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THE FARMER AND MECHANIC,

Devoted to Agricultural, Horticultural, Mechanical, and Domestic Subjects.

Vol. I. TORONTO, CANADA WEST, AUGUST, 1849. No. 11.

Agriculture.

The best Period for Sowing Wheat.

Since the prevalence of the Hessian fly, early sown winter wheat has suffered more severely from the effects of that insect than late sown: hence, many have been induced to sow later than they were formerly in the habit of doing. The loss sustained by this practice has been equal, if not greater, from the influence of rust, and damage by winter frosts, than any advantage that might have been gained by the consequent evasion of the insect. The severity of a Canadian winter, especially when the ground has not been covered by snow, has proved the best preventive against the fly that has yet been discovered. This applies particularly to the Hessian, which deposits its larvæ in the autumn, upon the young wheat plants.—Early sowing is clearly the most judicious course to pursue; and we would recommend, in all cases where it is practicable, that the business of sowing should begin as early as the 25th of August, and not be continued at farthest later than ths 15th of September. By sowing in August, some risk may be sustained by the plants throwing out *stov* before the setting in of winter, and also from the smothering influence of heavy falls of snow. But the damage thus sustained, in an average of cases, is trifling, when compared with the advantages attending early sowing, so that no one would be justified in protracting the period of sowing on those accounts beyond the above mentioned.

For a number of autumns past, winter wheat might have been safely sown as early as the 15th of August. In sowing at so early a period, the crop should be fed down with calves, colts, and other stock, that would not eat the plants so close to the ground as to affect their vitality. Where this practice is observed, the stock must not be allowed to remain on the crop during the period of protracted rains, as there would be a danger of the land becoming poached with the feet of the cattle, whereby the crop would receive greater damage than any benefit that could be produced by early sowing.

It would be well for those who have been unfortunate in cultivating winter wheat to make an experiment in early sowing, and at the same time deposit the seed in rows, from eight to ten inches asunder, either by the ribbing or drilling process. The quantity of seed sown might also, on many soils, be at the rate of two bushels per acre, with advantage, but this can only be decided by actual, practical experiment.

Early sowing, drilling, and thick sowing, after the manner described in the foregoing suggestions, deserve at the hands of every Canadian farmer a fair and impartial trial, especially those whose wheat crops have become more or less affected with rust, that great bane to nearly all American wheat growers.

Selection and Preparation of Seed Wheat.

In examining the growing crops of wheat, about the middle of July, when the plants are in full head, a careful observer must be struck at the vast difference in fields owned by different proprietors, with respect to the purity of the varieties sown; and also as to the presence or absence of chesa, rye, cockle, and other impurities calculated to depreciate the marketable value of the article. If there is one point more than another, in the management of farming, that requires close and vigilant attention, it is that of selecting the best varieties of grain for seed; observing, at the same time, to keep each

variety distinct, and entirely free from other grains and noxious weeds. If care, in this respect, be observed, and the soil be in a tolerably clean state, the doctrine of transmutation of grains would very soon be disposed of at a great discount. A pretty certain means of avoiding an evil is, "to shun the very appearance of it." Now, this excellent rule will hold good as to the assorting and selecting pure varieties of grain for seed. It is quite certain, if an impure variety of wheat be sown, mixed with a pretty fair proportion of rye, chess, and cockle, that a similarly impure article will be harvested, combining, in the mixture, more than the farmer bargained for, of rye, chess, and cockle; the reason for which may be obviously attributed to the fact, that these plants are more hardy and prolific than wheat, and hence, where any considerable portion of the wheat plants are destroyed by frost, or other causes, the inferior grain sown takes the place of them. Chess, as a plant, is as distinct in variety as are wheat, rye, and oats; and when it is sown with the seed wheat, or previously exists in the soil, an abundant yield may be confidently expected. Chess is as capable of enduring the rigour of a Canadian winter and spring as are the plants of timothy grass.

If seed wheat be entirely free from smut, it is scarcely necessary to wash in brine and lime it, to destroy this destructive fungus: in that case, simply mixing newly-slaked lime with the seed, before sowing, would answer the required purpose. But as very little of such pure seed is sown, it would be a judicious expenditure for our farmers to wash the entire quantity of wheat sown, in a brine sufficiently strong to bear up a fresh egg; after which, the entire mass should be dried on the barn floor, mixing with it a sufficient quantity of fresh-slaked lime, to assist in drying the wheat that had been thus put thro gh the purifying process. When the forego ng suggestions have been prudently followed out, a pure sample of wheat, free from smut, may be confidently expected.

Farmers, save your Straw.

It is a common practice to thrash out a large portion of a wheat crop directly after harvest, by those who live so convenient to market that they can speedily deliver it, so as not to seriously affect the autumn seeding, and other labour on the farm. By thrashing out a pretty large proportion of the wheat crop, so as to push it into market during September and the early part of October, the exporting merchant will have no difficulty in being able to make his shipments and get returns, in the short period of from three to four months, and frequently this may be effected much sooner. When there is a certainty that business may be thus done with promptness, a respectable export merchant will find no difficulty in effecting a loan from our banks, to any reasonable amount, for the purchase of the leading articles of export. That class of customers, from the first establishment of banks in the Colony, have had the preference over all others. This, to some extent, has been an advantage to the rural population, who have been unfortunately, in other respects, shut out of the money market, owing to the peculiar genius of our banking institutions, and the existense of absurd and useless laws on our statute books affecting the legal rate of interest. But bankers, for their own purposes, have conceived it most advantageous to have the principal portion of their capital employed in the purchase of wheat, flour, pork, and lumber, and the farmers have, doubtless, derived benefit from such a policy. This has been, and will continue to be, a much greater advantage to them than at first sight might be supposed. The competition created in our markets, from the superior facilities for obtaining money to

speculate in wheat and flour, and the prospect of immediate returns, induce those engaged in the business to pay the outside value of the article. The farmers by this means are enabled to get for their wheat full value, and not unfrequently more than it is worth. Besides, they derive an advantage from the use of their money at a much earlier period than if those facilities were not held out to them.

With all these advantages, it must not be forgotten that care should be taken to husband the straw made on the farm, as a means of keeping the cattle in comfort during winter, and for the purpose of increasing the manure heap. Although it may require some little time and trouble to carefully stock straw, yet no careful farmer will reglect this important matter.

LABOUR WELL APPLIED IS PRODUCTIVE OF PROFIT.

FARMERS should ever bear in mind that "well directed labour" will ensure its reward. Of all classes of men, there is none upon whom this truth needs to be enforced more than the farmer. How many of our farmers are year after year toiling on, overwhelmed with their business on an immense estate, and at the close of the year the accounts are about balanced, and again the same toil and vexation must be renewed. If right directed effort had been put forth, no more land farmed than could be done to perfection, what a saving of labour, what an increase of profit, what a reward in every point of view, would be received! In travelling through the best farming districts of this country, we often find illustrations of this truth most striking.

I have in my eye a farm of medium size, which, a few years since, was any thing but neat and in order, and which gave sad indications that labour had not been "well applied." But a change has come over this scene. A new occupant takes possession, fixed in his principles—determined that he would carry out this great maxim, on which depends the prosperity and success of the farmer, that "What is worth doing, is worth doing well." Now how soon the farm begins to assume a new appearance. The fences are repaired, the land is drained where needed, the buildings are neatly repaired and arranged; manures are obtained best suited to the soil, and crops which are adapted to this region; a new and improved stock of cattle, sheep and swine are secured, and in short every thing characteristic of the good farmer appears year after year, under the direction of him who knows how to *apply labour*. Instead of having, at the end of the year, to resort to loans to make up the deficiencies, this same farm yields a return that gladdens the heart of the farmer. As years roll on, each succeeding one finds a larger balance in favour of well directed labour; and now, in addition to the ordinary appendages of a farm, there is reared, out of the profits of this well-regulated concern, a neat and tasty cottage, in the midst of shrubbery the most tasty and luxuriant—alll the work of him who started with the determination to do all things well. And this is not all, as the well regulated expense book is balanced a profit which would gladden even the hearts of some of our bankers on the capital invested, is found on hand, to be applied as may best conduce to the comfort and welfare of an interesting family. There is no complaint of means to educate the children. They are brought up practically to appreciate the maxim that "What is worth doing, is worth doing well," and their education prepares them to carry out in all the varied scenes of life this all important but too little practised truth.

Let me then urge upon the farmers who read this paper—and I am glad to know they are many, and among the most intelligent in our land—to put in practice, if they have not already done so, this simple but ef-

fectual method of farm labour, which brings with it the most abundant reward, and without which they will in vain struggle on, never securing the end of their toil. Order is Heaven's first law—and let it be yours in every thing relating to your farm. Remember you belong to a noble profession, and one that is destined to exert a mighty influence on the destinies of a world. As one man, then, let the American Farmers adopt as their motto, "*All things relating to my farm shall be well done*"—and no more should be undertaken than can be thus done—and soon he will be found to occupy that exalted position that will cause his influence to be felt the world over. Surely it cannot be necessary to urge upon the enlightened, the intelligent, the hard working American Farmer, further considerations in support of a principle that must, on a moment's reflection, commend itself to every right-minded, reflecting man.

In the London Gardener's Chronicle I find the following anecdote which the celebrated Robert Bakewell used frequently to relate—he whose name is familiar to almost every one for his extraordinary success in breeding cattle and sheep, and to whom probably Great Britain as well as this country owes as much as to any one individual, for that system of breeding which has secured the choice breeds of animals which are now to be found. It is to our purpose, as it gives the history of an old farmer, and one of olden times too, who was renewed by adopting the principle laid down as the heading of our article—"Labour well applied is productive of profit."

Mr. Bakewell said: "A farmer who owned and occupied 1000 acres of land, had three daughters. When his eldest daughter married, he gave her one-quarter of his land for her portion, but no money; and he found, by a little more speed and a little better management, the produce of his farm did not decrease. When his second daughter married, he gave her one-third of the remaining land for her portion, but no money. He then set to work, and began to grub up his furze and fern, and ploughed up what he called his poor, dry, furze land, even where the furze covered, in some closes, nearly half the land. After giving half his land to two of his daughters, to his great surprise he found that the *produce increased*; he made more money, because his new broken up furze land brought excessive crops, and at the same time he farmed the whole of his land better, for he employed three times more labourers upon it; he rose two hours sooner in the morning; had no more dead fallows once in three years—instead of which he got two green crops in one year, and ate them upon the land. A garden never requires a dead fallow. But the great advantage was, that he had got the same money to manage 500 acres as he had to manage 1000 acres; therefore, he laid out double the money upon the land.

"When his third and last daughter married, he gave her 250 acres, or half that remained, for her portion, and no money. He then found that he had the same money to farm one-quarter of the land as he had at first to farm the whole. He began to ask himself a few questions, and set his wits to work how he was to make as much of 250 as he had done of 1000 acres. He then paid off his bailiff, (who weighed 20 stone,) rose with the larks in the long days, and went to bed with the lambs; he got as much more work done for his money; he made his servants, labourers and horses move faster; broke them from their snail's pace; and found that the eye of the master quickened the pace of the servant. He saw the beginning and ending of every thing; and to his servants and labourers, instead of saying, "Go and do it," he said to them, "*Let us go and do it my boys.*" Between *come* and *go* he soon found a great difference. He grubbed up the whole of his furze and his

ferns, ploughed the whole of his poor grass land up, and converted a great deal of corn into meat for the sake of the manure, and preserved his black water, (the essence of manure;) cut his hedges down, which had not been plashed for 40 or 50 years; straightened his zig-zag fences; cut his water-courses straight, and gained a great deal of land by doing so; made drains and sluices, and irrigated all the lands he could; he grubbed up many of his hedges and borders covered with bushes, in some places from ten to fourteen yards in width, and threw three or more closes into one. He found out that instead of growing white-thorn hedges and haws to feed foreign birds in winter, he could grow food for man instead of birds.

