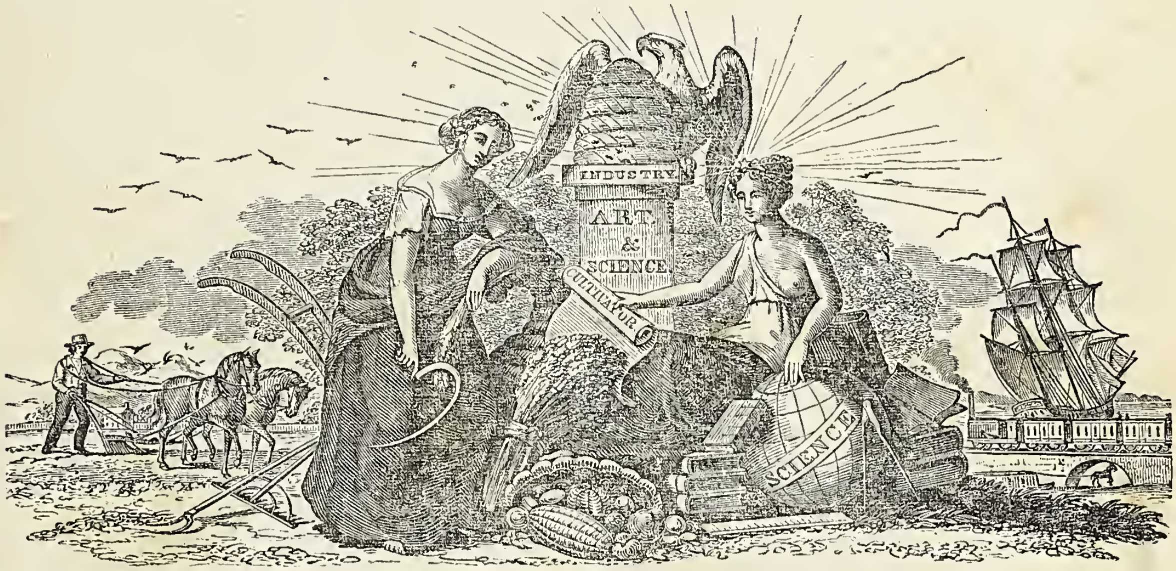
THE CULTIVATOR,

A MONTHLY PUBLICATION,

DESIGNED TO

IMPROVE THE SOIL AND THE MIND.



PUBLISHED BY THE NEW-YORK STATE AGRICULTURAL SOCIETY,

AND

CONDUCTED BY J. BUEL, J. P. BEEKMAN AND J. D. WASSON.

VOLUME I. SECOND EDITION.

☞ In this second edition, we have retained all the matter that can *now* be of use to the reader—the receipt of moneys, Price Current, &c. being omitted.

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A MONTHLY PUBLICATION, DEVOTED TO AGRICULTURE.

ALBANY, MARCH, 1834.

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TO IMPROVE THE SOIL AND THE MIND.

In behalf of the society who have assumed the proprietorship of the CULTIVATOR, we tender our thanks to the Post-masters and other gentlemen who have interested themselves in procuring subscribers for it. So far as returns have been received, the patronage is liberal—the number from a post-office seldom falling short of twenty, and frequently amounting to fifty, sixty and seventy. As the sole object of the publication is to disseminate useful information, in the cheapest possible form; and as the profits of subscription, if any accrue, will be applied to the improvement and embellishment of the work, we hope to stand excused for repeating our request, to all who are anxious to promote the improvement and prosperity of our country, to aid in its circulation, by their patronage and influence. We disclaim any wish to lessen the patronage of other agricultural journals. These, so far as we are acquainted with them, are producing important benefits, are well conducted, and are deserving of a better support than they receive. But they occupy but a small portion of the ground;—they do not reach one in sixty of our agricultural population. We seek to improve the unoccupied ground, in order to fit it for higher products. And in the mean time we hope to make our paper so useful, that gentlemen will be willing to ADD this to the periodicals which they already patronize. The low price at which this sheet is offered, is no criterion of what other journals can be afforded at. Our terms are predicated upon a large circulation, and are intended to cover merely the expense of paper and mechanical labor, and the latter greatly abridged by the economy of a steam printing press. Other journals are subject to heavy charges for services which are here gratuitous. It is for these reasons that we cannot employ, or pay agents, or commissions, and that we appeal to the liberal minded to volunteer their aid in extending the circulation of the paper.

TO THE READER.

In presenting this specimen, we have a few remarks to make to those for whose benefit it is mainly intended.

To the FARMER, the CULTIVATOR will communicate the best practices in farming, and afford occasional illustrations, in a plain style, of some of the principles upon which good husbandry is based. It will aim to render his labors more profitable and more respectable;—to produce system and economy upon the farm;—and intelligence, virtue and happiness in the domestic circle. There are more than 250,000 farmers in the state, not more than 5,000 of whom, or one in two hundred and fifty, it is believed, have access to an agricultural paper, or possess other means, except that of casual observation, of knowing the daily improvements which are making in their particular business. The reasons of this are, that they either cannot procure such papers, or that they are unable to pay for them—neither of which can apply in this case, as the cost of the CULTIVATOR, including postage, is too trivial to be objected to, and the mail will afford a certain and regular mode of obtaining them.

The MECHANIC is already, or expects at some future time to be, the cultivator of a garden, if not a farm. He will stand in need of instruction in his new art. This the CULTIVATOR will afford him. We shall, besides, advise him of the new discoveries and improvements which are likely to benefit his craft; and at all times endeavor to give him a two-penny-worth of rational entertainment.

The YOUNG MEN we would specially appeal to. You are destined soon to occupy the stage of public action, and to fill the important stations in society. *Now* is the time to *prepare* for these high duties, as well as for profit and distinction in your business. Your characters are but partially formed, and are yet susceptible of receiving good or bad impressions, which are to last through life. It is important to you, to your friends, and to society, that these impressions should be for good. We will lay before you rules and examples of the wisest and best men, to aid you in the formation of your characters—to enable you to become intelligent and successful in your business,—useful and respectable in society,—and beloved and happy in your families. Do not object that you have no *time* to read. Few young men labor more hours than did Benjamin Franklin, or are more humble and self-dependent than he was in his youth; and yet Franklin found abundant time for self-instruction; and so indefatigable and successful was he in his studies, that he became one of the most useful and celebrated men of his age. We need not limit the remark to Franklin: most of the distinguished men of the day have risen from humble stations by their own industry and frugality, and have acquired a great share of their knowledge in the hours not allotted to ordinary business. Your winter evenings are your own, and may be applied usefully. They may be computed at one-fourth of the day, or one entire month in a year. Time is money: and the young man who appropriates this month to the acquiring useful knowledge, does more to add to his future fortune, to say nothing of his intellectual wealth, than if he received pay for this month and loaned it upon interest. Knowledge is in another respect like money: the greater the stock of it on hand, the more it will administer to the respectability and enjoyments of life. But knowledge is not to be acquired without exertion, nor is any thing else that is useful in life. It is the labor we bestow in acquiring an object that imparts to it an intrinsic value. It has been well said, that "although we may be learned by the help of others, we can never be wise but by our own wisdom." It is the humble design of this monthly sheet to excite a laudable ambition to improve the mind as well as the soil. If we succeed in awakening the latent energies of the former, we think the latter will follow as a natural consequence, and our object will be attained.

We invite other classes of society than those we have addressed, to patronize this work. The subjects that relate to husbandry embrace a wide field of knowledge, and constitute some of the richest sources of intellectual enjoyment. We hope to make the Cultivator a cheap source of pleasure to all.—*Specimen Sheet.*

To the Executive Committee of the N. Y. State Agricultural Society.

The Corresponding Secretary of the New-York State Agricultural Society, having been prevented by indisposition, from attending the annual meeting in February, and making his report for the year 1833, now begs leave to do it through its Ex. Committee. It was made the duty of the Corresponding Secretary, by resolution of the society, passed at its meeting in February, 1833, to return the thanks of the society to Dr. William Darlington, of Pennsylvania, for his able and lucid communication to the society, on the "use of lime in agriculture;" and likewise "to Major John Adlum, of Georgetown, District of Columbia, for the book containing a treatise on the culture of the vine, and on the manufacture of wine from the produce of it; and for a box containing a sample of the wine so manufactured." The corresponding secretary has, in both these instances, performed the duty assigned him. It was likewise made the duty of the corresponding secretary, by resolution of the society, that he "address a circular to the presidents of the county agricultural societies already organized, or which may be formed the present year, requesting them to transmit to this society, at its annual meeting, an account of their several proceedings, with their views of the means best adapted to improve our husbandry, and to diffuse useful knowledge among those who manage its labors." The corresponding secretary has performed that duty, as far as the names of the officers of the county societies which were organized in this state could be ascertained, but he has received no communications from them in furtherance of the views of the society, and he is yet very imperfectly informed of the number of the county agricultural societies there are in this state, who are their officers, and whether they are auxiliary to the state society. While he regrets that this act of courtesy on the part of the officers of the county societies has not been extended to the state society, yet he is happy to acknowledge, that in several of the counties in this state, which have organized societies the present year, he has had the pleasure to receive, from gentlemen connected with them, an account of such organization, and of the names of those who have been chosen its officers. To such gentlemen, in behalf of the society, he returns his thanks; and he trusts that hereafter this act of courtesy will not be omitted by such other societies as may successively be formed in this state. Since our meeting in February, 1833, societies have organized, as far as I have been informed, in the following counties: Columbia, Albany, Rensselaer and New-York; and a re-organization has likewise been effected in Saratoga. No doubt there have been societies organized in other and more distant parts of the state, but in what particular counties I am unable to say, as in several of the western counties, agricultural societies, I perceive by the papers, are in a course of successful experiment. Most of these have had their exhibitions in the course of the last autumn, and I have not heard of a dissenting voice to the beneficial effects which have followed these first trials of agricultural skill and improvement. On the contrary, as far as public opinion could be gathered from the papers which have announced these meetings, they have spoken in warm commendation of the good effects which have already been experienced, and in anticipation that greater will follow. For myself, I attended a few of these exhibitions in neighboring counties and in my own, and in all instances was both gratified and amply rewarded for the time and money so spent. These exhibitions will annually become more useful as well as interesting, for as the respective societies increase their members, and have time to improve their internal organization, the subjects for premium will be more varied and better selected, the articles exhibited of better quality and in larger quantity. New fields of investigation will be opened, and the old ones more thoroughly and satisfactorily explored. The business, too, at their annual meetings will be more systematically conducted, and every thing connected with them assume a due course of improvement, so that they will command public approbation, and make advocates of those who are now unbelievers or neutrals. Besides the opportunity that is thus afforded by the meeting of these county societies for the exhibition of the best and varied kinds of stock, and all the available fruits of husbandry—and excited as their owners naturally will be by a laudable spirit of competition, which is still further increased by the hope of obtaining the badge of superiority —a premium—advantages of themselves sufficient to compensate for the little time and money they cost in our attendance upon them, farmers appear not to be aware of the great influence a well organized and conducted society will have upon the per acre price of their farms. To say it would be ten dollars per acre, after a few years of its existence, and its effects have been a little tested by time, would be surely saying little enough of what will hereafter be apparent. It must be obvious that when all of intellect in a whole community is brought to bear upon a single subject, with the zeal it naturally engenders, the new lights it constantly elicits, the improvements that must necessarily follow steps which all lead directly to the adoption of a better system, husbandry with these aids, will assume new forms and be rendered far more lucrative and attractive. Can it be otherwise then that our farms will be made more valuable, our pursuits more pleasant, our houses more comfortable, and our means more abundant? This concert of action will have the same effect in leading to important results that military combination and skill have over the uncombined and ill directed efforts of a disjointed but populous community. History teaches us that the united efforts of a few hundred have overcome thousands not so trained and connected. Let us avail ourselves of this lesson from history as applied to our particular pursuit, and by united effort, if it is guided by intelligence, our state will become as eminent for the successful cultivation of her soil, as she now is for the elevation which she has attained in her career of internal improvement. Providence has been bountiful to us, not only in our location, in giving us a healthy climate, a fertile soil, streams to float away our produce to the best markets, and strength of body to encounter the fatigues incident to the improvement of these great advantages,—but, has the mind heretofore borne her share with the toils of the body? My observation tells me not. Let us henceforward call her into active requisition, to aid the operations of our hands, and their joint labors will make our pursuits not only more pleasant, but infinitely more profitable. But what can concentration of effort effect without we have the aid of agricultural journals to inform the public mind? The answer must be—nothing. We have, however, these invaluable resources, and thanks to the intelligence of our community, they are daily becoming more numerous, interesting and instructive. It is but a few years since the first of these was established, and then it was more in the nature of an experiment. That day has gone by; the experiment, after years of trial, was successful, and we have now four valuable journals in circulation, and in successful operation in this state. From their reports, the numbers of their subscribers have materially increased within the last year, and it argues well for the public taste that political papers occasionally publish useful agricultural essays in their columns, as it clearly indicates a growing desire in their readers, who are generally farmers, for information upon their particular pursuit. The last year has been peculiarly auspicious on this subject. In every part of the state the calls for the publication of agricultural articles have been numerous, and cheerfully responded to, and the State Agricultural Society now makes its particular acknowledgments to editors of newspapers in every county in this state, for giving publicity to such communications as they have done themselves the honor to furnish them. We trust the editors of our state will continue to keep open their columns to all that tends to the improvement of agriculture, inasmuch as by their general circulation in all classes of our citizens, they diffuse most extensively whatever information they contain.

In conformity with a resolution of this society, Ambrose Spencer, Horatio Hickok and Jesse Buel were appointed a committee to report a memorial to the legislature, praying that legislative provision be made for a State Agricultural School. In conformity with the above resolution, a petition was prepared and presented to both senate and assembly, in February, 1833. In both branches reports favorable to the object solicited were made, and I must refer the society to the report of Mr. Sudam of the senate, and Gen. Skinner of the assembly, in which the advantages that would result from the establishment of such an institution are both ably and eloquently pourtrayed. In neither branch of the legislature were these reports acted upon. It was thought most judicious at first to inform the public of the object contemplated, and the purpose it was to answer, trusting that as the public mind became enlightened, it would perceive the necessity of the institution thus sought, the great benefits that would follow from it, and that if it met with a general approval, the public voice would at the proper time call for it. The call has been made: petitions from many counties in the state have this year been presented to the house; public bodies have given the project their sanction. The extremes of the state, from Long-Island to St. Lawrence and Erie, have united with the centre in a voice of approval, and the more the subject is canvassed, the more deep and abiding is the impression of the great benefits that will flow from the establishment of an agricultural school. In due time we trust our hopes will be consummated.

There has also been a general wish expressed within the last year, throughout every part of the state, for legislative aid to enable the county agricultural societies to offer and pay premiums for articles thought worthy of them. The object is extremely laudable in itself, and as the premiums are among the aliments essential to the existence of such societies, we trust the boon will not be denied. A resolution was likewise passed at the meeting of the State Agricultural Society, in 1833, that annual fairs be held at New-York and Albany, and that the first attempt be made in the then ensuing autumn. A correspondence was opened with the municipal officers of each of these cities to give effect to the resolution of the society. By an unavoidable delay, it could not be carried into effect in New-York, but it was in Albany. A fair was held under the auspices of this society at the latter place, which, although it was the first, fully met public expectation. It was visited by gentlemen from almost every portion of our state, by many from the eastern states, and those that were most competent to form an opinion of its merits, from having attended similar displays elsewhere, declared, that in the variety, excellence and value of the stock, particularly the cattle exhibited, the fair at Albany was most abundantly successful.

From the foregoing imperfect survey of the operations of this society for the last year, we have every inducement to persevere. We ought to be gratified at the success that has thus far crowned our efforts. We see hundreds of intelligent men springing up in every section of our state, willing to aid and share in our labors—the whole community alive and awake to the subject of farther improvement, and each individual member of it solicitous to perform his part in this general march of mind for the attainment of these great objects. It is only for the society to give a proper direction to these efforts, and make them subservient to the advancement of agricultural industry and prosperity, and her benefits will be felt and acknowledged throughout every portion of our state.

J. P. BEEKMAN, *Cor. Sec. N. Y. Ag. Society.*

Kinderhook, March 5, 1834.

MAPLE SUGAR.

As the season for its manufacture is at hand, we venture to offer some suggestions upon the subject, having been somewhat of a sugar boiler in our younger days.

The first care should be to preserve the trees. It is not safe in primitive woods, to cut away all the other timber, and to leave only the maples standing. In this way they are robbed of their protection, and are very liable to be prostrated by the wind. But trees growing in open situations adapt their forms to withstand the winds; and hence those which are termed second growth ought to be carefully preserved. Trees are often destroyed, in a few years, by injudicious *tapping*. We have seen them half girdled in a season, in order to increase the sap. The consequence is, that the wounds do not heal; the water lodges in the *boxes* and rots the wood; and the tree dies, or is broken off by the wind. A chissel and mallet are better than the axe to *tap* with, and a screw auger, two to five quarters in diameter, according to the size of the tree, is better than either—as the wound then soon closes, and little or no injury is inflicted on the tree. One or two holes may be bored on the south, and the like on the north side of the tree, if the size will warrant it. The holes at first should not exceed three-quarters of an inch, and the slope upwards should be so much that the sap will run freely in frosty weather, and not, by a slow motion, be liable to freeze in the mouth of the orifice. When the flow of sap begins to slacken, the holes may be increased to the depth of two and a half inches, or the depth of the sap or whitewood, and with an auger a quarter larger than was first used. The spout should not enter the hole more than half an inch; as the farther it enters, the more the running sap is obstructed. In ordinary seasons, the best time for making maple sugar, is the last twelve days in March and the first twelve days in April. It must freeze at night and thaw in the day to constitute good sap weather. A west wind is most favorable.

The next object is, to preserve the sap clean, and to do this, it is necessary to have clean vessels for its reception. The old way was to use troughs roughly cut from timber previously split through the centre. These answered tolerably well the first year. But being suffered to remain under the trees, they were often found when wanted the next year, filled with leaves, ice and filth, which unavoidably mingled with the sap. The best vessels for this purpose are wooden buckets, made broader at the top than at bottom, that they may be packed away in nests under cover, when the sugar season is over, and thus preserved clean. We have seen them sold at $8 per hundred. They will last many years.

It is found beneficial to put into each half barrel of sap a spoonful of slaked lime. This causes the impurities to rise better when boiling, which should be carefully skimmed off. The sap should be boiled before fermentation commences, which will happen, as the weather becomes warm, the second or third day. The greater the exposure of the surface to the atmosphere, when boiling, the greater will be the evaporation. When the sap has been reduced to syrup, it should be strained through a woollen or hair cloth, and then stand a few hours to settle; after which it should be turned carefully off from the sediment which has settled at the bottom. In *boiling down*, charcoal is the best fuel to use; for although the heat should be pretty brisk, it should be equable, and be confined to the bottom of the kettle. The *clarifying materials* should be added at the commencement of this process. These are generally milk, eggs, or what is better, calves' blood. The scum which rises should be carefully taken off. The impurities attach to these mucilaginous materials, and are carried with them to the surface.

When the syrup is sufficiently reduced, and taken from the fire, it should be stirred well for some time, in order to give it *grain*. This is effected by bringing every part of the mass in contact with the atmosphere; for if turned into moulds immediately, and not stirred, it will not be grained, but resemble candy rather than sugar. If intended to be caked, it must be turned into moulds before cold. Under the best process there will be a portion which will not granulate, on account of the vegetable mucilage which it contains, but which will drain off if the cask in which the sugar is deposited has holes at its bottom through which it can pass. To prevent the sap or syrup rising, a piece of fat may be thrown in, or the inner rim of the kettle rubbed with a piece of fat pork.

