinion—1. That it is best not to sow seed without steeping. 2. That it is best to make use of the sulphate of soda and lime produce, inasmuch as it is more simple and economical, and in no way injurious to the health of the sowers, or inimical to the public health, and that it yields the most productive and soundest wheat. 3. That as arsenic, sulphate of copper, verdigris, and other sulphate poisonous preparations can be advantageously replaced by sulphate of soda and lime, the use of the poisonous preparations should be interdicted by the Government.—The proportions of sulphate of soda (Glauber's salts) and lime recommended as a substitute for arsenic in the prevention of the smut are as follows:—Dissolve 22 oz. of sulphate of soda in hot water, and slake 4½lbs. of fresh and well-burnt quicklime in the ordinary way, by pouring on it small quantities of cold water; place 22 imperial gallons of the seed wheat in a cask or other suitable veesel, and throughly water it with the solution of sulphate of soda, stirring well the whole time, so that the whole of the seed may be well moistened, and there be a slight excess of liquid left; then sifted in the slaked lime, stirring well until each particle of seed be covered with lime. The seed is now ready for sowing. Should the seed be kept for a few days after it has undergone this preparation, it will be advisable to stir it occassionly, to prevent heating. Carefully conducted chemical analyses show that wheat, the produce of seed prepared with arsenic, does not contain any of that deleterious substance, whilst wheat, the produce of seed steeped in a solution of sulphate of copper (the most efficient preventitive of smut), contains a notable quantity of copper. The cheapest way is to purchase the anhydrous, or dry sulphate of soda, of the alkali manufacturers, which contains twice as much real sulphate as the crystals, whilst it may be obtained at about the same price. In this case, half the quantity of sulphate of soda above mentioned will suffice, and additional water may be supplied, equal in weight to that of the dry sulphate employed, thus compensating for the water of crystallisation contained in the crystals. The proportion of water above indicated may then be added, and the process followed out. Thus, instead of 22 oz. of crystals, use 11 oz. of dry sulphate of soda, and 2 galls. 11 oz. (or rather better than 2 gallons and ½ pint imperial) of water.—*E. Henry Durden.*

PURCHASE OF HORSES.—*Nothing requires more caution than the purchase of horses;* and we give the following hints, which are extracted from the excellent volume "On Horses," published by the Society for the Diffusion of Useful Knowledge:—

"In the purchase of a horse, the buyer usually receives, imbodied in the receipt, what is termed a *warranty.* It should be expressed thus: 'Received of A. B. forty pounds for a gray mare, warranted only five years old, free from vice, and quiet to ride or drive.' It is important to observe that the age, freedom from vice, and quietness to ride or drive should be mentioned, because warranty as to soundness alone does not include these. Many disputes have arisen as to what ought to be termed sound or unsound. A horse is sound in whom there is no disease, nor any alteration of structure which impairs his natural usefulness, and he is unsound if he labours under any disease, or had any accident that has impaired his natural usefulness by an alteration of the structure of any part of his body. The term unsoundness does not apply to any original defect in the temper of the horse, or any deficiency in the strength and powers of the animal. The principal circumstances which constitutes unsoundness, besides the great number of actual diseases, are *broken knees,* which may indicate a stumbler, though not always; for any horse may meet with an accident, and the knee may now be quite well, though it requires great judgment to distinguish in this case. *Contraction* of the foot is sometimes, but not always, unsoundness; for it is occasionally natural, and not a fault. The following defects are considered to indicate unsoundness; *Lameness,* through any cause; *pumicid foot; sand-crack; spavin; splent;*

thickening of the back sinews of the leg; thrush: ossification of the cartilages of the foot; defects or diseases of the eyes; coughs, roarings, broken wind, or *any defects of the lungs; quidding,* or imperfect mastication; *cribbiting; biting; kicking; restiffness.*

"In order to complete the purchase, there must be a transfer of the animal, or a memorandum of agreement, or the payment of earnest-money; the least sum will suffice for earnest. No verbal promise to buy or sell is binding without one of these; and the moment either of these is effected, the legal transfer of property or delivery is made; and whatever may happen to the horse, the seller retains or is entitled to the money. If the purchaser exercises any act of ownership by using the animal without leave of the vender, or by having any operation performed or done to him, or medicine given, he makes him his own. The warranty of a servant is considered to be binding on the master.

"A man should have a more perfect knowledge of horses than falls to the lot of most persons, and a perfect knowledge of the vender, too, who ventures to buy a horse without a warranty. Where there is no warranty, and a defect is discovered after purchase, an action may be brought on the ground of fraud; but this is difficult to be maintained, for it is necessary to prove that the dealer knew the defect, and that the purchaser was deceived by his false representation. If the defect was evident, the purchaser has no remedy—he should have taken more care; but if a warranty was given, it extends to all unsoundness, palpable or concealed. Although a person should ignorantly or carelessly buy a blind horse, warranted sound, he may return it—the warranty is his guard, and prevents him from so closely examining the horse as he otherwise would have done; but if he buys a blind horse, thinking him to be sound, and without a warranty, he has no remedy. The law supposes every one to exercise common circumspection and common sense. If the horse should be afterward discovered to be unsound *at the time of sale* when the warranty was given, the buyer may return it and recover the price; but this proof is requisite; coughing on the following morning will not be sufficient, except the horse was heard to cough previous to the purchase, for the horse might have caught cold by change of stable. Although not legally compelled to give notice to the seller of the discovered unsoundness, it will be better for it to be done. The animal should then be tendered at the house or stable of the vender. Should the latter refuse to receive him, he may be sent to a livery-stable; for, in case of action, the expense will be recovered with the price; and it will be prudent for the buyer to refrain from any medical treatment. If a person buys a horse warranted sound, and discovering no defect in him, and relying on the warranty, resells him, and the unsoundness is discovered by the second purchaser, and the horse returned to the first purchaser, or an action commenced against him, he has his claim on the first seller, and may demand of him not only the price of the horse, or the difference in value, but every expense that may have been incurred. When an action is brought, the lawsuit is usually very intricate; a fair trial of the horse is allowed, and a certain time specified; but it is not always easy to ascertain whether the fault lies with the horse or his rider, and sometimes the dealer, as well as the buyer, is hardly used. If the horse is detained after the specified time of trial, he is supposed to be sold, and with all his faults.

"In London, and in most great towns, there are repositories for the periodical sale of horses by auction. They are of great convenience to the seller, who can at once get rid of a horse with which he wishes to part, without waiting month after month before he obtains a purchaser, and who is relieved from the fear of having the horse returned on account of breach of the warranty; because in these places only two days are allowed for the trial, and, if the horse is not returned within that period, he cannot be returned afterward. They are also convenient to the purchaser, who can thus find a horse that will suit him, and by which, from this restriction as to the returning the animal, he may, perhaps, obtain 20 or 30 per cent. below the dealer's prices. But although an auction may seem to offer a fair open competition, there is no place at which it is more necessary for a person not much accustomed to horses to take with him an experienced friend, heedless of the observations or manœuvres of the by-standers, the exaggerated commendations of some horses, and the thousand faults found with others. There are also always numerous groups of low dealers copers and chanters, whose business it is to delude and deceive."

THE CAPITAL OF AGRICULTURE.—As statistical facts form the basis of our reasonings and conclusions, it is highly important that they should be accurately stated. Mr. Spackman, in his "Analysis of the Occupations of the People," estimates the farmers' capital at 500 millions of pound sterling, being a fraction over £10 15s. per acre on 46,522,970 imperial acres. My own calculation and impression is, from the perusal of sundry evidence on the subject, and from facts within my own knowledge, that the average would not exceed £8 per acre, even if it attained to near that amount, which I very much doubt, when we set off against a few rich gardens and hop grounds an immense extent of very poor grass lands. If I am correct this deduction alone would diminish Mr. Spackman's estimate of the farmers' capital by 128 millions, a most important item. Perhaps you, or some of your talented correspondents, will throw a little more light on this interesting subject. Am I right in calculating that the farmers' gross produce per acre is considerably under £4. If so, his capital would only be turned over once in two years, which I apprehend is correct. I believe the slowness of return is one principal cause of farming being so slow a way of getting money, or rather, in some cases, so quich a way of losing it.—*J. J. Mechi, Tiptree-hall, near Kelvedon, Essex, Jan. 3.—Agric. Gaz.*

SALT FOR CATTLE.—In giving salt to neat cattle or sheep when stall-feeding, care should be taken not to give too large a quantity, or so much as would relax the bowels. If hay that is given to animals has been salted when storing, every farmer should be aware that this would be sufficient salt for the animals consuming it. One gallon of salt put to the hundred bundles of hay when storing, will never act injuriously upon any animal fed on this hay, as some of the salt may be lost. For hay that has been injured in curing, perhaps double this quantity of salt might be applied, but damaged hay should not be given to animals that were stall feeding for the butcher. The object of giving salt to animals confined in stalls in winter, and fed on dried food, is to keep their bowels in a proper state, without scouring them. When such animals get a proportion of roots, however, there is not much danger of anything wrong with the bowels. We have unquestionable authority that a *due* proportion of salt may be given to stall-feeding animals with excellent effect, but of course, the farmer requires to be careful that too large a quantity is not given, whether in the hay, or in any other way. There is no part of the farmer's business requires closer attention than the stall-feeding of cattle to make it profitable. Without this, food may be wasted, and the animals not improved, and unless they are constantly improving by the food given to them, and the mode of management adopted, something must be wrong, and a loss is almost certain to be incurred instead of a profit.—*Agricultural Journal. (L. C.)*

Top Dressing.—Every farmer and gardener knows that a generous application of manure, whether plowed in or spread upon the surface, is of great benefit to the crop. Green, unfermented manures, we have found, always were most efficacious when plowed or dug in; but in regard to fermented manures, many think that they are most useful when spread upon the surface.

A writer in the London Gardener's Chronicle has some good ideas upon this subject, which have been approved by some of our best horticulturists. Few persons, says he, are aware of the immense importance of top dressing. The merits may be classed as follows: 1st: they may be made capable of transmitting a vast amount of food to a suffering tree (for instance) in a very speedy way. 2ndly: they retain a steady permanency of moisture, in spite of adverse circumstances without stagnation. 3rdly: they are the cause of a series of annual fibres which are of much importance to tender trees. 4thly: by means of such, continued systematically, trees may be planted in shallower soils than without them; this tends to the production of much better ripened wood. 5thly: If a check is needed through rampant growth, or total absence of fruit, the removal of the dressing in summer will supersede the necessity of root pruning.