"After all this improvement, he grew more and made more of 250 acres than he did from 1000; at the same time he found out that half of England at that time was not cultivated, from the want of means to cultivate it with. I let him rams, and sold him Long Horned bulls," said Mr. Bakewell, "and told him the real value of labour, both indoors and out, and what ought to be done with a certain number of men, oxen, and horses within a given time. I taught them to sow less and plough better; that there were limits and measures to all things; and that the husbandman ought to be stronger than the farmer. I told him how to make hot land colder, and cold land hotter, light land stiffer, and stiff land lighter. I soon caused him to shake off his old prejudices, and I grafted new ideas in their places. I told him not to breed inferior cattle, sheep, or horses, but the best of each kind, *for the best consume no more than the worst.* My friend became a new man in his old age, and died rich."

Is it not true, that "Labour well applied is productive of profit?"—[Genesee Farmer.

SPOKEN AGAINST.—What if people do speak against you? Let them feel that you are able to bear it. What is there gained by stopping to correct every word that is whispered to your discredit? Lies will die, if left alone. Slander never kills a sterling character.

Plants and Seeds.

Few things appear to me more curious than the fact, that the seeds of various plants and flowers, which have lain dormant in the ground through a succession of ages, have vegetated on being exposed to the air, or have been brought into action by the application of some compost, or manure, agreeable to their nature.

This was shown in trenching for a plantation a part of Bushy Park, which had probably been undisturbed by the spade or plough since the reign of Charles I., or still longer perhaps. The ground was turned up in the winter, and in the following summer it was covered with a profusion of the tree mignionette, pansies, and the wild raspberry, plants which are nowhere found in a wild state in the neighbourhood; and, in a plantation recently made in Richmond Park, a great quantity of the foxglove came up after some deep trenching. I observed a few years ago the same occurrence in a plantation in Devonshire, the surface of which was covered with the dark-blue columbine. A field also, which previously had little or no Dutch clover upon it, was covered with it after it had been much trampled upon and fed down by horses; and it is stated, from good authority, that if a pine forest in America were to be cut down, and the ground cultivated, and afterwards allowed to return to a state of nature, it would produce plants quite differed from those by which it had been previously occupied. The *Hypecoum procumpens* was lost in the Upsal garden for forty years, but was accidentally resuscitated by digging the ground in which it had formerly grown. A species of *Lobelia*, which had been missing for twenty years in the Amsterdam garden, was unexpectedly recovered in the same manner. There is a very curious

account in Monson's Preludia Botanica, of the appearance of a species of mustard, *Sisymbrium Iris*, after the fire of London, and another species, *Sisymbrium Panonicum*, made its appearance suddenly among the ruins, after the fire of Moscow, and continues abundant there ever since. A gentleman tells me that he saw a crop of barley where oats had been sown, in Glamorganshire, and the farmer assured him that the ground had not been stirred before for thirty years. A similar circumstance occurred in Scotland. So completely, indeed, is the ground impregnated with seeds, that if earth is brought to the surface, from the lowest depth at which it is found, some vegetable matter will spring from it. I have always considered this fact as one of the many surprising instances of the power and bounty of the Almighty, who has thus literally filled the earth with his goodness, by storing up a deposit of useful seeds in its depths, where they must have lain through a succession of ages, and which only require the energies of man to bring them into action. In boring for water lately, at a spot near Kingston-on-Thames, some earth was brought up from a depth of three hundred and sixty feet; this earth was carefully covered over with a hand-glass, to prevent the possibility of any seeds being deposited upon it, yet in a short time plants vegetated from it. If quick-lime be put upon land which, from time immemorial has produced nothing but heather, the heather will be killed, and white clover spring up in its place.

The care which is taken to supply the ground with those seeds which, being of a farinaceous nature, would not preserve their vital powers through a succession of ages, as other seeds do, is very curious. Many of them are deposited by crows, and other birds and animals. The Rev. Mr. Robinson, in his Natural History of Westmoreland and Cumberland, says, that "birds are natural planters of all sorts of trees, disseminating the kernels upon the earth, till they grow up to their natural strength and perfection." He tells us, that early one morning he observed "a great number of rooks very busy at their work, upon a declining ground of a mossy surface, and that he went out of his way on purpose to view their labour. He then found that they were planting a grove of oaks. The manner of their planting was thus:—They first made little holes in the earth with their bills, going about and about till the hole was deep enough, and then they dropped in the acorn, and covered it with earth and moss." "The young plantation," Mr. Robinson adds, "is now growing up to a thick grove of oaks, fit for use, and of height for the rooks to build their nests in. The season was the latter end of autumn, when all seeds are fully ripe."

Mr. Edwards observes that even the droughts of the autumn contribute to increase and propagate seeds and plants; for, by causing deep chinks or chaps in the earth, the seeds of trees and larger plants that require depth are lodged at proper depths for their growth, and at the same time secured from such animals as feed on them.

Mice bury a great number of seeds for their winter store, many of which vegetate: and some seeds are provided with a sort of down, by which they are carried, with the help of the wind, to great distances; others fix themselves on the ground by means of a glutinous substance attached to them.

It is a curious fact, that more recent deposits of earth, such as peat, leaf-mould, &c., produce little or no vegetable substances, while, as has been shown, soil, from whatever depth it is brought, is impregnated with seeds, which grow freely on being exposed to the influence of light and air.

The coral reefs in the South Seas are first of all covered with marine substances—then with the excrements of birds, in which are undigested seeds, that spring up and flourish in the deposits which have been formed on

the reefs. So various are the ways in which a beneficent Providence has enabled the earth to produce food for the benefit of his creatures, making a small migrating bird, or an insignificant insect, the instrument of his power and goodness.

The influence which particular soils have on the colours of flowers is very curious.—Whoever has attended to the growth of the better sort of tulips knows, that by planting them in too rich a soil, the colours will *run*; and unbroken tulips, that is, new varieties from seed, sooner obtain their perfect colours by being removed from one soil to another. If a common wild primrose is taken up, and the root separated and planted in another soil, the blossom loses its brilliant yellow hue, and becomes of a pale brown or light chocolate colour.

The tendency observed in plants to follow light, which is so necessary for them, makes them display a power approaching to real motion. The following exemplification of this tendency is taken from the Memoirs of the American Academy of Arts and Sciences at Boston.

In the spring, a potato was left behind in a cellar, where some roots had been kept during the winter, and which had only a small aperture at the upper part of one of its sides. The potato, which lay in the opposite corner, shot out a runner, which first ran twenty feet along the ground, then crept up along the wall, and so through the opening by which light was admitted.

Action of Lime.

Chemical investigation has led to the idea that one of the effects of lime, when applied to the soil, consists in its rendering soluble certain mineral substances which are essential to the growth and perfection of vegetation. Granite, trap, and slate contain potash, which is liberated by caustic lime. There is good reason to believe that this action of lime is of great importance, and that in many instances it is one of the principal causes of the increased productiveness which the application of this substance imparts to the soil. The following remarks, from a valuable paper by Professor Johnston, serve eminently to illustrate this subject, and will be read with profit :—

The decaying vegetable matter in the stems, roots, and leaves of plants, which form the so-called humus of the soil, contain a large proportion of the inorganic matter which was necessary to their existence in the living state. As they decompose, this inorganic matter is liberated. By promoting this decomposition, therefore, lime sets free this mineral matter, and provides at once abundant organic and inorganic food to the growing plant. The result of the action of lime is no less important in reference to its fertilising quality than that by which it causes the production of those numerous changes in the purely organic matter of the soil to which I have already adverted.

If the vegetable matter decay rapidly, it will supply in abundance all the materials, both organic and inorganic, which new races of plants require to form their entire substance. If it be in an inert state, or decompose slowly, the food it contains remains locked up, and comparatively useless to vegetation. In quickening the decay of this inert or slowly-decomposing matter, it is easy to see, therefore, how lime should render the land more fertile, and should do so more sensibly where vegetable matter is more abundant.

The mineral and rocky fragments in the soil are acted upon in a similar manner.

Among the early constituents of soils, there often exists fragments of feldspar and other minerals, derived from the granitic and trap rocks, as well as portions of the slaty and other beds from which the soils have been formed, and which, as they crumble down, yield more and more of those inorganic substances on which plants live.

The decomposition of these minerals and rocks proceed more or less rapidly under the conjoined action of the oxygen, the carbonic acid, and the moisture of the atmosphere. But the presence of lime promotes this decomposition, and the consequent liberation of the inorganic substances which the rocks contain.

The silicates of potash and soda are among

the most important compounds which these minerals and rocky fragments contain.—These silicates, after being heated to redness with quick-lime, readily yield a portion of their potash or soda to water poured upon the mixture. The same result follows, but more slowly, when, without being heated, the silicates and the lime are mixed together into a paste with water, and left for a length of time at the ordinary temperature of the atmosphere. It is reasonable, therefore, to suppose, that in the soil of our fields a similar decomposition will slowly take place, when quick-lime is mixed with it. It will take place also, though still more slowly, when lime is added to it in the form of carbonate.

By some, the liberation of potash and soda in this way is supposed to be the most important action exercised by lime in rendering the land more productive. With this extreme opinion I do not agree, though it must be conceded, I think, that in numerous instances a certain amount of benefit must follow from the chemical action it is thus fitted to exercise.

I have spoken of lime as liberating the inorganic constituents of the decaying matter of the soil. The stalks of the grasses, and the straw of our corn-bearing plants also coutain silicates of potash and soda, which lime sets free in hastening the decomposisition of the vegetable matter of which they form a part. Besides liberating, it further decomposes these silicates, as it does those of the minerals in the soil, and sets their potash and soda free to perform those important functions they are known to exercise in reference to the growth of plants. I am inclined to consider this part of the action of lime as of nearly equal importance to vegetation in many instances, with that which it exercises upon the mineral silicates.

While the potash of soda is set free in a soluble state, the lime unites with a portion of silica, forming a silicate of lime of which traces are to be met with in nearly all soils. This silicate, again, is slowly decomposed by the agency of the carbonic acid of the atmosphere and of the soil, as I have already explained when speaking of this compound as one of the causes of the know fertility of soils formed from the decay of trap rocks.

Potash and soda exist sometimes in considerable quantity, in our stiff clay soils, in combination with the silica and alumina, of which they chiefly consist. From their extreme tenacity, the air is in a great measure excluded from these soils, and hence chemical decomposition proceeds in them very slowly. The addition of lime alters their physical character, and, by making them more open, admits the air, and thus promotes its decomposing action upon them. But it acts chemically also, in the same way as it does upon the silicates already spoken of, and thus compels them to give up more freely to the roots of plants those mineral substances by which their growth is to be made more luxuriant.

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Action of Lime on Salts of Iron, Magnesia and Alumnia.—*Salts of Iron.*—Lime, either in the mild or in the caustic state, possesses the property of decomposing the sulphate and other saline compounds of iron, which especially abound in moorish and peaty soils, and in many localities so saturate the subsoil, as to make it destructive to the roots of plants. Sprengel mentions a case in which the first year's clover always grew well, while in the second year it always died away. This, upon examination, was found to be owing to the ferruginous nature of the subsoil, which caused the death of the plants as soon as the roots began to enter into it.

When land is rendered unproductive by the presence of salts of iron, a dressing with lime will bring the land into a wholesome state without other aid than those of the drain and the subsoil plow. If sulphate of iron be the cause of the evil, the lime will combine with the acid and form gypsum, (sulphat of lime,) while the *first* oxide of iron which is set free will, by exposure to the air, be converted into the *second* or red oxide, in which state this metal is no longer hurtful to vegetation.

The drain and the subsoil plow are useful auxiliaries to the lime in lessening the injurious effects of the compounds of iron, because they allow the rains to descend and gradually to wash away the noxious matter which has accumulated in the under soil—because they permit the descending water to carry with it portions of the lime in a state of solution, and thus to spread its good effects through the whole soil—and because they admit successive supplies of air as deep as the bottom of the drains, by which, while the action of the lime is promoted, those other good effects also are produced which the oxygen of the atmosphere can alone

accomplish. In fact, unless an outlet for the surface water be thus provided beneath, by which the lime may be enabled to descend, and the rains to wash away slowly the noxious substances from the subsoil, even the addition of a copious dose of lime will only produce a temporary improvement.