Molasses and vinegar are generally made from the last runnings, as the sap is then less adapted for sugar, abounding more in mucilage as the buds of the tree swell and being more liable to ferment. The molasses, when properly clarified, is superior to that from the sugar cane, having a peculiarly grateful flavor. The vinegar, though excellent for ordinary use, is not so well adapted for pickles as that made from cider.

Claying or whitening the sugar.—To promote the molasses passing more freely from the sugar, when draining in the moulds or tubs, and to improve its color, in two or three days after the moulds or tubs are unstepped at the bottom, mix white clay with water so as to reduce it to a thin mortar; with this cover the top of the sugar one inch and a half thick: when the covering appears dry, remove it, and supply the place with a fresh covering about two inches thick. This process may reduce the sugar one-fifth, but will add correspondingly to the molasses.

The Roller is in many ways serviceable on a farm, and it is an implement which every farmer, with trifling aid from the smith, may shift to make for himself. It may consist of a log of two or three feet in diameter, and eight or ten feet long, nicely smoothed on the outside, with gudgeons in the centres of the ends, a frame, and tongue and shafts to draw and guide it by. After sowing small grains and grasses, the roller should follow the harrow. It breaks down the clods, smooths the surface, and presses the earth to the seed, and thereby causes more of it to vegetate and grow than otherwise would; for if the earth does not come in close contact with the seed, it remains dry, and is lost. In the spring, as soon as the fields are dry and firm enough to resist the feet of the cattle, the roller is very beneficially applied to meadows and winter grain. At this time the surface of tilled ground is crusted, and generally checked with small fissures, which expose the collar (the part which connects the roots and leaves,) and roots to the drying influence of the sun and winds. The roller breaks and pulverizes the crust, and renders the soil more pervious to heat, and closes the fissures. It is also serviceable in partially covering the crowns of the plants, which induces them to send out new roots and to send up more seed stalks. This effect is particularly noticeable in barley, when the roller is passed over it, after it has become three or four inches high. If winter grain is harrowed in the spring, the roller may follow the harrow.

In rolling grass lands it is necessary to attend in a particular manner to the season, as it cannot be performed to advantage when the surface is either in a too dry or too wet a condition: if too wet, the ground will become poached by the cattle's hoofs; and if too dry, the roller will make little impression in levelling the surface; and it is generally necessary, if the roller be of wood, to add to its weight for grass grounds, by placing stones in the box, which is attached to it for that purpose.

Potatoes.—The object of farmers generally is, to plant those varieties which will give the greatest yield, without regard to flavor or nutritious properties. This is wrong. Potatoes differ one-half in the nourishment they afford to domestic animals, as well as to man; and the eating of a *good* thing, may be as grateful to the brute as to the man. It has been ascertained by chemical tests, that one hundred parts of a good potato contain twenty-eight per cent, or twenty-eight parts, of nutritious matter, and that one hundred parts of some poor varieties contain not more than fourteen parts of nutritious matter. The man or the brute, therefore, that eats 100 lbs. of poor potatoes, swallows 86 lbs. of water and ligneous matter which does not contribute in the least to nourish the body, nor to promote health. If the crop is to be consumed in the family, or on the farm, there is a propriety, on the score of economy, in selecting good sorts, though these do not yield more than half as many bushels as the poor sorts do. But the difference in product, seldom, if ever, exceeds a quarter. For market, the difference between good and bad potatoes is, or ought to be, a quarter; and it will be, when the buyer knows how to appreciate and to distinguish the difference. The best varieties of potatoes now in vogue, are the kidneys, or foxites, the pink-eyes, the Mercers, and the Sault St. Marie.

The potato requires, with us, a rich, moist and cool soil; that part at least in which the tubers form to be loose, that the stolens may penetrate, and the potatoes swell, without much obstruction. A clover ley, and long manure, are particularly beneficial to the crop. They should not be planted so close that the tops shall exclude the sun from the soil. Three feet in drills, or two and a half in hills, is near enough for ordinary varieties. Nor is it beneficial to earth them after the tubers have began to form, as this removes the roots too far from the surface, and causes a new set of stolens to issue.

Stolens are the roots on which the potatoes form, and are distinct from those which penetrate deep, and supply food to the plant. But all weeds should be carefully destroyed; as one of these if suffered to ripen its seed, takes as much nourishment and moisture from the ground as a stem of the potatoes. This crop should not be planted twice on the same ground in succession, as the second year the product will be greatly diminished.

Grafting is a mode of propagating varieties of fruit of esteemed quality. Grafts may be cut any time after the fall of the leaf in autumn, and before the buds begin to swell in the spring. They should be of the preceeding year's growth, are best from bearing trees and exterior limbs. They may be preserved by embedding their larger ends in clay, a potato, or in moist earth, in a cellar in winter, or in the open ground, partially or wholly covered, in the spring. Grafts are annually sent across the Atlantic. The great care should be that they are not kept too warm or too moist, so that the buds swell before they are wanted for use. The rationale of grafting will suggest the time and the manner in which it should be done. The scion and graft are to be so adjusted that the sap wood of the stock, by which the sap ascends from the root, comes in contact with the sap wood of the scion; and a like adjustment must be observed between the inner bark of both, through which the sap descends from the graft to the stock after it has been elaborated in the leaves. Without the first precaution, the sap will not reach the graft, which will consequently shrivel and die. Without the last, the graft cannot knit or unite to the stock: for it is the descending sap which forms the new wood, and which indeed causes the graft to send its roots down into the earth, upon the outside of the wood, but under the bark of the stock. The union can only take place after the sap has begun to circulate in the stock, which is when the buds are bursting. The clay or composition is applied to exclude the drying influence of the air and sun, and also rain, from the wound until a complete union has taken place. The graft does not become injured by being somewhat shrivelled before it is inserted; but if it appears too much so, it may be buried a few hours in moist earth before it is used. The compositions used as substitutes for clay are many. A good one is one part tallow, two parts beeswax, and four parts rosin, melted and incorporated like shoemaker's wax. If the weather is cold, this will require to be softened by immersing it a time in warm water. A thin layer of this, covering the end of the stock, and the slit, will suffice. With the addition of a little more tallow, the composition may be spread upon linen or cotton cloth, when warm, and the cloth cut to the required size for a graft, and applied with less trouble in the form of a prepared plaster. The different processes of grafting are so generally known that we need not detail them; our object being only to throw out such suggestions as may tend to render the success of the operation more certain.

Canada Thistles.—Of all the expedients which we have seen recommended to destroy this troublesome and prolific plant, a writer in the Genesee Farmer recommends a mode entitled to a preference; because he has, in successive years, found it to be efficient in practice—and because the result is in perfect consonance with the laws of vegetation. The method is, to plough and plant the field where they have obtained a footing with corn, and to go over the field twice a week, as soon as the thistles appear, and carefully cut every one with a hoe, as far under the suface as practicable. In August, says the writer, they began to become thin and scattering, and appeared of a sickly yellowish hue. The operation was continued till October. In September, the roots were found, on examination, in a state of decay, and of a blackish color. The whole were destroyed. Leaves are as necessary to the growth and being of a plant as lungs are to an animal. Plants cannot grow without the agency of leaves; for it is in these that the food of the vegetable is elaborated and fitted for its wants. Trees are often killed by caterpillars that destroy the leaves, when the sap is in free circulation, and the plant most in need of their active offices. The ascending sap becomes stagnant, ferments, and destroys the vitality of the plant. Thus with the thistles, by constantly destroying the leaves, before they elaborate the food collected by the roots, although very tenacious of life, the roots die for want of nourishment. Where the thistles are confined to a small patch, a pile of manure left on them a few weeks will effectually destroy them, as will any other covering which excludes the light and air wholly from the leaves.

Chemistry in the Kitchen.—Why is it necessary to mix lime with ashes in soap making? The answer to this question will explain the reason why the process often fails, and suggest a remedy for the evil. Common soap is a compound chemically united, of alkali, or ley from potash, and grease, fat or tallow. The alkali is naturally combined with carbonic acid, for which it has a stronger affinity than it has for grease; hence while it continues united with the acid, it will not unite with the grease, and produce soap. But lime having a stronger affinity for the acid than the alkali has, extracts it from the ley, and the alkali then readily unites with the grease, and forms soap. From this it will be seen, that the lime should be spread over the bottom of the leech tub in order that the ley may filter through it; and also that the lime be fresh burnt, as it then has a greater capacity for the acid.

The Swine, in many parts of our state, are of a bad breed, with long legs and snouts, and sharp back, of a roaming propensity, and slow and expensive to fatten. The method of improving, where a good breed cannot be readily procured, is pointed out in the directions for improving farm stock, under the head of the Science of Agriculture, an article which we particularly recommend to the perusal of our farmers.

Have you planted a Vine?—If you have planted one that produces good fruit, take care of it, and propagate it by cuttings and layers, and its fruit will richly repay your labor. If you have not, buy or beg one, and plant in the present spring. If you buy, it will cost you two or three shillings; if you beg one, I don't know how much it will cost you to requite the favor. The second year after planting it will produce you fruit, which will every year increase as the plant enlarges. The fruit will be found to be wholesome and grateful, and you will realize the pleasure of *sitting under your own vine*, during the intense heat of summer; and you will wonder that you have lived so long without enjoying this pleasure. The native kinds most worthy of cultivation, are the Isabella, Winne and Catawba, all hardy, thrifty and abundant bearers, and their fruit ripening in the order in which they are named. If you want foreign fruit, the Sweet-water, Chasselas, black cluster, and other early kinds are to be preferred. These demand more care than the native kinds, and the vines will require a slight covering of earth during the winter. A little experience will make you familiar with their management, and convert the labor required for their care into a recreation.

Rearing Calves.—The following is the general method of rearing calves in Britain, and differs not materially from that followed by Bakewell, the great cattle breeder:

"The calves sucked for a week or fortnight, according to their strength: new milk in a pail was then given a few meals: next new milk and skim milk mixed, a few meals more; then skim milk alone, or porridge made with milk, water, ground oats, &c. and sometimes oil cake, until cheese making commenced, if it was a dairy farm; after which, whey porridge, or sweet whey, in the field, being careful to house them in the night, until the warm weather was confirmed. Bull calves and high bred heifers, however, were suffered to remain at the tile until they were six, nine, or perhaps twelve months old, letting them run with their dams, or more frequently less valuable cows or heifers."

It is to be remarked that they have no Indian meal in Britain. This is substituted with us, for oat meal, and even oil-cake. A handful put into skim milk or whey, for calves, improves their condition greatly.

Massachusetts Premium Crops.—Among the premiums recently awarded by the Massachusetts Agricultural Society, were the following:

To E. H. Derby, of Salem, for the best crop of turnips. Product on two acres one quarter and seven poles, 1,730¼ bushels. Seed sown with drill barrow.

To Payson Williams, of Fitchburgh, for spring wheat, on one acre. Product 55 bushels three pecks. Seed sown, 2¼ bushels. Variety from Black Sea.

To William Carter of Fitchburgh, for potatoes. Product 677 bushels on an acre. Seed 55 bushels, long reds and blues.

To the same, for barley. Product on one acre, 55 bushels. Seed 5 bushels, of the two rowed kind.

Memorandum.—February 20. No snow. Thermometer 55 degrees in shade. Blue birds appear. Sowed spring wheat and garden peas.

Plaster.—It is a practice with some farmers, and we venture to recommend it to all, to sow plaster of Paris on their grass grounds in March.

To destroy the Weevil in grain.—Soak linen cloths in water, wring them, and cover your grain with them: in two hours time you will find all the weevils upon the cloth, which must be carefully gathered off, that none of the insects may escape, and then immersed in water to destroy them.—*Dom. Ency.*

ADDRESS OF THE PRESIDENT,

Delivered before the New-York State Agricultural Society, at the Annual Meeting, February 12, 1834.

We have associated, gentlemen, to increase the pleasures and profits of rural labor—to enlarge the sphere of useful knowledge—and, by concentrating our energies, to give to them greater effect in advancing the public good. In no country does the agricultural bear so great a proportion to the whole population as in this. In England, one-third of the inhabitants only are employed in husbandry; In France, two-thirds; in Italy, a little more than three-fourths*—while, in the United States, the agricultural portion probably exceeds five-sixths. And in no country does the agricultural population exercise such a controlling political power, contribute so much to the wealth, or tend so strongly to give an impress to the character of a nation, as in the United States. Hence it may be truly said of us, that our agriculture is our nursing mother, which nurtures, and gives growth, and wealth, and character to our country. It may be regarded as the great wheel which moves all the machinery of society, and that whatever gives to this a new impulse or energy, communicates a corresponding impetus to the thousand minor wheels of interest which it propels and regulates. Knowing no party, and confined to no sect, its benefits and its blessings, like the dews of Heaven, fall upon all. Identified, then, as agriculture is, with the interests of every department in society, it becomes *our* profession, in particular, to endeavor to enlighten its labors, to remedy its defects, and to accelerate its improvement.

Of the multitude of objects which present themselves as worthy of our consideration, I can only embrace a few of the most prominent ones in the subject matter of this address. I shall particularly invite your attention to

The economy and application of manures;
The improvement of farm implements and machines;
The advantages of draining;
The defects which exist in the present mode of managing our hop and barley crops;
The division of labor;
The introduction of new articles of culture; and
To some illustration of the comparative profits of good and bad husbandry.

Manures.—If we consider that all animal and vegetable substances are susceptible of being converted into manure, or food for farm crops, and reflect upon the great quantity of these which are wasted upon a farm; and if we add to these considerations the fact, now well established by chemical experiment, that yard dung loses a large portion of its fertilizing properties, in the gases which escape, where fermentation is suffered to exhaust its powers upon it in a mass, we may be able to appreciate, in some measure, the great defects which exist in our general management of this all-important material.—Manures are a principal source of fertility. They are to our crops what hay and forage are to our cattle—the food which is to nourish and perfect their growth. Continual cropping, without manure, as certainly exhausts land of its fertility, as constant draining from a cistern that is never replenished exhausts the water which it contains. The practice of some, who, disregarding one of the soundest rules of farming, continue to crop without manuring, till the soil will no longer yield a return to pay for the labor, is upon a par with that of the man who undertook to teach his horse to live without food: just as the experiment was about to succeed, the horse died. A considerable portion of the lands in Virginia and Maryland, which were originally fertile, have in this way been judiciously exhausted, and thrown into commons as not worth enclosing. I lately received a letter from a young gentleman in the former state, soliciting my advice as to the means best adapted to restore fertility to two worn out farms, which had recently come into his possession, and which he stated, would no longer produce clover. It is much easier to prevent sterility than to cure it, on the same principle that it is easier to *keep* a cow in flesh when she is so than to *restore* her to flesh after she has become wretchedly lean. In some soils, to which nature has been uncommonly bountiful in imparting the means of fertility, as in many of our river alluvions, the deterioration is slow and imperceptible; yet it nevertheless goes on even there. But in ordinary, and particularly in the lighter soils, the profits of husbandry depend, in an eminent degree, upon the faithful application of all the manure which a farm can be made to produce.

In regard to the question,—in what condition are manures most economically applied?—I am sensible that a difference of opinion exists, many contending, even on philosophical grounds, that it is most wise to apply them after they have undergone fermentation. If the question was merely, whether a load of fermented or unfermented dung is of the greatest intrinsic value, in ordinary cases the former would be entitled to the preference, because it contains the greatest quantity of vegetable food. But the correct way to state the question would be this: Will *five* loads of rotted manure impart greater fertility than *ten* loads that are unrotted? The numbers ought rather to be five and fifteen—for I think common dung suffers a dimunition of two-thirds, instead of one half, in volume, by a thorough process of rotting.* It will assist in determining the question, if we ascertain what the manure parts with during fermentation, for it evidently loses much in weight as well as in bulk, and whether this lost matter would, if buried in the soil, have afforded food to the crop. For if it possessed no fertilizing property, the sooner it is got rid of the better, and we save the expense of transporting it to the field. But if it really consists of prepared or digested food, fitted for the organs and wants of plants, it is truly improvident to have it wasted and lost for all useful purposes. The latter is really the case.† The matter which escapes in fermentation is vegetable matter in a gaseous form, fitted by natural process, like chyle in the animal stomach, to enter into and become a constituent in a new generation of plants. It is principally carbonic acid gas, the aliment of vegetables and the true staff of vegetable life. It has been vegetable matter, and will become vegetable matter again. Without resorting to chemical proofs or authorities to prove this, I will suggest a mode by which the matter can be satisfactorily settled. Let any farmer, in the spring, before yard manure ferments, put twenty-five loads in a pile to rot, and take another twenty-five loads to the field where he intends to plant his corn, spread it upon one acre, plough it well under, harrow the ground, and plant his seed. Let him plant another acre of corn along side this, *without manure.* As soon as the corn is harvested, carry on and spread the twenty-five loads of prepared or rotted manure left in the yard, or what remains of it, upon the acre not manured for corn, and sow both pieces to wheat. Unless my observation and practice have deceived me, he will find the result of the experiment to be this:—the acre dressed with long manure will yield the most wheat, because the manure has been less exhausted in the process of summer rotting, and for the reason, that in cultivating the corn, it has become better incorporated with the soil—*and it will, besides, have increased the corn crop some twenty or thirty bushels, in consequence of the gases upon which the crop here fed and thrived*, but which in the yard were dissipated by the winds and lost.

Plants, like animals, require different modifications of food. In general, the plants which afford large stocks or roots, as corn, potatoes, turnips and clover, thrive best on the gases which are given off from dung in the process of fermentation—while those exclusively

* Babbage on the Economy of Machinery.

* During the violent fermentation which is necessary for reducing farm-yard manure to the state in which it is called *short muck*, not only a large quantity of fluid, but of gaseous matter is lost; so much so that the dung is reduced one-half or two-thirds in weight, and the principle elastic matter disengaged is carbonic acid, with some ammonia; and both these, if retained by the moisture in the soil, as has been stated before, are capable of becoming a useful nourishment for plants.—*Davy.*

† As soon as dung begins to decompose or rot, it throws off its volatile parts, which are the most valuable and most efficient. Dung which has fermented so as to become a mere soft cohesive mass, has generally lost from one-third to one-half of its most useful constituent elements. It evidently should be applied as soon as fermentation begins, that it may exert its full action upon the plant, and lose none of its nutritive powers.—*Davy.*

cultivated for their seeds, as wheat, barley, &c. are often prejudiced by these volatile parts, which cause a rank growth of straw, without improving the seed. Hence the first mentioned crops may be fed on long manure without lessening its value for the second class, provided they immediately follow, and hence unfermented manures are most economically applied to hoed crops.

Different rules should govern in the application of fermented and unfermented manures. The latter should be buried at the bottom of the furrow with the plough, the former only superficially with the harrow. The reasons are these—unfermented dung operates mechanically while undergoing fermentation, in rendering the recumbent soil porous and pervious to heat and air the great agents of decomposition and nutrition, and the gaseous or volatile parts being specifically lighter than atmospheric air, *ascend*,* and supply the wants of the young roots. The next ploughing turns the residue of the dung to the surface, when it benefits on a different principle; for fermented manures consist of ponderable substances, which have a tendency only to *descend.*

Manures possess a high value in a good farming districts, where the natural fertility of the soil has been impaired by culture. In most of our large towns, it is bought up at one to two dollars a cord, and transported ten or twenty miles by land carriage, and much farther by water. So essential is it considered in Europe to profitable husbandry, that every material which imparts fertility is sedulously economised, and applied to the soil. Among other things, ship loads of bones are annually brought from the continent into Great Britain, and ground for manure. Bone dust is in such high demand in Scotch husbandry, that its price has advanced to 3*s.* 6*d.* sterling per bushel.