The above reasons which the writer adduces, refer principally to trees and shrubs, which are, to all intents, fixed or permanent crops. We have, however, often thought that the application of decomposed manure to the surface for annual crops, such as Indian corn, was better than ploughing it under. Many farmers harrow it in to pretty good advantage. We once ploughed in a quantity of green manure from the barn-yard, and spread on the surface a quantity of fermented manure. A part of this was harrowed in, but some circumstance, we have forgotten what now, prevented us from harrowing the whole piece. We planted it to corn, and at havesting it was observed that the corn where the fermented manure was not harrowed in, was much the best. This, to be sure, was only one experiment, and an accidental one at that; but its result accords with the belief of very many farmers.—

Pig Manure.—We have great confidence in the following statement, made at a late meeting of the Frome Agricultural Society, by S. Pocock, of Thoulstone Farm:—"Well knowing the excellence of pig manure five years ago, I was induced to try it solely for turnips. I tested it against guano and bone dust. The result was quite equal to the guano, and beat the bone dust hollow. My farm is one part clay, and another sand: I found the same result on both. I have also the management of a farm in Hampshire—a poor thin soil, and there the manure was equally good. I have continued to use it ever since with the same beneficial results. To carry out my plan, convenient farm buildings are necessary. I have a large dry shed, in which, first of all, I put a layer of dry coal ashes, about a foot thick and four feet wide, to which the deposit of the pigs is taken, both liquid and solid; and as soon as it begins to ooze out, I put on more ashes, and so on till it gets to about four feet in thickness. I then again commenced a fresh layer, and so on; after lying some time it is turned two or three times, and then it is fit for drilling. I have put in this year 45 acres of turnips with nothing but this manure, and the result is now open for the inspection of any who may choose to see it. I find the droppings of three pigs, carefully preserved, to be ample for two acres, and quite equal to three sacks of bone dust per acre. I am not speaking theoretically, but from experience; and I consider, if we can get such valuable manure for nothing but the labour, it will be much better than putting our hands in our pockets and paying 28s. or 30s. for artificial manure."

New Variety of Wheat.—Advices from St. Petersburgh mention that a new variety of wheat has been recently discovered and cultivated in Bessarabia. It is called the Kolus, or large-eared wheat, on account of the peculiar beauty of its ears. At present it is limited to mere seed-wheat, and fetches twice the price of the ordinary Arnautka. One other and more important peculiarity of this grain is, that it is less affected by drought than any other varieties. At the same time, it possesses several other features, being distinguished by its greater fertility, its deep amber colour, and its early ripening. The important discovery was made by a peasant of the name Bulatewisch in the village of Troitzk, in the district of Bender, who, being a strict observer of nature, detected in his crops certain ears which were longer and became ripe earlier than the rest of the crop. These were collected, and sowed separately, and the result was an abundant harvest, and the introduction of a new and valuable variety of wheat. The Russian Government, it is to be hoped, will not let such an opportunity pass of rewarding one so deserving of a substantial mark of its favour. The event has created a great sensation amongst the agriculturists and dealers in grain, and the wheat well merits being named after the discoverer.

Lime vs. Insects.—I beg to assure your correspondent that lime may be applied with the most perfect safety to his trees, shrubs, &c.; and will also prove certain destruction to the slug tribe. With respect to the quantity, that must depend on the nature of the soil. In April last, having then recently obtained possession of a garden, &c., that had been greatly neglected, and was overrun with slugs, I spread quick lime over the whole, (vegetables, shrubs, grass, and orchard,) at the rate of about 80 bushels to the acre, so that all through that month we appeared to be in the midst of winter, with the ground covered with snow, even the evergreens being white. The result was, that not a slug was seen till the rains of October, and but very few then. The vegetables have been pretty good, and the growth and vigour of the evergreens have been quite remarkable. The soil is clay. February would be a very good time to lay on the lime.—*Gard. Chron.*

Sore Shoulders, &c.—Farm horses are liable to be injured on the shoulder or back with the collar or cart saddle. In these cases stypties are commonly used to dry up the wound, which is quite contrary to the nature of this kind of sores. Lime water and linseed oil are what I have found most beneficial in these cases. It may be prepared in the following way:—Put two quarts of water upon two quarts of unslaked lime; let it stand till the ebullition is over, then pour off the liquor for use; and add five gills of linseed oil and two ounces of sugar of lead. Mix them well together, and keep the solution in a bottle for use. When the animal comes in from work at night the sores should be washed with soap and water, dried with a soft towel, and dressed with a feather dipped in the mixture. This process should be repeated every night till the sores are healed, observing to shake the mixture well every time it is used.

When a horse is injured by the harness, it is necessary to examine what part of it caused the injury, and get it removed by altering the stuffing of the collar or saddle, that it do not press on the sore; for if a wound be constantly irritated, it is hardly possible to heal it. Too few that have the charge of horses consider properly how little is the cause that irritates and injures them, and makes them either dull and spiritless or refractory and spiteful; and I would therefore enforce on those who work them, the incumbent duty that devolves on them to adjust the harness for the care or comfort of the animal as much as possible.

Horticulture.

FRUIT TREES—BEST VARIETIES, &c.

We have much pleasure in directing the attention of our correspondent J. C. B., and that of our readers generally, to the following valuable communication from an experienced Nursery-man in the vicinity of this city, on the important subject of Fruit Trees—the best method of planting—including the most suitable varieties for the climate of Canada; together with many useful hints and general directions. As the writer has been for several years extensively engaged in the Nursery business, our readers may depend upon the accuracy of his statements, and place the utmost reliance on the soundness and practicability of his instructions.

Toronto Nursery, Kingston Road,
March 12, 1849.

GENTLEMEN,—The season for transplanting Fruit Trees has again arrived. In compliance with your request, I now send you a few remarks, the result of twenty years' experience and observation in this neighbourhood. If they be the means of directing the attention of a single individual to this important subject, the task will not have been in vain.

In favourable years, and on dry soils, Fall planting is to be recommended; but in general, Spring is reckoned the best time for this operation. To have a reasonable anticipation of success, it is necessary that it should be done early: to get the roots perfectly established in their new position, before the weather becomes dry and hot, it is necessary that transplanting be attended to at the earliest practicable moment. Spring is the busy season of the year, but the time and labour bestowed on the procuring and planting out of a quantity of Fruit Trees must be considered as advantageously expended.

The value of a good Orchard is not yet fully appreciated in this country. It is pleasing, however, to witness the increasing interest manifested in this subject. Every owner of a piece of land, however small, should think it an imperative duty to plant out some trees. Independently of numerous other considerations, the positive profit, and augmented domestic comfort, resulting to the proprietor, from the ready sale and high price that good fruit commands, ought not to be overlooked. The facilities with which fruit trees of first-rate excellence can be procured, the easiness of their culture, and the favourable nature of Canadian soil and climate, are cogent reasons why every family in the land should enjoy an abundance of choice fruit. Moreover, Canada has a right to share, with other parts of North America, the profit and honour of having her fruit shipped to all parts of the world.

It is superfluous to insist on the necessity of cultivating good fruit; this is universally acknowledged; your readers only require the subject to be brought *seasonably* under their notice, to induce them to give it that attention which its merits claim. Even if confined to our own markets only, the demand will steadily increase. The progress of civilization and refinement, the increase of population, and the accumulation of wealth, invariably increase a demand for choice productions of the *garden* and *orchard*, faster than they do the means of producing them.

Nursery catalogues usually contain a large amount of useful information in regard to fruit trees generally. If not deemed egotistical, I would recommend the descriptive catalogue of the "Toronto Nursery," lately published, as useful for occasional reference, and as containing some valuable hints for the best methods of transplanting, and the general management of trees. For the benefit of such of your readers (of which it is to be hoped there is a large number) as contemplate planting out trees this spring, the following brief directions will in general secure success—if carefully followed:—

Have the ground for your orchard securely fenced; the admission of hogs or cattle always proves fatal to the growth of young trees. If equally convenient, the aspect should be southerly, with as much declivity as at all times to prevent the lodging of superabundant moisture. The ground must be ploughed, and the furrow so deep as to turn up part of the subsoil. It will also be of much advantage to cross-plough and harrow it. The trees may then be planted; and according to the careful mode in which this part of the work is performed, much of the future thriftiness of the tree depends. In this case the old axiom, that what is worth doing is worthy of being done well, holds strictly true. The effects of proper transplanting are *permanent*. No subsequent amending of the soil can realize the advantages of having the operation properly performed in the first instance.

Let the holes be dug three feet in diameter, and twenty inches deep. Throw the subsoil aside, and put into the bottom of the hole sufficient fine friable surface mould, to bring it to the proper depth to receive the tree. Prune off carefully all bruised or broken portions of the roots: although trees be raised in the best manner out of the nursery, it is impossible to pervent the spade coming in contact with and bruising some of the lateral roots. Place the tree in a perfectly upright position, spreading out with the hand the roots horizontally in their natural order; fill in with finely pulverized surface soil, gently shaking the tree to fill up all vacuities. When the roots are covered, throw in a pailful of water, fill up with the remainder of the earth, press it firmly down with the foot, and the operation is complete. The tree should then stand about two inches deeper than in the nursery rows. Deep planting should be avoided; it is ruinous to the growth and vigour of young trees: after transplanting, the upper roots should not be more than three inches under the surface.

Mulching, in technical language, should by no means be neglected. This consists in putting a quantity—say a wheelbarrow-load—of long manure on the surface, around each tree. Allow this to remain till the following spring, when it may be spaded into the ground at the extremity of the roots. This practice is recommended in the extract from Downing, in your last number; but it is productive of such beneficial results that I cannot, at the risk of repetition, refrain from urging on your readers the necessity of its adoption in all cases.

To promote the vigorous growth of the transplanted tree, let the wood of last year's growth be cut off from two-thirds to at least one-half of its

growth. By this means the ascending sap is concentrated, and strong leading shoots freely developed, forming the limbs of the future tree. This cutting-in of the young wood is not to be repeated in future years; the main object in doing so at the period of transplanting, being to give a fresh impetus to the growth of the tree, which was in some degree checked by its removal.

Having said this much on the propriety and *modus operandi* of transplanting fruit trees, I will be brief in advising a selection of suitable sorts for general cultivation. When trees are procured from respectable, well-established nurseries, the selection may in general be safely entrusted to the proprietors. The opportunities they enjoy of properly estimating the value of orchard products, the desire to establish and maintain the character of their own establishments, are motives sufficiently strong to induce them, when the selection is left to them, to do their best for the satisfaction of their customers. In the following list, none are included but such as have come under the personal notice of the writer, and all the sorts therein enumerated may be depended on as thriving well, and being in all respects adapted to this latitude.

THE APPLE

Is more generally known and universally esteemed than any other fruit. It is not a native of North America, but has been perfectly naturalized, and in the Northern States and in Canada succeeds better than in any other part of the world. Good varieties are now extremely numerous, and no excuse is left for the cultivation of poor inferior sorts. It accommodates itself to almost any variety of soil, but in a deep heavy loam it is most productive, and attains the greatest perfection.

Early Apples.—Red Juneating—Early August, the best eating apple known—Early Strawberry, Keswick Codlin, excellent for cooking from the beginning of July—Summer Queen, large and fine.