Salts of magnesia and alumina.—Lime decomposes also the sulphates of magnesia and alumina, both of which, but especially the former, are occasionally found in the soil in too large proportions, and, being very soluble salts, are liable to be taken up by the roots in such quantity as to be hurtful to growing plants. With the sulphuric acid of these salts the lime forms gypsum, as it does with the acid of sulphate of iron when this salt is present in a soil to which it is added: besides removing the evil effects of these very soluble sulphates, therefore, it exercises the beneficial action which gypsum is known to exhibit upon many of our cultivated crops.

Alumina has the property of combining readily with many vegetable acids, and in the clay soils exercises a constant influence —though more feeble in degree than that of lime—in persuading organic matter to those forms of decay in which acid compounds are more abundantly produced.—Hence, clay soils almost always contain a portion of alumina in combination with organic matter. These organic compounds decomposed by lime, and by the more energetic action of this substance, their constituents are sooner made available to the wants of the new races of plants.

Address delivered before the New York State Agricultural Society, by Prof. E. Emmons, M.D.

I know of no business or profession which has so much to do with the deep and profound principles of science, and which at the same time has made such shifts to get along without them, as Agriculture.

This fact, that it can get along without the direct aid of the principles of science is one cause that it has advanced so slowly, and that, considering its great age, it is so much behind other arts and professions. In this respect it furnishes a very curious example of the mutual dependance of the sciences and arts upon each other, for progress and advancement.

Famines have depopulated whole districts, and millions of the human race have died of starvation, and yet we have no evidence that all this suffering, and all the evils necessarily connected with them, have ever operated to the improvement of Agriculture, or have been instrumental in causing two blades of grass to grow where only one grew before. The agricultural world has jogged along as if nothing had happened, and as if nothing could be done to save men from these wide-spreading calamities. When, however, the mind has been awakened by the light of science; when discoveries are announced, which, if they illuminate only a small part of his field of labour, it usually happens that an impulse is given to his dormant powers, which propels him forward in a career of improvement. What, therefore, calamity fails to produce—what the strongest incentives fail to do, is, in truth, effected by an agency the least expected, the gentle light of discovery, beaming from a kindred department of knowledge. The same things happen in morals. Earthquakes swallow up their thousands, and their continual shocks day by day startle the living, but they have never created, or even improved the religious sentiment: their frequent alarms, and the exposure to such imminent dangers and continual sufferings, have produced rather a recklessness of conduct, than a life of religion and charity.

It is not my purpose to stop here and inquire into the cause of such seeming anomalies in the human constitution: it is sufficient to allude to the facts. I pass on to say that agriculture had made only a feeble effort to improve its mechanical modes of tillage until the period when chemistry had so far advanced that it was an established truth that its principles stood in very intimate relationship to it. So Botany and Geology, which had been cultivated as independent systems, about the same time with chemistry, began also to be studied in their relations to other sciences; and hence these, together with physiology and other collateral branches, implanted clearer views of the wants of Agriculture, as well as to furnish striking illustrations of the true nature and import of the principles which lie at the foundation of its system. It is true that practical agriculture is not deeply interested in questions relating to life in the abstract or essence; but certainly much more so to those powers which modify or control its developments. These powers belong to the deep and profound inquiries which, in later times, are destined to achieve triumphs for

her, of a still more decided character than the world has yet witnessed. It is the peculiar province of the sciences to improve the outward condition of men. Literature had attained its highest state of excellence, and yet men were not discontented in hovels, nor with straw beds, nor coarse food spread out on rough boards. Literature was brilliant as well as solid in Queen Elizabeth's day, and yet labouring men were more poorly fed and cared for than cattle in the period in which they are permitted to live. Times have therefore changed: the necessities of men have increased—the value of time is felt—the supremacy of mind is acknowledged—the schemes of life are of a more exalted character—the destiny of the race begins to assume its importance; and now, awakened from slumber, man tames the wildest elements, and compels them to speed his progress towards an universal dominion over the powers of matter. Light paints for him pictures true to life: lightning bears his commands. He imprisons the steam, and compels it to roll his car over mountains and through vallies, and transport his products to the most distant parts, over water and over land. The mind, once aroused, turns itself to find where it may still have something more to do. Agriculture could not be overlooked—the art which makes all other arts possible, and which, perfected, is civilization itself. Agriculture *is civilization*, and hence its progress is linked with the highest destiny of the race. But regarded in a subordinate light, and in following out the practical requirements of the age, that of drawing from the earth greater supplies of bread, it was soon found that it might be overtaxed. Such a result could not fail to open the whole field of inquiry relating to production and exhaustion, and the relation in which they stood to each other. From exhaustion originated the analysis of productions, in which are locked up the elements they have drawn from this storehouse; the first leads to a knowledge of what, and how much the soil contains; the latter of what, and how much has been taken from it. So also the fact is brought out by inference, what must be returned, to maintain it at least in its present state of fertility, or increase it to an indefinite extent.

The state of agricultural knowledge at the present time is characterized by an accumulation of facts which are unclassified and unarranged. They are like the brick and stone piled before and around the site of a great edifice about to be founded, and which are ready to be arranged in the walls of a spacious building. Many of these facts, it is true, have a definite signification, or, in other words, their relations are well known, but a great majority of them have no known collocation, although they clearly belong to the edifice. So, too, to keep up the similie, I may with truth remark, that the master-builder is yet to be found, whose sagacity and skill is equal to the task of putting together the discordant parts, and to construct from them a symmetrical whole.

Notwithstanding the illustration I have employed, to show the view which I entertain of the state of agricultural science, it is still true that it requires only a moderate amount of information of Chemistry and the collateral sciences to understand many of the applications of the principles upon which the practices of husbandry are based.—When I speak, therefore, of the accumulation of facts, I mean to be understood that it is their relation to a system, and not to the meaning which they may have as individual facts. For example, the good effects of draining may be explained on philosophical principles, though the theory of Agriculture is yet to be put into form and shape. Draining operates beneficially in many ways; it may merely remove superfluous water, by the construction of artificial underground channels, or it may, in addition to this, carry off water charged with astringent salts, which are poisonous to the more valuable plants. In either case, the principal result upon which the good effects depend, is the permanent elevation of the temperature of the soil. Surfaces constantly bathed in water, and which are supplied with this element from living springs, cannot attain the temperature required for the better grasses, cereals, or esculents, so long as it is in this condition. Evaporation, as you well know, is a source of cold; vapor cannot be formed without heat; and hence, the heat, instead of being expended in the elevation of the temperature of the earth, as it is in a dry place, is wholly taken up by vaprous water, and carried off. Hence, in a hot day, the temperature is always low, rising scarcely above 50° of Farenheit, while the surrounding dry places are 70, 80, and even 120 degrees, when the soil is dark. The principles of draining, then, are perfectly un-

derstood, and this is the case with many other agricultural practices.

The practice of hoeing or stirring the soil is far more general than draining, but the principle upon which the practice is founded are not so well under stood. Generally farmers suppose that the object is to kill the weeds; so far it is good; but the effect of hoeing is not confined to this single result; for hoeing, when all the weed is already extirpated is followed by the most decided advantage to the crop; hence some thing more than the destruction of the weeds comes to pass. One result undoubtedly arises from the absorbent powers of a fresh surface. Nutritive matters, such as carbonic acid and ammonia dissolved in atmospheric air, are readily taken up in this state of the surface, but an old and indurated surface becomes inert and inactivo. The power of surface alone is effectual in promoting absorption and decomposition of the most active bodies. The perfect combustion of vegetable and animal matter, takes place first upon the surface, upon which they rest. An impure ash exposed to heat, though just elevated above redness, undergoes a perfect combustion in contact with platina foil, while that part of the ash above the surface is still impure or unburned. So the power of surface condenses the nutritive gases and chemical changes take place there more energetically than elsewhere. The surface of a leaf has surface action, and becomes the seat of chemical combination through its physical powers; for surface action is at first all physical action, and precedes that of decomposition. What is here termed surface action may not be readily apprehended; it is undoubtedly analogous to the action of platinum black, or platinum sponge in igniting hydrogen. If a jet is thrown upon it, it takes fire, and has long been used as a means for producing instantaneous light and combustion. The earth acts upon the gases when light and porous and fresh, as platinum sponge on hydrogen gas. Whatever way we may choose to explain the good effects of hoeing, there is no doubt that a fresh surface is frequently required if we desire a rapid and vigorous growth.

There is probably no substance in use as a manure which as frequently disappoints the farmer, as plaster. In the first place, it may operate far more effectually than is expected, and again it may have no effect whatever; and finally, when it has operated very beneficially for a time, it ceases to do so. This is what is called plaster sickness. Now these facts ought to be explained. On what principle does plaster ever promote vegetation? Liebig says that it is by the absorption of ammonia; sulphate of ammonia being the product of change. Were this always true, I can see in it reasons why it *should always benefit* crops. Sulphate of ammonia always does, but plaster does not. But there is another reason why plaster is useful. Its sulphur is wanting in the nitrogenous bodies—the protein compounds. It may, too, operate well in virtue of its lime, which is an element of the highest importance to vegetables. There may be therefore three reasons why plaster promotes vegetation—the supply of ammonia for the nitrogenous bodies, the supply of sulphur for the same, and finally, the supply of lime. But why it should cease to do good, is a question than has been answered only hypothetically. We may suppose that in the first place the soil requires, at the time, no additional matter which plaster itself can furnish; it is in this case an negative. When it ceases to do good at the end of a few years, it may be from exhaustion; that is the soil originally light may be deprived of phosphoric acid, of chlorine, of magnesia or soluble silica and the alkalies particularly, at a much earlier period than if plaster had not been used. It has aided in the removal of a larger quantity of inorganic matter, different from itself, in less time than if it had not been employed. If a crop is increased one-third, it has taken up one-third more of the potash of the soil than would have been obtained without it. If this is true, we may see that the further use of plaster will be worse than useless.

There is nothing plainer than this, that every element which is found in a plant in analyses, is necessary to its constitution, and *is liable to be removed in a series of cropping*. This leads to the necessity of supplying it directly; but what element or elements may be wanting, can be known for a certainty only by analysis. In plaster sickness, therefore, our remedies need not be hypothetical, if we pursue the method proposed; analysis will reveal the cause of plaster sickness, and probably any other sickness which follows from constant cultivation.

BLIND BRIDLES.—"Why are blinders injurious to the horse?" Because they gather

dirt and heat round the eyes. Dirt irritates the eye, and heat produces inflammation. Eyes were placed in the corner of the head that the horse might have the advantage of looking in different directions. Men, in the abundance of their imaginary wisdom, concluded the horse had to much sight, and they wished to curtail it; hence the origin of blind bridles. These so entrammel the eyes, that the horse is constantly compelled to strain them to see his way. This over exertion soon brings on disease.

From the American Agriculturist.

AGRICULTURAL CHEMISTRY.

When a field is kept under cultivation from year to year, without the application of manure, the crops continually decrease, until at length, the land refuses to yield a return sufficient to repay the expenses of tillage. The reason of this deterioration is obvious. Plants, you know, extract a part of their nutriment from the soil, and but a small proportion of the soil consists of those ingredients which are capable of ministering directly to the wants of vegetation. Therefore, the land, in a few years, becomes so far exhausted as to be unable to furnish as much food as the crop requires, and it becomes necessary that it should receive a new supply of the matter that has been abstracted. This matter maybe directly returned in the form of manure, or the lost fertility, may, in a measure, be restored by allowing the land to lie idle for one or more years. This last method is termed *fallowing*, of this I now purpose to treat.

Of fallowing, there are two systems—one called *naked fallowing*, consisting in ploughing the fallow land repeatedly, without cropping, thus leaving it naked, and exposed to the full influence of the sun, air, and moisture, until it is supposed to be sufficiently recruited to produce a remunerating crop. The other method is to sow on the ground a fallow crop, (usually clover or buckwheat,) which is afterwards plouged into the soil. If buckwheat be sowed, it is ploughed in when in blossom, and left to form a bed of humus. This mode is sometimes called *green manuring*. But the more common, and in most cases the more judicious way, is to put clover on the field, which needs fallowing, and leave it for two or three years in pasture. By this means, the field, instead of laying idle, yields a profitable return; all the benefit ordinarly derived from fallowing is obtained; a firm sod is made, which, when turned over with the plough, forms a fine bed of humus, and the fertility of the soil is restored to a remarkable degree.