We possess no certain data to ascertain the saving which may be introduced into this branch of farm economy; yet if we put down the number of farms in the state at one-tenth of our population or 200,000, and estimate that an average increase of five loads upon each farm might annually be made, it will give us a total of one million loads, which, at the very moderate price of 25 cents, would amount to $250,000 per annum.

Farm implements.—We must all have noticed the great improvements which a few years have made in the mechanic and manufacturing arts. Scarcely a process is managed as it was 20 years ago. Scarcely an old machine but has undergone improvements, or given place to a better model. Manufacturing operations have been simplified and abridged, and human labor has been reduced to a comparative cypher, by the substitution of machinery and the power of steam. The effect has been a great reduction in the price of manufactured commodities, and an increase in their consumption. We are assured that during the twelve years which elapsed between 1818 and 1830, Sheffield wares—hardware and cutlery—experienced an average reduction in price of sixty per cent, varying upon different articles from forty to eighty-five per cent.† Cotton goods, books, and various other fabrics, have undergone a reduction no less remarkable within our time. These beneficial changes have resulted in a great measure from the aid which science has either itself imparted, or which it has elicited from mechanic skill—for a useful invention often awakens latent genius, and calls forth successful competition, even in the unlearned. No sooner is an improvement in the manufacturing arts announced, than it is adopted whenever it can be rendered beneficial—such is the facility of intercourse—such the desire—the necessity—*there*, of profiting from every discovery which benefits their art. The farmer is less able and less willing to keep pace with the march of intellect. He has few opportunities of becoming acquainted with the improvements of others, except by slow degrees; and he is so liable to be taken in by the catch-penny productions of the day, and is, withal, so distrustful of new experiments, that he will hardly venture to buy new implements and machines, nor to adopt new practices, however beneficial they might prove on trial. Mr. Coke tells us that his examples in farming, (and few men ever gave better,) only enlarged the circle of their influence about a mile in a year. Hence, as regards this branch of improvement, we have much to do ere we can overtake the spirit of the age, as exemplified in our sister arts.

Many of our farm implements have undergone improvement; yet there are others which have been either but partially introduced, or are hardly known, that are calculated to abridge labor and to increase the profits of the farm. There exists a great disparity in the quality of implements. In ploughs, for instance, there is a difference which eludes superficial observation, particularly in regard to the force required to propel them that is worth regarding. I have seen this difference, in what have been termed good ploughs, amount to nearly fifty per cent, or one-half. The perfection of our implements is intimately connected with a correct application of mechanical science, a branch of knowledge hitherto too little cultivated among us. Mr. Many, the enterprising proprietor of an iron foundry in this city, has assured me that there are more than two hundred patterns of ploughs now in use in this state. Of this number some may be very good, but many must be comparatively bad. But what individual is able to decide upon their relative merits, or even to become acquainted with the different sorts? It would be rendering an important service to the state at large, and especially to the farming interests, if a competent board was appointed, comprising men of practical and scientific knowledge to test thoroughly, by examination and perfectly satisfactory trial, not only the ploughs, but the other implements of husbandry now in use, or which may be hereafter invented, and to publish the result of their examination, and certify their intrinsic and relative merits. Such board might meet once or twice in a year, and no inventor or vender who had confidence in the goodness of his machine would fail to repair to the place of trial. This would tend to call into action mechanical science and skill, in the confidence of receiving a just reward; the public would confide in the trial and opinions of the board; good implements would be extensively introduced, and bad ones would be discarded. The expense of the examination would bear no proportion to the public benefit.

Draining.—Few expenditures in husbandry are calculated to make better returns than those made in draining, a branch of labor which has had a very limited practice among us, and of which we have yet much to learn. Many of our best lands are permitted to remain in a comparative unproductive state, on account of the water which saturates the surface, or reposes on the subsoil. To render these lands productive, even for arable purposes, it is only necessary, by well conducted and sufficient drains, to collect and carry off the surplus water which falls upon the surface, or rises from springs below. The rationale of draining is briefly this:—Air and heat are essential agents in preparing the food of plants which is deposited in the soil, and they are also necessary for the healthful development of most of the cultivated varieties. These agents are in a measure excluded from the soil by the water. The temperature of a soil, habitually saturated with spring water from beneath the surface, seldom exceeds 55 or 60 degrees at midsummer. Hence the grains and grasses, which require a heat of 80 or 90 degrees to bring them to a high state of excellence, can never thrive in these cold situations, where they find neither the warmth nor the food suited to their habits. But drain these soils, and they become light and porous, pervious to solar and atmospheric influence, the process of vegetable decomposition is accelerated, and a high state of fertility is developed.

One of the modern improvements in draining, which tends very much to give permanency to the work, is to dig the trench with a spade adapted to the purpose, with a wedge shaped bottom, say three inches at the bottom and five inches at the upper surface of the lower cut, and to fill this part with *broken* stone. The trench is dug two feet deep before this cut is made, and the wedge shaped bottom cleaned with a scraper fitted for the purpose. By concentrating the water, it acquires force, and keep the passage open. And if broken stone is employed, not exceeding three inches in diameter, it affords no harbor for ground mice or moles, which otherwise get in and open passages to the surface, through which water and earth are apt to enter and choke up the drain. Drains of this description are very efficient and economical to keep the bed of a road dry, placed either at it sides or in the centre, having a fall to carry off the water. A cubic yard of stone will lay about 120 feet of under drain of the dimensions above given, and eight inches deep. The breaking of the stone will cost three or four shillings the cubic yard.

The acknowledged utility of irrigation, or of spreading, occasionally, the water from streams or the highways over lands, has led to

* A friend made this experiment: He trenched a quarter of his garden, and deposited a layer of *dry straw*, three inches thick, one foot below the surface, as the only manure, and planted it with water-melons. The crop, he said was the finest he ever grew. On examining the straw in autumn, he found it was completely rotted, and reduced to the condition of short muck. He was satisfied that his melons had been highly benefitted by the straw while undergoing fermentation, and that, had the straw rotted in the yard, the volatile portions of the manure would have been wholly lost.

† Babbage on the Economy of Machinery.

a misapprehension with many of the principles of draining. Irrigation is employed to furnish water to soils, generally slopes, where it is deficient, and from whence it speedily passes off, or to cover grounds in winter to exclude severe frosts. The water thus employed is nearly of the warmth of the atmosphere, and is generally charged with fertilizing properties. Draining is employed upon flat surfaces, or upon slopes abounding in springs, where there is an excess of water, and of a temperature which materially chills and deadens the soil. Irrigation supplies water where there is a deficiency—draining carries it off where there is an excess. Both are intended, by opposite modes, to produce the same result—a suitable degree of moisture for the wants of the crop.

We have illustrations in abundance of the advantages of draining; and so apparent have been its benefits, in districts where it had a fair trial, that a knowledge of the science, for a science it may be called, is considered an important branch of agricultural knowledge. Upon one estate in Scotland, where the farmers are generally tenants, sixty-five miles of under drains have been made within a few years, at the joint expense of the landlord and tenant. The benefits of this expenditure have been—to the landlord, an additional 5s. per acre upon his annual rental—and to the tenants, a more than corresponding advantage in the increase of their crops. A gentleman who deservedly ranks high in this society,* and who has been a pioneer in this branch of improvement, has assured me, in answer to my inquiries, that he has applied under draining to twenty different fields, to the extent of more than two thousands rods, at the average cost of fifty cents per rod; and that he has been fully remunerated for the outlay in every instance, in the increased products of three years. In some cases, he adds, where the lands produced coarse grass of little value, and where tillage was out of the question, he has expended twenty dollars per acre in under draining, and now grows upon these lands Indian corn, oats, wheat and clover, luxuriantly. The value of this land has been increased from 20 to 100 dollars per acre, or 500 per cent, by the operation of draining. I have had some personal experience in this sort of improvement, and have made it the subject of calculation, and am induced to believe that where stone is convenient, efficient and *permanent* under drains may be made as low, if not lower, than what they cost my friend. A laborer accustomed to the work averaged ten rods per day upon my farm, for thirty days. The ground was sandy and soft. Other materials were substituted for stone, which would, had they been employed, have required more labor, though they had been prepared to his hands.

The benefits of under drains are not limited to lands which show water upon the surface. We may often notice at midsummer, that some flat lands have a sterile and compact appearance, whose general aspect would indicate fertility. This is readily accounted for by supposing what is often known to be the fact, that the soil reposes upon a compact strata which prevents the descent of water, and which has not sufficient inclination to pass it off. This water chills the ground, retards the decomposition of vegetable food, and causes comparative infertility. This may be effectually remedied by parallel under drains, the space between them to depend upon the compactness of the soil, a drain being supposed to collect the water nine or ten feet on each side in the most tenacious ground. It is usual, where fields are thus drained, to make a cross drain along the upper side, and also one along the lower side, to receive and carry off the water which the parallel drains collect from the soil.

Barley and Hops are becoming important staples of our state, particularly of the northern and western portions. Few persons, I presume, have a just conception of the quantity which we annually produce, or the immense loss we sustain for want of better knowledge, and more care in cultivating and preparing these crops for market. Our soil and climate are found to be well adapted to their growth, and we have produced as fine samples of both as are grown in any part of the world. Independent of an increasing home consumption, the hop in particular is always in demand for exportation. If in good condition, it is one of the most profitable crops to the grower that can be raised. If in bad condition, it is often a losing concern, not even affording a return for the labor bestowed in its culture.

Deeming the subject one of deep interest to the community, and as coming particularly within the province of this society, I have been at some pains to collect data from the best sources in relation to the barley and hop trade, with a view of submitting an abstract of the facts to your consideration.

Two-thirds of all the barley grown in the United states is believed to be marketed at Albany and the neighboring towns upon the Hudson. The amount brought to our market last year, is estimated at 450,000 bushels. It is of two kinds—two rowed and six rowed, one possessing a thin and the other a thick skin, and larger berry, ill adapted to be malted together, as one kind malts quicker than the other, and becomes sensibly deteriorated before the saccharine matter of the other kind is fully developed. The two varieties are often mixed by the grower; but that which passes through second hands, as the merchant, boatman, &c. is almost universally so, and is besides frequently adulterated with oats and other foreign matters, which seriously depreciate its value. It is stated that the deterioration and loss consequent upon the bad condition of the barley brought to market the last season, was equal to ten per cent, or 45,000 bushels—which, expressed in money, at 75 cents the bushel, amounts to $33,750.

Serious as our loss seems to be from the bad management of our barley, it will be found to be no less so upon our hop crop. About 2,300 bales, or 50,000 pounds, is the estimated quantity brought to market the last year. Of this quantity, I am assured by the best judges of the article, there were not 200 bales which ought to have been denominated *first sorts.* Many of the hops were imperfectly dried, and in consequence of the moisture in them when bagged, a fermentation was induced highly detrimental to their quality. The criterion by which hops are determined to be well dried is, when the stocks become perfectly shrivelled and dry. This is not found to be the case with those sent to this market, and the effect is, that deterioration goes on till the hops are used; whereas well dried hops lose very little of their goodness by being kept over. Again—too much heat, particularly in the outset, is prejudicial, as it drives off with the moisture the aroma or essential oil which gives value to the hop. A great portion of our hops are picked too early, before they are sufficiently matured, while other parcels are scorched or otherwise injured in the process of curing; and although they might bear a superficial appearance of being prime, most of them, on critical examination, were found to be extremely deficient in the principle which gives them value. While the average price may be stated at 18 cents, many of these hops are declared not to have been worth two cents the pound.

Here then—if the data which I have given are correct—are two of the staple productions of our soil, on which we have lost, or what amounts to the same thing, have failed to realize, from 50 to 100,000 dollars in a single year, *from carelessness, or a want of knowledge in their culture and preparation for market.* To what extent might this sum be swelled, were we to embrace in this inquiry, the other products and labors of husbandry! A like disparity, I apprehend, between good and bad management would be found to exist in almost every department of our agriculture.

Division of Labor, although not so well adapted to farm labor as it is to the mechanic and manufacturing arts, is nevertheless susceptible of being advantageously studied and applied by the husbandman. The process of pin making is subdivided into seven branches, to each of which is assigned a distinct set of hands. The advantages which result from this arrangement may be appreciated when I state, that where the workmen who whiten the pins to perform all the different processes, they would cost in making "three times and three-quarters as much as they now do by the application of the division of labor."* This principle is extensively adopted in manufactures, and is no inconsiderable cause of the reduction of price of their fabrics. It has been advantageously introduced in the farming of Great Britain. Men are kept as much as possible to the same branch of labor, because by becoming familiar with it, they perform more and do it better, as a great individual responsibility rests upon them. All light work is performed by women and children. A man who can earn six shillings should not be employed on what a boy can do equally well, who is paid two shillings per day. Say a farm affords one hundred days of this kind of labor in a year—the gain to the cultivator, by employing the boy instead of the man will amount to fifty dollars.

New articles of Culture.—Forty years ago cotton was hardly recognized as an article of culture in the United States. In 1832, it constituted by far our greatest material of export, the quantity ex-

* The late H. W. Delavan, Esq.

* Babbage on the Economy of Machinery.

ceeding three hundred and twenty-two millions of pounds, and the estimated value falling but a fraction short of thirty-two millions of dollars. In addition to this, the home manufacture of the raw material now gives employment to half a million of our population, while the goods fabricated from it constitute a material source of our internal commerce. Who can pretend to say what will be the great staples of our country forty years hence? Almost every discovery in science calls into existence a new art, and almost every new art furnishes a new demand for some product of the soil. It is the province of wisdom to keep pace with the knowledge of the times, that it may profit by its constant improvements. There is already an increasing demand for products of the soil, which we have the ability to supply, but which we continue to import from Europe. Madder, woad and weld are essential to our manufactures, and the quantity which is consumed, draws no inconsiderable amount annually from our country. Our soil and climate are adapted to their culture, and with a little enterprise and experience we may soon be able to supply the home demand. The madder now imported is computed to cost more than two millions of dollars per annum.

The turnip culture will yet become, as it has proved in Britain, the basis of a great improvement in our husbandry. Turnips are at the same time an ameliorating and a cleansing crop, and are admirably fitted to precede barley or wheat. But their chief value consists in the abundant product, and the adaptation of the crop to the wants of all descriptions of farm stock, at the time when succulent food is most wanted, and when it can be but scantily supplied from other crops. The Swedish variety has a decided preference. On lands adapted to their culture, 600 bushels, or twenty tons of roots from the acre may be stated as a moderate average crop. The greatest objection to their culture is the labor and expense of securing them for winter use; but this is far greater in imagination than in reality. On this I can speak from personal experience. A neighbor raised last year from five acres of land, three thousand bushels, which he has fed during the winter, and upon which he is now fattening more than one hundred wethers, besides oxen.

The raising of mulberry trees and the production of silk is another branch of rural labor yet new among us, which bids fair to become a source of individual and national wealth, and which this society can enlighten and promote. The experiments already made have shown, that while the business abstracts very little labor from the ordinary employments of the farm, it is susceptible of yielding a handsome income to the farmer. The early attention of this Society in distributing seeds of the mulberry, has done much towards introducing and extending this branch of labor. It is computed that that seed may have produced half a million of trees, and that this number may have been doubled by individual efforts in that time. A new species of the mulberry, (*morus multicaulis,*) has been introduced from the Phillippine Islands, through France, by M. Perrottet, which promises new advantages in the production of silk. The tree is as thrifty and as hardy and as easily propagated as the white mulberry, while the leaves being much larger, are far more easily gathered, and are said to be better adapted to the production of fine silk than the other species of this tree. The Asiatic mulberry was introduced into France in 1824, and in 1830, it bore seeds abundantly. I would beg leave to suggest that the corresponding secretary be instructed to procure seed of the morus multicaulis, with a view of its being distributed by this society.

The demand for silk fabrics is already great in the United States, and is likely to increase in a far greater ratio than our population. The importation of silks in 1832, amounted to ten million dollars. As an article of export, the raw material will be in demand for the European, and the manufactured fabrics for the South American market. France imports raw silk to the value of 30,000,000 francs, and in Great Britain, the annual importation of the article exceeds 120,000,000 dollars. Hence there is little danger of the market becoming overstocked.

The contrast in the profits of good and bad farming is worthy of a moment's notice, as few take the trouble to scan it with care. I have already alluded to the bad management of our hop crop. Had all the hops which were brought to this market the last year been equal in quality to the best, and such they probably might have been with better knowledge and more care in their management—some twenty or thirty thousand dollars might have been put in the pockets of the growers, which they failed to obtain. Let us examine what the difference is in the corn crop. I estimate the cost of cultivating and harvesting an acre of corn at fifteen dollars, and that a farmer will ordinarily plant four acres. His expense then will be sixty dollars. If the crop yields him thirty bushels an acre—and more falls short than goes over this quantity—and he sells the product at fifty cents the bushel, he will be remunerated for his labor, but get not a cent of profit. *Now, if instead of thirty, the acre was made to produce, by good management, eighty bushels, the four acres, at the assumed price, would pay for the labor and afford him a nett profit besides, of one hundred and thirty dollars.* Here then would be a difference, in one year, in the profits of four acres, of $130, all resulting from good and bad management. I beg leave here, as affording to my hands a happy illustration of the contrast I would exhibit, the *practice* of an individual who stands deservedly high as a practical farmer,* and as a gentleman of respectability and veracity. I will first show what his land DID produce; and then what it DOES produce. "The land I now till, (he observes,) *at first,* would not produce, on an average, more than fifteen or twenty bushels of corn, ten or fifteen bushels of wheat, barley, or rye, and from half a ton to one ton of hay." By good management, economizing manures, and a proper rotation of crops, he adds, "some of my fields *now yield* from eighty to one hundred bushels of corn, thirty-five to forty bushels of wheat, fifty to sixty of barley, and from two and a half, to three and a half tons of hay per acre, *and with less labor* (except in harvest) *than when I did not raise more than one-third or one quarter as much per acre as I do now.*" The same intelligence and industry, that have trebled or quadrupled the profits of this farm, will produce like results whenever they are diffused and brought into exercise.

I have thus adverted, gentlemen, to those defects in our husbandry, to which I proposed at this time to call your attention, and have endeavored to show their magnitude, and the importance of applying efficient remedies. I will now call your attention to some of the available means of placing our agriculture on a more respectable and productive basis. The means which I shall particularly commend to your notice, may be embraced under the following heads:

1. A school, to illustrate the principles of science upon which the labors of agriculture are based, and to teach the best models of practice.
2. A more general diffusion of useful knowledge, in a cheap form, accessible to the humblest condition in life.
3. Agricultural associations; and,
4. The bestowments of pecuniary rewards, as stimulants to enterprise and industry.