Autumn Fruit.—Early Crofton or Irish Peach Apple—Fall Pippin, "a noble fruit"—St. Lawrence, Fameuse or Snow. These two varieties had their origin in Canada, and for fall fruit cannot be surpassed. Ribston Pippin, in Europe a winter fruit of great excellence, but not keeping here after the end of October. Toole's Indian Rareripe, Hawthorndean, begins to bear very early—a handsome fruit, and very productive. Pumpkin Sweeting—large and productive.

Winter Fruit.—Rhode Island Greening, the most useful and saleable apple in cultivation. Nothing superior to this famous variety has yet been discovered. A gentleman in Toronto last winter sent 35 barrels of this fruit to Glasgow, where they were sold at 35*s.* sterling per barrel, leaving him a clear profit of $4 per barrel. Baldwin, the best market apple in Boston—Esopus Spitzenburg—Welland Pippin—Yellow Bellflower—Hubbardson's Nonsuch, an early winter fruit—Blue Pearmain—Tolman's Sweeting, productive and superior for baking—Pomme Gris, the finest dessert apple, and a long keeper—Swaar—English Golden Pippin, small, but a long keeper and fine flavour—American Golden Russet, will keep till the end of June.

In an orchard, apples should be planted at the distance of 30 feet, requiring about fifty trees to the acre.

THE PEAR,

Like the apple, is not indigenous to North America, but was introduced by the early settlers. It is a hardy, long-lived tree, and succeeds well here. New varieties to an almost endless extent, have recently been raised in Europe and the United States. Being cultivated on a more limited scale than the apple, I will only enumerate a few, whose merits cannot be disputed. The soil best adapted to the growth of the pear, is a strong clay loam; light sandy soils should be deepened by trenching and liberal admixture of clay. They should be planted at the distance of 25 feet apart, for standard trees. For a garden, pears wrought on quince stocks are now in much estimation. In this way they do not attain great size, but come early into bearing—generally the second or third year after being budded. Ten feet apart is ample space when on quince stocks.

Summer Pears.—English and French Jargonelle—Summer Bonchretien—Summer Bell—Madelaine Virgalieu or White Doyenne.

Fall and Winter Pears.—Steven's Genesee, Bartlett, Buerre Diel, Buerre Gris, Napoleon Buffum, Hazel, Chaumontelle, Orange D'Hiver, Winter Bergamot, St. Germain, Jersey Gratioli.

PLUMS.

The Plum thrives best on a rich clay soil. It succeeds so admirably here, and the fine sorts are possessed of such a rich luscious flavour, that a few choice varieties should be cultivated by every one. In Toronto market, plums of the best varieties are readily sold at four to five dollars per bushel, a price which handsomely remunerates the grower. The following varieties are all of great merit:

White Egg or White Magnum Bonum, Green Gage, Prince's Imperial Gage, Bolmar's Washington, Duane's Purple, Coe's Golden Drop, Smith's Orleans, Huling's Superb.

An ornamental variety of the Plum, the Double-flowering Sloe, is a remarkably handsome shrub. In spring, when covered with a profusion of small double blossoms, it is universally admired. This is worthy of a conspicuous place near the houses of such as possess the taste to adorn the neighbourhood of their dwellings.

CHERRIES.

The culture of Cherries commends itself to every grower of fruit, from the farmer with his hundreds of acres, to the merchant and mechanic, with their village lot. The fruit is ripe at a season of the year when no other is to be had. Nothing surpasses it in beauty, delicacy and richness for the dessert, and some varieties are of great value for cooking and preserving. The tree grows rapidly, comes early into bearing, is of a regular, handsome shape, and well adapted for shade and ornament. It combines in an eminent degree utility and beauty. The following are all of great merit:—May Duke, Large Red Biggareau, Napoleon Biggareau, Black Eagle, Black Tartarian, Elton, Yellow Spanish, Transparent Elkhorn. For preserving, Downing's Late Red and Morello are considered the best.

PEACHES.

Although the crop of Peaches in this neighbourhood is somewhat precarious, and not always to be depended on, yet a few trees of the early sorts are worthy of a place in every garden. In some parts

of the country, particularly west of this, it thrives well, and bears abundantly. I have occasionally seen as fine peaches as could be desired, grown in this neighbourhood. I am of opinion that if none but the following or similar early sorts were grown, there is every reason to believe that the cultivation of this delicious fruit might be attended with more success:—Early Tillotson, Early York, Early Crawford, Large Early Red Rareripe, Yellow Allberge, Royal George.

It was intended to have noticed briefly what may be called the minor fruits—such as vines, strawberries, &c.—but this communication having extended itself to a greater length than was anticipated, I will postpone their notice, and that of ornamental trees, shrubs, &c., to a future number.

The pruning of orchards should be done in March or early in April. Young trees require but little pruning; it is enough to keep the heads in proper shape, and to remove branches that cross or interfere with others. All suckers and side-shoots should be removed. Old trees, the heads of which have grown dense with branches, should be thinned out, to admit the sun and air. This improves very much the size and flavour of the fruit. In doing this, a pruning saw should be used. The limbs should be cut close to the tree, and the cut smoothed over with a sharp knife. No pruning should be done, if it can be avoided, after the sap has commenced flowing. The plum, cherry, and other trees, apt to give out gum, which is termed "bleeding," should not be pruned till midsummer.

In conclusion: it is difficult to persuade a great number of persons, that for transplanting, trees are not the better for being *too large*. Many insist that the larger the better; but my experience, and that of every observing cultivator, has convinced me that this is highly injudicious. Apple trees about six feet high, and three, or at most four years from the graft, are the most suitable for transplanting. Pears and plums the same. Cherries, two or at most three years from the inoculation, and peaches one year. Having been planted, they should be carefully tied to a stake, to prevent them being blown about by the wind, and the land—or at least the land about the trees—cultivated and occasionally manured for four or five years. This system will ensure healthy, handsome trees, and bring them rapidly forward into a productive state.

I am, Gentlemen,
Your obedient servant,
GEORGE LESLIE.

CULTIVATION OF THE GOOSEBERRY.

To the Editors of the Canadian Agriculturist.

GENTLEMEN,—I send you the following brief observations on the cultivation of the gooseberry, in reply to the inquiries of "*An Amateur.*"

The gooseberry in Canada is not one of those fruits that will grow and bear good crops except a good deal of pains be taken to prepare the soil, which ought to be a deep, rich loam. It is generally found that the gooseberry will do best in a situation that is partially shaded from the mid-day sun; at the same time, it will not do to be planted under the drop of trees. They require regular pruning; cutting the young wood well in, and leaving the centre of the bush free and open to admit light and air; which will be a great means of preventing the fruit from being attacked with the mildew. The gooseberry is also subject to the attacks of the green caterpillar; the only safe cure for which is to gather them off carefully with the hand, and repeat the operation every morning until you clear them off. There are a great many varieties of the gooseberry cultivated in England; some of the sorts attain to a very large size. The *Roaring Lion* has been known to weigh over an ounce and a half. But the kinds best adapted for Western Canada are those of a medium size. The following varieties I consider suitable for a small garden:—

Red—Warrington, Crown Bob, British Hero. *Green*—Large Green Hairy, Green Bottle. *White*—White Smith, White Honey. *Yellow*—Golden Yellow, Rilton Hero, Britannia.

JAMES FLEMING.

Toronto, March 16, 1849.

FORMATION OF HOT-BEDS.

Thinking that a few directions on this subject might be useful to some of our subscribers at this season of the year, we copy the following practical instructions from Mrs. Loudon's interesting work on Gardening for Ladies.

Many kinds of manure may be used in making hot-beds, but the principal materials in use in most gardens are stable manure, dead leaves and tan:—The first of these, which is by far the most general, consists partly of horse-dung, and partly of what gardeners call long litter, that is, straw moistened and discoloured, but not decayed. The manure is generally in this state when it is purchased, or taken from the stable, for the purpose of making a hot-bed.

The necessary quantity of manure is procured, at the rate of one cart load, or from twelve to fifteen large wheel-barrowfuls, to every light, (as the gardeners call the sashes of the frames,) each light being about three feet wide; and this manure is laid in a heap to ferment. In about a week the manure should be turned over with a dung-fork, and well shaken together; this operation being repeated two or three, or more times, at intervals of two or three days, till the whole mass is become of one colour, and the straws are sufficiently decomposed to be torn to pieces with the fork.

The size of the hot-bed must depend principally on the size of the frame which is to cover it; observing that the bed must be from six inches to a foot wider than the frame every way. The manure must then be spread in layers, each layer being beaten down with the back of the fork, till the bed is about three feet and a half high. The surface of the ground on which the hot-bed is built, is generally raised about six inches above the general surface of the garden; and it is advisable to lay some earth round the bottom of the bed, nearly a foot wide, that it may receive the juices of the manure that will drain from the bed. As soon as the bed is made, the frame is put on, and the sashes kept quite close, till a steam appears upon the glass, when the bed is considered in a fit state to be covered three or four inches deep with mould; observing, if the bed has settled unequally, to level the surface of the manure before covering it with earth. The seeds to be raised may

either be sown in this earth, or in pots to be plunged in it.

The proper average heat for a hot-bed intended to raise flower seeds, or to grow cucumbers, is 60°; but melons require a heat of 65° to grow in, and 75° to ripen their fruit. This heat should be taken in a morning, and does not include that of the sun in the middle of the day. When the heat of the bed becomes so great as to be in danger of injuring the plants, the obvious remedy is to give air by raising the glasses; and if this be not sufficient, the general heat of the bed must be lowered by making excavations in the dung from the sides, so as to reach nearly to the middle of the bed, and filling up these excavations with cold dung, which has already undergone fermentation, or with leaves, turf, or any other similar material which will receive heat, but not increase it. When the heat of the bed falls down to 48° or lower, it should be raised, by applying on the outside fresh coatings of dung, grass, or leaves, which are called linings.

When hot-beds are made of spent tanner's bark or decayed leaves, a kind of box or pit must be formed of bricks or boards, or even of layers of turf, or clay, and the tan or leaves filled in so as to make a bed. Where neatness is an object, this kind of bed is preferable to any other; but a common hot-bed of stable manure may be made to look neat by thatching the outside with straw, or covering it with bass mats, pegged down to keep them close to the bed."

The above mode of preparing hot-beds, recommended by our fair authoress, will answer well for growing melons and cucumbers, but if cabbage plants, lettuce, or radishes are required, the bed need not have more than 13 inches of manure. The soil put on the hot-bed will require to be at least one foot thick; on the surface of this sow the seed, and give plenty of air as the plants advance in growth.

HORTICULTURE, &c.—It is truly gratifying to the lovers of horticulture and botany, to see the number of structures, from the unostentatious glazed pit to the magnificent conservatory, which have appeared around us within the last few years.