This method has almost entirely superseded the old one of naked fallowing, and is decidedly preferable, in most cases, though circumstances may occur where the other can be more judiciously practiced. Thus, stiff, agrillaceous, (clayey,) soils, are often very materially benefitted by repeated ploughings while lying fallow, as by this means the hard lumps become divided, air and moisture are freelyadmitted, and the land thus becomes well prepared for sustaining a vigorous growth of vegetation.

While all are willing to admit the advantage of a fallow, all are not agreed as to the manner inwhich these advantages are brought about. The explanation usually given by the unlearned is, that land, after producing several crops in succession, requires *rest*, and like a wearied animal, is recruited by repose. But this explanation conveys an erroneous impression, and shows how easily the minds of many are satisfied by substituting a *comparison*, or a *name* for a *reason*. The term *rest* is certainly very improperly employed when applied to land in the same sense in which it is used with reference to animals. I will endeavour to explain to you, in accordance with the views of some of our best modern chemists, the process which Nature adopts to reinvigorate an exhausted soil.

I told you in a former number, that soils were originally formed by the degradation and decomposition, (crumbling and wasting away,) of rocky masses, and that the solid structures were originally composed of the same inorganic constituents as are found in the soil. Now the agency which reduces rocks to the form of powder, does not cease its operations when the change is effected, but continues acting upon the mineral particles until those portions essential to vegetable life are brought to such a state as to be soluble in water, when the roots of plants can readily imbibe and appropriate them, as needed.

The progress of this decomposition is slow, and when a field is required to furnish food for a crop every year, for a succession of years, it cannot be furnished as fast as it is needed; the supply is inadequate to the demand; and time is required to allow a new accumulation, or fresh supply. Al-

though the necessary ingredients, or food, may be in the soil, yet it is not in such a form to be available, and Nature refuses to change her laws, or to act more vigorously than she is wont, merely to gratify the inordinate cravings of her creature, man.

And now another question arises—Can a field *always* be kept in a state of fertility by careful fallowing? I reply, it cannot. The soil does not contain an exhaustless supply of those ingredients which our crops require, and though land can be induced, by fallowing alone, to produce abundant harvests for a limited period, yet the time must arrive, when, unless manure be supplied, barrenness will ensue. There are, as I have previously informed you, sixteen elements belonging to plants, twelve of which must be furnished by the soil, and if any one of these which is required, be absent, the plant cannot mature though all other circumstances be favourable. Now, as by far the greater portion of all soils consists of matter which cannot contribute to the growth of plants, and as nearly every soil is lacking in a full supply of every ingredient which our crops require, it is unreasonable to expect perpetual fertility without returning, occasionally, to our fields a portion of those constituents which have been taken from them.

Before closing this article, I will add a few more remarks on the subject of fallow crops, and green manuring. As the crop ploughed into the soil can only return to it the same inorganic ingredients which were drawn from it, we naturally inquire, what benefit can be derived from this source. The question is well worthy of consideration; for it would seem that if land can be thus enriched, it must disprove the theory that the fertility of the soil can only be preserved by returning to it, occasionally, new supplies of the matter which has been withdrawn. But the advantages of this system are only temporary, and may be thus accounted for:—

1. The bed of humus thus formed, improves the texture of the soil; allowing air and moisture to gain admittance, and these agents hasten that final decomposition of mineral particles which fits them for entering the circulation of plants.

2. The green, or fallow crop, draws nutritive principles from the air, especially carbon, and (indirectly) nitrogen, and these, becoming incorporated with the soil, are ready to aid in promoting the growth of the succeeding crop. (For farther particulars on this point, I would refer you to what I said on the subject of *humus* in my tenth number.)

3. The roots of the green crop, having penetrated for a considerable depth in the soil, lower than the plough has ever reached, have drawn from below such nutritive ingredients as had become deficient near the surface.

These constituents, after contributing to the formation of the stalks, leaves, &c., of the fallow crop, are again disengaged and left near the surface when this crop is buried in the soil, and are now within the immediate reach of the roots of the succeeding crop. Clover and buckwheat are well adapted for fallow crops on account of their roots extending to a much greater depth than those of most other cultivated plants.

The effect, thus produced, may be compared to that of a very deep or trench ploughing, as in both cases these ingredients, which lie below the reach of most plants, are brought near the surface. The roots also render the hard and compact soil beneath, into which they penetrate, more loose and porous, and thus, as in deep ploughing, the texture is improved to a considerable depth. When, after sowing a fallow crop, the land is left for several years undisturbed, we must attribute much of the benefit afterwards observed, to the decomposition of mineral portions, as above mentioned.

J. Mc Kinstry.

Greenport, N.Y., April 1, 1849.

REARING, KEEPING AND FATTENING DOMESTIC ANIMALS.

The science of breeding, keeping and fattening domestic animals is too much neglected in the United States. Few practical farmers have the courage to take hold of the somewhat forbidding subjects of comparative anatomy, physiology, and organic chemistry, with a resolute purpose to understand the living organism by which grass, hay, grain and roots are transformed into beef, mutton, pork, butter, cheese and wool. The natural machinery for effecting these important changes of vegetable into animal substances, deserves to be studied with great care, in order to make the most of the food consumed by every animal kept on the farm. There is no class that has reached perfection in yielding the largest product in flesh, milk or wool, for the aliment consumed in the course of its life time. All are fed unequally—

sometimes too much, and sometimes too little; and, again, they suffer from food more defective in *quality* than deficient in *quantity*. One often sees store pigs eat the dung of over-fed fatting hogs; and in this city, half-starved cows voraciously devour the solid excretions of corn-fed carriage horses. In rearing swine they are commonly under-fed about three-fourths of their lives, and over-fed the other fourth; so that in the aggregate not more than one-half as much meat is elaborated from the food taken into the stomach of pigs as might have been formed.

All animals demand a certain quantity of nutritive matter to preserve them in a normal condition, or to prevent their losing weight and becoming poor and poorer. In all cases where the object is to form meat, it is bad economy to keep animals for weeks and months, as thousands of farmers do, without gaining a pound of flesh, although they necessarily consume a large amount of food. This forms the manure; i. e. 100lbs. of solid matter taken into the stomach yield 40 in dry yard dung and urine, and no more. If we feed much above the point of normal nutrition, a portion of aliment fails to enter the lacteal vessels which surround the alimentary canal, and through which digested matter presses into the blood vessels to nourish the system. This excess of food, whether partially digested or not, passes on through the bowels and appears as feces or dung. There is always an immense loss in seeking to make animals excessively fat. Of course, when two or three prices are realized for such beef, mutton, or pork, the loss in the waste of food, is paid by the consumer. Our object is to develope the true economy of making meat, regardless of the fact whether it is sold or consumed by the producer. This consists in providing a reliable supply of suitable food, so that the animal from its birth to the day of its being slaughtered, should steadily gain in weight. So long as it is adding to the length and size of its bones and muscles—growing—its system will be little inclined to take on fat, if not over-fed. Excessive stuffing and no exercise, bring the development of bone and muscle to a premature ripeness. They cease to expand, and you have a fat lap-dog or a pocket china pig. Habitual starving will also bring the carcass to maturity before it attains to its proper size. Skilful feeding implies that one never gives *too much nor too little*; and has the food well adapted to the constitution and habits of the animal, whether a horse, sheep, cow or swine.

This sytem of feeding is not so easy as some may imagine; for the quanity of grass that will grow on a given number of acres in pasture and meadow in a dry or wet season is very unequal. Hence, in the one case the farmer will have more feed than stock; and in the other more stock than feed. If one must err in the matter, it is usually better to have an excess, rather than a deficiciency in forage. Grass left to rot on the ground in a pasture or meadow is far from being lost. It improves the soil.

After having taken all due pains to make two blades of grass and corn grow were only one of either grew before, the stock grower should study closely the business of breeding domestic animals. The leading idea in this art and science is, to select the best males and females from which to propagate and improve the race. This rule applies alike to the equine, bovine, ovine and swine families. In each genus there are several species, in each species there are numerous breeds, and in the several breeds not a few varieties. It is no part of our duty to attempt to write up one species or breed of animals, whether of cattle, horses, hogs, or sheep, and to write down another. Practical farmers know best what kind of stock will suit their land and markets. Our advice, if offered, would be quite as likely to miss as to hit the wants of the reader. There is more difference in the value of breeds than many are willing to admit, and less than some breeders of improved races claim. A yearling of the short horn stock, less than 13 months old, was weighed in this city a few days since, and brought down 675 lbs. This heifer, which was not fat, is the offspring of Mr. Clay's importation. Another heifer of the same family weighed 718 lbs. when 15 months old. The mother of the calf first named belongs to the lady with whom the writer boards, and this valuable cow gives some twenty quarts of rich milk per day. There are Devons near here from the herd of L. F. Allen, Esq., which are much admired for their beauty.

The Texas Telegraph of May 24, published at Houston, says that wool grown in that State, and sent to New York market has brought $1.25 a fleece this season. Men are buying large flocks in Mexican States, Missouri, Tennessee and elsewhere, to drive

into the northern parts of Texas. Sheep husbandry is beginning to excite considerable attention at the south and south-west.

Believing as we do, that this Republic is likely to enjoy great prosperity during the next ten years, and receive large accessions to its population and wealth from Europe, the demand for good-breeding animals will be steady and at quite remunerating prices. Whoever will take due pains to improve his cows, sheep, horses and swine, cannot fail to be well paid for his trouble.—[Genesee Far.

LIMESTONE SOILS.

Every month's experience and observation increase our esteem of limestone lands. We have studied the growth of wheat and other crops on granitic and sandstone soils, and compared them with the products of lime lands, with which we have long been familiar. The latter not only contain more *lime*, but more potash, soda, magnesia, chlorine, phosphorus and sulphur—more of all the earthy elements of cultivated plants. Having become satisfied that such is the fact, we were for a time at a loss to account for the circumstance that, lime rocks yield other minerals on their disintegration as well as the one that forms the main bulk of this product of nature. The remains of animals with which they abound, that once lived in the ocean, furnish unmistakable evidence that all, or nearly all ordinary lime rocks were slowly built up in the bed of an ancient sea. The same minerals which makes the stoney covering of an oyster, serves under favourable conditions to form many strata of precipitated lime rocks in which to embed the oyster, and a thousand other animals and plants.

These depositions carry down and fix permanently in the growing rock, not only the carbonate of lime, but an appreciable quantity of all the minerals dissolved in the water of the ocean. A moment's reflection will satisfy the reader that this water must abound in all the constituents of vegetables and animals, or they could not flourish in such prodigious numbers in this medium. By analyzing water taken from the ocean, we find that it contains every substance necessary to organize either a whale, a tree, or a man. It abounds in potash, sodo, magnesia, iron, chlorine, bone earth, gypsum, and compounds of carbon and azote.

When the bed of the ocean is elvated by volcanic action into islands and continents, and dry land is formed, we find the best soils for the support of terrestrial animals where marine deposits were most abundant. And these vegetable and animal remains are most abundant where sedimentary rocks were slowest in forming. Most sand rocks appear to have been deposited rapidly; for they usually contain little beside mere traces of lime, potash, soda, and other minerals dissolved in sea water. Shales, such as may be seen along the terraces above Genesse in Livingston county, and most limestones appear to have been built up very slowly. There are some fresh water deposits of lime, both ancient and modern, that contain little beside the pure carbonate of that mineral. There are one or two deposits of this character in Cattaraugus county, and one on General Harmon's farm in Wheatland. Prof. Peter of Kentucky, gives the following as the composition of the limestone near Lexington, remarkable for the excellent soil which it forms in that vicinity. He says:—

During the past month or two, in my leisure moments, I have submitted to analyses, several specimens of the Kentucky Blue limestone, and have been much gratified to find my anticipations realized in relation to its agricultural value, as will be seen by reference to the results given below.