I need not stop to dwell upon the advantages which learning affords to agricultural labor. Science may be defined a study of the immutable laws of the Creator which govern and regulate mind and matter. The study of these laws, and their application to the wants and comforts of life, have for ages constituted one of the highest and most useful employments of man; and have contributed, more than any other human effort, to refine and elevate us above the grosser and degraded condition of savage life. The concentrated benefits of these labors are now proffered to our hands. The pleasures and the benefits which they impart, are held out as noble rewards to mental labor, in the same spirit that the blessings of health and competence are promised to him who "earns his bread by the sweat of the brow." Labor, mental or bodily, is the inseparable attendant of rational enjoyment. And is that knowledge to be contemned, which has done so much good to the world, and which has countless blessings yet in store for the human family? "In a *theological* view," says a late eminent writer,† "science is nothing else than a rational inquiry into the arrangements and operations of the Almighty, in order to trace the perfections therein displayed. And what, continues our author, are the truths which science has discovered? They may be regarded as so many rays of celestial light descending from the Great Source of Intelligence to illuminate the human mind in the knowledge of the Divine character and government, and to stimulate it to a still more vigorous exertion in similar investigations, just as the truths of revelation are so many emanations from the 'Father of Lights,' to enlighten the darkness, and to counteract the disorders of the *moral* world."

Our state may be compared to a great family, the members of which are employed in diversified pursuits, all designed and calculated to promote the common weal—having a common as well as individual object, and all united by reciprocal ties. In this light it is considered as respects crime and want. One is punished, and the

* Earl Stimson, of Galway.

† Dick on the Improvement of Society by the Diffusion of Knowledge.

other relieved, by common consent, and at the common charge. We have erected splendid and extensive establishments for the vicious and the poor. The county of Albany has been at greater expense for its poor than would be required of the state to establish and support a school of agriculture. Would it not evince both prudence and economy to endeavor to *prevent*, or to *lessen*, these growing evils in society, by devoting a portion of the common means to schools, which should teach the hands useful labor, and imbue the heart with the love of virtue? The adage teaches, that "an ounce of prevention is worth a pound of cure." If ignorance be one of the chief causes of vice, and indolence the parent of want; and if knowledge be one of the mainsprings of virtuous conduct, and competence the sure reward of industry—then the more knowledge is diffused, and the more that industry is encouraged, the less we shall be called upon to expend upon poor-houses and penitentiaries. It no longer admits of doubt, that knowledge and industry are the great conservators of public morals, as well as the great instruments of public wealth.

It has been remarked, that the more we provide for any one class, the more it will increase. This would seem to hold good in regard to the vicious propensities of our nature, and why not in regard to habits that are commendable and praiseworthy?

To speak practically. Our agriculture is greatly defective. It is susceptible of much improvement. How shall we effect this improvement? The old are *too old to learn*, or rather, to unlearn what have been the habits of their lives. The young cannot learn as they ought to learn, and as the public interests require, because we have no suitable school for their instruction. We have no place where they can learn the *principles* upon which the *practice* of agriculture is based—none where they can be instructed in all the modern improvements of the art. It is devoutly to be hoped, that our fathers in council, justly appreciating the importance of the subject, will add another to the proud trophies which New-York has already won in the noble march of improvement, by properly responding to the correct views of this subject expressed in the message of our chief magistrate.

Our periodical publications, devoted to the interests of the agricultural and mechanical classes, have proved highly beneficial, and are daily enlarging the sphere of their influence. These benefits, however, may be greatly multiplied by a cheap work, adapted to the means of persons in humble circumstances, and to the economy of those who are able but unwilling to expend two or three dollars a year for an agricultural paper. It is believed there are more than 200,000 farmers in the state who read little or nothing calculated to improve their knowledge in the business by which they live. With the view of bringing the subject before the society, I have made inquiries as to the price at which a respectable publication of this character can be printed. The estimates have been predicated upon the supposition, that the editorial labors will be gratuitous—that the subscriptions will uniformly be paid in advance—that arrangements will be made to give it an extensive circulation, and that an edition of at least ten thousand copies will be disposed of. The result of my inquiries is, that a monthly publication, of sixteen quarto pages to each number, making one hundred and ninety-two pages in a year, can be furnished in parcels of twenty or more, at twenty-five (50) cents per annum. The postage to any place within the state will swell the cost to the subscriber to thirty-seven and a half (62½) cents per annum. An amount so trivial, as to win indifference, and to silence the objections of avarice. I submit to you, gentlemen, whether a more efficient mode of furthering one of the objects of our association—the diffusion of useful knowledge—can be devised, than the one here presented. Through the liberality of two public spirited and highly respected gentlemen,* a specimen sheet of the proposed publication has been published, and has been submitted for public examination. Under the auspices of this society, the CULTIVATOR may be rendered a vehicle of useful knowledge, and a means of effecting great public good. I commend it to your guardian care.

In referring to *agricultural associations*, as a means of improvement, I think I shall be sustained by the opinions of those present, as well as by the authority of past experience, in the little I have to say. These associations tend to promote social and friendly intercourse, and an interchange of kind offices; to make our farmers emulous of excelling in their cattle, in their crops, their buildings and in the neatness and order of their domestic arrangements; they bring them acquainted with each other's improvements and means of economising labor; instruct them in the comparative value of breeds of animals and the relative value of crops. They promote industry, frugality, and the love of knowledge. They tend to multiply our comforts and increase our wealth, by the laudable emulation they call into action, and to enlighten and embellish our country.

And yet I am sensible that those associations find but comparatively few ardent advocates among our farmers. Many are indifferent because they do not appreciate their benefits, or from an apathy, common to our nature, in every measure which does not promise present gain. Some will not support them, lest they should lose a day or a dollar. And others oppose them from an envious wish to deprive their neighbors of that public commendation which they are conscious they do not themselves deserve, and are not likely to obtain. The man who thinks and acts only for *self*, regardless of the welfare of those around him, and who fancies that he rises because others sink, mistakes alike his interest and his duty, and is a stranger to those ennobling feelings which flow from disinterested acts of benevolence and philanthropy. If the comparison may be tolerated, I would liken the selfish man to the moon, whose sombre rays impart no vivifying influence upon terrestrial objects:—and his contra to the sun, shedding abroad on every side his effulgent beams, and dispensing life, light and gladness to all around.

The remaining subject which I proposed to notice, is the awarding premiums for beneficial experiments and improvements in husbandry. I confess I am not satisfied of the utility of paying for the *largest* products or the *fattest* animals, yet I believe there are many other subjects on which premiums may be awarded with public advantage. If my neighbor shall be induced by the expectation of a premium, to make some new application of science, or some new experiment in practical husbandry, which shall prove successful, and lead to important public benefits, we become gainers, however expensive the investigation on the experiment may have been to him who obtains the premium. In this way great public improvements have accrued; and like means will produce like results. These rewards are often the exciting cause to active industry, philosophical research, and to the development of inventive genius; which, like the seed whose latent vitality is quickened into action by solar influence, grows, expands and matures into fruits of usefulness. Go to the American Institute at New-York, and see the numerous productions which its premiums are eliciting from science and art. Look at Scotland, a country which is surpassed by none in recent improvements in husbandry, and where agricultural premiums have been awarded for fifty years, and see its society distributing nearly ten thousand dollars a year, as rewards for diligence and skill displayed in her rural affairs. But I need not seek for illustrations abroad. They abound in every county in our state where premiums have been awarded. Upon this subject I quote again my highly respectable correspondent, who remarks in strong language—"I have no doubt that the money which was appropriated by the state to encourage agriculture, has increased the wealth of this county more than twenty per cent a year."

I have thus gone through with what I proposed to embrace in this address. I have pointed out some of the prominent defects in our husbandry, and have suggested means of remedying them at least in part. The means are partially at your command, and over them all you can exercise a salutary influence. I hope the present opportunity will not be suffered to pass without a united and successful effort to advance the objects of public usefulness for which we have associated, and for which we have met on this occasion.

Ballston, Dec. 3d, 1833.

To Jesse Buel, Esq. President of the New-York State Agricultural Society:

SIR—In reply to your letter of the 27th ultimo, in which you ask me to state to you the result of my experience of the utility and expense of under-draining farm lands, I have to observe, that it is a subject to which I have devoted some attention for the few years during which I have had an interest in agricultural pursuits, and my opinion of its great utility is confirmed by every successive day's observation.

I have applied under-draining to twenty different fields, to the extent of more than two thousand rods, and compute the average cost at half a dollar per rod. The expense, however, is determined by the proximity of materials, and the economy with which the work is performed.

* Stephen Van Rensselaer and James Wadsworth.

I am convinced the operative farmer, who performs his own labor, can effect similar improvements considerably less than I have stated.

In some instances, the state of my lands required an expenditure of at least $20 per acre in draining. In such cases the production was coarse, unwholesome grasses, of little value, and tillage was quite out of the question. Twenty dollars per acre was the extent of the value of the land; whereas, after being effectually drained and cultivated, these lands have produced Indian corn, oats, wheat and clover in great luxuriance, paying an income on one hundred dollars the acre.

Every practical farmer is aware of the inconvenience and disadvantage attending the cultivation of fields, the different parts of which are so various as to preclude a uniform crop and uniformity of cultivation. Draining is the remedy for this.

As the improvement here treated of is of the most enduring nature, it would be unfair to charge the expense attending it upon the product of a single year. My belief is, that I have been fully remunerated by the increased products of three years in all cases; and further, in nearly every field I have, at the termination of the stone drains, durable supplies of water for animals, which, in my estimation, fully compensate the whole expense incurred.

Upon the whole, I know of no subject, connected with agricultural improvement, of more importance than draining; and if these facts I have detailed at your request, should lead a single individual to experiment on this subject, I shall deem the hour occupied in the detail fully compensated.

I am, sir, very respectfully, your ob't servant,
HENRY W. DELAVAN.

Letter from Earl Stimson to Jesse Buel, dated

Galway, 18*th Dec.* 1833.

Dear Sir—In reply to yours of the 23d November, requesting some information in regard to the difference between good and bad farming, I submit the following facts:

When the land was first cleared in this town, being about forty-five years since, its timber consisted principally of beach, maple, elm, ash and basswood. The soil produced good crops of all kinds; but the farmers neglecting to save and apply their manure, the consequence was, that their crops decreased, and in about twenty-five years the land would not produce more than one-half as much, on an average, as when it was first cleared, and this half cost them more labor than when they got double the quantity of grain or grass.

The land I now till, at first, would not produce on an average, more than fifteen or twenty bushels of corn, ten or fifteen bushels of wheat, barley or rye, and from half a ton to one ton of hay per acre. I commenced making, saving and applying my manure in the most economical way on the surface, and ploughing shallow; and in ten or twelve years I found I had brought it back to its original state of fertility. My practice has been to turn over the sod in the fall or spring, spread eight or ten tons of barn-yard manure on an acre, and then plant with corn; and to follow the corn with barley and grass seeds, putting three pounds of clover and four of timothy seed on an acre; then let it lay two years to grass; then to go over with the same rotation of crops; and my third rotation was first wheat, second corn, third barley, to seed down with, applying about the same quantity of manure every time I turned over the sod. In this way, in the course of twenty years, I got some of my fields to yield from eighty to one hundred bushels of corn, thirty-five to forty bushels of wheat, fifty to sixty bushels of barley, and from two and an half to three and an half tons of hay per acre, and with less labor, except in harvesting, than when I did not raise only about one-third or one-quarter as much. I know from my own experience, that it does not cost one-half, if more than one-third as much, to raise a bushel of grain by good husbandry, as it does by bad management.

The farmers have much improved their farms in this town, since our State Agricultural Society was organized, and of course their crops have increased in proportion. *I have no doubt that the money which was appropriated by the state to encourage agriculture, has increased the wealth of this county,* MORE THAN TWENTY PER CENT A YEAR *since*, yet there seems to be a want of enterprise with our farmers in promoting their true interest.

The crops in this town were generally good the last season, except corn, which, owing to the unusually wet and cold season, did not yield more than one-third or one-half of a usual crop. I planted a field of four acres, which was in my highest state of cultivation. Occupied as pasture, I turned over the sod about the first of June, and planted it two feet eight inches apart, with eight rowed yellow corn. When the stalks were fit to cut, I had the curiosity to ascertain the weight of the corn and stalks on an acre, and found that I had 38,000 pounds, and 26,000 ears of corn. This was the heaviest growth I think that I ever raised, and I have no doubt that there was 150 or 160 bushels of corn when fit to crib.

Respectfully yours,
EARL STIMSON.

Communication from David Hosack, M. D. read before the society Feb. 12, 1834.

New-York, Jan. 26, 1834.

Dear Sir—I rejoice to learn, from the hints dropped in the course of conversation when you were last in town, that you have it in view to recall the public attention to the subject of agriculture, which, some few years since, obtained the patronage of the legislature, and, I may add, was manifestly improved throughout this state, by the impulse it then received.

The scheme originally suggested for promoting agricultural knowledge by our late governor, De Witt Clinton, in 1818, and the valuable observations on that subject, contained in his annual messages to the legislature, since that period, cannot be too frequently called to our recollection, and made known throughout our land.

The establishment of agricultural associations of practical farmers in the different counties of this state, and who, as formerly, with the aid of legislative provision, shall be enabled to reward the enterprise and merit of those who may excel in improving the qualities of their stock, or in augmenting the various produce of the soil, must doubtless advance the interests of the farmer, diffuse a knowledge both of the principles and practice of agriculture, and increase the general resources of the state. It has also occurred to me, that the institution of one or more *schools* or *colleges*, with *farms* annexed to them, where the students of agriculture may practically acquire a knowledge of the *art* and *science* of farming combined, is a most desirable object, and cannot fail to prove highly useful to the community.

As a garden is essentially necessary to teach the culture of plants, so is the farm required to illustrate the practice and the principles of agriculture.

For this purpose, such agricultural school should be provided with competent instructors in all the different subjects necessary to constitute the *scientific* as well as the *practical* farmer.

It should be supplied not only with teachers or professors capable of instructing youth in the various departments of *practical husbandry*, and the *theory* of farming, but also with able instructors in those collateral branches of science that are directly connected with agriculture, as *geology, chemistry* and *natural history*, embracing *zoology, botany* and *mineralogy*. To these should be added lectures on *horticulture, rural economy* and *landscape gardening*.

The subject of agriculture, viewed in this extent, appears to me to claim our notice, as one of great importance to the character, as well as tributary to the interests and wealth of our state and country.

While you will doubtless recommend the society to ask from the state the appropriation of a small *premium fund*, in addition to that to be contributed as formerly by the different county societies, to be bestowed upon the most successful cultivator of the soil, or breeder of the various animals employed as stock, I hope you will not fail to urge the benefits to be derived from the establishment of an *agricultural college and farm*, where youth may be instructed in all the different departments of knowledge necessary to constitute the scientific as well as the practical cultivator of the soil: where the pupil may be instructed, by the professor of agriculture, in a knowledge of the general *principles of farming*, the *rotation of crops* as adapted to different climates, soils and situations; where he can witness the operation of the different *implements of husbandry*, obtain a knowledge of the various animals, those best suited to our climate and country, whether employed in the cultivation of the land, those most profitable for the dairy, or are most valuable as food for man: where, too, from the professor of *chemistry as connected with agriculture*, he can learn the nature and composition of *soils*, the effects of *manures*, their various sorts, whether animal, vegetable or mineral; their different qualities and operation, whether acting directly as the *food* of plants, or as *condiments*, exciting them to healthy growth: where, too, the pupil, under the professor of natural history, can acquire a knowledge of the various *trees of the forest*, whether cultivated for *timber*, for *house*, or *ship* building, whether employed in the various *mechanic arts*, or for the purpose of *fuel:* where, too, he can practically learn and witness the growth of the various *fruit trees* and *shrubs*, ascertain their different species and varieties, and their several modes of *propagation*, obtain a knowledge of the different *diseases* to which they are liable, and the means found most useful to counteract those evils: where, too, he can learn the various *seeds* and *plants* employed by the husbandman, whether cultivated as food for man, or the various animals necessary to his well being, or those vegetables tributary to the table, or cultivated with fruit, or the kitchen garden, as affording him the gratification of the *conservatory*, of the *hot-house*, or as constituting to the ornaments of the *pleasure ground.*

An agricultural college thus organized, and provided with able professors and teachers, cannot fail to prove highly useful to the community, by affording the means of education to our youth in one of the most honorable and useful professions in which they can be employed, and eminently tributary to the independence and happiness of man.

The education of youth to farming, as a distinct profession, has always appeared to me a subject that merits as much attention from our citizens, and should receive the protecting care of our legislature, as any other profession or occupation for which the various academies, schools and colleges of our state, have been established.

While immense appropriations have been made from the public purse, for the institution and maintenance of schools and colleges, as preparatory to the learned professions, as they are too exclusively denominated, no provision has been made for qualifying youth for the profession of *farming*, which is perhaps equally important to the interests and happiness of the individual, as well as to the country in general, and which calls for instruction, and embraces in its various branches a system of education equally extensive with that of any other pursuit to which the human mind can be directed. For these purposes, too, a *library* containing the standard treatises on husbandry, horticulture, rural economy, planting, landscape gardening, the various memoirs and transactions of the agricultural and horticultural societies of London, Edinburgh, France and other parts of Europe, as well as the various productions of our own country, should be attached to the proposed institution.

A lecture room, where the contemplated lessons may be delivered, containing a chemical laboratory and apparatus, furnished with the necessary tests for examining the various soils and manures, and a repository, where the various tools and implements of husbandry, and models of the different improvements in their constructions may be exhibited, are also necessary in an establishment of this nature.

A new learned profession, as it may with great propriety be denominated, being hereby presented to our notice, in addition to those of theology, law and medicine, it obviously becomes the interest of every parent who has a large family of children to provide for, to educate one or more of his sons to the profession of agriculture, as well as to those pursuits that have been enumerated.

Indeed, in some instances this healthy and active occupation holds out peculiar inducements, especially where, as in certain families, or particular members of those families, a delicate frame of body exists, or a tendency to peculiar diseases is manifested, as *scrofula* or *consumption* such pursuit would be found especially beneficial, in imparting strength to the constitution, and thereby counteracting the evils to be apprehended.

As the expense of the proposed system of education would be very moderate, and would fall within the reach of most of our citizens, and indeed of our farmers themselves, it would not fail to attract very general attention, and to invite our youth destined to reside in the country. and to engage in the cultivation of the soil, to avail themselves of the advantages of instruction in the branches enumerated, by spending one or more years in attendance upon the lectures delivered in such institution.

When we take into view the great extent of our uninhabited territory, our various soils and climates, the immediate return that would be derived from the successful cultivation of the land, by those well qualified by education to undertake its settlement, the inducements that are thereby held out to the industrious tenant, and the great encouragement it affords to families to emigrate from the present over-populous parts of our country, such a preparatory school of agricultural education appears to promise the most beneficial results. Such an establishment, too, by the great number of pupils that would resort to it from various parts of the state, and indeed from the different states of the union, would in a great degree support itself from the fees of education and of board that would be thence derived.

Such an institution might also be rendered valuable to our country in another point of view, viz. as a nursery for the education of farmers and gardeners in all the different departments of their trades and occupations.

Instead of importing persons of these professions from abroad, as has hitherto been the practice of this country, an abundant supply of both classes may be furnished from such institution, not only well qualified in all the various branches of their pursuit, but possessing a knowledge of our seasons, climate, soil and habits of culture, (in which especially the foreigner, from want of experience, must be necessarily ignorant,) that would enable them at once to perform the duties of their calling, and to the greater satisfaction of their employer, than would be expected from the stranger to our climate and our customs. *Apprentices*, too, of good moral character, taken from those classes of society who cannot defray the expenses of their education, should be received at such establishment for a certain period of time, for the purpose of being taught the various practical branches of farming and gardening.

The labor of such apprentices would also in a great degree, if not entirely, indemnify the institution for the expense incurred by their board and education.