I am fully convinced that, generally speaking, there is no class or profession, which can erect and keep in repair, and work at less expense a small greenhouse or vinery, than the farmer. There are many landlords, I know, who would object to farmers having structures of the kind, as they consider them superfluous, and not in accordance with the farmer's vocation. May I ask, why may not the farmer have his little greenhouse or pit to grow a few early grapes or potatoes, or his wife and daughters, a few ericas, camellias, or calceolarias? he pays his rent, and manages his farm well, therefore I assert that he has as much right, if he chooses, to erect a small house or pit, as his landlord his extensive conservatory. I know there are some landlords who object to their tenants enjoying the sports of the field, or in fact any enjoyment at all; but would have them continually plodding on in their daily vocation of tilling the soil and attending their stock without any recreation at all; however such fancies have their own reward, for I have always seen that where the most generosity and liberality exist, the best tenants and good management abound.

The various papers which follow on this subject will show what can be performed at a small cost and little room; it is true that the produce cannot be great, at the same time many little luxuries can be obtained, which although intrinsic in value, are gratefully received as presents, and give pleasure to the donor to be able to give a dish of fruit weeks before the out door season would allow.

There is generally some sunny corner or convenient spot, where a small house can be placed, if near the house so much the better, as by the great improvements which have taken place of late years in the system of heating by hot water and steam, the fire of the kitchen or sitting room will perform the office with little cost and extra trouble. A house fifteen feet long, and twelve feet wide inside, will produce much if properly managed, for fruits, plants, and vines, and two glazed pits, eight feet by seven feet, will be ample.

If fruits are the object, the house should have a pit eight feet wide in the front part of the house, built of brick set in cement, so as to hold water for bottom heat, and a galvanized iron tank against the back wall, to heat the atmosphere of the house. In a house of this kind vines in pots could be grown so as to come in early, and ripen their fruit before the vines planted outside are brought into the house in the end of April. A few dwarf peaches or nectarines also in pots; cucumbers in boxes on the tank at the back, while a hanging shelf and the front would contain a few pots of strawberries or French beans. The pits could be planted with early potatoes, so as to be ready by January, when another planting is made of the same, followed by cucumbers, melons, or vines, in pots according to the fancy of the owner.

If on the other hand, flowers are preferred, an upright glass in the front would be requisite, with the entrance in the centre, and a stage on each side, with galvanized tanks under each for heat. I would not advise the cultivation of plants that require a strong heat, but the more hardy denizens of the Cape, Australia, and China, among which some of our most magnificent exotics are found, many of these would only require the exclusion of frost, and plenty of air on all occassions when safe. A house of this kind, with little care and trouble, would give a continued succession of flowers.

First, in the autumn, the beautiful Chrysanthemums, followed in the middle of winter, by the Chinese primrose, Primula sinenses, camellias of all sorts, hyacinths, jonquils, tulips, narcissus; succeeded in spring by cinerarias, fuchsias, calceolarias, pelargoniums, epacrides, and Australian plants, until the vines are brought into the house, and the weather sufficiently warm to allow of the plants being turned out of doors, for the vines to be accommodated with the temperature most congenial to them, when a few balsams, coxcombs, and other annuals can be admitted to fill the stages.

The pits would preserve during winter, verbenas, heliotropes, and other half-hardy plants, for bedding out in spring.

Such a house would be erected for £20 or £25, and the pits in proportion. Glazed lights can now be purchased at from 9d. to 1s. per square foot, painted and all ready for putting up; a common carpenter could make the rafters and put the frame work together, and a bricklayer complete the remainder.

As I said before, the structure could be heated by the kitchen or house-fire, or from the boiler that cooks the food for the cattle: or at a small cost a boiler and pipes might be purchased; or the old smoke flues could be made if preferred, which, after all, are perhaps the best.—*Thomas Keir Short.—Farmer's Herald.*

Nothing is bestowed on man in this life, without great labour.—*Horace.*

Labour relieves us from three great evils—indolence, vice and want.—*Voltaire.*

Mechanics and General Science.

We think it right to inform our readers, that the following article is one of a series, from the pen of a gentleman of high scientific standing, whose critical acquaintance with the theory and practice of Chemistry, as well as Natural Philosophy generally, we hope to see occasional proofs of in the pages of the *Agriculturist*.

SCIENTIFIC NOTICES.

NO. I.

ON THE SUBSTANCES THAT FALL FROM THE HEAVENS.

The consideration of these bodies may be divided into two parts. In the first we shall treat of those substances which are solid, and not easily altered in form; while in the second part will be included those that are either fluid originally, or may be rendered so by the application of heat.

In the first part we shall therefore speak of the so-called sulphur rains; the root, fish, frog and corn rains; as also of meteoric stones. In the second we shall describe the different forms under which water is separated from the atmosphere, and shall thus embrace the subjects of rain, hail, snow and frozen rain; and shall append to this a short account of clouds, from which these bodies are originally derived, as well as of fogs and mists.

The phenomena are so constantly occurring, and so continually attracting our attention, that it is extraordinary how few persons ever give themselves the trouble of enquiring either into their real nature, or into the causes that produce them. The following series of articles may perhaps serve to give some of our readers, who may not have paid particular attention to the matter, a clearer insight into the nature of these phenomena than they at present possess.

To commence with the first on our list, "The sulphur rains." How unusually prevalent is the idea that sulphur or brimstone occasionally falls from the sky! We find the same idea extending in all countries—for in almost every part of the world the phenomena has been observed, under precisely similar circumstances. We find, indeed, that in some localities the so-called sulphur rain is of much rarer occurrence than in others: thus, in some parts of England the yellow deposit which characterizes the phenomena is scarcely ever seen, while in every part of Canada it appears every year.

Sometimes the quantity of the yellow substance that falls is so great, as to cover the whole ground with a thin coating, like snow; but it is more generally only seen on the surface of water in butts and tanks, or on the edges of puddles. The substance floats easily on water, without immediately becoming wetted; and it is in such situations as the above-mentioned, that it more readily attracts our attention.

It is not to be wondered at that this substance should have received the name of sulphur; its yellow colour, its granular structure just like common flowers of sulphur, and its burning when thrown into the fire, are sufficient reasons for the prevalence of the opinion regarding its composition. If it were sulphur, however, we could perhaps only account for its presence in the atmosphere by supposing that it had been ejected from some active volcano, and brought to us by the winds. Were that the case, however, these sulphur rains would probably occur at one season of the year just as well as at another; while we find, on the contrary, that they occur, at least in this country, almost exclusively in June or July. It does occasionally happen, particularly in some parts of the world, that these sulphur rains are observed in April or September, or other summer months; but by far the greater number take place in those above mentioned; from which we may conclude that there is some cause existing every year at that particular period which produces the phenomena.

A microscopical examination of the yellow substance affords us immediate insight into its nature, and we find it to consist of minute grains of the pollen of plants. The substance that we generally find in Canada, is the pollen or fructifying principle of the different species of pine, the flowers of which arrive at maturity and produce abundance of pollen just about the time when these sulphur rains are usually observed. The cones being charged with this light substance, if a high wind should arise and drive through a pine forest, it will naturally carry with it, by the agitation of the trees, a large quantity of the pollen, which will not be deposited from the air for a considerable time, or will perhaps only be carried down by the first rain that falls. We find, indeed, that on the side of a pine forest from which the wind blows, there is no yellow substance to be found, while it extends for miles on the other side in the direction of the wind. All doubt as to the origin of the substance may be removed by collecting some of the sulphur rain, and also some pollen from the cones of the red and white pine, when, on examining them both with a tolerable microscope, they will be found to be exactly the same—the powder in both cases consists of small particles, not perfectly globular, but rather kidney-shaped, a form that is peculiar to the pollen of all pine trees. All plants produce pollen, the grains of which vary very considerably in shape, each plant having a peculiar form of pollen; and hence we can easily determine from the shape of the grains, the plant from which the pollen is derived; and as some plants come to maturity and produce pollen at different seasons, it may occasionally happen that a sulphur rain will be at other seasons than that mentioned above as the common one, and which will be found to consist of the pollen of other plants than pines.

That the yellow substance called sulphur rain, does not really consist of sulphur, has been proved since the time of Scheuchzer, but the idea of its being so remarkable a substance was too attractive to be easily relinquished. It has been stated that lightning when passing over a wall or other surface sometimes deposits a quantity of sulphur, and it has also been stated that these sulphurs, or to speak more correctly, pollen rains, are observed principally during thunder storms, and hence the one has been supposed to depend on the other. The observation is probably correct, but the explanation of the circumstance seems to be, that the period when the pines become loaded with pollen is that part of the summer when electrical storms are prevalent, and as they are usually either preceded or followed by

violent gusts of wind, we can easily understand why the two phenomena appear together.

Whether sulphur is ever deposited from the atmosphere seems to be a matter of doubt; it is by no means impossible, when we consider the immense quantities of vapours of sulphur produced by volcanoes, but the only authentic record of any such precipitate or deposit that I have met with is in one of Berzelius' Annual Reports (I unfortunately cannot lay my hands on the article at this moment). The substance was examined by a competent chemist and proved to be sulphur.

In the years 1735 (in the month of October,) and 1814 (in July,) a curious phenomenon was observed in Canada, which has received the name of the dark days; during the prevalence of this peculiar appearance, a yellow substance was observed floating on water, which is described by Chief Justice Sewell in his excellent paper on the subject, as having consisted of sulphur. He attempts to explain the phenomenon by the assumption of a volcanic eruption in Labrador; but whatever may have been the cause of the darkness, and other circumstances (such as a fall of ashes, &c.), there is no ground for supposing that the yellow substance observed was anything but the pollen of some plant or other, especially as storms of wind, thunder and lightning, prevailed for a considerable time.

H. C.

ROAD MAKING.

To the Editor of the Canadian Agriculturist.

Sir—The most important improvement that our country requires, is improved Roads. We have got canals enough for a while—let us now have good roads to get at them. No country can prosper until its principal thoroughfares are thoroughly improved; and unless we very soon get good roads and railways in Canada, we will be behind all the civilized world. See how our neighbours to the south go a-head!—and go to Europe, especially Britain, and see what roads and railways they have there!

I am glad to see a general Bill brought in below, for Joint Stock Companies in making roads and bridges. I hope they will make it as liberal and encouraging as possible for contractors.

Many people dread and object to being obliged to pay tolls on a good road. Why should they, when they can travel with double and treble the load, with more ease, more speed, and more comfort, than they did before? Why, the very saving in tear and wear of wagon, harness and horse-flesh, would more than pay for the toll-bars. What a difference in spring, betwixt a good Macadamized or planked road, and mire and mud to the axle!—and that is generally the time when it is our special interest to get to market. It would be a great improvement if our roads were even drained on each side and graded—much better still if a portion were Macadamized or planked. Where materials are at hand, I should think Macadamizing the roads the most advisable. Is there no machine for breaking stones for roads? I have never heard of any but hammers and human hands. Still I think, in this wonderful age of discovery, some machine might be contrived, with the power of a small steam-engine, to move along, which would break the stones wholesale for roads, at a cheap rate. I wish some mechanical genius would set his brains to work, and produce something effective for the purpose I have mentioned. No doubt it can be done.