Specimen No. 1, is of the hardy gray limestone; it was dug out of a well in the city of Lexington; it contains geodes lined with brown spar, pearl spar, cale spar, and fluor spar and the usual fossils; its specific gravity 2.45 in a dry specimen. On analysis, it was found to be composed of the following materials, viz:

Carbonic acid	36.675
Phosphoric acid	1.850
Sulphuric acid	807
Lime	47.046
Magnesia	900
Alumina and oxide of iron	9.880
Fine sand a d silicates	1.790
Moisture and loss	1,552
	100.000

Specimen No. 2, from the hard thin layers which are more superficial than the first in this locality, yielded:

Carbonic acid	40.53
Phosphoric acid	36
Sulphuric acid not estimated.	
Lime	50.97
Magnesia	66

Oxide of iron	32
Alumina	15
Sand and silicates	52
Moisture and loss	49
	100.00

In addition fo these ingredients, potash and soda were obtained from the limestone, whenever the proper processes were employed; in one case as much as 0.0487 per cent of potash; in another, 0.0058 per cent.

The above extract is copied from the May number of the Albany Cultivator. In the June number of the American Agriculturist a gentleman in Winchester, Va., says that he raised eighty-three bushels of corn per acre, without manure, on a piece of ground which had been irrigated for several years by a "limestone spring."

The rivers Euphrates and Nile, not less than the Genesee in New York, and the Cumberland in Tennessee, run over lime rocks. These valleys are remarkable for their fertility. On the contrary, all granite regions are characterized by comparative sterility. Granite, unlike sedimentary rocks, have been melted by intense heat deep in the earth, and crystalized on cooling, under great pressure. All this class of rocks decompose slowly, and form comparatively thin, poor soils. They usually lack lime and all the other minerals held in solution by the waters of the ocean. Granitic formations show no signs of organic beings, either animal or vegetable.

The fair inference from the above remarks would seem to be, that salts of lime, potash, soda and magnesia are indispensable to the growth of crops. Every farmer whose soil lacks lime, should take measures to remedy the defect in the cheapest way possible. In many places gypsum, common salt and wood ashes can be had on such terms as will warrant their use for agricultural purposes far more extensively than is now done. The salt which can be obtained by evaporating sea water, will some day be extensively consumed as a fertilizer. Nor will the salts extracted from the soil and wasted in the liquid excretions of domestic animals be always regarded of so little value.—[Genesee Farmer.

THE HORSE.—IMPROVEMENT IN BREEDING.

Although the improvement in the modes of traveling, resulting from the application of steam, may in many sections of our country, diminish the use and value of fine horses, still the horse will always be of incalculable importance to us. Any thing therefore, that may tend to enhance his worth, by improving his character, will be thought useful.

The intrinsic value of the horse, consists in his *power*, *speed*, and *endurance*. And as he is, to a great extent, the subject of taste and fancy, his highest value is attained, when he unites beauty of form, with these three requisites. But every farmer knows, he is not to expect the pear from the thorn bush, nor the pippin from the wild crab apple. But then these stocks will produce the pear and the pippin, if such scions are introduced. Since, then, the same expense of care, culture, feed, and time, is needed to sustain and rear a four years old horse worth $60, and one worth $100, is it not astonishing that farmers, who spare no expense to obtain the best quality of grains, grasses, and roots for seed, should still employ as sires, the low bred dung-hill at twenty shillings, instead of the brave and noble blood horse worth twenty dollars. The result in such a case, as a general rule, must necessarily be, the colt will be a twenty shilling colt, instead of a twenty dollar colt, if nature proves true to her principles.

Many farmers do not reflect sufficiently, or judge correctly on this subject. They seem to think, a half blood sire, derived from a blood horse and *common dam*, may produce as fine stock, as the full blood horse himself; whereas, *he cannot be half so good*. Being only a half blood himself, he can infuse into his progeny only one fourth of the good qualities of his sire. His stock his only quarter bloods. No farmer, desirous of making the greatest gain in perfecting his stock, will use any horse as a sire, who cannot claim to inherit, in the line of his dam, as well as of his sire, *Power*, *Speed*, and *Endurance*; the three items which give value to the horse. Hence it is, that the pedigree of our blood horses is given in the line of the dam, instead of the sire. It is to show, that the valuable blood of the horse, derived from his sire, is not deteriorated by any impure, low blood, derived from the mother. A little reflection therefore, will satisfy the former, not to breed from a horse, (although his sire may have been good,) in the hope of greatly improving his stock, if he cannot claim excellence also, from the blood of his dam, as

well as of his sire. In this particular, American Eclipse excelled any horse of his day; and to this source was he indebted, in a great degree, for his matchless powers. His dam was got by "Messenger," whose stock, for power and endurance, has proved equal, and often superior, to that of any horse ever brought to this country. Her dam, by a son of "English Eclipse;" next to "Childers," the fleetest horse ever known. His sire, "Duroc," was by "Diomed;" the best horse of his day—deriving his excellence from judicious crosses, blending the best strains of English and Arabian blood.

It is perfectly idle for a farmer, who has a mare of good size, of fine qualities and blood, to raise a colt from a common horse worth only $65 to $80, at four years old; when he can, with the same expense of care and feed, rear one worth $120 to $150, by resorting to a better sire, at a cost of a few dollars more. And even if his mare is in some respects inferior, he should still resort to horses of high and celebrated blood,—of large size, just proportions, and fine speed,—horses, superior in those very particulars in which his mare is deficient. A half blood filly from such a cross, would probably make a valuable stock mare, producing colts of great worth, if bred from a superior blood horse.

Every farmer should have one or two good brood mares. We have the experience and testimony of intelligent men, that brood mares may be steadily and safely used until within a few days of foaling; and very soon after. They should not be improperly used and abused, by extreme, sudden, and violent efforts. But it will not injure them nor their foals, to do constant, reasonable labor. In addition therefore, to accomplishing the ordinary service of a span of horses on the farm, they may produce the farmer annually, a pair of colts.

It should here be remarked, that much of the value of our colts depends on the care and keeping we give them. We err greatly on this point. Colts generally, are neglected the first winter. Their growth is retarded, and their forms are injured thereby. They should be kept in the best manner, the first year; should be kept constantly thriving. Their forms will then be properly sustained, and their points and proportions be finely developed. Nor should they be fed on the ground, but in racks so situated, as to require them to extend and elevate the neck and head.

Dutches County, in this State, has derived a large revenue for half a century, from the sale of her valuable horses. Spans of horses bred there, have been sold in New York, from five hundred to one thousand dollars.—and multitudes of single horses from fifty pounds, to one hundred pounds each. They secured these results at an early period, by perfecting their stock of brood mares, in the use of such imported horses as Messenger, Highlander, Paymaster, Drone, Babjazette, and others; not hesitating to pay $20 or more, to horses of such character and blood.

As "like produces like," the brave and noble blood horse is expected to give the index of his character to his progeny. To decide whether he has "power, speed, and endurance," he is put to trial on the race course. In a greater or less degree, his *courage*, *resolution*, *temper*, and *constitution*, as well as his form and proportions, are imparted to his stock. The farmer who would make gain by breeding colts, should look to these things. His colts will always sell, if they have size and speed, even if less perfect and beautiful in form. By blending the Arabian blood, with that of the English race horse, the product has been considered, as having attained the highest degree of perfection. It has united to the size and bone of the English race horse, the round, smooth, beautiful form of the Arabian, together with his hardiness, fleetness, and ability to endure fatigue. By such crosses, the fleetest and best horses have been produced, that have been ever known. And in the use of such horses can our stock be soon perfected; but it cannot be done, by a resort to low bred horses, who have no blood on the side of the dam, and who are removed to the third and fourth cross, from the pure blood sire.

There are two leading purposes for which we rear colts. One is for the plow, and one for the road. For the plow, stout, heavy, compact built horses are needed, with no special regard to fleetness. For the road, as for stages, pleasure carriages and the saddle, in addition to size, power, and form, *high courage*, and *fleetness or speed*, are indispensible. If the farmer therefore, designs to rear a colt for market, he must resort to a sire either celebrated himself, or, in the line of his immediate ancestry, for fine action, and great speed as roadsters; in the hope that he will impart these properties to his stock. If for the plow, he will look for a sire possessing a kind, docile, gentle temper;

of good size, large bone, and great muscular powers. As the stock will be, in a good measure, characterised by the sire, he will look for suh qualities in the sire, as are especially adapted to the uses and purposes he has in view. If these few hints should influence the farmer to reflect on this subject, and the means of inducing correct impressions, my purposes will have been answered. —[Rochester, N. Y. July, 1819.

CANADA THISTLES.

Mr. Editor,—Believing in the fact that the root is as much dependent for prosperity on the branch as the branch is on the root, I take a hoe, in the spring of the year, when they first make their appearance, and just crop them off at the surface with one stroke, which a man can do and walk right along. I repeat the operation as often as the thistles appear, which may be three or four times in the season. I have frequently killed them in this way the first season, so that they have not appeared again in the same place; but if they should appear the next season they will look sickly, and by repeating the same process the second year they will be entirely subdued. But if, unfortunately, you have neighbors less faithful than yourself, you will be constantly annoyed with new cases which will require attention.

I have pursued this practice of cutting thistles with a hoe for nearly forty years; and although my neighbor's farm is now filled with them in every field, there has never been on mine in any one year more than a man could cut up with a hoe in ten minutes, provided they were standing in one spot. But they will spring up in some new places every year or two, requiring, like the maintenance of liberty, "eternal vigilance."—[An Old Farmer.

ON FATTENING CATTLE.

Presuming that the object of the Council of the Royal Agricultural Society of England, in offering prizes for essays on various subjects, is that the farmers themselves may be induced to commit their practice and experience to paper, I trust that my humble attempt to describe what I have found to be the best method of fattening bullocks, if considered unworthy of a prize, may at least be criticised with lenity, as it is the *bona fide* production of a practical farmer.

The first point I wish to impress upon my readers is, to have a good sort of bullock to begin upon; not that I wish to recommend one particular breed, to the depreciation of all others, for I am sure tha different localities require different descriptions of animals; but to caution them that it is right to select the characteristic marks of the breed they intend purchasing—to warn them particularly never to buy a coarse, ill-made, bad-bred animal, because they may fancy it cheap. A man has never got so bad a bargain, as when he has, as the saying is, "got too much for his money."

The first criterion for judging of the disposition of the beast to fatten quickly, in my opinion, is that peculiar soft, supple feel of the skin which is commonly called handling well; this is generally accompanied by hair of a soft, fine quality, in great plenty; the eye should be full and clear, and the head well-formed, the shoulders not upright, but lying well back, the chest full, the ribs deep and well arched out, the flanks well down, the hips nearly level with the backbone, and in proportion to the rest of the carcass as to width, the rumps wide, and not too low down, appearing as if when fat the tail and rumps' ends would be level, (but this the butchers in my neighbourhood are in the habit of calling the fool's point,) the purse should be of a full size, and soft to the touch, (this I consider a material point,) the twist good, and the legs short and small in proportion to the carcase, as the offal will be light in proportion to the leg-bone.

Next observe the temper of the animal: in selecting from a considerable drove you will often find beasts possessing many of these good points, yet in lower condition than some of the animals of a worse appearance; consider well whether this may not arise from the masterful disposition of the ill-made one; and whether, when put to fatten where every beast may eat his share of feed without disturbance, the good-bred one will not soon surpass his more masterful neighbor. If you observe a beast that is constantly watching an opportunity of goring any other that comes in his way, leave him behind, even if he is much heavier than those you select; he may be a great trouble to you: and although the jobber may think you have selected them badly, he will sell them according to what they are worth at the time, and the present weight is the great point with him. For this reason always select the

animals before purchasing, rather than agree to give a certain price per head to pick where you like from the drove.

I think the quality of an animal is of more consequence than his form, for common fattening purposes, but have both good if you can. But if you are thinking of fattening an animal to show for a prize, be sure to have his form as perfect as possible; for all the flesh you may lay on him will not hide any great defect in his form: also ascertain, if possible, how the animal is descended; ten to one but the progeny becomes similar to the progenitor. But this is generally a most unprofitable affair, and I strongly recommend all young farmers to leave it in the hands of those gentry who can afford the loss, many of whom there are in the country, and they deserve our best thanks for their patriotism, for it certainly shows the capabilities of different breeds, and thereby enables the observing farmer to profit by the experience of others. Never buy any animals that are *excessively* poor; they will consume a great deal of food before they are got into health enough to fatten.