I have with great regret observed that the valuable suggestions, on the subject of agriculture, by the late governor Clinton, whose views were not limited to the fiscal or political concerns of the state, but extended to the general interest and welfare of his fellow-men, have been so totally disregarded since his death.

I am persuaded that an institution so manifestly useful in diffusing an important branch of education, and spreading its benefits throughout our country, calls for little more than the protection given by the approbation of the state society with which you are connected, and the countenance of the legislature.

I am, dear sir, with sentiments of the greatest respect, your friend,

DAVID HOSACK.

Extract of a letter to the President of the N. Y. State Agricultural Society, dated

Saratoga Springs, Jan. 24, 1834.

With regard to an agricultural school, it has always been a favorite project with me. Agriculture is a SCIENCE, and in this country, above every other, it should form an essential part of a classical, or what is called a liberal education; and I think there can be no doubt, that if such a school was properly endowed and rightly conducted, it would be more useful and better patronized than any other in the state, or indeed in the union.

Our farmers, the best of them, have as yet advanced but a little beyond their horn-book in the science, and the reason is obvious. Their business has heretofore consisted in clearing up and in subduing new lands, and in preparing a rich and fertile natural soil for the reception of the seed; and in the management of this department of agriculture, I will venture to say they are not exceeded by any people on the face of the globe; but this is the mere rudiments, or simply the alphabet of the science. A new era has commenced in our agricultural pursuits; the new lands are principally subdued, and their soil, though naturally rich and fertile, has become exhausted, and in the common phrase, *worn out*, by the long course of unscientific tillage to which it has been subjected; and it is obvious to every one that the lands must be abandoned, or a more successful management adopted.

The great business of agriculture must now consist in renovating and reclaiming an exhausted and impoverished soil, in such a manner as to produce the greatest possible profit with the least possible expense. On this subject our farmers are but imperfectly informed, even with its practical details; of the *science* they know nothing. On this subject I could write volumes; but it is unnecessary. You know it all.

Your contemplated cheap journal is a good thing, and I doubt not it will take. I shall certainly do all in my power to encourage its circulation, and hope to be able to furnish something for its pages.

Dupes.—The greatest dupes are those who exhaust an anxious existence in the disappointments and vexations of business, and live miserably and meanly, only to die magnificently rich.

Tillage Husbandry.

This department will be devoted to tillage crops and alternate husbandry,—or that system of farming which brings most parts of the farm successively into plough, meadow and pasture land. We consider this system as one of the greatest improvements in modern husbandry; and we shall illustrate its advantages in the communication which follows, which was prepared for, and fairly belongs to, the *Farmers' Register*. With this acknowledgment, we trust its liberal editor, Mr. RUFFIN, will be neither displeased with us, nor his correspondent.

Most of our readers have heard of, or seen, the pine plains of Kinderhook.—They were, *under the old system of farming*, deemed of little value. It is not many years since three dollars per acre was deemed a liberal price for these lands. Under the alternate system of husbandry, they have been rendered extremely profitable and valuable, and it will be seen, have recently been sold at $60 the acre. The subjoined communication will suggest useful hints to those who cultivate similar lands. Mr. Harder's is not a solitary case; but we are told exhibits a fair specimen of the system and profits of farming in that district.

PRODUCTS AND PROFITS OF A FARM OF TWO HUNDRED ACRES OF SANDY SOIL, IN 1833.

SIR,—At the solicitation of a friend I am induced to give a statement of the products of my farm for the year 1833, and of its general arrangement. In doing this, as my grain is not yet all thrashed and taken to market, I cannot now arrive at perfect accuracy; but from what is thrashed and sold, I can make a correct estimate of the quantity, and I have ascertained the price for such as has not been actually sold. My farm is situated on an extensive plain that was once covered pretty generally with small pine timber. The soil is sand, occasionally gravel, and more or less mixed with loam. It consists of two hundred acres, of which thirty acres are in wood, twenty in meadow, and ten acres of waste, leaving for cultivation about one hundred and forty acres of arable, or land used for the plough, which is divided into seven lots, of twenty acres each.—One of these lots is planted in corn, on clover sod. The corn is the large twelve rowed early yellow, and my usual produce is about fifty bushels per acre. My mode of cultivation is, that after the lot has lain one year in clover, to plough it the last of April or first of May, about six inches deep; then furrow both ways with a light corn plough; the first time across the furrows about two feet nine inches apart, the next about three feet. I plant immediately after furrowing. As soon as the corn is up the length of the finger, I harrow it with a large heavy harrow lengthwise with the furrow, as the ground was originally ploughed, and take two rows at a time. Two men or boys follow the harrow with aprons, out of which they plaster the corn, and also raise any plants which may have been thrown down by the harrow passing over them. In a week after, I plough once between the rows, as they are planted the narrowest way; the men follow with the hoe, and they will finish twenty acres in ten days. In about a fortnight more, I plough it the widest way of planting, twice between the rows, and throw the ground towards the plant. I cut the stalk above the ear as soon as the kernel in the ear is hard, and secure the stalks in shooks. We husk the corn on the hill, and two men will gather one hundred bushels of ears in a day. The lot which was in corn, I put down the succeeding year to oats, and it commonly produces about forty bushels per acre.—This lot I seed down with western clover seed, eight quarts per acre. Two lots are in wheat, which were likewise the year previous in clover seed. The one is ploughed the first of August, and again just previous to sowing in September; the other but once, the last of August or first of September, about a fortnight previous to sowing. These lots have the benefit of my barn manure, which is scattered on such portions as I think require it most.

I commonly sow about one bushel twelve quarts per acre, and my common yield is twenty bushels of wheat per acre. Thus four lots are employed, one in corn, one in oats, two in wheat; the remaining three are in pasture. Two of these are again to be ploughed up in the fall for wheat, and the remaining one is for corn the succeeding season. The experience of twenty years has confirmed me in the belief that this is the most successful mode of cultivation in our soil, and I have at all events been satisfied with the amount of produce my farm has yielded me. I annex a statement showing the amount of produce and the proceeds therefrom, of my farm, for the year 1833, and the expenses of its management.

		Cr.
20 acres meadow, 2 tons hay per acre, sold at $7½ per ton,		$300 00
20 acres producing 1,000 bushels corn, for which I am offered 62½ cts. per bushel,		625 00
40 acres producing 800 bushels wheat, sold *a* 8‖6,		850 00
20 acres producing 800 bushels oats, sold *a* 37½,		300 00
500 bushels potatoes *a* 2‖,		125 00
3000 weight of pork, *a* $5.50,		165 00
Sold one beef,		25 00
500 lbs. butter, *a* 16 cts.		80 00
225 lbs. wool, *a* 4‖,		112 00
55 lambs, increase of my flock,		80 00
		$2,662 00
The item of pasturage not put down.		
	Dr.	
To hiring one man per year,	$100 00	
To do do seven months,	70 00	
To hiring 15 days in haying and harvest,	13 12	
3½ tons plaster, *a* $7.50,	25 25	
3½ bushels clover seed, *a* $7.50,	25 25	
Taxes,	15 00	
Mechanics' bills,	50 00	
	$320 62	
		320 62
Income,		$2,341 38
The farm sold *a* $60, for 200 acres,	$12,000	
Stock and implements valued at	1,000	
	$13,000	
Interest on this sum at 7 per cent,		910 38
Gain,		$1,431 00

Making the entire interest upon $13,000, after deducting expenses, about 18 per cent. There are other profits from the farm not enumerated in the within statements, such as house-rent, garden, orcharding, raising of poultry, &c. I will put them against any little incidental expenses not enumerated, but which they will be amply sufficient to defray. The labor upon my farm is performed by two men as above stated, but under my own direction, and all our operations tend to lessen the amount of labor as much as practicable; and I find that nothing conduces more to this result than to keep ahead of my work through the season. For myself, I labor but moderately, but keep up a constant supervision. I will only farther add, that since I have adopted the principle of total abstinence from ardent spirits, at all seasons of the year, I think I have not only gained vastly in the amount of work done by my men, but my farming business has gone on more cheerfully.

Yours respectfully,

TEUNIS HARDER.

Kinderhook, Columbia co. Jan. 14, 1834.

ROTATION OF CROPS.

We find a great deal said in English publications, of the importance of a rotation of crops; and although we may receive, and doubtless do receive, many valuable hints from our trans-atlantic brethren, yet their soil, their climate, their markets, and price of labor, are so different, as to render it highly improper for the American farmer implicitly to follow their directions. Indeed, it would be imprudent to follow the directions of the best farmers of New-England, for the good reasons, that our most valuable products, as well as our soils, are different. In western New-York the soil is well adapted to wheat. It is the great staple. To that the farmer looks to supply him with money. That mode of farming, therefore, which produces this crop in the greatest perfection, is the one he ought to pursue. It is well known that land may be too rich for wheat, and that the application of barn-yard manure immediately preceding a crop of wheat, is considered by the best farmers injudicious. I am in favor of an alternation of crops, and have found the following to answer best on my farm, which is considered a good wheat soil.

Indian corn is a gross feeder; indeed it is impossible to make land too rich for it; I therefore give my corn and potato ground al-the manure I can collect, and if the corn be planted early, and well tended, it may be cut and drawn off in season for wheat, and the ground put in a good state to receive it by one ploughing. If however the farmer have sufficient ground for wheat without it, the better method is to put on barley or peas next season, and as soon as the crop is taken off, give the ground a thorough harrowing, which will cause the seeds that may have dropped, to vegetate, in which state it should be left till near the time of seeding, when one good ploughing will be better than more. Then run a light harrow over it, which puts the ground in a better state to receive the wheat. Then harrow twice and follow with the roller, when every good farmer will strike water furrows. By this mode of management, all the vegetable matter which may have sprung up will be completely *buried in the soil*, and there remain to enrich it.

Few farmers occupy as many acres with corn, potatoes and ruta baga, as they wish to sow with wheat. If the system of clovering is pursued, (which I recommend to every farmer,) I deem naked fallows unnecessary. A good sward turned in, after plastering—if a heavy soil, in the fall, if light in the spring—rolled, and then harrowed, will put the ground in a fine state for peas, barley or oats.—Immediately after the crops are taken off, proceed as above directed, and if the land be in good heart, we may safely calculate on a good crop of wheat. If the land be rich, I have frequently taken a second crop of wheat before seeding with grass, equally heavy with the first.

This mode cannot be profitably pursued unless the land is rich; and if not so, green crops ploughed in will make it so. I have this year turned in a heavy crop of buckwheat in blossom, in a field exhausted by the previous occupant. I then sowed wheat, and shall give it at least ten pounds of clover seed per acre early in the spring, and then plaster.

Some of the best farmers of Pennsylvania assert, that calcareous land may be made to produce heavy crops of wheat for several successive years by means of clover and plaster sown every year; and where the farmer raises his own clover seed, he may sow it in the chaff, and find the method profitable, not only as it relates to crops, but what is equally important, his land is continually growing richer. I have not given this method a trial, but intend to do it. If found to succeed, it will go to establish a fact not yet settled, that clover restores to the land the principles yielding starch and gluten, without which wheat cannot perfect itself. This fact once established, the farmers of our western country will raise of other crops no more than may be necessary for their own consumption.

I saw the last of five successive crops of wheat growing in the calcareous soil on the east bank of Cayuga Lake, which was estimated to yield 25 bushels per acre. If then this soil, managed as in Pennsylvania, actually furnishes the pabulum of wheat, may we not draw the conclusion, that such soils only as are primitive, or are destitute of lime, require a regular rotation of crops?—*Genesee Farmer*.

Cattle Husbandry.

Under this head we purpose to give what we deem most likely to benefit the cattle farmer, in the selecting, breeding, rearing and improving his farm stock. We shall particularly describe the *improved short horn* and *Devon* cattle, and give such criteria of a good animal of those and other breeds, as will assist the breeder or buyer in estimating their genuineness and relative value, and tend to prevent imposition. We shall endeavor to point out the relative value of the several kinds for breeding, grazing, the dairy and the plough.

Within the last century the cattle of Great Britain have been made nearly to double their average weight. This has in a measure resulted from the improved condition of husbandry generally, but principally from a judicious system of breeding. Most of the improved breeds of animals which our farmers are desirous of propagating, have been derived recently from Great Britain, where the art of breeding is carried to higher perfection than in any other country. Hence it is in British practice, and British publications, which are the record of that practice, that we must seek for the best guides for our improvement. And in fulfilling our task, we intend to consult some of the most approved and recent authorities.

The neat cattle of England have been classed under the heads of
1. *Long horns*, including the improved stock of Bakewell;
2. *Middle horns*, including Devon and Hereford cattle;
3. *Short horns*, comprising Teeswater, Holderness, Durham, and Improved Short Horns;
4. *Hornless*, or polled, or Galloway breed; and,
5. *Crumpled horns*, or Alderney, derived from France.

From these general classes all of our native cattle have been derived; and in Great Britain, as here, they have become intermingled in every possible way. Yet while every thing *here* has been left too much to chance, *there* a systematic course has been successfully pursued, by many distinguished breeders, to improve the original breeds. Before we proceed, however, to describe the manner and extent of the improvement which has taken place, or the form of the improved animals, we will quote what we find laid down, and we think correctly, as the

PROPER FORM AND SHAPE OF CATTLE.

"Whatever be the breed, there are certain conformations which are indispensable to the thriving and value of the ox or cow. When we have a clear idea of these, we shall be able more easily to form an accurate judgment of the breeds of the different counties as they pass before us. If there is one part of the frame, the form of which, more than that of any other, renders the animal valuable, it is the chest. There must be room enough for the heart to beat, and the lungs to play, or sufficient blood for the purposes of nutriment and of strength will not be circulated; nor will it thoroughly undergo that vital change which is essential to the proper discharge of every function. We look therefore, first of all, to the wide and deep girth about the heart and lungs. We must have both; the proportion in which the one or the other may preponderate, will depend on the service we require from the animal; we can excuse a slight degree of flatness of the sides, for he will be lighter in the forehand, and more active; but the grazier must have width as well as depth.—And not only about the heart and lungs, but over the whole ribs, must we have length and roundness; the *hooped*, as well as the deep barrel, is essential; there must be room for the capacious paunch, room for the materials from which the blood is to be provided. The beast should also be ribbed home; there should be a little space between the ribs and the hips. This seems to be indispensable in the ox, as it regards a good healthy constitution, and a propensity to fatten; but a largeness and dropping of the belly is excusable in the cow, or rather, notwithstanding it diminishes the beauty of the animal, it leaves room for the udder; and if it is also accompanied by swelling milk-veins, it generally indicates her value in the dairy.

"The roundness and depth of the barrel, however, is most advantageous in proportion as it is found behind the point of the elbow, more than between the shoulders and legs; or low down between the legs, rather than upwards towards the withers; for it diminishes the heaviness before, and the comparative bulk of the coarse parts of the animal, which is always a very great consideration.

"The loins should be wide: of this there can be no doubt, for they are the prime parts; they should seem to extend far along the back; and although the belly should not hang down, the flanks should be round and deep. Of the hips it is superfluous to say that, without being ragged, they should be large; round rather than wide, and presenting, when handled, plenty of muscle and fat. The thighs should be round and long, close together when viewed from behind, and the farther down they continue to be so the better. The legs short, varying like other parts, according to the destination of the animal; but decidedly short, for there is an almost inseparable connection between length of leg and lightness of carcases, and shortness of leg and propensity to fatten. The bones of the legs, and they only being taken as a sample of the bony structure of the frame generally, should be small, but not too small—small enough for the well known accompaniment,—a propensity to fatten—small enough to please the consumer; but not so small as to indicate delicacy of constitution, and liability to disease.

"Last of all the hide—the most important part of all—thin, but not so thin as to indicate that the animal can endure no hardship; moveable, mellow, but not too loose, and particularly well covered with fine soft hair."

Ill-natured Jests.—If it is dangerous to speak of ourselves, it is much more so to take freedoms with other people. A jest may tickle many; but, if it hurts one, the resentment that follows it may do you more injury than the reputation service.

Science of Agriculture.

ALL KNOWLEDGE IS FOUNDED ON EPPERIENCE.

In the infancy of any art experience is confined and knowledge limited to a few particulars; but as arts are improved and extended, a great number of facts become known, and the generalization of these, or the arrangement of them according to some legal principle, constitutes the theory, science, or law of an art.

Agriculture, in common with other arts, may be practised without any knowledge of its theory; that is established practises may be imitated; but in this place it must ever remain stationary The mere routine practitioner cannot advance beyond the limits of his own particular experience, and can neither derive instruction from such accidents as are favorable to his object, nor guard against the occurrence of such as are unfavorable. He can have no resources for unforeseen events, but ordinary expedients; while the man of science resorts to general principles, refers events to their causes, and adopts his measures to meet every ease.

IMPROVING THE BREEDS OF ANIMALS.

By improving of a breed, is to be understood the producing such an alteration in shape or description, as shall render the animal better fitted for the labors he has to perform; better fitted for becoming fat; or for producing milk, wool, eggs, feathers, or particular qualities of these. The fundamental principle of this amelioration is the proper selection of parents. Two theories have obtained notice on this subject, the one in favor of breeding from individuals of the same parentage, called the *in-and-in* system, and the other in favor of breeding from individuals of two different offsprings, called the system of *cross-breeding*.

That the breed of animals is improved by the largest males, is a very general opinion, but this opinion is the reverse of the truth, and has done considerable mischief. The great object of breeding, by whatever mode, is the improvement of form, and experience has proved, that crossing has only improved, in an eminent degree, in those instances in which the females were larger than the usual proportion of females to males, and that it has generally failed where the males were disproportionably large. (*Cully's Introduction, &c.*) The following epitome of the science of breeding, is by the late eminent sorgeon, Henry Cline, who practised it extensively on his own farm at Southgate.

The *lungs* are of the first importance. It is on their size and soundness that the strength and health of animals principally depends. The power of converting food into nourishment is in proportion to their size. An animal of large lungs is capable of converting a given quantity of food into more nourishment than one with smaller lungs; and therefore has a greater appitude to fatten.

The *chest*, according to its external form and size, indicates the size of the lungs. The form of the chest should approach the figure of a cone, having its apex situated between the shoulders, and its base towards the loins. Its capacity depends on its form more than on the extent of its circumference; for where the chest is equal in two animals, one may have much larger lungs than the other. A circle contains more than an elipsis of equal circumference; and in proportion as the elipsis deviates from the circle, it contains less. A deep chest, therefore, is not capacious, unless it is proportionally round.

The *pelvis* is the cavity formed by the junction of the haunch bones with the bone of the rump. It is essential that the cavity should be large in the female, that she may be enabled to bring forth her young with less difficulty. Where the cavity is small the life of the mother and her offspring are endangered. The size of the pelvis is chiefly indicated by the width of the hips, and the breadth of the waist, which is the space between the thighs. The breadth of the loins is always in proportion to that of the chest and pelvis.

The *head* should be small, by which the birth is facilitated. Its smallness affords other advantages, and generally indicates that the animal is of a good breed. Horns are useless to domestic animals and they are often the cause of accidents. It is not difficult to breed animals without horns. The breeders of horned cattle and horned sheep sustain a loss more sensible than they conceive; for it is not the horns alone, but also much bone in the skulls of such animals to support the horns, for which the butcher pays nothing; and besides this there is an additional quantity of ligament and muscle in the neck, which is of small value. The skull of a ram with horns weighed five times more than a skull which was hornless. Both these skulls were taken from sheep of the same age, each being four years old. The great difference in weight depended chiefly on the horns, for the lower jaws were nearly equal; one weighing seven ounces, and the other six ounces and three quarters, which proves that the natural size of the head was the same in both, independent of the horns and the thickness of the bones which support them. In horned animals the skull is extremely thick. In a hornless animal it is much thinner, especially in that part where the horns usually grow. To those who have reflected on the subject it may appear of little consequence whether sheep and cattle have horns, but on a moderate calculation it will be found, that the loss in farming stock, and also in the dimunition of animal food is very considerable, from the production of horns and their appendages. A mode of breeding which should prevent the production of these, would afford a considerable profit in an increase of meat, wool, and other valuable parts.