W. F.

Brockville, Feb. 19, 1849.

Dear Sir,—I was much struck with an article in the last number of your excellent journal, entitled "Ice in hot ashes," in which a traveller describes his having found *heavy* crystals of ice, resembling shark's teeth, and all set in one way, among a heap of *warm* ashes; and the aforesaid traveller compares the formation of ice in such a locality to the production of the same substance in a red-hot crucible, an experiment which has lately been made. Now, with all due humility, I would beg to remark that in the experiment alluded to, the vessel has to be made very hot—nearly red, and it seems probable that if the ice in Mount Ætna had been produced from a similar cause, the incautious traveller would have burnt both his fingers and the soles of his feet, which he does not mention—in fact he says the ashes were *warm*. I should be sorry to throw the least doubt on so curious a circumstance, but I may perhaps be permitted to ask whether the above-mentioned traveller may not have mistaken for ice, the beautiful transparent crystals of Cœlestine or sulphate of strontia, which are very heavy, are as clear as water, have very much the appearance that he describes, and are found in great abundance on the sides of the craters of volcanoes?

Hoping I may be wrong in my supposition,
I remain

Incredulous.

The Electric Light.—The electric light must not be considered a *new* discovery. One of the earliest experiments performed by the aid of the galvanic battery was the producing of an intense light, by transmitting the electric fluid through the interval between two points of charcoal. Nor is the attempt to adapt the electric light to purposes of general illumination anything new. Seven years ago, an American patented an invention for this purpose; but obstinate difficulties were in the way. It was necessary to procure charcoal of a peculiar kind, unvarying in the density of its substance; and to regulate the voltaic current in its passage across the charcoal points. Any variation in the condition or position of the points, or the slightest diminution in the voltaic current, produced a change in the degree of quality and colour of the light so as to render it unavailable for practical purposes, and indeed, it often occurred that one of the points falling from its position, left the surrounding space instantly in utter darkness. Mr. Staite, the patentee of the new invention, however, reduces coke to impalpable powder, makes it into a paste with water, forms it into sticks, and exposes it to violent heat. He then dips the sticks into melted sugar (the chief constituent of which is charcoal), so that every minute interstice may be filled up, and exposes it to heat again. The result is a carbonaceous mass of density superior to any that can be obtained from wood, and which can easily be obtained in the form of straight sticks, an impossibility with charcoal made from wood. The other desideratum, viz. a steady light, dependent on a regular flow of electricity and the maintainance of certain given relations of position between the two carbonaceous points, required certain mechanical appliances of a self-acting kind. Thus, in order to the development of the light, it was necessary that the two charcoal points should be

first brought into contact; then separated and maintained (notwithstanding the variation of the charcoal points as the result of the electric action) at a given and unvarying distance from each other. These objects have been accomplished by passing the electric current itself through a coil of copper wire surrounding a bar of soft iron. The bar becomes magnetised, and is adapted to rise or fall as the current is strong or weak. These motions of rising and falling act upon the escapement, by means of which an equal current of electricity is always maintained, and the charcoal points held at a distance from each other proportionate to the passing amount of electric current. Thus the difficulties of this invention are said to be overcome. It has been stated that it amounts only to *one-twelfth* of the cost of gas—but this with regard to expense, is doubtful. The advantages of the light are, that it does not deteriorate the air of the apartments in which it is employed, and will not blacken or soil the most delicate fabrics, being unacompanied by smoke or vapour; there is no danger from fire; its light is white, and exhibits objects in their true colours; its intensity is much greater than that of gas, and may be employed on railway trains, on board ships, and in mines, without danger of explosion.

THE ECONOMY OF CREATIVE POWER.

The Lord of hosts, wonderful in council, and excellent in working."—*Is.* xxviii, 29.

It is a *thing observable* through every province of nature—a *principle* to which every science lends its authority, that the power of God, *infinite in its development, is infinitely economized in its operation*—a principle to be traced in every manifestation of force in inanimate matter, and under every form of independent motion. All that we call design in natural things has in some way a direction to it. The very weed under our feet shews it in the form of its stalk; and the tree of the forest shapes out its trunk, moulds its branches and tapers the very stems and fibres of its leaves, in obedience to it. That economy of creative power which thus manifests itself in the works of God, infinitely *perfect* in its degree, has its remote but visible type in the *imperfect* husbandry of *our* efforts, which impels us to use the simplest possible means of effecting that which we have to do, and which is implied in what we call the best means of doing it. In us this economy has for its object the preservation of our *living powers; and for its immediate origin, a sense* of lassitude and fatigue, for that end especially implanted in every living thing. In him by whom this sense was laid upon us as a law, but whose own arm is "not straitened," and who "fainteth not, neither is weary" (Ps. xl. 28), that which in us he has made a necessity of nature, is but a principle of wisdom in operation.

Let us now seek if there be any evidence by which it is given us to perceive the operation of this principle in the architecture of the heavens. Let us listen if, in the stillness of the universe, there be not a *voice* re-echoed from worlds which, "without speech or language," traverse its unfathomable regions, and stars which silently repose in its depths—the voice of revelation: "by H' *wisdom* hath he made the heavens, and stretched them out by his *understanding*."

It is a high privilege thus to be able to commune with God in his works—to feel (as it were with a *sense* of the understanding) his wisdom guided the hand of his power. It is to enjoy here a knowledge of which, little though it be, that of heaven, as far as it includes the mysteries of creation, cannot but be a continuation—to hold here a few links of a chain which proceeds from the throne of God. And although now it is to the silent monuments of nature that the researches of science are limited, and in respect to these although now we see but as "through a glass darkly," yet is there a spirit of devotion which, regarding these things as *beginnings*, with a faith almost invigorated into knowledge, anticipates, walking in this twilight,—the daylight of heaven—when we shall see "face to face," and "know even as we are known;"—a time when to the soul, now released from the corruptible body, in some degree (however slightly) schooled by the instruction of faith and knowledge, and no longer straitened by the imperfections of sense, the works of Grace, the works of Providence, and the works of Nature, shall present, under one vast but simple and united scheme, the equal evidence of God's mercy, his wisdom and his power.—*Moseley's Astro-Theology.*

ETCHING AND ENGRAVING IN BLACK MARBLE.—An interesting feature connected with the manufacture of black marble, is the depicting, by the application of an acid, representations of figures, flowers, Egyptian hieroglyphics, and other objects upon a polished surface. The method employed in doing this kind of engraving is similar to that pursued with respect to copper, viz., by first tracing with wax or varnish upon the marble the object intended to be represented; then, when the preparation is perfectly set, with a point marking in the finer parts of the figure, it is then covered with an acid, which bites off the polished surface of the marble, which was not covered with the preparation, leaving those parts which were covered standing in slight relief; the wax is then cleaned off. Thus it will be seen that any one with a knowledge of drawing could practise this part of the art; not so, however, with regard to another style of engraving on marble, which I will mention, and which is peculiarly English, such productions from abroad being unknown. There is no preparation of wax, or application of acid used here; the entire process is done by graver's points and diamonds, hence called the "diamond engraving." It must be observed, that for effect in this work, the artist is confined to a most limited space, viz., from a black polished surface to a grey ground, the natural colour of the marble before it is polished. —*The Builder.*

WHEELBARROWS.—The greater the diameter of the wheel of a barrow, and the smaller the axis or spindle on which it turns, the less power will be required to drive it forward; for the friction is proportionately reduced.

The diameter of the wheel might be increased with manifest advantage to double that now employed, for even then it would be below the point of draught or impulsion, (the hand of the labourer,) and the nearer it can be brought to a level with this, the more efficiently he exerts his power.

The breadth of the wheel's periphery, or felloes, might be also increased two inches advantageously, for as it is always employed upon a surface in some degree soft, such an increased breadth would decrease the depth to which the wheel of a loaded barrow usually sinks into the soil, and would proportionately decrease the power required to overcome the augmented opposition. In a wheelbarrow so constructed, a man might move with more ease 8 cwt., than he now impels 5 cwt., which is a full barrow load.

If a wheelbarrow be made of wood, the feet and handles should be clasped with iron, and its joints strengthened with bands of the same metal. If so guarded it will outlast two others left unprotected.

Barrows are now very frequently employed, made entirely of wrought iron, and Mr. Stratton informs me that they weigh 92lbs., being but little heavier than common wooden barrows. The wheels are of wrought iron, 16 inches in diameter, and the ends of the gud-

geons or spingles run in brass bearings. This reduces the friction, or makes, in customary parlance, the barrow "run light." The face of the felloes is from ½ inch to 3 inches, according to order. They seem to have been approved by those who have used them, both in this country and in the West Indies, but I have never had an opportunity myself of testing their qualities.—*Gardener's Almanack.*

AIR CHURN.—Some time ago we gave a notice of a newly invented churn, called the "Atmospheric Churn." The principle of its action, in bringing butter, was the forcing a stream of atmospheric air through the cream during its agitation, while being churned. It was a patent, and it is said a right to make and vend it in a single state, has been sold for ten thousand dollars.

It seems, however, that the principle of forcing air through cream, in the process of butter making, is not new. If this be the fact, all that the patentees can hold, is their *mode* of forcing the air through, and not the principle of it.

Mr. Nathan N. Barlow, of Homer, N. Y., has published a communication in the last Boston Cultivator, on the subject of atmospheric churns, accompanied with a drawing of one, which he says he invented in 1836. He found, by experiment, that although the mode he adopted brought the butter rather quicker than the common mode, he could not collect the particles of butter that formed together, into a mass without much trouble, and that the dash churn still took precedence, and he applied the principle to that. This he says was a great improvement; for it not only causes the cream to change sooner, by communicating a stronger ebullition than can be obtained from the simple dash churn, while those who have them in use, declare they obtain a larger proportion of butter, determined by actual weight.

I construct the handle of the common dash, hollow, with a ferule at the top, and insert in that ferule a valve that opens outwards, (downwards?) so that when the dash is raised, the air draws in, and when it descends, the valve closes; and thus you perceive that the air is drawn into the churn by the vacuum formed by raising the dash, and by the operation of churning there is a continual current of air passing through the cream in the churn.

We perceive, by the cut in the Cultivator, that there is a short tube inserted through the lid of the churn, through which the air escapes. Thus by using Mr. Barlow's invention, you have an atmospheric churn, which combines all the advantages of the old dash churn, with the new atmospheric action. All that you need do is to have a hollow handle made, with a valve or clapper fixed into its upper end. If you wish to be a little more systematic, you can have a thermometer set into the side in such a manner as to communicate with the cream, and by keeping the cream at a temperature of fifty-nine degrees, you will have all the requisites of a philosophical churn. Then, with a lot of *good* thrifty cows to yield good rich cream, and a *good* hand to churn, and a *good* neat wife with *good* clean hands to work it in a *good* thorough manner, you will have real *good* butter—no mistake.—*Maine Farmer.*

A PROCESS OF HARDENING HIDES.—The following patent process for hardening hides, extracted from Examiner Pag's Report, will be found not a little interesting. The hide is hardened and rendered as transparent as horn.