I fear I have been rather prolix in these remarks, but have thought it necessary; for, depend upon it, unless your animals are well bought, fattening cattle will never pay enough to leave the manure clear profit, which it ought to do, although, I fear, with the majority of farmers, it is far otherwise.

I shall say but little with respect to summer-grazing, as the wording of the Society's advertisement appears to apply more particularly to winter fattening; merely remarking that the fences should always be kept thoroughly good, a weak place being strengthened before it becomes a gap, prevention in this case, like many others, being better than cure; that the bullocks should be well supplied with water, and have plenty of shade; never allow them to be frightened by dogs, &c.; treat them kindly, and they will soon cease to fear your presence; do not let a day pass, if you can help it, without seeing them. There is an old saying, which ought to be impressed on every farmer's memory—it has been of great service to me in the course of my life—it is, "The master's eye graseth the ox." A friend of mine has lately adopted a plan which, under the same circumstances, I should strongly recommend; it is that of giving a small quantity of oil-cake to animals grazing, for the sake of improving an ordinary pasture, and its effects are astonishing. The pastures I allude to are small, and one or two bullocks more than they are calculated to carry are put into each; the lot are then allowed 4 lbs. of cake per day per head; this, at a cost of about 2*s.* (50 cents) per head per week—which, I believe, the stock well paid for—has entirely *altered the face of pastures* from what they were three years ago, when the plan was first adopted by him; and, I believe, without any loss to himself.

I now come to the point of winter feeding. First, as to the place in which they are kept, I unhesitatingly give my opinion in favor of stall-feeding, for all the common purposes of grazing; but not for young beasts that are to be summered again, or for prize oxen: the former should have small, well-sheltered yards, with good sheds, (if the fences are so high that they cannot see over, it is much better;) and the latter, *loose boxes*, with plenty of room for them to walk about, because they have to be kept up for such a long period, that if no exercise were taken the health might suffer. It is the abuse of stall-feeding that has got it into disrepute with some people, and the not treading down straw enough with others. This last I hold to be an advantage, instead of a disadvantage; for, depend upon it, it is not the size of the dunghill, but the *quality of the manure* that causes the farmer's stock-yard to be well filled. If managed well, I contend that there is no plan so good as stall-feeding. The fattening-house may be of any size or shape, but it is necessary that there should be underground drains, with gratings, to carry off the urine into the liquid-manure tank; shutters behind the bullocks to regulate the heat, and a wide passage at their heads to feed them and clean their mangers. The advantages I conceive to be the quantity of litter required being smaller, therefore the muck being made better; the temperature being more easily regulated, and every bullock being allowed to eat his share in peace. The disadvantage of the animal not being able to rub himself so well, I consider fully done away with by the rough brush which you will observe I recommend using; and although theorists may fancy the health of the animal likely to suffer, I have never found it so in practice.

Now, with respect to their food, so much does this vary, (from the plan pursued by some people with an ox intended to be shown at Smithfield, in a class restricted from corn,

cake, pulse, &c., *which has the cream from several cows given him*, by way of a compensation, to that by the man who endeavors to fatten his animals on turnips and barley-straw,) that it would take up far to much of the Society's valuable journal even to enumerate them; I shall therefore simply give the plan I recommend, leaving my reader to follow it if they like, and improve upon it whenever they can.

I think, in many instances, stall-feeding is not commenced early enough in the autumn: as soon as the weather becomes damp, and the days shorten much—say some time in October—the grass in my neighbourhood loses its feeding properties, and then the sooner your bullocks are put up the better; for this purpose I recommend having some of the large, forward descriptions of turnips provided, perpaps the "red tankard," although watery, and soon becoming of little value, are at this very early season the best of any, from their early maturity: these are sown in April, at the rate of an acre to every eight bullocks, which will last them three or four weeks, according to the crop, and leave a light fold to begin the sheep upon; at the end of which time the forward swedes are ready to begin. During this period I give them little or no oil-cake, if they are only in moderate condition; but they have half a stone of pollard a day, mixed with an equal quantity of hay or straw-chaff. Some persons may fancy this food is of too loosening a nature, but I can assure them, from several years' experience, that although pollard is loosening of itself, yet it has the effect of preventing the watery white turnips from purging too much. Although the bullocks do not gain much in weight during this time, yet I am satisfined they go on faster afterwards; the reason of which, I suspect, is that their bodies are more prepared for the artificial state they have to live in for the next few months. Early in November the food must be changed to swedes, cake, &c.; the quantities of each must vary according to circumstances: the following I consider a good allowance were swedes are not scarce, if they are, more oil-cake must be given instead of a part of them; or, if very plentiful, they may be allowed even more. The morning's bait, 1 bushel of swedes, well cleaned from dirt, and cut small, given a few at a time, (I always use Gardener's *sheep turnip-cutter* in preference to any other;) then, the refuse pieces being well cleaned out, a dry bait, consisting of 2 lbs. of oil-cake, 3 lbs. of pollard, and a little hay-chaff. While they are feeding, the manure and wet litter must be well cleared away, and any which may be on the bullocks taken off, the floor swept clean, and plenty of fresh litter put in; then have every bullock well brushed with what is called a dandy-brush, (being a brush made with whalebone, for taking the rough dirt off horses.) Let not any slovenly farmer fancy this to be a whim of mine; depend upon it, the bullocks are kept in much better health and greater comfort for it. They must now be left quiet; they will soon lie down and rest, and chew the cud till after dinner, when another bushel of swedes is given as before, in small quantities, followed by a similar dry bait of cake, pollard, and hay-chaff, but with the addition of 3 lbs. of bean-meal; this is left with them at night. Be careful that the shutters are opened or closed, according to the weather, so as to maintain an even, warm temperature, but not hot enough to make them perspire, if it can be avoided. Be also careful that the mangers are well cleaned out between every bait. I have mine cleaned at the commencement of the season, and as often afterwards as I think necessary, with scalding water and the scrubbing-brush.

After a month or so the cake may be increased; and, if it is thought more convenient, the swedes may be changed for mangold-wurtzel. Many persons object to using mangold until the spring; they certainly are more valuable than swedes in the spring, and therefore should always be used last. Never change from mangold-wurtzel to swedes after you have once begun them, or the bullocks will not go on so fast; but if from having a bad crop of swedes, or from any other cause, you want to begin mangold early, you have only to lay them exposed to the air for a week or two to wither, and they may be used as early in the season as is required.

It will be observed that cleanliness, warmth, and quiet are the great points I insist upon; of course coupled with good feeding: bnt very many tons of oil-cake are annually wasted, because the comfort of the animals is not more attended to. It will also be observed that I have introduced a cheap article of food, which I think does the beasts more good, in proportion to its cost, than any thing I give them; I allude to pollard, or millers' offal, as some call it. This I can

generally purchase at 4*l.* 15*s.* a ton. I have used it extensively for some years, and like it much; some of my neighbours are now following my example.

Before I conclude, I wish to give these recommendations respecting selling the bullocks when fat. Do not determine upon parting with them exactly at any given time; but if a butcher wants to buy a part of them, a few weeks before you think them ready, calculate how they are paying for what they eat; and, if you feel satisfied on that head, do not run the hazard of getting a bad sale by refusing a good offer, or perchance the opportunity may not return. Sell them to butchers at home, if you can. Always estimate the weight and value of your bullocks the day before any one is coming to buy them; and, after letting the butcher handle and examine them well, let them out into a yard for him to see; they will always show better than when tied up.—[From the Journal of the Royal Agricultural Society of England, a Prize Essay, by George Dobito.

FEEDING AND MANAGING MILCH COWS.

The grasses, particularly the clovers, are the best summer food. When these begin to fail, the deficiency may be supplied by green corn, which is very sweet, and produces a large quantity of milk, of excellent quality. The tops of beets, carrots, parsnips, and cabbage and turnip leaves, are good. Pumpkins, apples, and roots, may be given as the feed fails. Give only a few at first, especially apples, and gradually increase.

Roots are of great importance when cows are kept on dry fodder. Potatoes, carrots, beets, turnips, parsnips, artichokes, and vegetable oysters, are good. The last three and cabbage and turnips keep good in the ground through the winter, and are fresh and fine in the spring, before the grass starts.

Potatoes produce a great flow of milk, but it is not very rich. A little Indian meal is good with them, to keep up the flesh and give richness to the milk; and this is the case with beets and most kinds of turnips, as they tend largely to milk. A little oil meal or flaxseed is excellant, in addition to the Indian meal, to keep up a fine, healthy condition, and impart a rich quality to the milk, and give a lively gloss to the hair of cattle, and softness and pliancy to the skin.

In all cases of high feeding in winter, particularly when cows have but few roots, shorts or bran are excellant to promote digestion and keep the bowels open. Three pints each of oil and Indian meal, or two quarts of one and one quart of the other, is as high feed in these articles, as cows should ever have. On shorts, bran and roots, they may be fed liberally. Four quarts of indian meal, in a long run, will dry up and spoil the best cows, so that they will never recover.

Carrots are among the very best roots for milch cows, producing a good but not very great mess of rich milk, and keeping the cow in good health. Parsnips are nearly the same. Ruta-bagas are rather rich, and keep up the condition. To prevent any unpleasant taste in the milk from feeding turnips, use salt freely on them, and milk night and morning before feeding with turnips. Cabbage turnip, (or turnip-rooted-cabbage-below-ground,) has no such effect. It resembles ruta-baga, is raised in the same way, and yields as much or more.

Some keep cows in the barn, by night, in a warm season. They are saved from storms, and more manure is saved. There should be good ventilation in hot weather. Cows are much better for being kept in the barn nearly all the time in cold weather. To drink freely of cold water, and then stand half chilled to death, is highly injurious. But they should go out a little while daily, in favourable weather, and be driven around gently, for exercise. Inaction is death to all the animal race.

Cows and other cattle are badly managed. They are not *watered*, in short days, until ten o'clock in the morning and their last chance for drinking is about four in the evening. Thus they go sixteen hours without drink, and during that time they take nearly all their food, which is as dry as husk. They suffer to a great degree from thirst, and then drink to excess. As a remedy, give cattle a part of their breakfast, and then water them, and water again after finishing their morning meal; and if kept up, water at noon, and at night. If it be too much trouble to take good care of stock, then keep less, and they will be as productive and more profitable if well managed. We have fed sheep that had constant access to water within eight or nine rods, and after eating thirty or forty minutes in the morning, they would all go and drink.

Milch cows are injured by being driven far to pasture, especially in hot weather, and still more if hurried by thoughtless boys.—[Cole's American Veterinarian.

Management of Bees.

Mr. Editor:—In all the numbers of the Farmer which I have read, I do not recollect of having seen a single article in regard to that very useful insect, the honey bee. This is a little remarkable, especially when we consider how great a share of our farmers keep bees, and how few manage them successfully. That bees when they "do well," as the saying is, are very productive capital, is an indisputable fact; and that they will "do well" almost every season, with proper management, is equally certain. That our climate is not such a one as an experienced apiarian would select, in which to raise bees with the least trouble and the fairest prospect of success is readily admitted; yet, at the same time, it is believed that a little attention to the subject will enable every farmer, and, in fact, every family, to supply themselves, at a trifling expense, with an abundance of good honey, one of the greatest luxuries that our country affords.

There is not, probably, more than one in five of those that try their hands at bee-keeping, that are really successful. Their bees swarm and go to the woods, or they "melt down" on a sultry summer day, or perish with cold in winter. Now most misfortunes of this nature arise from carelessness, or want of skill on the part of the apiarian, and may, with a little care, be easily avoided.