The length of the neck, should be proportioned to the height of the animal that it may collect its food with ease.

The muscles, and the tendons, which are their appendages, should be large; by which an animal is enabled to travel with greater facility.

The bones, when large, are commonly considered an indication of strength; but strength does not depend on the size of the bones, but on that of the muscles. Many animals with large bones are weak, their muscles being small. Animals that have been imperfectly nourished during their growth, have their bones disproportionately large. If such deficiency of nourishment originated from a constitutional defect, which is the most frequent cause, they remain weak during life. Large bones, therefore, generally indicate an imperfection in the organs of nutrition.

To obtain the most approved form, the two modes of breeding described as the in and-in and crossing modes have been practised. The first mode may be the better practice, when a particular variety approaches perfection in form; especially with those who may not be acquainted with the principles on which improvement depends. When the male is much larger than the female, the offspring is generally of an imperfect form. If the female be proportionably larger than the male, the offspring is of an improved form. For instance, if a well formed large ram be put to ewes proportionately smaller, the lambs will not be so well shaped as their parents; but if a small ram be put to large ewes, the lambs will be of an improved form. The proper method of improving the form of animals, consists in selecting a well formed female proportionately larger than the male. The improvement depends on this principle, that the power of the female to supply the offspring with nourishment is in proportion to her size, and to the power of nourishing herself from the excellence of her constitution. The size of the fœtus is generally in proportion to that of the male parent; and, therefore, when the female parent is proportionably small, the quantity of nourishment is deficient, and her offspring has all the disproportions of a starveling. But when the female, from her size and good constitution, is more than adequate to the nourishment of a fœtus of a smaller male than herself, the growth must be proportionately greater. The larger female has also a larger quantity of milk, and her offspring is more abundantly supplied with nourishment after birth.

Abundant nourishment is necessary to produce the most perfect formed animals, from the earliest period of its existence until its growth is complete. As already observed, the power to prepare the greatest quantity of nourishment from a given quantity of food, depends principally on the magnitude of the lungs, to which the organs of digestion are subservient. To obtain animals with larger lungs, crossing is the most expeditious method; because well formed females may be selected from a larger size, to be put to a well formed mal of a variety that is rather smaller. By such a mode of crossing, the lungs and heart become proportionately larger, in consequence of a peculiarity in the circulation of the fœtus, which causes a larger proportion of the blood, under such circumstances, to be distributed to the lungs, than to the other parts of the body: and as the shape and size of the chest depend upon that of the lungs, hence arises the remarkably large chests which is produced by crossing with females that are larger than males. The practice, according to this principle of improvement, however, ought to be limited; for it may be carried to such an extent, that the bulk of the body might be so disproportioned to the size of the limbs as to prevent the animal from moving with sufficient facility. In animals, where activity is required, this practice should not be extended so far as in those which are intended for the food of man.

The character of animals, or the external appearance by which the varieties of the same species are distinguished, are observed in the offspring; but those of the male parent more frequently predominate. Thus, in the breeding of horned animals, there are many varieties of sheep, and some of cattle, which are hornless. If a hornless ram be put to horned ewes, almost all the lambs will be hornless; partaking of the character of the male more than of the female parent. An offspring without horns, or rarely producing horns, might be obtained from the Devonshire cattle, by crossing with bulls of the Galloway breed, which would often improve the form of the chest, in which the Devonshire cattle are often deficient.

Examples of the good effects of crossing may be found in the improved breeds of horses and swine in England. The great improvement in the breed of horses arose from the crossing with the diminutive stallions, Barbs, and Arabians; and the introduction of Flanders mares into the country was the source of improvement in the breed of cart horses. The form of the swine has been greatly improved by crossing with the small Chinese boar.

Examples of the bad effects of crossing a breed, are more numerous. When it became the fashion in London to drive large bay horses, the farmers in Yorkshire put their stallions to much larger mares than usual, and thus did infinite mischief to their breed, by producing a race of small chested, long-legged, large-boned, worthless animals. A similar project was adopted in Normandy, to enlarge the breed of horses there, by the use of stallions from Holstein; and in consequence the best breed of horses in France would have been spoiled, had not the farmers discovered the mistake in time, by observing the offspring much inferior in form to that of their native stallions. Some graziers in the isle of Sheppy conceived that they could improve their sheep by large Lincolnshire rams; the produce of which, however, was much inferior in the shape of the carcass and the quantity of the wool; and the flocks were greatly impaired by this attempt to improve them. Attempts to improve the animals of a country by any plan of crossing should be made with the greatest caution; for by mistaken practice, extensively pursued, irreparable mischiefs may be done. In any country where a particular race of animals has continued for centuries, it may be presumed that their constitution is adapted to the food and climate.

It may be proper to improve the form of a native race, but at the same time it may be very injudicious to attempt to change their size; for the size of animals is commonly adapted to the soil and climate which they inhabit. Where produce is nutritive and abundant, the animals are large, having grown proportionally to the quantity of food which, for generations, they have been accustomed to obtain. Where the produce is scanty, the animals are small, being proportioned to the quantity of food which they were able to procure. Of these contrasts, the sheep of Lincolnshire and Wales are samples. The sheep of Lincolnshire would starve on the mountains of Wales.

Crossing the breeds of animals may be attended with bad effects in various ways, and that even when adopted in the beginning on a good principle; for instance, suppose some larger ewes than those of the native breed, were taken to the mountains of Wales, and put to the rams of that country; if these foreign ewes were fed in proportion to their size, their lambs would be of an improved form, and larger in size than the native animals; but the males produced by cross, though of a good form, would be disproportionate in size to the native ewes; and, therefore, if permitted to mix with them, would be productive of a starveling, ill-formed progeny. Thus a cross, which at first was an improvement, would, by giving occasion to a contrary cross, ultimately prejudice the breed. The general mistake in crossing has arisen from an attempt to increase the size of a native race of animals; being a fruitless effort to encounter the laws of nature.

From theory, from practice, and from extensive observation, the last more to be depended on than either, "it is reasonable," Cline continues, "to form this *conclusion*: it is wrong to enlarge a native breed of animals, for in proportion to their increase of size, they become worse in form, less hardy, and more liable to disease."—*Communications to the B. of Agriculture, Vol. IV. p.* 446.

Miscellaneous.

GATHERING AND CURING HOPS.

Taking the crop is the most important operation in the hop economy. Hops are known to be ready for pulling when they acquire a strong scent, and the seeds become firm and of a brown colour, which in ordinary seasons, happens in the first or second week of September. And when the pulling season arrives, the utmost assiduity is requisite on the part of the planter, in order that the different operations may be carried on with regularity and despatch; as the least neglect in any department of the business, proves in a great degree ruinous to the most abundant crop, especially in precarious seasons. Gales of wind at that season, by breaking the lateral branches and bruising the hops, prove nearly as injurious as a long continuance of rainy weather, which never fails to spoil the colour of the crop, and thereby render it less saleable.

As a preparation for pulling the hops, frames of wood, in number proportioned to the size of the ground, and the pickers to be employed, are placed in that part of the field which, by having been most exposed to the sun, is soonest ready. These frames, which are called *bens* or *cribs*, are very simple in the construction, being only four pieces of boards nailed to four post, or legs, and when finished, are about seven or eight feet long, three feet broad and about the same height. A man always attends the pickers, whose business it is to cut over the vines near the ground, and to lay the poles on the frames to be picked. Commonly two, but seldom more than three poles are laid on at a time. Six, seven, or eight pickers (women, girls, and boys) are employed at the same frame, three or four being ranged on each side. These, with the man who sorts the poles; are called a set. The hops after being carefully separated from the leaves and branches, or stalks, are dropped by the pickers into a large cloth, hung all around within side of the frame with tenter-hooks. When the cloth is full, the hops are emptied into a large sack, which is carried home, and the hops lain on a kiln to be dried. This is always done as soon as possible after they are picked, as they are apt to sustain considerable damage, both in color and flavor, if allowed to remain long in sacks, in the green state in which they are pulled. In very warm weather, and when they are pulled in a moist state, they will often heat in five or six hours; for this reason the kilns are kept constantly at work, both night and day, from the commencement to the conclusion of the hopping season.

To set on a sufficient number of hands, is a matter of prudence in the picking season, that the vast or kilns may never be unsupplied with hops; and if it is found that the hops rise faster than could have been expected, and that there are more gathered in a day than can be conveniently dried off, some of the worst pickers may be discharged; it being very prejudicial for the green hops to continue long in the sacks before they are put on the vast, as they will in a few hours begin to heat, and acquire an unsightly colour, which will not be taken off in the drying, especially if the season be very moist; though, in a wet hopping, it is no easy matter to prevent the kilns from being overrun, supposing that there were pickers enough to supply them if the weather had been dry, because in a cold wet time the hops require to lie a considerable while longer on the kiln, in order that the superabundant moisture may be dried up. It is therefore expedient in this case that each measuring be divided into a number of green pockets or pokes. The number of bushels in a poke ought never to exceed eleven: but when the hops are wet, or likely to continue together some time before they go on the kiln, the better way is to put only eight bushels in a sack, pocket or poke.

Donaldson asserts, that diligent hop pickers, when the crop is tolerable abundant, will pick from eight to ten bushels each in a day, which when dry, will weigh about one hundred weight, and that it is common to set the picking of hop grounds by the bushel. The price is extremely variable, depending no less on the goodness of crop than on the abundance or scarcity of laborers. The greatest part of the hops cultivated in England are picked by people who make a practice of coming annually from the remote part of Wales for that purpose.—*Enc. of Ag.*

The operation of drying hops, is not materially different from that of drying malt, and the kilns, or vasts, are of the same construction. They should be dried as soon as possible after they are gathered; if not immediately, they must be spread on a floor to prevent their changing colour. The best mode of drying them is with a fire of charcoal, on a kiln covered wih hair cloth, in the manner of a malt kiln.* The fire must be kept steady and equal, and the hops stirred gently. Great attention is necessary in this part of the business, that the hops may be uniformly and sufficiently dried; if too much dried they will look brown, as if they were burned; and if too little dried, they will lose their colour and flavor. They should be laid on the hair cloth about six inches thick, after it has been moderately warmed; then a steady fire kept up till the hops are nearly dry, lest the moisture or sweat, which the fire has raised, should fall back and change their colour. After the hops have been in this situation seven, eight, or nine hours, and have got a thorough sweating, and when struck with a stick, will leap up, then throw them into a heap; mix them well and spread them again, and let them remain till they are all equally dry. While they are in the sweat, it will be best not to move them, for fear of burning them. Slacken the fire when the hops are to be turned, and increase it afterwards. Hops are fully dried when their stalks break short, and their leaves are crisp and fall off easily. They will crackle a little when their leaves are bursting; and then they must be taken from the kiln. Hops that are dried in the sun, lose their rich flavor, and if under cover, they are apt to ferment and change with the weather, and lose their strength. Fire preserves the colour and flavor of hops, by evaporating the water, and retaining the oil of the hop. After the hops are taken from the kiln, they should be laid in a heap, to acquire a little moisture, to fit them for bagging. It would be well to exclude them from the air, by covering them with blankets. Three or four days will be sufficient for them to lie in that state. When the hops are so moist as to be pressed together without breaking, they are fit for bagging. Bags made of coarse linen cloth, eleven feet in length, and seven in circumference, which hold two hundred pounds weight, are most commonly used in Europe; but any size that best suits may be made use of. To bag hops, a hole is made through a floor large enough for a man to pass with ease; the bag must be fastened to a loop larger than the hole, that the floor may serve to support the bag, and for the convenience of handling the bag, some loops should be tied in each corner to serve as handles. The hops should be gradually thrown into the bag, and trod down continually till the bag is filled. The mouth of the bag must then be sewed up, and the hops are fit for market. The harder hops are packed, the longer and better they will keep; but they must be kept dry. In most parts of Great Britain where hops are cultivated, they estimate the charges of cultivating an acre of hops at forty-two dollars, for manuring and tilling, exclusive of poles and rent of land. Poles they estimate at sixteen dollars per year; but in this country they would not amount to half that sum. An acre is computed to require about three thousand poles, which will last from six to twelve years, according to the kind of wood used.

The English growers of hops think they have a very indifferent crop, if the produce of an acre does not sell for an hundred and thirty-three dollars, and it frequently sells for two hundred dollars, and has been known to rise as high as four hundred dollars. In this country experiments have been equally flattering. A gentleman in Massachusetts, in the summer of 1801, raised hops from one acre of ground that sold for three hundred dollars; and land is equally good for hops in this state. Upon the lowest estimate, we may fairly compute the nett profit of an acre of hops to be eighty dollars, over and above poles, manure and cultivation.—*Tr. Ag. Soc. N. Y.*

The produce of the hop crop is liable to a very considerable varition, according to soil and season, from two or three to so much as twenty hundred weight; but from nine to ten, on middling soils, in tolerable seasons, are considered as average crops, and twelve or fourteen as good ones. Bannister asserts, that sixty bushels of fresh gathered hops, if fully ripe, and not injured by the fly or other accident, will, when dried and bagged, produce a hundred weight. When the hops are much eaten by the flea, a disaster which often befals them, the sample is not only reduced in value, but the weight diminished; so that, when the misfortune occurs, the planter experiences a twofold loss.

To judge of the quality of hops, as the chief virtue resides in the yellow powder contained in them, which is termed the condition and is of an unctuous and clammy nature, the more or less clammy the sample appears to be, the value will be increased or diminished in the opinion of the buyer. To this may be added the colour, which it is of very material consequence for the planter to preserve as bright as possible, since the purchaser will insist much on this article; though perhaps the brightest coloured hops are not always the best flavored.

The duration of the hop plantation on good soil, may be from fifteen to thirty years; but in general they begin to decline about the tenth. Some advise that the plantation should be destroyed, and a fresh one made elsewhere; other consider it the best plan to break up and plant a portion of new ground every two years, letting an equal quantity of the old be destroyed, as in this way a regular succession of good plantation will be kept up at a trifling charge.—*Enc. of Ag.*

GO TO WORK THE RIGHT WAY.

Addressed to Farmers.

I am sorry there is so much need of the admonitions I am about to give. Depend upon it, you do not "*work it right*," or you would make your farms just twice as valuable as they now are. Many of you *farm too much*. You would find it much more profitable to farm twenty acres well, than forty by halves. The last season, I made my grounds produce at the rate of one hundred bushels of Indian corn to the acre. Is this not much better than a common crop of thirty or forty bushels? You will certainly say it is, and with the same breath ask how I manage to make it produce so plentifully? My land being much infested with ground mice, or moles, and overrun with grubs and other vermin, I put on early in the month of March, about seven bushels of salt to the acre, which thoroughly destroys all kinds of vermin, being an excellent strong manure, and ploughed and harrowed the ground over and over until it became completely mellow. I then had every corn hole filled with long manure; and after dropping my corn, (which had previously been soaked in warm water,) I scattered a pint of lime over every hill, and then covered the whole with a little mellow earth. In about a week the corn began to come up plentifully; after which I nursed it with the plough and hoe, every other week for eight weeks, at which time it was as high as my head, and not a spire of it was destroyed either by frost, grub or birds. My other things I manured equally well, and I have been amply paid for all my extra care and trouble, as I raised more than twice as much per acre as any of my neighbors, and did it in much less time. I mean I got all my harvesting done two or three weeks before many others. This is accomplished in a great measure by redeeming time: rising between three and four o'clock in the morning; then if the day be sultry and hot, I lie by from twelve to three, and rest; I then feel refreshed, and able to work till quite dark. This I call "*working it right*;" whereas should I lay in bed until the sun be up and shame me, haunt the tavern at night, drink too much whiskey, but half manure, half plough, half plant, half nurse, half harvest, and do every thing by halves, I surely should not "*work it right*," nor get half a crop.

I shall now conclude by giving you, for further consideration, a few excellent observations, from a wiser head, perhaps, than my own, and hope that every brother farmer will do likewise.

"I often say to myself, what a pity it is our farmers *do not work it right!* When I see a man turn his cattle into the road to run at large, and waste their manure during a winter's day, I say that man *does not work it right*. Ten loads of good manure, at least, is lost in a season, by this slovenly practice—and all for what? For nothing indeed but to ruin his farm.

"So when I see cattle, late in the fall and early in the spring, rambling in a meadow or mowing field, pounding the soil and breaking the grass roots, I say to myself, this man *does not work it right*.

"So, when I see a barn-yard with a drain to it, I say this man *does not work it right;* for how easy it is to make a yard hollow or lowest in the middle, to receive the moisture and all the wash of the sides, which will thus be kept dry for the cattle. The wash and moisture of the yard, mixed with any kind of earth, or putrid straw, is excellent manure; yet how much do our farmers lose by neglecting these things! In fact, *they do not work it right*.

"When I see a farmer often going to a retailer's store, with a bottle or jug, or lounging abeut a tavern or wrangling about politics, or quarrelling and defaming his neighbor's good name, I am certain such a man *does not work it right*."—*Prov. Repub. Herald.*

HINTS TO HOUSEWIVES.

Vessels intended to contain liquid of a higher temperature than the surrounding medium, and to keep that liquid as long as possible at the highest temperature, should be constructed of materials which are the worst radiators of heat. Thus, tea urns and tea pots are

* Mats made of the splinters of Walnut, or rush, will answer the purpose and come cheaper than hair cloth.

best adapted for their purpose when constructed of polished metal, and worst when constructed of black porcelain. A black porcelain tea pot is the worst conceivable material for that vessel, for both its materials and colour are good radiators of heat, and the liquid contained in it cools with the greatest possible rapidity. On the other hand, a bright metal tea-pot is best adapted for the purpose, because it is the worst radiator of heat, and therefore cools as slowly as possible. A polished silver or brass tea urn is better adapted to retain the heat of the water, than one of a dull brown colour, such as is most commonly used. A tin kettle retains the heat of water boiled in it more effectually if it be kept clean and polished, than if it be allowed to collect the smoke and soot to which it is exposed from the action of the fire. When coated with this, its surface becomes rough and black, and is a powerful radiator of heat. A set of polished fire irons may remain for a long time in front of a hot fire, without receiving from it any increase of temperature beyond that of the chamber, because the heat radiated by the fire is all reflected by the polished surface of the irons, and none of it is absorbed; but if a set of rough, unpolished irons were similarly placed, they would become speedily so hot, that they could not be used without inconvenience. The polish of fire irons is, therefore, not merely a matter of ornament, but of use and convenience. The rough, unpolished poker, sometimes used in a kitchen, becomes speedily so hot that it cannot be held without pain. A close stove, intended to warm apartments, should not have a polished surface, for in that case it is one of the worst radiators of heat, and nothing could be contrived less fit for the purpose to which it is applied. On the other hand, a rough, unpolished surface of cast iron, is favorable to radiation, and a fire in such a stove will always produce a most powerful effect.—*Cabinet Cyclopædia.—Dr. Lardner, on Heat.*

CHEAP FARMING.

I have been much gratified by the receipt and perusal of your first number of the Farmers' Register.