In the first place they are submitted to the sweating operation, or liming, for removing the hair. They are then submitted to the action of powerful astringents, such as sulphuric acid, alum or salts of tarter dissolved in water at a high temperature. During the operation of cleaning the hides of the oil, they are rubbed or friction is applied in any convenient way, whereby the hide becomes thickened; and after this process is finished they are rinsed in warm water and dried. After being dried they are submitted to the action of boiling linseed or any drying oil, and retained in the hot oil until a yellow scum appears on the surface of the hides, when they are withdrawn. If it is desired to impart color to the material, as staining it in imitation of tortoise shell it is done while in the oil bath, and when removed from the bath it is submitted to pressure in moulds for the formation of various articles, as knife handles. &c., for the article when it comes hot from the oil bath, is very soft and pliable but when allowed to cool becomes hard and susceptible of high polish.

NEW SAW FILING AND SETTING MACHINE.—Messrs. Norton & Cottle, of Holmes Hole, have recently patented a machine for filing and setting saws, which is very valuable, enabling the operator to set and whet the teeth of saws in such a manner that every tooth will be equal in size and length, the proportion being graduated by an index, and so adjusted as to suit the teeth of saws of every description. Saws that have been used and become useless in consequence of bad filing can be recut and made as valuable as new. The *set* is attached to the machine in such a manner, that when the filing is completed, no alteration is required in the adjustment of the saw to complete the setting. The inventors have found, by experience, that the hardest saws can be set without breaking or injuring the teeth. Saws considered in a measure useless, having passed through this machine, are said to work perfectly easy, and perform much faster than those filed in the usual manner, and the teeth being all of an equal length, will not require filing as frequently. These machines, if not too expensive, we think will come into extensive use.—*Far. & Mec.*

SEWING MACHINE.—Mr. Lerow, of this city, says the *Transcript*, has invented a "Rotary Sewing Machine," which will sew a yard a minute, with the "fast stitch" made in sewing the seams of pantaloons, &c. The workmanship is excellent; and unlike that of other similar machines, the stitch will not pull out. It seems as strong and perfect as the best sewing by hand. The machine is simple in its construction, small and portable, and not likely to get out of order. To housewives and tailors we should think the contrivance would be one of great utility.

AN ATMOSPHERIC MAIL TELEGRAPH.—Among the new things claiming a patent in Washington, is an invention of Mr. Van Vechten, of the Towando Democrat, N. Y., who claims the discovery of a plan by which mail and all express matter can be transmitted one thousand miles an hour, by means of an Atmospheric Telegraph. A tube is formed of a given size and length, and by means of an air pump, a carriage is propelled of a cylindrical form,—the air operating on a piston head or driver, which is in the rear of a train of cars.

COATING TELEGRAPH WIRES.—Mr. B. H. Green, of Princeton, has patented a machine to coat telegraph wires, after the same are stretched ready for use on the posts. The composition at once insulates the wires, and prevents them from rusting. The machine, weighing about eight pounds, is hung on the wires, and drawn along by a cord from post to post. The brushes used in coating supply themselves with the composition.

Domestic and Miscellaneous.

SPEAK GENTLY.

BY D. BATES.

Speak gently!—It is better far
To rule by love, than fear—
Speak gently—let not harsh words mar
The good we might do here!

Speak gently! Love doth whisper low
The vows that true hearts bind:
And gently friendship's accents flow;
Affection's voice is kind.

Speak gently to the little child!
Its love be sure to gain;
Teach it in accents soft and mild;—
It may not long remain.

Speak gently to the young, for they
Will have enough to bear—
Pass through life as best they may,
'Tis full of anxious care!

Speak gently to the aged one,
Grieve not the care-worn heart.
The sands of life are nearly run,
Let such in peace depart!

Speak gently, kindly, to the poor;
Let no harsh tone be heard;
They have enough they must endure,
Without an unkind word!

Speak gently to the erring—know,
They may have toiled in vain—
Perchance unkindness made them so;
Oh win them back again!

Speak gently! He who gave his life
To bend man's stubborn will,
When elements were fierce with strife
Said to them, "Peace, be still."

Speak gently!—'tis a little thing
Dropped in the heart's deep well;
The good, the joy which it may bring,
Eternity shall tell.

ACCIDENTS IN THE FAMILY.—*Fractures.*—The most inexperienced eye can often detect that a bone is broken, for sometimes the skin is wounded, the muscles are torn, and the bone is plainly seen, with perhaps one end protruding through the wound; but independent of this, when the skin is not broken, the limb is evidently seen to be deformed, bent, one portion forming an angle with another, and it is obvious this cannot occur without fracture of the bone. But whether a fracture is plainly discerned or only suspected, the treatment to be employed till the arrival of a medical man is very simple. The limb, if it be a limb, is to be laid in the position easiest to the patient: the easiest position must evidently be that in which the limb is, as nearly as possible, in its natural condition, when the broken bone has no weight to support, and the ends of the bones are prevented from rubbing on each other and the surrounding parts. Therefore, if the leg be broken below the knee, the plan is to put the leg and thigh quite straight, while the patient lies on the back; but if left to itself in this position, the foot must evidently fall to one side or the other, and turn one broken end of the bone upon the other, so it is necessary to keep the foot straight up, either by holding it there, or by means of pillows placed along each side of the limb; and it may be convenient to know that, when the assistence of a surgeon cannot at once be procured, very excellent pillows may be formed extempore, by making some large linen bags, and half filling them with sand, previously dried and sifted; one large bag should be laid under the leg from the knee to beyond the heel, and depressions made in it for the calf and the heel; two or three other bags, longer and less broad, should then be laid on either side of the straightened leg; and by this means the limb is kept quiet, and in a convenient position, till such time as the surgeon can arrive and *"set"* the limb by applying splints, which are merely mechanical contrivances, of a less rude kind than the sand pillows described, but serving the same purpose, viz., to keep the ends of the bones together without permitting movement.

Again, when the collar bone is broken, and which may be suspected when the patient cannot raise the hand to the head, it is obviously very important to take off the weight of the arm by means of a sling, and this often gives much relief. A sling should also be used if a fracture of the upper arm is suspected. If a fracture of the lower arm is suspected, the best way is to lie down in bed, and to place the fore arm on the large sand-bag already mentioned, with the arm bent, and the thumb kept up, or, indeed, in any easy position. With regard to all fractures, it is difficult to go wrong, if it be remembered that the principle is to put the limb in the position it would be in were it not broken, and to prevent one end of the broken bone from rubbing upon the other. If the surgeon cannot at once attend, it is often very useful to apply cold water or cold lotions continually to the part, by means of linen rags, to keep down the inflammation, in addition to employing the means just mentioned.

Dislocations.—When a limb is out of its socket, it is advisable to replace it as soon as possible, and therefore medical aid should be immediately sought for; beyond this simple remark we shall say nothing, because without much description it would be impossible to tell when a dislocation had occurred; and even then such imperfect knowledge would be dangerous, as a dislocation might be mistaken for, or complicated with, a fracture, and the remedies necessary for the former would do incalculable mischief to the latter.

Contusions, or Severe Bruises.—In all contusions the dark appearance, and the successive changes of colour which occur in this, are owing to blood poured out from ruptured vessels. In the treatment of contusions, the first thing is to keep down inflammation by means of leeches, cold evaporating lotions (such as one part of spirit of wine and six parts of spirit of Mindererus), and to mitigate pain by laudanum fomentations in the intervals of the applications of the lotions. When the colour begins to change, the absorbtion of the blood may be accelerated by rubbing the part briskly with camphor liniment, or any common stimulating application.

Sprains.—In the treatment of sprains the most agreeable remedy is rest, with constant application of warm flannels dipped in warm laudanum, or warm poppy fomentations; afterward the part may be bandaged with a broad linen roller.

Wounds.—When a severe incised wound (*i. e.*, a cut with a sharp instrument) has been inflicted, and medical attendance cannot immediately be obtained, the attention must first be directed to the bleeding: supposing the wound to be on the arm or leg, if there be a mere oozing, a simple trickling of the blood down the limb, then it will probably soon stop of itself; linen dipped in very cold water may be applied, and it is of great importance to elevate the limb, so that gravity may not assist the flow of blood: thus if the wound be on the leg, the person should lie on the bed, and the

leg be raised high on pillows; if the arm be the part injured, it should be held above the head; but, supposing the flow of blood to be more violent, supposing it to gush out in a large stream, as it would from a large cut vessel, it is necessary to stop such a jet, else so much blood may be lost as to induce alarming fainting; the best plan is to put the finger or fingers boldly into the cut, and press upon the part from which the blood seems to come without any regard to the pain it may give the patient; the finger must not be removed till the surgeon arrive and tie the wounded vessel with a ligature. When the bleeding has stopped, or nearly so, the next object is to bring the sides of the cut into contact, so that they may unite; this is done by means of adhesive plaster, long stripes of which are applied, so as not merely to cover the wound, but to draw its sides together; a very little reflection will easily show any one how a particular cut is to be *dressed*, as the covering it with plaster is technically termed. If the wound be not merely a simple cut, but complicated with a severe bruise, the straps of plaster must not be firmly applied, the sides of the cut must not be forcibly pulled together; indeed if the contusion be very great, and the bleeding moderate, it may be better not to apply plaster at all, but to use warm poppy fomentations for twenty-four or thirty-six hours, or to apply a bread and water poultice.

Scalds and Burns.—*Scalds*, when caused by boiling water, will, it is obvious, be always the same degree of severity; directly a scald has happened, it is advisable to prevent the action of air upon it, and this is done by sprinkling it thickly over with flour, or covering it with cotton wool, which must not be removed till the scald is well, which will be probably in ten days or a fortnight. When scalds are caused by water not boiling, the lead liniment recommended for slight burns is the best application.

Burns, are much more difficult to treat, as they may be of very different degrees of severity; in the slighter kinds, in which there is merely redness and blistering of the skin, cotton wool or flour may be used, as in scalds; or the following liniment may be constantly applied, viz.:—Take of undiluted Goulard's solution of lead (liq. plumb. diacetatis), ½ ounce; olive oil, ½ ounce; water, 8 ounces; mix the oil and lead solution, shake them well together, and add the water; make a liniment, to be applied by a camel's hair brush to the burned places, or spread upon linen and applied to the parts.