The first difficulty—that of bees seeking a new home in the woods—is less easily overcome than the others, yet I believe there is seldom any necessity of suffering a loss of this kind. This evil is certainly avoided when the patent hive is used, and new swarms are *manufactured* instead of being permitted to come forth in the usual way. I have also used successfully a double hive, or hive made in two parts, so that it could be separated and a new part attached to each—thus dividing the swarm without risk. Yet after all I prefer letting them swarm—it seems most natural—and besides, is a kind of pastime, of which it appears wrong to deprive them. How, then, should bees be managed when they swarm, to prevent them from leaving for the woods? But few directions need be given. As a general thing the less management the better. Above all, do not enrage your bees, nor frighten your neighbors, by jingling bells, or drumming on tin pans, or firing guns. Throw no dirt or water among them. Be quiet, and let them have their own way until they alight, which they will be sure to do in a few minutes, usually at a distance of from two to ten rods from the old hive. Then is the time, and the proper time, to commence operations. Place under the tree upon which the swarm hangs, a table, or something to answer the purpose. Place the hive upon it, each corner being raised from half to three-fourts of an inch from the table by blocks placed under them. Then gently shake the bough or tree upon which the bees hang, so as to precipate them upon the table near the hive. If the hive is clean they will most assuredly enter. Many invert the hive and shake the bees directly into it. This may be sometimes destrable—many consider it indispensable, but it is not. If the hive is new and clean do not attempt to render it more agreeable to the bees by washing with sugar and water, whiskey, or any nostrums. If it is not perfectly sweet, and a better cannot be had without too great delay, I know of no other better way of preparing it than by rubbing thoroughly with hickory leaves dipped in strong, clean brine.

Sometimes when a swarm has been hived and comes forth dissatisfied with their new home, it is found necessary to use means to make them alight. They will, it is true, generally do so of their own accord, but this cannot be as certainly depended on as when they first issue from the old stock. Hence, if they manifest a disposition to abscond, throwing sand or water among them or firing a gun will generally bring them to a halt. In all such cases, when they are again hived, the queen should be sought out and one of her wings clipped, so that she cannot fly. Then the swarm will not go, or, if they do, will return as soon as her majesty is missed. One of my neighbors had a swarm leave after the queen's wings had been clipped. They went to the woods, were gone over half an hour, when, missing their queen, without whom they seem to know full well they must soon perish, they again returned. Finally, it is always well, when hiving a swarm, to watch closely the queen, and, if discovered, clip one of her wings, which prevents the possibility of losing the swarm unless there happen to be more than one queen, a thing that seldom happens in early swarms.

If the new swarm comes out in a hot sunny day, the hive in which they are put should

be well shaded. This, doubtless, will often prevent their leaving it.

All hives should also be shaded, and so situated that air can circulate freely around them. Many fine swarms are lost every summer through negligence in this particular. It has generally been supposed that hives should front the east or south, but I am convinced that there is less philosophy than fancy in this idea. The north or west, upper or lower side of the hive, answers just as well, and some of them, perhaps, better for the entrance, than the south or east.

I intended in this communication to say a few words in regard to the size of hives; the superiority of the patent over the common hive; the proper management of bees in winter; the diseases of bees, &c., &c. But fearing, Mr. Editor, that I have already tired your own and your readers patience, I will drop the subject for the present, promising to resume it at some future time, should this prove acceptible. In the meantime I should like to hear from others on this subject, whose age and experience render them much better qualified than myself to interest the readers of the Farmer. Respectfully,

D.W.C.L.

—Michigan Farmer.

Flax Cultivation and Manufacture.

Flax and hemp are now grown to a considerable extent in some of the Western States. In 1847, there were imported into New Orleans from the interior States, 2654 tierces of flaxseed, and 1090 barrels of linseed oil. At Cincinnati there arrived by the Miami canal, in the same year, above 43,000 bushels of seed and 1400 barrels of oil. At Portsmouth there arrived 4600 bushels of seed, and at many other cities in the central and western States, the arrival of flaxseed or oil was proporionately great. The American produce of flax fibre varies from 300 to 1000 pounds per acre; the Irish produce in scutched flax varies from 500 to 900 lbs. the acre. Perhaps the great benefit of flax growing to any country is, that it is a profitable crop agriculturally, and a great source of manufacturing industry. In this point of view, it is a crop far superior to any food crop which could be raised. Flax crop is a source of industry, of skillful labour, of manufacture.

American farmers generally sow their flax too thin. They have a strong stalk and a coarse one, therefore, the flax produced is not so fine.

It has been found that 1680 pounds of dressed flax, when converted into cambric cotton handkerchiefs, spun by hand, employ constantly for twelve months 158 women in spinning, 18 weavers, during the same period, in weaving it, 40 women in hemstitching or veining the handkerchiefs. Thus giving in all, employment to 210 persons the year round, arising out of the growth of three acres of one plant useful in manufactures. This does not include the hands that are supported in raising the raw article. What a field for employment in a home market. At present, we could in no shape compete in price with the linen made in Ireland. French embroidered linen collars and linen cambric handkerchiefs are the beau ideal of grandeur to our fair and gay ones, but the most of these articles come from the North of Ireland, which sell under a French name, and by giving "honor to whom honor is due," we say that they surpass the French goods. Much as has been said of Irish linen, and the fame it has conferred upon Ireland, it was the banished Huguenots of France that first introduced the manufacture into that country. This is one good that religious persecution in another country, did to Ireland.

A very valuable improvement has recently been invented in this State in the preparation and manufacture of flax. The flax is prepared, drawn in a certain state upon the common drawing frame, and it is spun like cotton, and on the same machinery. In short, the flax is so prepared as to be drawn and finished on cotton machinery; producing yarn far surpassing in beauty any ever produced in the common way, and at a great deal less cost, as it dispenses with the use of the Hetchell Gill Frame, except merely for spreading the flax into strakes. The linen trade will yet be prosecuted vigorously in the Northern States, for it is not likely that in the cotton manufacture, the North will be able to compete with the South, in thirty years hence.—[Scientific American.

MULLED WINE.—One pint of wine and one pint of water.

Beat eight eggs and add to the above, while boiling, stirring rapidly. As soon as it begins to boil it is done.

TAMARIND WHEY.—Mix an ounce of tamarind pulp with a pint of milk, strain it, and add a little white sugar to the whey.

EXPERIMENT IN WIRE FENCE MAKING.

BY D. KINGMAN.

Messrs. Editors :—Believing that my brother farmers feel an interest in whatever experiments others may try, whether useful or otherwise in themselves considered—especially if facts are stated, so that they can practice, throw away, or improve upon them, as their judgments may direct—I have been induced to send you my experience in making wire fences.

During the last fall I constructed 104 rods of wire fence in the following manner:—I placed red cedar posts one rod apart, the posts being sawed about 3½ inches square at the bottom, and 3½ by 2 inches at the top, and set firmly in the ground to the depth of 2½ feet. I then bored holes through the posts with a ¼ inch bit—the upper one 4½ feet from the ground, and then 9, 8½, 7½ and six inches below, using five wires. Five inches below the lower wire I placed a board 14 inches wide, (with a short post in the centre to which I nailed the board,) which comes near enough to the ground. I then drew the wires through the posts and strained them by means of a lever, one end of which I stuck into the ground. I then looped the end of the wire around the lever near the ground, and while one is drawning upon the top of the lever, I plug the holes tight with pins of red cedar, previously prepared. I usually strained the wires 15 or 20 rods at a time, and then spliced the wires by looping and twisting the ends, and proceeded in like manner again. After the wires are in and the boards on, I take pieces of wire of the right length and make one end fast to the upper wire, and then wind it round the wires below till I come to the board, through which I bore a hole and fasten the lower end of the wire; three of these wires between each two posts, thus fastening it altogether.

The upper and lower wires are No. 10, and the others No 11. I bought my wire of Messrs. Pratt & Co., of Buffalo, at $7.50 per hundred. The five wires weighed 355 pounds. The wire that I used to weave in up and down was No. 16, and cost 10 cents per pound: it took 25 pounds. My posts I bought in the log (pretty large ones) at $12 per cord; one cord made 105 posts, the number used. It took 2000 feet of hemlock boards, which I reckon at $7 a thousand. The sawing of the posts was $2.25. The cost foots up as follows:—

355 pounds of wire, at 2½ cents . . .	$25.02
15 pounds of wire at 10 cents . . .	2.50
One cord red cedar posts	12·00
2000 feet boards, at $7	14.00
Sawing posts.	2.25.
Making the cost of materials	$55.77

Which being divided by 104, the number of rods of fence made, gives 53½ cents as the cost per rod—aside from nails, of which I kept no account.

Some of your numerous readers may be anxious to know whether such fence will answer the purpose in all cases. I can only say that mine is a road fence, and that when it was built, there was a good crop of pumpkins lying in the field along side, where they grew, and that notwithstanding many cattle and hogs made the attempt at them, they did not succeed; and my short experience goes far to convince me that no cattle, hogs, or fowls will get over or through it.

Ridgeway, N. Y., January, 1849.

Mr. Vail's Sale of Short Horn Cattle.

A part of the stock of George Vail, Esq., of Troy, was offered for sale at public auction, at his farm, near Lansingburgh, on the 13th ult. There was a large attendance of gentlemen at the sale. Among others, we noticed R. L. Allen, Esq., one of the Editors of the American Agriculturist, and A. Stevens, Esq., of New York city; L. G. Morris, Morrisinia; Hon. A. Van Bergen, Coxsackie; Messrs. Prentice, Tucker, Howard, McIntyre, and B. P. Johnson, Esq., Secretary of State Ag. Society, Albany; Messrs. Kirtland and McCullock, Greenbush; T. Hillhouse, Watervilet; Mr. Ogden, Quebec; Mr. Jean, Lewis County; Messrs. Jessup and Drinker, Penn.; Col. D. D. Campbell, Schenectady; Mr. Starkweather, Maine; Gen. Wool, U. S. Army; Gen. J. J. Viele, Troy; Amos Briggs, Esq., Schaghticoke.

Mr. Vail gave, at his cottage lately erected on his farm, a fine collation during the progress of the sale, where everything was in the best style, and the gentlemen in attendance were highly pleased with the arrangements, and all seemed gratified. The sales were at fair prices, and such as we presume will be deemed encouraging to breeders. We give a list of sales and purchasers, so far as obtained. There may be

one or two omissions. The nubers are from the catalogue :—

No. *Cows & Heifers & Purchasers.*

1. Sally, red and white, 9 years old, Mr. Niles, Washington co. N.Y. $110.00
   Her calf, 2 weeks old, Mr. Percival, Waterville 37.50
2. Judy 2d, white, 3 years, Drinker, Jessup & Co., Penn. 75.00
4. Queen 3d, roan, 4 years old, Col. D. D. Campbell, Shenectady . . . 135.00
5. Countess 18th, roan, 3 years old, Mr. Jean, Carthage Jefferson co., 80.00
   Her calf, Red Lady, No. 17, 2 months old, Mr. Jean, Carthage, Jefferson county 25.00
6. Victoria 2d, light roan, 5 years old Messrs. Drinker & Co., Penn. . . 105.00
7. Fanny 2d, red and white, 3 years old. Mr. Jean, Lewis Co. 90.00
8. Ariadne 4th, red and white, 2 years old, Mr. Burguyn, North Carolina . 105.00
9. Sophia 3d, red and white, 2 years old, Mr. Burguyn, North Carolina . 105.00
13. Charlotte 2d, principally red, 2 years old, Mr. Ogden, Quebec . . 100.00
16. Queen 5th, roan heifer calf, 2 months old, Mr. Burguyn, North Carolina 50.00
   6 heifers were sold to Mr. Starkweather,—at what price not ascertained.

Bulls.

18. Beppo, white, 3 years old, Mr. Holton, Vt. 37.50
19. Brutus, red, 2 years old, Col. D. D. Campbell, Schenectady 135.00
20. Belvidere, roan, 1½ year old, Mr. Remington, Philadelphia 150.00
22. Victor, white, 2 pears old, Drinker & Co. Pennsylvania 90.00
23. Nimrod, roan, 1½ year old, Mr. Starkweather 147.50
25. Minpa, red and white, 1½ year old, Mr. Harrington, Troy 60.00
26. Albion, red and white, 1 year old, T. Hillhouse, Watervilet 75.00
28. Essex, red and white, 1 year old, H. R. Burguyn, North Carolina . 80.00
29. Lenox, white, 1 year old, H. R. Burguyn 85.00
   White bull calf, Mr. Jean, Lewis Co. 30.00
—Genesee Farmer.

INDUSTRY.—"There is more pleasure in sweating an hour than in yawnidg a century."

COST OF FENCES IN THE UNITED STATES.

BY J. S. SKINNER.

The cost of building and repairing the Fences in the United States, is enormous, almost beyond the power of calculation, and forces the inquiry, whether Legislatures ought not to be called upon to compel every man to keep his stock to himself. Then no man, who did not choose to do it, would be forced to enclose his land against the ravages of his neighbor's stock.