I wish your paper may have the effect of producing some amendment in our farming; and that you may be remunerated for your labor and good intentions. I am greatly fearful, however, of your success in both respects.

We Virginia farmers, (I mean such as I am, who are at least four-fifths of the whole,) require to have some plan devised, by which, without *much labor*, and with *no expense*, we may improve our lands, and that speedily, or we will remove to the western forests, and encounter all the labor and privations attending a new settlement. We have no notion of submitting to the tardy and laborious system of your *real farmer*. We go for a kind of *slight of hand* or *no work* plan—or we are off.

Our general course of operations has been, to cultivate our lands in corn one year, and *rest them* in wheat the next; and so on, until they are prepared for a good crop of *old field pines*——the best crop, by the way, since the introduction of steam-boats, of the whole.

A piece of land thus *highly improved*, I got possession of some years ago; but instead of waiting patiently for the *pine crop*, I determined I would cultivate it every year in corn, until I got it rich; and this too without manure, although I lived near a town where any quantity might have been had; but I scorned all such *foreign aid.*

I prepared the land early, and having procured some buckwheat, I mixed it with oats, and sowed them in March or April. In due time, I planted my corn in drills, say eight feet apart. I ran a single coulter deep on each side; hoed and thinned the corn; and, in due course, turned a slice to it, and gave it another dressing with the hoes. I took no more than was absolutely necessary for the corn, from the oats and buckwheat, until it became proper to break the middlings, and *lay by* the corn. By this time the oats were so matured that the seed would vegetate. I preceded the plough by coultering deep with a single coulter, so as to pulverize the middlings, and then turned them with their coat of oats and buckwheat on the corn, drawing the dirt over the straw with hoes, so as to cover it up pretty well. The corn was a sorry crop, but the ground was well covered with young oats. These I turned in, in the fall, and proceeded in like manner the next year, with this difference, that I had no buckwheat to mix with my oats. This was a bad *look out;* but as it required some little foresight and management to avoid this mishap, it was *beyond me.*

I had heard of the chinck bug, but had never seen it; and knew not its great fondness for oats. My last ploughing, instead of destroying, saved it even the trouble of travelling to the corn: It had nothing to do but to "*arise, slay and eat.*"

Being thus rudely and unexpectedly assailed in my *grand experiment*, I had nothing left but to sow the land down in rye, which I had tried without success, before I began my experiment. From what cause it proceeded, you know better than I do; but so it is, I have rarely seen a heavier crop of rye than I obtained from this sowing.

I sold the land soon after, and so ends *that experiment.*

I have lately purchased another tract, improved to the *pine crop state* also; inasmuch that a crop of rye on part of a field where I purchased, was too mean to be cut; and I ran a harrow over it so as to prostrate it. I observed that even this slight cover produced such a change in the appearance of the ground that I determined last fall to make *another experiment*, if such it may be called.

After taking off a crop of wheat, preceded by one of corn, as usual, and after pasturing the land with stock of every kind, as *imprudently* as any *experimentalist could require*, in testing a plan to counteract bad management; and after all my other crops were sowed, I harrowed half a bushel of rye to the acre, not *in* but *on* land thus beat hard by the hoof.

It formed no part of *my plan* to have preceded this operation by deep coultering. That would have been too much like your *laborious farming.*

Plaster would cost money as well as time to sow it, and that also was entirely out of *my line.*

In this situation the field was left to shift for itself, except that I kept every thing off until the rye was ripe. The crop proved better than, under such circumstances, could be expected.

The field was also well covered with white and red clover, and what we call ribwort or narrow plantain, (I don't know its botanical name;) *but if it is good for any thing*, it must be an excellent grass for bad farmers, for it will grow in any place, and on any kind of land.

I intended to have prostrated the rye by running a harrow over it, (for I have no roller;) but how can it be expected I would take so much time and trouble? It would have covered the ground much better, it is true, and no doubt would have added greatly to its improvement; but I never have time to do any thing, however proper, that can *possibly be avoided;* and so I have contented myself with turning in my hogs first, and finally my cattle, horses, and every thing, to eat and tread it down, intending this fall and winter to turn in this cover of straw and grass, and plant corn next year.

The adjoining field, now in wheat, I will treat in the same way this fall, and prepare it for corn, to take its course the year after next; and as these fields are better adapted to corn than wheat, I mean to cultivate them afterwards alternately in corn, harrowing rye in after the corn is cut off, with some clover and timothy seed, (if I can muster energy and cash enough,) so as to have as heavy a cover as possible to tread, pasture down, and turn in during the fall and winter preceding the corn crop.

If I can discover a plan in this, or some such way, to improve our lands, without trouble or expense, indeed one which will *overpay* us at once for any little trouble or expense we may be at, it may enable *my class of farmers* to remain in the Ancient Dominion; otherwise (unless indeed you can reclaim us and our *lands too*) we must remove.

But seriously speaking, my dear sir, could you not cast this matter in your mind, and mature some simple plan of this kind, that might as an entering wedge, do some good, and strike the attention of that great class of farmers, who, from habit, &c. are incapable, at once, of any great efficient change?

I little expected, when I took up my pen, to trouble you with my *crude* and *unsatisfactory notions*, for they can't be called *experiments* —much less to offer any thing to the public eye. This you will at once see is not my object.

Deciphering such pieces is a price you will have to pay. *We will have our money's worth out of you in some way or other.* I would be ashamed though to expect an answer, other than such hints, if this shall have suggested any, as you may deem it proper to give us in your paper.

By the way, you can also inform us in that way, whether you are acquainted with the rib-wort, and what you think of it as an improving grass. It has entirely taken possession of my farm, and I begin to entertain hopes it will prove a valuable grass: if it is not, there is no getting clear of it.

[If our correspondent has had "his money's worth out of us," we will take the liberty of getting it back by publishing his letter: his satire will amuse, if it does not indirectly help to benefit that class of farmers of which he professes to be an example.]—*Ed. Farmers' Register.*

Young Men's Department.

ON THE UTILITY OF KNOWLEDGE IN PREVENTING DISEASES AND FATAL ACCIDENTS.

The first class of accidents to which I shall advert, comprises those which have happened *from ignorance of the nature and properties of the different gases*, and of the noxious effects which some of them produce on the functions of animal life.

We have frequently read in newspapers and magazines, and some of us have witnessed such accidents as the following:—A man descends into a deep well, which has for some time been shut up. When he has gone down a considerable way, he suddenly lets go his hold of the rope or ladder by which he descends, and drops to the bottom in a state of insensibility, devoid of utterance, and unable to point out the cause of his disaster. Another hastily follows him, to ascertain the cause, and to afford him assistance; but by the time he arrives at the same depth, he shares the same fate. A third person, after some hesitation, descends with more cautious steps. But he soon begins to feel a certain degree of giddiness, and makes haste to ascend, or is drawn up by assistants. In the mean time, the unhappy persons at the bottom of the well are frequently left to remain so long in a state of suspended animation, that all means of restoration prove abortive; and the cause of the disaster remains a mystery, till some medical gentlemen, or other person of intelligence, be made acquainted with the circumstances of the accident. Similar accidents, owing to the same cause, have happened to persons who have incautiously descended into brewers' vats, or who have entered precipitately into wine cellars, and vaults which had been long shut up from the external air, and where the process of fermentation was going on: they have been suddenly struck down, as by a flash of lightning; and, in some instances, the vital spark has been completely extinguished. Many instances, too, could be produced, of workmen who have incautiously laid themselves down to sleep in the neighborhood of lime-kilns where they were employed, having, in a short time, slept the sleep of death. The burning of charcoal in close apartments has also proved fatal to many; more especially when they have retired to rest in such apartments, while the charcoal was burning, and before the rooms had received a thorough ventilation.

Numerous are the instances in which accidents have happened, in the circumstances now stated, and which are still frequently recurring: all which might have been prevented, had the following facts been generally known and attended to:—That there exists a certain species of air, termed *fixed air*, or *carbonic acid gas*, which instantly extinguishes flame, and is destructive to animal life; that it is found in considerable quantities in places which have been shut up from the external atmosphere—as in old wells, pits, caverns and close vaults; that it is copiously produced during the fermentation of liquors in brewers' vats, where it hovers above the surface of the liquor; in cellars where wine and malt liquors are kept; and by the burning of lime and charcoal; and that, being nearly twice as heavy as common air, it sinks to the bottom of the place where it is produced. The following plain hints are therefore all that is requisite to be attended to, in order to prevent the recurrence of such disasters. Previous to entering a well or pit which has been long secluded from the external air, let a lighted candle or taper be sent down; if it continues to burn at the bottom there is no danger, for air that will support flame, without an explosion, will also support animal life; but, should the taper be extinguished before it reaches the bottom, it would be attended with imminent danger, to venture down, till the foul air be expelled. The noxious air may be destroyed by throwing down a quantity of *quick-lime*, and gradually sprinkling it with water; for as the lime slakes, it will absorb the mephitic air, and a person may afterwards descend in safety. Where lime is not at hand, a bush, or such like bulky substance, may be let down and drawn up several times; or some buckets of water may be thrown into it, till the air be so purified that a lighted taper will continue to burn at the bottom. These precautionary hints will apply to all the other gases referred to, where this species of gas may happen to exist. To which I may also add, as another hint, that in every situation where fixed air is supposed to exist, it is more dangerous to sit or to lie down in such places, than to stand erect; for as this gas is the heaviest of all the gases, it occupies the lowest place; and therefore, a person lying on the ground may be suffocated by it, while another, standing at his side, would feel no injury, his mouth being raised above the stratum of the noxious fluid. I shall only remark further on this head, that several disorders have been contracted by persons sleeping under the branches of trees in the night-time, and in apartments where great quantities of fruits, or other vegetable matters, are kept—from ignorance of the fact, that during the night the leaves of trees, and all vegetable matters, perspire a deleterious air, which, when it has accumulated to a certain degree, may induce a variety of serious complaints, and sometimes prove fatal.

The injuries which are produced by the stroke of lightning, form another class of accidents which are frequently owing to ignorance. Such accidents are more numerous and fatal, even in our temperate climate, than is generally imagined. From an induction of a variety of facts of this kind, as stated in the public papers and other periodical works, in the year 1811, the author ascertained that more than twenty persons were killed by lightning, during the summer months of that year, or at the rate of a thousand persons every fifty years, within the limits of our island; besides the violent shocks experienced by others, which did not immediately prove fatal, and the damage occasioned to sheep and cattle, and to public and private edifices; and it is worthy of notice, that most of the individuals who were killed by the lightning, had either taken shelter under trees, or were in situations adjacent to bells or bell-wires. The experience of succeeding years proves that a similar number of disasters of this kind annually take place. It is, however, more than probable, that at least half the number of accidents arising from the same cause might have been averted, had the nature of lightning, and the laws which regulate its movements, been generally known. Seldom a year passes, but we are informed by the public prints of some person or other having been killed by lightning, when taking shelter under a large tree—of whole families having been struck down when crowding around a fireplace, during a thunder-storm—of one person having been struck when standing beside a bell-wire, and another while standing under a bell connected with the wire, or under a lustre hanging from the ceiling.

There can be little doubt, that a considerable number of such accidents would have been prevented had the following facts respecting the nature of lightning been extensively known:—That lightning is a fluid of the same nature, and is directed in its motions by the same laws which regulate the motions of the electric fluid in our common electrical machines; that it is attracted and conducted by trees, water, moisture, flame and all kinds of metallic substances; that it is most disposed to strike high and pointed objects; and that, therefore, it must be dangerous to remain connected with or in the immediate neighborhood of such objects when a thunder-cloud is passing near the earth.

Hence the following precautionary maxims have been deduced, by attending to which the personal accidents arising from thunder-storms might be, in a great measure, prevented. In the open air during a storm, rivers, pools and every mass of water, even the streamlets arising from a recent shower, should be avoided; because water, being an excellent conductor, might determine the course of an electrical discharge towards a person in contact with it, or in its immediate neighborhood. All high trees and similar elevated conductors should also be avoided, as they are in more danger, of being struck than objects on the ground; and, therefore, a person in contact with them exposes himself to imminent danger, should the course of the lightning lie in that direction. But, to take our station at the distance of thirty or forty paces from such objects, or at such a distance as may prevent us from being injured by the splinters of wood, should the tree be struck, is more secure than even in the midst of an open plain. Persons in a house not provided with thunder-rods, should avoid sitting near a chimney or fireplace, whether there be a fire in the grate or not. For when there is a fire in the grate, the flue contains the following conductors—flame, smoke, rarified air and soot. Even when there is no fire, the soot with which the flue is lined is a conductor; and from the superior height of the chimney-shaft above every other part of the building, it is more liable than any other part of the house to be struck with lightning. In a house, too, gilt mirrors or picture frames, lustres or burning candles, bell-wires, and all metallic substances, should be carefully avoided, as they afford so many points of attraction, which might determine the course of an electric discharge. The safest position is in the middle of the room, if not near a lustre, a bell, or any thing hanging from the ceiling; and if we place the chair on which we sit on a bed or mattress, almost every possible danger may be avoided. Such are a few maxims easy to be recollected and put in practice, by attending to which not a few accidents from electrical explosions might be averted.

In the next place, *various accidents have happened from ignorance of certain plain mechanical principles.* For example, serious accidents have sometimes occured from the want of acquaintance with *the laws of motion.* Persons have heedlessly jumped out of moving vehicles, and got their legs and arms sprained or dislocated, and from one boat to another when both were in rapid motion, and run the risk of being either bruised, drenched or drowned. But had the effects of *compound motion* been generally known and attended to, in all those cases where it occurs, it would have prevented many of those accidents which have happened from persons rashly jumping out of carriages when in rapid motion, or attempting to jump from the top of a moving cylinder, in which cases they are always precipitated with violence, in a direction different from what they expected, from the obvious effects of a combination of forces. Boats and carriages have been sometimes overset by persons rising hastily when they were in danger of such accidents,—from ignorance of the principle, that the centre of gravity of the moving vehicle, by such a practice, is raised so as to endanger the line of direction, being thrown beyond the base, when the vehicle must, of course, be overturned; whereas had they clapped down to the bottom, they would have brought down the line of direction, and consequently the centre of gravity, farther within the base, so as to have prevented the accident and secured their safety.

Many affecting and fatal accidents have happened, and are frequently recurring, particularly to children, and females in the higher ranks of life, *from their clothes catching fire,* most of which might be prevented were the two following simple facts universally known and practically applied,—*that flame has a tendency to mount upwards; and that air is essentially requisite for supporting it.* When the clothes of females take fire, as the fire generally begins at the lower parts of their dress, so long as they continue in an upright posture, the flames, naturally ascending, and meeting with additional fuel as they rise, become more powerful in proportion; whereby the neck, the head, and other vital parts of the body are liable to be most injured; and, by running from one part of the room to another, or from one apartment to another, as is most frequently the case, the air, which is the fuel of fire, gains free access to every part of their apparel, and feeds the increasing flame. In such cases, the sufferer should instantly throw her clothes over her head, and roll or lie upon them, in order to prevent the ascent of the flames and the access of fresh air. When this cannot conveniently be effected, she may still avoid great agony, and save her life, by throwing herself at full length on the floor, and rolling herself thereon. Though this method may not, in every case, completely extinguish the flame, it will to a certainty retard its progress, and prevent fatal injury to the vital parts. When assistance is at hand, the by-standers shou'd immediately wrap a carpet, a hearth-rug, a great-coat, or a blanket around the head and body of the sufferer, who should be laid in a recumbent position, which will prove a certain preventative from danger. During the year 1813, the author noted down more than ten instances, recorded in the public prints, of females who were burnt to death by their clothes catching fire, all of which might have been prevented, had the simple expedients now stated been resorted to, and promptly applied.

Pure air is as essentially requisite to the health and vigor of the animal system as wholesome food and drink. When contaminated by stagnation, by breathing, by fires or candles, it operates as a slow poison, and gradually undermines the human constitution; yet nothing is less attended to in the economy of health by the great majority of mankind. Because air is an invisible substance, and makes little impression on the organs of sense, they seem to act as if it had no existence. Hence we find, that no attention is paid by the lower orders of society to the proper ventilation of their apartments. In some cases, the windows of their houses are so fixed in the walls as to be incapable of being opened; and in other cases, where the windows are moveable, they are seldom opened, except by accident, for weeks and months together; and were it not that a door and a chimney are to be found in every habitable apartment, the air would be rendered in many instances absolutely unfit for respiration. Crowds of tailors, weavers, shoe-makers and other mechanics, employed in sedentary occupations, are frequently pent up in close, and sometimes damp apartments, from morning till evening, without ever thinking of opening their windows for a single half-hour for the admission of fresh air; and consequently, are continually breathing an atmosphere highly impregnated with the noxious gas emitted from the lungs, and the effluvia perspired from their bodies, which is most sensibly felt by its hot, suffocating smell, when a person from the open air enters into such apartments. The sallow complexion of such persons plainly indicates the enervating effects produced by the air they breathe; and although its pernicious effects may not be sensibly felt, it gradually preys upon their constitutions, and often produces incurable asthmas, fevers, consumptions, and other dangerous disorders, which are frequently imputed to other causes. Nothing is more easy than to open the windows of an apartment, and other apertures that communicate with the external air, at meal hours, when the room is empty, in order to expel the contaminated air, and admit the pure vital fluid. No medicine or restorative is cheaper or of more importance to health and vigor than pure atmospherical air; yet, because it costs nothing, it is little regarded. Hints and admonitions in reference to this point are seldom attended to; for ignorance is always proud and obstinate, and the inconveniences supposed in certain cases to flow from the practice of ventilating particular apartments are seldom attempted to be remedied. It is therefore, presumed, that were a knowledge of the nature of the atmosphere, of the ingredients that enter into its composition, of its indispensable necessity for the support and invigoration of animal life, of the circumstances by which it is deteriorated, and of the baneful effects which are produced by its contamination, more widely diffused, its use and importance would be more duly appreciated, and the disorders which flow from the circumstances now stated, effectually prevented.

Much benefit might also be produced, were *a knowledge of the means of restoring suspended animation,* in cases of drowning, strangulation, &c. generally disseminated. As prompt measures in such cases are absolutely necessary, many fatal effects have happened from the delay occasioned by medical assistance having been at a distance, which might have been prevented, had the proper means of resuscitation been known, and immediately resorted to by the persons present at such a juncture. Were the nature and importance of the function of *perspiration* generally known and attended to, it might likewise be the means of preventing those diseases and disasters which flow from making sudden transitions from heat to cold which are the origin of many fatal disorders among the laboring classes. If a man is thoroughly convinced that more than the one-half of what he eats and drinks is thrown off by insensible perspiration, he will at once see the importance of avoiding every practice and every circumstance which has a tendency to obstruct the operations of this important function.