If the burn be more severe, and if a part or the whole of the substance of the skin be destroyed, the turpentine liniment is preferable; if this cannot be obtained from a druggist, then flour should be applied as before. When flour is used to burns and scalds, and the part is kept quiet, the pain soon ceases. If after a burn the face be deadly pale, and the pulse unfelt, a tea-spoonful of wine or brandy, according to the age of the child, should be given from time to time.

Means to be used in Recovery from Drowning and Suffocation.—When a person has been taken out of the water, and is insensible, he should be conveyed as speedily as possible to the nearest house or cottage; but if there be no residence near, that is to say, within two or three minutes' walk, it is necessary to use the measures for restoring animation on the spot; although recoverable when taken from the water, the patient may die in ten or fifteen minutes' transit, for want of certain necessary measures. It is necessary that every body should know that death occurs in drowning because the water prevents the entrance of air into the lungs; the small quantity of water which gets into the lungs is of no consequence, and still less that which passes into the stomach, which occurs during life, or if the body be not drowned alive; consequently, the direction sometimes given in old books of holding the head down, in order to *drain off* the water, is not only useless, but positively hurtful; but if death occurs from the want of air, it is obvious that the thing needful is to restore air to the lungs as fast as possible, and this is done by artificial inflation. The patient should be laid in the bed, and hot bottles may be applied to the feet; but while these are getting ready inflation must, if possible, be commenced: in the absence of a regular apparatus, it can be readily performed with a pair of bellows; one person should close the mouth, and one the nostril of the patient very accurately, and in the open nostril the muzzle of the bellows should be inserted by another person; then the nostril should be pressed round the muzzle, so that when the air is blown it may pass *through* the nose, and not out into the apartment; directly the position is rightly attained, the bellows must be worked, and the air from them will pass into the lungs; the blowing must be very gentle, else some harm may be done to the structure of the lungs; the rising of the ribs will at once announce that the chest is filled with air; then the bellows must be removed, the mouth and nose opened, and the abdomen and ribs pressed upon so as to expel the air; then the bellows must be used again in the manner described, and the series of changes persevered in for a long time, or till recovery occur; during this time warmth may be applied by means of hot bottles, friction, &c. When a house is some way off, and the bellows cannot be procured, inflation may be performed by any person closing the nostrils of the insensible man, and then applying his mouth that of the patient and blowing into the lungs, then pressing down the ribs as before to expel the air, and then blowing in again. Before the operator breathes air in, he should make three or four deep inspirations and expirations, so as to change the air in his lungs, and get it as like atmospheric air and as free from carbonic acid gas as possible. These means should be persevered in for a long time; hope should not be given up, for recoveries have occurred under very untoward circumstances.

Suffocation.—In many cases the inflation described above is the remedy applicable here also: thus, if a person be suffocated in a brewer's vat, or by any mephitic gas, the body should be brought into the air, and the above-mentioned process immediately be had recourse to; medical aid, of course, will always be speedily obtained.

[For the recovery of persons drowned, or suffocated by non-respirable gases, experience has shown that to throw suddenly and violently several buckets of water successively against the spine is a mode of concussion which will be found successful if life be not extinct. This method of treatment is of vastly more importance than the inflation of the lungs by bellows, rolling the body upon a barrel, &c., neither of which can be relied on with half the certainty of resuscitation. So soon as by this method the signs of life become unequivocal, by commencing respiration, groans, or involuntary motions of the head or limbs, indicating sensibility to the concussion upon the spine, the body should be wrapped in blankets, and heat applied, as directed in the foregoing section.]

THE SCENERY ON THE ST. LAWRENCE.—Lofty and foaming are the surges which a gale of wind raises on the wide surface of Lake Ontario. The traveller from Toronto to Kingston is quite as liable to certain disagreeable sensations as his friend on board the Atlantic liners. After a night of decided misery, how delightful it is to rise out of bed, ascend to the hurricane deck of the mail steamer, and find her ploughing her way through calm waters between those lovely wooded islands which defend the quays of the latter city from the swell of the lake. Kingston is situated on an imposing eminence at the point where the majestic St. Lawrence flows out of Ontario in a stream twelve miles

wide. The morning was without a cloud, the sun pouring down his rays from a summer sky, as we steamed past the batteries of Fort Henry and entered the region of the "Thousand Islands." The river, of great depth, yet clear as a Highland stream, reflected the foliage of the trees in its glassy surface, and gently laved the rocky banks with the waters which were displaced by the revolving paudle-wheel. This archipelago, it is said, contains 1,500 islands, a considerable number of which are low and densely wooded, but the greater part are composed of bold cliffs, rising abruptly from the water's edge in most romantic forms. The caverns and grottoes, the deep arborvitæ groves, the natural quays of rock, the pine woods, the odoriferous banks of wild flowers, the maple shades, the creeks and capes and promontories of these islets, vividly recalled to our mind the descriptions of Fairyland, that mysterious paradise which filled us with such varied emotions in the days when we were young. Well might the wandering Algonquin steering his canoe in these channels, before the white man drove him to the north, murmur a prayer to the Great Spirit that he would inhabit a like lovely region for ever after death. On passing this Canadian Eden, the scenery of which is unequalled on any of the American rivers, the St. Lawrence contracts to about two miles in width, and flows on majestically between well cultivated banks. This is the only part of the frontier where the provincials can bear comparison with their democratic neighbours in point of enterprise and prosperity. The British villages are actually about as populous as those on the American side. Brockville and Prescott are thriving little towns, rivalling even the bustling Ogdensburg, a place of considerable trade in the state of New York. The appearance of the river here is truly magnificent, as it sweeps swiftly along in one unbroken stream of crystal-like purity more than a mile and a half wide. A very short way farther down the channel contracts again, the current becomes stronger, and a certain bustle on board the steamer warns the passengers that "the rapids are near." A sudden bend, meanwhile, revealing the commencement of the Galop Falls, the least important of the obstructions to the navigation. Not many miles below them, a strong force of sailors again musters at the wheel, the waters acquire renewed vigour, and the steamer, like an Indian on the track of his enemy, darts down the splendid rapids of Long Sault. Away she goes on the top of the angry billows, scarcely avoiding the sharp pinnacles of rock which rise out of the foam in frightful proximity to the vessel. Dark forests nod funereally over the boiling waters, which are now tossed aloft by some sudden rock, and anon rush with fearful impetuosity in the circle of a whirlpool. Several islands divide the river at this point, on passing each of which a momentary glance is obtained of the roaring cataract beyond them. The quiet surface of the Lake St. Francis, an expansion of the river below Cornwall, affords a striking contrast to the stormy scene above. Here you meet the upward bound steamer, and pass the rafts of timber on their way to the depot at Quebec. At Coteau du Lac, the roar of angry waters again is heard, and the frail bark once more quivers under the buffeting of the waves. The exciting rapids called the Cedars and the Arcades follow in quick succession. At one spot during the descent of the former, there is a whirlpool close to the navigable channel, into which a single erroneous turn of the helm would hurry the vessel, to be dashed in a few moments to a thousand pieces. What a sublime spectacle it is to witness the fury of the impeded waters from the deck of the steamer, as she pursues unscathed her serpentine course in the midst of danger! At Lachine, on the opposite side of the Lake St. Louis, the traveller disembarks, and after a short ride comes in sight of the lofty towers, which proclaim to the inhabitants of wide spread plains, that the exiles of the Roman Catholic Church are predominant at Montreal.—*Correspondent of the Scottish Press.*

A Bivouac in Canada.—Baptiste, halting, strikes his axe in a tree, and tells us we shall in that spot spend the night. Whereupon the half-breed and the Canadian, leaving their tabogins, cut a couple of splinters out of the next pine, which, with their axes, they fashion into rude spades, and clear a space in the snow about twelve feet square, and three or four in depth. Meanwhile Baptiste has cut down some firewood, which is laid across the middle of the space, and has also, by some inscrutable means, discovered a spring in the neighbourhood, from which the kettle is filled, and hung over the fire depending from a long stick, the further end of which is thrust in the snow. Jenkin and I have employed ourselves in cutting down all the young fir-trees—*sapins*, the Canadians call them—within reach; and stripping off the branches, which look like plumes of green ostrich feathers, we strew them on each side of the fire for a bed, stick some around the snow walls of our residence to act as tapestry, and thatch a small roof overhead, to keep off falling snow, with the remainder. The space on one side of the fire is allotted to our retainers, the other to us; and, spreading a buffalo robe over the sapins, we lie down and change our wet mocassins and leggings; then we unpack the tabogins and pile our provisions around—the flour, biscuit, coffee, pepper, tea and coffee, butter, and onions. We had brought a small keg of brandy with us, which was always stuck in the snow over Jenkin's head. Boniface makes pea soup; Da Fini fries pork and onions in the pan; we unpack our canteen and get our knives and forks ready. But Jenkins and I hated fat pork like a couple of rabbis, but we managed, notwithstanding, to make a dinner; and then, tired with our unusual exertions, rolled ourselves in our blankets, stretched our feet to the fire, and slept like tops, leaving our three friends jabbering and eating on the other side of the fire in full vigour.—*Fraser's Magazine for January.*

Killing a Moose-Deer.—When we had gone about four or five miles, Baptiste suddenly stopped, and, pointing to the snow, uttered the word "*Ravage.*" We all rushed eagerly up, and there, in the snow, were the tracks of the huge animals—a deep furrow, indented every foot or so with the print of their hoofs. Instantly our guns were loaded, and off we went like maniacs, Baptiste leading, the rest scrambling and panting along, sometimes losing a snow-shoe, and stooping to tie it (no easy matter when the strings and your fingers are both frozen), sometimes slipping into some treacherous hole. At last the Indians stopped, and looked round at us with a face of disappointment, which, on reaching him, was easily accounted for; for a line of snow-shoe tracks came up from another direction, and then went off on the *ravage*—we had evidently been forestalled. Very crest-fallen and ill-tempered we followed in their path, to have the melancholy satisfaction of discovering the authors of our disappointment—our "infernal sell," as Jenkins called it—expecting to find them cutting up their game. But while running on the tracks we saw a fire to the left, and, going up to it, found two ragged Irishmen sitting by it broiling venison. They told us they had killed the moose, two in number, half a mile further on, and had returned here to encamp. Neither of them had a hat, and their clothes were too thin and ragged to defend them even from the cold of the same season in England; yet, thus insufficiently clad, the hardy fellows had ventured into the forest to take Winter, in his sternest mood, by the beard. Jenkins was very indignant at the "bogtrotting rascals," as he called them, daring to kill "our moose,"

and uttered some sentiments on the occasion, quite in unison with the conqueror's forest laws. However, his bark was worse than his bite, for he presently proposed giving the said bogtrotters a horn each of grog, which the poor fellows were very glad of; greatly to the disgust of Mr. da Fini, who had conceived a violent hatred towards the unfortunate men, and scowled at them like a demon: his indignation afterwards reached a climax on our giving them peas to make soup.—*Ib.*

Food of the Chinese.—A late traveller Mr. Williams, contradicts the popular impressions that kittens and puppies are an ordinary food of the Chinese. He says:

"A few kittens and puppies are sold alive in cages, mewing and yelping as if in anticipation of their fate, or from pain caused by the pinching and handling they receive at the hands of dissatisfied customers. Those intended for the table are usually reared upon rice, so that if the nature of their food be considered, their flesh is far more cleanly than that of the omnivorous hog; few articles of food have, however, been so identified with the tastes of people as kittens and puppies, rats and snails, have with the Chinese. The school geographies in the United States usually contain pictures of a market-man carrying baskets holding these unfortunate victims of a perverse taste, (as we think) or else a string of rats and mice hanging by their tails to a stick across his shoulders, which almost necessarily conveys the idea that such things form the usual food of the people. Travellers hear beforehand that the Chinese devour every thing, and when they arrive in the country, straightway inquire if these animals are eaten, and hearing that such is the case, perpetuate the idea that they form the common articles of food.—However commonly kittens and puppies may be exposed for sale, the writer never saw rats or mice in the market during a residence of twelve years there, and heard of but one gentleman who had seen them; in fact they are not so easily caught as to be either common or cheap. He once asked a native, if he or his countrymen ever served up *lau-shu-tang*, or rat-soup, on their tables; who replied, that he had never seen or eaten it, and added, 'Those who do use it, should mix cheese with it, that the mess might serve for us both.' Rats and mice are, no doubt, eaten now and then, and so are many other undesirable things by those whom want compels to take what they can get; but to put these and other strange eatables in the front of the list, gives a distorted idea of the every-day food of the people."