Mr. Biddle, a few years since, in an address before the Philadelphia Agricultural Society, stated that the cost of the fences in Pennsylvania amounted to $100,000,000, and their annual expenses he estimated at $10,000,000. A distinguished writer on National Wealth, says: "Strange as it may seem, the greatest investment in this country, the most costly production of human industry, is the common fences which enclose and divide the fields. No man dreams that when compared to the outlay of these unpretending monuments of human art, our cities and our towns, with all their wealth, are left far behind. In many places the fences have cost more than the fences and farms are worth. It is this enormous burden which keeps down the agricultural interest of this country, causing an untold expenditure, besides the loss of the land the fences occupy."

Estimating a chesnut post and rail fence to last 18 years, and including inside fencing and repairs, the *annual* tax to the farmer holding 150 acres, will be $130 to $140, and judging from the present appearances, the tax is perpetual, and there seems but little hope of escape from it.

Did the intelligent farmer reflect a moment, and estimate the annual tax which his fences impose upon him, he would not rest till the system was abolished, or else the live hedge took the place of the present expensive fence of timber.

The system of compelling every landholder to enclose his property, is peculiar to the United States, with only the exception of England, where the fence nuisance appears again under the form of the hedge; and although these hawthorn hedges, when they are well tended—and not more than half of them are so—are beautiful objects, and answer all the purposes of protection against the inrods of cattle, still the public voice is beginning to cry out against them.

because of the enormous amount of land required to support them. Each hedge is five or six feet wide at its base, and taking into account the amount of land they exhaust on either side, the whole space cannot be less than twelve or fourteen feet wide. When it is recollected that the divisions and sub-divisions of land in England are very numerous, the amount of arable land abstracted from the purposes of agriculture, is very great. It has been estimated at several million bushels of grain.—[Plough, Loom and Anvil.

Poetry.

Singing Bird's Petition to Spoartsmen.

Wouldst thou have me fall, or fly?
Hear me sing, or hear me die?
If thy heart is cold and dull,
Knowing nothing beautiful—
If thy proud eye never glows
With the light love only knows—
If the loss of friends or home,
Ne'er hath made life wearisome—
If thy cheek has never known
Tears that fall from sorrow's moan—
If a hopeless mother's sigh
Brings no tear-drop from thine eye,
Thou may'st smile to see me die?

But if thou canst love the lay,
Welcoming the birth of May—
Or summer's song, or autumn's dirge,
Cheering winter's dreary verge—
If thou lovest beauty's hues,
Decked with light or gemmed with dews—
If, all meaner thoughts above,
Thou canst hope, and trust, and love—
If, from all dishonour free,
Thou canst Nature's lover be—
Spare her minstrels,—pity me? M.

Philadelphia, May, 1849.—[Horticulturist.

Horticultural.

Cleansing the Bark of Fruit Trees.

This operation should be performed in early spring, as well as in midsummer. The rough, loose parts of the bark should be scraped off, as well as moss and other parasites. The bark should then be covered with the following mixture, as high as the operator can reach, with an ordinary long-handled white-wash brush:—Five pounds soap, one pound fine salt, one pound sand, two pounds potash, two pounds nitrate of soda, dissolved or mixed with water to the consistency of cream, and thoroughly rubbed upon the bark.

Many kinds of insects are kept from the trees by a solution of whale oil soap alone, and manysuch as are resident in the crevices of the bark are destroyed by salt. The fine sand is intended, during the rubbing, to scratch the outer coating of the bark, and thus assist the other ingredients for more perfect action. The potash and nitrate of soda will decompose or soften the dead parts of the bark, so that during the summer they will be thrown off by the healthy action of the growing bark. If the above mixture be applied in dry weather, it will become so hard as to remain during several showers, and thus have time to perform its office. Trees with smooth bark, such as the plumb, many of the cherries, &c., should be rubbed with a wet, rough, woollen cloth, in a few hours after applying the mixture; this rubbing will cause the sand to clean the surface so perfectly as to give the bark an improved and more healthy surface. Trees so cleansed are not so likely to be revisited by insects as those left with their natural surfaces, nor are they as likely to become bark-bound. Indeed we have never known a tree to exhibit the disease called *bark-bound*, the surface of the trunk of which had been softened by a soap-wash in early spring. The cherry, apricot, peach, and nectarine are subject, when left to their natural state, to this disease, and it has usually been attributed to too rich or too moist a soil; and underdraining and slitting the bark lengthwise with the knife are the usual remedies. The one is expensive, and often impossible where choice trees are planted, and the other is barbarous and unsightly, causing exhalation of gum and consequent canker. In any case, a few applications of soap to the surface of the part hide-bound will remove the difficulty, and the mixture before recommended my be applied, slightly warmed, when required to soften the bark of a hide-bound tree.

WORKING FARMER.

Preservation of the Tomato.

Mr. R. B. Morrell gives us the following:—

"The tomato, which has come into universal use, and is deemed a luxury by almost every one, may be preserved for winter use

in the following manner. When ripe, let them be prepared by stewing as for the table, and to the liking; put them in small jars (1 quart) with covers. Over the top put a piece of linen or cotton cloth, which well cover, and press the cover on; then pour into the cavity melted mutton tallow, and keep them in a cool and dry place in the cellar until required for use. They need only to be warmed to serve them for the table. I use small jars for the reason, that when exposed to the air they soon ferment."—[Albany Cult.

Miscellaneous.

Assaying Metals.

The assaying is the most curious and scientific of all the business in the mint. The melters take the gold dust, melt it, and cast it into a bar, when it is weighed accurately, and a piece is cut off for the assayer. He takes it, melts it with twice its weight of silver, and several times its weight of lead. It is melted in small cups made of bone ashes which absorb all the lead; a large part of the silver is extracted by another process, and the sample is then rolled out to a thin shaving, coiled up, and put in a sort of a glass vial called matrasses, with some nitric acid. The matrasses are put in a furnace, and the acid is boiled some time, poured off, a new supply put in and boiled again. This is done several times, till the acid has extracted all the silver and other mineral substances leaving the sample pure gold. The sample is then weighed, and by the difference between the weight before assaying and after, the true value is found. All the silver over and above five pennyweights for each lot, is paid for by the mint as its true value. The gold, after it has been assayed, is melted, refined, and being mixed with its due proportion of alloy is drawn into long strips (not unlike an iron hoop for a cask) the round pieces cut out with a sort of punch, each piece weighed and brought to right size and put into a stamping press, whence it comes forth a perfect coin. —Scientific American.

Utility of Nettles.

The Medical Times says it is a singular fact that steel dipped in the juice of the nettle becomes flexible. Dr. Thornton, who has made the medical properties of our wild plants his peculiar study, states that lint dipped in nettle juice and put up the nostril, has been known to stay the bleeding of the nose, when all other remedies have failed—and adds that fourteen or fifteen of the seeds ground into powder, and taken daily, will cure the swellings in the neck known by the name of goitre, without in any way injuring the general habit.—[Scientific American.

Maternal Influence.

The mental fountain is unsealed to the eye of a mother, ere it has chosen a channel, or breathed a murmur. She may tinge with sweetness or bitterness the whole stream of future life. Other teachers have to contend with unhappy combinations of ideas. She rules the simple and plastic elements. Of her, we may say, she "hath entered into the magazine of snow, and seen the treasure of the hail." In the moral field she is a privileged labourer. Ere the dews of morning begin to exhale she is there. She breaks up a soil which the root of error, and the thorns of prejudice have not pre-occupied. She plants germs whose fruit is for eternity. While she feels that she is required to educate not merely a virtuous member of socety, but a Christian, an angel, a servant of the Most High, how does so holy a charge quicken piety, by teaching the heart its own insufficiency!

"The soul of her infant is uncovered before her. She knows that the images which she enshrines in that unoccupied sanctuary must rise before her at the bar of doom.—Trembling at such tremendous responsibility she teaches the little being, whose life is her dearest care, of the God who made him; and who can measure the extent of a mother's lessons of piety, unless his hand might remove the veil which deivides terrestrial things?

"When I was a little child, said a good man, my mother used to bid me kneel beside her, and place her hand upon my head while she prayed. Ere I was old enough to know her worth, she died, and I was left too much to my own guidance. Like others, I was inclined to evil passions, but often felt myself checked, and as it were, drawn back, by a soft hand upon my head. When a young man I travelled in foreign lands and was exposed to many temptations. But when I would have yielded, that *same hand* was upon

my head, and I was saved. I seemed to feel its pressure as in days of my happy infancy, and sometimes there came with it a voice, to my heart a voice that must be obeyed—'O! do not this wickedness, my son, nor sin against thy God.'"

Beauty.

Some are more susceptible to the beauty of the face, and implicit homage is rendered to it; oftentimes to such a degreee, that those who are destitute of this gift, are viewed with apathy or disgust; while their minds are erroneously imagined to correspond with their uninviting exterior. Pleasant is it to gaze upon lovely features, catching e almost heavenly expressions, which irradiate them; but how soon are we taught their evanescence! Sickness, afflictions, age, and a multitude of lesser ills will eventually imprint upon that delicate brow, Time's fatal seal; and how often concealed 'neath this pleasing guise, exists a heart cold, uncultivated, and actuated by no motive save selfishness. True, we happily find it is not always so; and how transcendently charming does it appear, when the countenance is the beaming index to a mind and soul, sanctified and adorned with holiness and love!—Boston Cultivator.

Slander.

Yes, pass it along, whether you believe it or not—that one-sided whisper against the character of a virtuous female. You say you don't believe it, but you will use your influence to bear up the false report and pass it on the current. Strange creatures are mankind! How many reputations have been lost by a surmise! How many hearts have been bled by a whisper! How many benevolent deeds have been chilled by the shrug of a shoulder! How many individuals have been shunned by a mysterious hint! How many chaste bosoms have been wrung with grief by a single nod! How many graves have been dug by a false report! Yet you will pass the slander along; you will keep it above the waters by a wag of your tongue when you might sink it forever. Destroy the passion for telling a tale we pray you. Lisp not a word that may injure the character of another. Be determined to listen to no story that is repeated to the injury of another, and as far as you are concerned the slander will die. But tell it once, and it may go as on wings of the wind, increasing with each breath until it has circulated through the state, and brought to the grave one who might have lived and been a blessing to the world.

NEVER GO BACK—Never go back—never. What you attempt, dowith all your strength. Determination is omnipotent. If the prospect is somewhat darkened, put the fire of resolution to your soul, and kindle a flame that nothing but the strong arm of death can extinguish. Energy and perseverance are more potent than the gold of drones.

MORAL CHARACTER.—There is nothing which adds so much to the beauty and power of man as a good character. It is his wealth, his influence—his life. It dignifies him in every condition and glorifies him at every period of his life. Such a character is more to be desired than every thing else on earth. No servile tool, no crouching cycophant, no treacherous honor seekerwill be such a character. The pure joys of righteousness never spring in such a person. If young men but knew how much a good character would dignify and exalt them, how glorious it would make their prospects, even in this life, never should we find them yielding to the groveling and baseborn purposes of human nature.

TRUE GLORY consists in doing what deserves to be written, writing what deserves to be read, and making the world the happier and the better for having lived in it.

CURE FOR A HORSE PULLING AT THE HALTER.—Fold one ear under a small strong cord which fastens him. He will give one jerk but never a second.—[Boston Cult.

Markets, &c.

LIVERPOOL, July 9.—The corn market has been dull throughout the week. American flour 24s. to 25s. 6d. per barrel. Indian corn has further declined 6d. to 1s. Bacon has been in good demand, at a reduction of 2s. per cwt. Ashes have also declined 1s. per cwt.

TORONTO, August 1.—Flour 17s. 6d. to 21s. 3d. Oatmeal 15s. to 18s. Wheat, per bushel, 3s. 6d. to 4s. Rye 2s. 6d. to 3s. 2d. Barley 1s. 6d. to 1s. 9d. Oats 1s. to 1s. 3d. Peas 1s. 4d. to 1s. 8d. Potatoes, new, 5s. Onions 5s. Batter 6d. to 7½d.—Eggs, per dozen, 6d. to 7d.