Wonderful Discovery.—We find in the *Boston Atlas* an interesting communication from a correspondent in the copper mine region of Lake Superior. One of them details some remarkable discoveries which have been recently made a few miles interior from the mouth of the Ontonagon River:—"A large mass of native copper, the weight estimated at seven tons, was found in the loose ground. A vast amount of labour had been expended upon it. Every inch of it had been battered and hammered over, and attempts had been made to pry it up, and place it on a platform. All this was the labor of a race of beings long since passed away. There is too much skill manifested for the present race of Indians, and yet the workings are too ancient to be those of white men. Many loads of rude stone hammers are found buried below the surface—are abundant proofs that in stoning up a cellar, it was found more convenient to use them than to throw them out. Hemlock trees, two feet in diameter, and, from examination, two and three hundred years old, are growing over the workings, and have to be felled to enable the miners to excavate the earth. Remains of charred wedges, and levers, and copper gads, are found under these trees and under the principal mass. These ancient workings can be traced for more than half a mile through the forest, and an expenditure of $50,000 at this time would not pay for the accomplishment of the like amount of labour. Their great antiquity would seem to carry us back to other times. Yet it is not impossible that the present Indians may be the descendants of those who wrought them."

Benefits of Machinery.—Fifty years ago wages were no better, in fact less, than at the present day, and comforts and luxuries of life were far more difficult to obtain. Articles needed by the poor man, cost in those days of comparative freedom from machinery, from twice to three times what they do now, and often more, and you will find that the greatest reductions are in those articles to which machinery has been most successfully applied.—There is no article of luxury or comfort to which machinery has been extensively and successfully applied, of which the poor man cannot now get more for a day's labour than he could before such application of machinery. Salt is now less than one-third; iron less than one-half; shirting and calicoes and cloth generally from one half to one fourth; pins, needles, shoes, hats, everything in similar proportions.

Forty years ago, such articles of use or ornament as locks were scarcely known, and could be afforded by the rich only. Farmers' waggons were chiefly sleds; their houses, cabins; their chairs, stools and benches; their bureaus, pins drove in the wall or poles hung across; and their windows often an old sheet or blanket.—Nails and glass cost money in those days, and labour commanded little.

Since machinery has been applied, better roads, turnpikes, railroads—all of which are a species of machinery—have been constructed. Steam has been made to propel the boat and the great ship, and to give power to the mill, to the jenny and the loom. Production in many articles has been more than trebled, and everything the labourer needs has fallen, while his wages have risen or remained stationary. The clock, which the farmer had not and could not afford, now adorns the mantel of his poorest tenant, and summons him to his meals.

There have been less improvements in agricultural implements than in machinery for manufacturing purposes—but this is the age of improvement. Let machinery be applied to husbandry also. Let bread and meat be as cheap as clothing, and if the distributing is not as equal as it might be, let us rejoice that if the rich man has more, so also the poor man has much more.

The cottager has now, by the aid of machinery here, what great kings have not in Africa, and what the kings of England had not before the introduction of machines. The great Alfred sat upon a three-legged stool, while many an English or American tenant now reclines on a gilded sofa. If the poor of England and America are not so well off as they should be, machinery is not at fault. It has saved them from much greater misery, and the reforms which they need are chiefly governmental and social.—*Scientific American.*

Stone Cutting.—Mr. C. Wilson has invented a new stone cutting machine, propelled by steam, and said to be capable of doing the work of 100 men. Only one has been made, and that is in use at New Haven. It is thus described: "The cutting instrument is simply a half-dozen circular saws fastened firmly by an axle running through the centre. These saws are made very hard, and the teeth rather larger than the ordinary size. When firmly adjusted, it is forced rapidly over the surface of the stone, smoothing it very evenly."

Editors' Notices, &c.

TORONTO NURSERY.—We beg to call the attention of our readers to Mr. Leslie's advertisement in our advertising columns. Having an extensive stock of the various kinds of fruit trees, of the best varieties adapted to this climate, the genuineness and proper naming of which may be depended upon, together with the usual assortment of ornamental trees, shrubs, flowers, &c., we consider the enterprising proprietor of the Toronto Nursery highly deserving a large share of the patronage of the Canadian public. Mr. Leslie has unfortunately sustained a heavy loss by the recent burning of his extensive green-houses; notwithstanding, we are happy to be informed that he will still be able to execute any orders with which he may be favoured. We hope that so laudable a spirit of private enterprise, combined as it is in a new country with a large share of public utility, and promotive of the ornamental and beautiful, will not fail to receive its just measure of reward.

W. M. P., Cornwall.—Remittance—papers forwarded, with thanks for his friendly co-operation.

G. L., on the Cultivation of Asparagus; too late for the present number.

LEICESTERENSIS.—In consequence of the late arrival of your valuable communication, we must defer it till our next. Many thanks for your good wishes and exertions on behalf of the Agriculturist.

SKIRVING'S SWEDE TURNIP.—This valuable variety, so highly esteemed in England, may now be obtained, for the first time in Canada, at Lyman, Kneeshaw & Co.'s, of this city, who have just received their usual stock of garden and agricultural seeds direct from England.—See advertisement.

VENTILATION.—We beg to acknowledge the receipt of Mr. Sheriff Ruttan's interesting work on this important subject, which shall receive a notice in our next.

C. B., Cobourg.—The first parcels were sent to the stage office to be taken in charge by Mr. Ruttan, who was returning home. But it was found he had left, and he gave no instructions as to how they should be sent, and thinking they might miscarry or be injured, we thought it best to send them in the usual way by post. The last No. was sent by stage in a box.

C. P. J., Clarke.—Your communication on ploughing was received and laid by for correction, and when given to the printer, sufficient matter had been set up for this No. It shall appear in our next.

T. C., Guelph.—Remittance—your communication in our next.

J. R., Three Rivers.—Request attended to.

H. W., Wellington Square.—Remittance received.

N. N., Peterboro'.—ditto, ditto.

R. Y., Port Sarnia.—papers sent according to your directions, though from the difficulty of making out some of the names, it is probable errors will occur.

CORRESPONDENTS will know that their letters have been received, by the receipt of their papers, as we send to none but those who order them. It is unnecessary, as well as impossible, to notice the receipt of every letter; only those requiring reply, will be noticed in this place.

AN OLD COUNTRYMAN.—Thanks for your useful hints, and friendly wishes; the subject of *draining* is, as you say, "of the utmost importance, and forms the foundation of all agricultural improvement." We will take up the question in its details, at our earliest convenience, giving the results of our experience in reference to the *principles* of draining, expence, and the effects produced. In the meantime, we should be glad to be favoured with the opinion of such of our readers, as have practised draining in this country.

STATE OF THE MARKETS.

ENGLAND.—The *Canada* brings news from Europe, to the 10th of March. *The British grain markets* were dull, and prices looking down. Importations continued larger. Wheat from 6s. 10d. to 7s. 2d. per bushel of 70 lbs. *Flour, 25s. to 25s. 6d. A fair* trade doing in American cured provisions. We hear from correspondents, that in several parts of England the wheat was *looking indifferently, suffering from the* devastations of slugs, wireworm, &c. The winter had been mild and open. Much distress in the hop districts, *arising chiefly from unprecedentedly depressed* prices. Hops, 40s. to 50s. per cwt. Great efforts are being made for the repeal of the malt and hop duties, the influence of which is now *felt to be seriously oppressive.* Butcher's meat lower than for many years; from 2s. 6d. to 3s. 9d. per stone of 8 lbs. Upon the whole, *the present condition of the British farmer,* under the free trade policy, seems gloomy enough.

NEW YORK, March 27.—Flour dull, with downward tendency; $5.27. to $6.25. per barrel. Wheat, $1.12. to $1.30. per bushel. Rye, 60c. Corn, 50c. to 57c. Oats, 33c. to 35c.

MONTREAL, March 27.—*Nothing* of importance doing. Sale of Flour to a small extent at 23s., to be delivered in May.

TORONTO, March 29.—*But little* wheat or other kinds of grain has come into this market for some time past, owing chiefly to the state of the roads, occasioned by the breaking up of the frost; yet the supply is sufficient. Prices may be said to have a downward tendency. The ice is fast breaking up in the bay, and our steamboats will be put on their different routes in a few days. Let us hope that the approaching season may restore to us a large share of our wonted animation and prosperity.

TORONTO MARKET.

MARCH 29, 1849.

Flour, per barrel of 196 lbs.	16	3	@	21	3
Wheat, per bushel	3	6	@	4	6
Oats, per bushel, 34 lbs.	1	0	@	1	2
Barley, per bushel, 48 lbs	1	8	@	1	10½
Rye, per bushel, 56 lbs.	3	0	@	3	4
Pease, per bushel, 60 lbs	1	6	@	2	0
Potatoes, per bushel	2	2	@	3	0
Beef, per 100 lbs.	12	6	@	20	0
Pork, per 100 lbs.	17	6	@	20	0
Bacon, per cwt.	25	0	@	30	0
Butter, in kegs, per lb.	0	6½	@	0	7½
Butter, (fresh) per lb.	0	7½	@	0	9½
Turkeys, each	2	6	@	5	0
Fowls, per couple	1	8	@	2	0
Eggs, per dozen	0	5	@	0	7
Hay, per ton	40	0	@	55	0
Straw, per ton	25	0	@	30	0