The last example I shall mention, though not of the least importance, is the fatal effects produced by ignorance of *the proper mode of treating children during the first stages of infancy.* It is a fact deduced from the annual registers of the dead, that one half the number of children born, die under seven years of age. This extraordinary mortality is universally imputed, by medical writers, to wrong management during the first and second years of their infancy, and the practice of giving anodyne aromatic medicines. Instead of clothing infants in such a manner as to give free scope for the exercise of all the vital functions as soon as they are ushered into the world, the midwives and officious matrons frequently vie with each other to improve upon nature by attempting to model the head and to strengthen the limbs by the application of fillets, rollers, and swaddling bands of several yards in length; thus loading and binding them with clothes equal to their own weight to the manifest injury of the motions of their bowels, lungs, limbs, and other animal functions. Instead of covering the head with a thin single cap, and keeping the extremities in a moderate degree of warmth, an opposite course is most frequently pursued, which is supposed to be one among the many existing causes of hydrocephalus, or water in the brain. Instead of allowing the first milk that is secreted, which nature has endowed with a purgative quality, to stimulate the bowels, it is a common practice, immediately on the birth of a child, to administer a variety of purgative medicines in close succession, "as if," says a modern writer, "to prove that it has arrived in a world of physic and of evils." Instead of being exposed to the invigorating effects of pure air, and kept in a moderate degree of temperature, they are too frequently confined to a hot contaminated atmosphere, which relaxed their solids, impedes their respiration, and frequently induces fatal convulsions. There are but a few examples out of many which could be produced of the improper treatment of children, from which multitudes of painful complaints and dangerous disorders derive their origin. It is therefore reasonable to believe, that were general information on such topics extensively disseminated, and a more rational mode of nurture during the first years of infancy adopted, not only fatal disorders, but many subsequent diseases in life might either be wholly prevented, or, at least, greatly mitigated.—*Dick on Knowledge.*

TRANSFORMATIONS IN NATURE.

Numerous transformations take place in nature ; indeed it may be said, that every thing in the physical world, at one period or another is metamorphorsed. The figure of objects continually varies ; certain bodies pass successively through the three kingdoms of nature ; and there are compound substances, which gradually become minerals, plants, insects, reptiles, fish, birds, quadrupeds, and man. Every year millions of bodies blend together, and are reduced to dust. Where are the flowers which during the spring and the summer, ornamented our fields and our gardens ? One species has appeared, withered, and given place to others. The flowers of March, and the modest violet, after announcing by their presence the arrival of spring, have yielded their place to the tulip and the rose. In the room of these we have seen others, till all the flowers have fulfilled their design. The same holds good with regard to man. One generation shews itself, and another disappears. Every year thousands of human bodies return to the dust from whence they were taken ; and of these evanescent bodies others more beautiful are formed. The salts and the oils of which they were composed dissolve in the earth ; the more subtile particles are raised into the atmosphere by the sun's heat, and mixing there with other matters are dispersed in different directions by the winds, and fall down in rain and dew, sometimes in one place, and sometimes in another ; whilst the grosser particles mix with the earth. The grass which is nourished by them grows up into long blades ; and it is thus that the flesh of men, transformed into grass, serves as aliment to the flocks, whose wholesome milk is again converted to our own subsistence.

These continual transformations, thus operating in nature, are so many certain proofs that the Creator has designed that nothing should perish or be useless. The dust of flowers used in the fecundation of plants, is only a very small part of what each flower contains ; and that the superabundant portion may not be lost, bees are created, which make use of it to form their honey. The earth daily presents us with new presents, and it would in the end be exhausted, if what it gives was not in some way or other returned again.

All organized bodies suffer decomposition, and are at last converted into earth. During this dissolution, their volatile parts rise into the air, and are dispersed in every direction. Thus the remains of animals are diffused through the air, as well as through the earth and the water. All these particles, so dispersed, unite together again in new organic bodies, which in their turn will undergo similar revolutions. And this circulation, and these continual metamorphoses, which commenced with the world, will only terminate with its dissolution.

The most remarkable transformation, or at least that which interests us the most, is that in which we are immediately concerned. We know that our body was not once composed, and will not be so in the end, of the same number of parts as it is when in its greatest perfection. Our body, when in our mother's womb, was extremely small ; it became much larger when we were brought into the world, and since then has increased to fifteen or twenty times the bulk it then had ; consequently blood, flesh, and other matters, supplied by the vegetable or animal kingdom, and which formerly did not belong to our body, have been since assimilated to it, and are become parts of ourselves. The daily necessity of eating proves that there is a continual waste of the parts of which we are composed, and that this loss must be repaired by alimentary matter. Many parts insensibly evaporate ; for since the experiments which a certain great physician made upon himself, it is ascertained, that of eight pounds of nourishment necessary to support a healthy man in one day, only the fiftieth part is converted into his own substance ; all the rest passing off by perspiration and other excretions. Hence also it may be inferred, that in ten years there will not remain many of the same particles that now constitute our bodies. And at length, when they shall have passed through all their different changes, they will be converted into dust, till the blessed day of the resurrection, when they will undergo that happy and final revolution that will place them in a state of eternal rest.—*Sturm.*

PRINCIPLES NECESSARY TO BE OBSERVED BY THOSE YOUNG MEN WHO ARE NOT YET IN BUSINESS FOR THEMSELVES.

Every young man should remember that the character which he is to sustain, and which is to *sustain him*, when he shall be in business for himself, is to be formed while he is yet in a subordinate station. This observation holds true, not only with respect to the reputation which he is to possess among men, but also with regard to his real characteristics. The habits, principles, and manners of the *youth*, will be essentially those of the *man ;* and as it is our object to place these on a solid basis, and form them in a manner suited to the real exigencies of life, we shall express ourselves plainly, going directly to the point ; and calling the vices and virtues by their right names. We begin by pointing out some practices which are to be avoided : and as the foundation of all that is beautiful in character is ingenuousness, we shall first bear our testimony against

Lying.—To lie to the prejudice of others, argues malice and villany : to lie in excuse of ourselves, guilt and cowardice : both ways, a design to elude with false representations of things, and advantage ourselves by the deceit. Now, however artificially we may carry on this infamous practice for a while, in the end it is always discovered ; and it is hardly to be imagined what infinite contempt is the consequence. Nay, the more plausibly we have conducted our fallacies before, the more severely shall we be censured afterwards. From that moment we lose all trust, all credit, all society ; for all men avoid a liar as a common enemy ; truth itself in his mouth loses its dignity, being always suspected, and often disbelieved.

If, therefore, you should ever unwarily fall into an offence, never seek to cover it over with a lie ; for the last doubles the former, and each makes the other more inexcusable ; whereas, what is modestly acknowledged is easily forgiven, and the very confession of a small tresspass establishes an opinion that we are innocent of a greater.

Dishonesty.—But truth in speech must likewise be accompanied by integrity in all your dealings ; for it is as impossible for a dishonest person to be a good agent, as it is for a madman, or an idiot, to govern himself or others by the laws of common sense. Dare not, therefore, allow yourself even to wish to convert the property of another to your own use, more especially where it is committed to your charge ; for breach of trust is as heinous an aggravation of theft, as pretended friendship is of murder. If, therefore, you should be lucky in your frauds, and escape without being punished and detected, you will nevertheless stand self-condemned, be ashamed to trust yourself with your own thoughts, and wear in your very countenance both the consciousness of guilt and dread of a discovery ; whereas innocence looks always upward, meets the most inquisitive and suspicious eye, and stands undaunted before God and man. On the other hand, if ever your knaveries come to light, (to say nothing of the penalties of the law,) with what shame and confusion of face must you appear before those you have wronged ! and with what grief of heart must your friends and relations be made eye or ear witness of your disgrace ? Nor is this all ; for, even supposing you should be convinced of your folly, and sincerely abhor it for the future, you must nevertheless be always liable to suspicion, and others will have the boldness to pilfer, on the presumption that you will be understood to be the thief.

Fidelity.—There is still another sort of fidelity, which may be called affection, as the other is of action, being almost of as much consequence, too, and what never fails to endear you to those in whose favor it is employed ; we mean that of defending their reputations, not only negatively, by avoiding all reproachful, indecent or even familiar terms in speaking of them, but positively, by endeavoring at all times to vindicate them from the open aspersions and base insinuations of others.

That which makes us discontented with our own condition, is the false and exaggerated estimate we are apt to form of the happiness of others.—*Fr.*

The rust of the mind (idleness) is the blight of genius.—*Seneca.*

THE CULTIVATOR—APRIL, 1834.

TO IMPROVE THE SOIL AND THE MIND.

THE WHEAT INSECT.

The wheat crop has been more or less injured in the northern states, for some years, by small maggots which prey upon the kernel while growing in the field, and before the grain has become hard. In some instances nearly the entire crop has been destroyed, while in other cases the injury has only been partial. It has been generally believed, that the maggots have proceeded from a fly, which deposites its eggs while the wheat is in blossom, or soon after. It has also been remarked, that the fly is seen but for a few days; and that if, during its presence, the wheat ear has either not burst in the sheath, or is far advanced towards maturity, no evil is experienced from the insect. In some instances late sown grain has escaped most, and in other cases it has suffered most. No general rule upon this point can be laid down. Nor has any preventive of the evil been published among us. The most plausible recommendation that we have heard mentioned, is to strew fresh slaked lime over the field soon after the grain is out of blossom. This is recommended to be done early in the morning, while the dew is upon the grain. At this time the maggots are small and tender, and the causticity of the lime, brought in contact with them by the dew, it is thought will destroy them. If the field is laid in ridges, or narrow lands, the lime may be thrown from the middle or water furrows without prejudice to the grain. Though this is mere theory, we think it worth a trial; and we beg to be apprized of the result of any trial that may be made upon this suggestion, be it favorable or otherwise.

A very sensible writer in the Penny Magazine, F. Bauer, has written several communications upon the diseases of wheat and other grain, which contain the result of close and continued examination, and are accompanied with drawings, showing the appearance of the diseased grain, and of the fungi and insects which cause these diseases. He considers the smut of grain a parasitic plant, or fungus, whose seeds are so minute as to pass from the seed grain in the soil, with the ascending sap, to the ear of the grain, where it grows and produces smutty grain. His preventive is to steep the seed in strong lime-water, which he supposes kills the seed of the smut. There is no doubt that the steeping and liming seed wheat is a sure remedy against smut. Thousands of trials, made in this country and in Europe, leave not a doubt upon this subject.

Mr. Bauer's last communication is on what he calls the *grain worm*, (*vibrio tritici*,) and is accompanied with drawings of the diseased grain, and of the insects as they appeared under a highly magnifying power. The disease is known in England under the different names of *ear-cockle*, *brown-purple* and *burnt-corn*. Mr. B.'s experiments and observations were commenced in 1807, and were continued down to 1823, at which time he communicated a detailed account of them to the Royal Society, which may be seen in the Philosophical Transactions of the latter year. We do not feel competent to decide, whether the *grain worms* described by Mr. Bauer are the same as those which attack our wheat, but we are inclined to the opinion that they are identical. We subjoin an extract from Mr. B.'s communication, which cannot fail to interest the farmer as well as the naturalist.

"Being fully convinced that the worms or their eggs, like the seeds of the pepper-brand and dust-brand, [smut,] must be absorbed by the germinating seed corn, and propelled by the circulating sap into the young germens, and reflecting that I had successfully inoculated the wheat grains with the fungi, I determined to try the same experiment with the worms; accordingly I selected a sufficient number of sound wheat grains, and extracting a small portion of the worms from the cavities of the infected grains, (which had been previously soaked in water about an hour,) and placing some in the grooves on the posterior sides of the sound grain, I left them for some days to get dry, and planted them in the ground on the 7th October, 1807. At the same time I planted some sound wheat grains in separate holes, about two inches deep, and in each hole two or three infected grains also. About the middle of November most of the seeds had come up, and from time to time I took some of these young plants for examination, but did not perceive any effect of the inoculation until the 3d of December, when, out of nine plants, five appeared to be affected with worms. In the first plant, after carefully splitting the young plant from the root upwards, I found in the unorganized substance, between the radicle and plumula, three young worms, very lively, but not much larger than those with which the seed corn was inoculated; in another plant I found a full sized worm, but no eggs about it; in the third plant I found a still larger worm than the last, but in dividing the stem I had cut the worm in two, and it soon died; it seemed to be full of eggs; in the other two plants I found some worms quite young, and some half grown; but on the other four plants the inoculation had no effect. The fact that at such an early stage of the vegetation of these inoculated seed grains, such large worms were found, confirms my first supposition, that it requires several generations of these worms to introduce their eggs into the young germens; the large worms found in the substance of the young stem were undoubtedly some of the worms with which the seed corn was inoculated, for they were on the point of laying their eggs in that stage, and these eggs being again propelled by the rising sap a stage farther, there come to maturity, and then lay their eggs, and thus progressively reach the elementary substance of the ear, where they are finally deposited in the then forming grain; the whole progress probably requires three or four reproductions."

Mr. B. then describes many subsequent examinations of infected plants, and continues:

"My experiments for resuscitating the grain worms, I have repeated almost every succeeding year to this day, and always with the same success; but I find that the longer the specimens are kept dry, the grains require to lay in water a greater length of time before the worms will recover; and that after the same specimens had been kept dry *six years and one month*, the worms were all really dead.

"That this disease is contagious, is sufficiently proved by the fact, that it can at pleasure be successfully inoculated on the soundest seed corn. The infection, however, is not so generally nor so readily communicated as the disease occasioned by the fungi of the smut balls or dust-brand, a few infected ears of which are capable of contaminating and infecting the whole contents of a barn. Grains infected with these worms having no embryo, cannot vegetate and produce again diseased grains of themselves, but can only communicate the infection by coming in contact with the germinating seed corn in the soil, by the moisture of which the worms are revived and extricate themselves, which I have so often observed they do when kept some time in water.

"Steeping the seed corn in lime-water, in the same manner as advised for preventing the diseases occasioned by the fungi, is the most effectual method of preventing the spreading of this disease. I have repeated the experiment by inoculating, very strongly, sound wheat grains with the worms, and afterwards steeping them in lime-water, and the infection was always prevented; I have also steeped some sound wheat grains in lime-water, and after having kept them in a dry state for some days, I inoculated them strongly with the worms, but on examining the plants, not one case of infection occurred. From these facts it is evident, that properly steeping the seed-corn in lime-water before sowing, is a sure preventive of the disease occasioned by grain worms."

THE ORCHARD.

The most usual practice has been, so far as our observation has extended, to prune fruit trees in March or April; but it has been recommended by some to omit this work till May, till after the leaves are out; and by others still further to postpone it till the last of June or beginning of July. Against March and April pruning it is urged, that the wood, where cut, is liable to crack, through the influence of the drying winds of those months, and being unprotected by foliage, that the sap is apt to exude and waste, and to corrode the lips of the wound; and that, *at this season*, the efforts of nature to heal the wounded parts are feeble. May pruning has been objected to for the reason, that as at this time all the organs of the plant are in active operation, and the growth more vigorous than in any month of the year, pruning cannot but be prejudicial. The sap vessels are at this time full, and the sap pushing with great force to the extremities; and if the branches are materially diminished, the sap will force itself out near where its flow has been stopped, in numerous shoots, useless for fruit, and unsightly to the eye. Those who have pruned at this season can judge what force there is in these objections. Most of our trees, and particularly fruit trees, have two periods of growth in a season, the first principally in May or June, and the other towards autumn. Between these two periods, their growth is in a manner quiescent. This is declared by many to be the best period for pruning—because the second growth suffices to cover the lips of the wound, or, when small, the wound itself, with new wood and bark; and, in the second place, because the volume and force of the sap are then so much diminished, that few shoots or spray are thrown out. We have tried the different seasons, and are of the opinion, that the last mentioned time has a decided preference. For three successive years, we have pruned our orchard after cutting an early crop of grass, say the middle of July, and have witnessed none of the evils which have resulted from autumn and spring pruning.

We recommend to the cautious orchardist to do as we have done: try the three methods, and hold fast to that which does best. Experience is the best school in which to gain instruction, and it is the only school in which most of us are willing to learn.

We will give but three rules in regard to the operation of pruning an orchard, and they will be short ones.

Prune annually. If judiciously done, none but small branches will be required to be cut, and the wounds of those will soon heal.

Make a clean cut, and pare smooth, with a sharp knife, the edges of the wound. This will greatly facilitate the healing process, and preserve the tree from decay.

When the habit of the tree will allow, take out the leading shoot, at the height where you design to have the branches spread. A horizontal branch will produce more fruit than an upright one.

The best application that we have tried, (and we have used it to advantage six or seven years,) to kill bark lice upon the apple tree, to destroy larvæ of other insects, and to give a clean, healthy appearance to the tree itself, is a *strong* ley, made of wood ashes or potash. It is applied to the bole or trunk of the tree, and branches if necessary, with a brush, nailed or tied to a stick a yard or more in length. The most suitable time to make the application is between the middle and last of May..

There are advantages and disadvantages in tilling an orchard. In tilled ground, trees are the most vigorous and thrifty; and it seems to be in a measure necessary to plough a few years to give the young trees a start. Yet even at this period, great care is required not to cut the roots with the plough. But when the trees have acquired six or eight years' growth, and the roots become extended, still greater precaution is necessary, or the injury becomes serious. It is not altogether the large roots that are so liable to be cut, for these are often below the plough, but the innumerable fibres that spread in every direction, which escape the ploughman's notice, but which are literally the mouths that convey food to the plant. Our practice has been, when an orchard is to be ploughed, to proceed, first to dig the ground superficially with the spade, about the tree, two or three feet in breadth, and as many yards lengthwise of the furrow, so that there shall be no balk, and to run the plough shallow near the dug part: and where the orchard is in grass, to dig circles round the trees after harvest, both to facilitate growth and to prevent injury, in winter, from moles. There is no less caution necessary in using the spade than the plough, to preserve the roots entire. It is a good practice to cut the grass close with a hoe, and then to strew rotten chip dung, if mixed with a little lime the better, about the tree.

THE GARDEN.

If a snug well kept kitchen garden is not an infallible proof of thrift, when seen near a farm-house, it is a pretty certain indication of comfort and good sense. It shows that the owner is well to live, and intends to live well, so far as his labor and his lands can conduce to good living: for it will not be denied, that the farm and the garden *may* be made to produce, not only the substantials, but a great many of the luxuries of life—we mean those luxuries which, while they are grateful to the senses, neither pall the appetite, vitiate the taste, impair the health, nor corrupt the morals of those who partake of them. Some consider the productions of the garden as constituting a necessary part of human food. So the man of the forest would tell us, that *bread* is an unnecessary article of food—the Abyssinian, that it is unnecessary to *cook* our meat—and many of the inhabitants of Asia would insist, that it is i p ous to indulge in the use of animal food at all. But as none of these opinions are suited to our age and country, there is no need of combatting them. The pleasures and benefits of a garden are so manifest, that none who have once enjoyed them are willing voluntarily to do without them. To have a succession of delicious fruits, plucked at maturity from the trees and vines which one has planted and reared;—and to partake daily of fresh gathered vegetables from one's garden, the product of his labor, promotive alike of health and pleasure, are no mean gratifications; and yet they are privileges, we are too sorry to say, which, though all *can* enjoy, but few, comparatively, at present, *do* participate in.

Let us enumerate some of the good things, conducive alike to health and innocent gratification, which a garden may be made to produce with very little expense. Our perennial products, which require very little care after they are once established. We will name, of fruits, the strawberry, (for these will be smothered by the grass on a well conducted farm,) the currant, gooseberry, plum, pear, quince, grape, and, in situations where they will thrive, the apricot and peach. But of fruits, we would have none but the best sorts; for the best are as cheap as the worst, are as easily cultivated, and are infinitely more healthy and grateful. These, if well selected, will give a succession of fruit from June to November, and in a preserved state during the year. Plants to begin with will cost from three to five dollars. They may be multiplied, by grafting, budding, &c. by the boys or men of the family, without any expense. The trees should be so arranged as to shade as little as possible the grounds that are to be tilled. Half a dozen roots of the pie-plant (rhubarb) will furnish abundant materials for pies and tarts, little if any inferior to the gooseberry, from April to July, or until the fruit is sufficiently advanced to supply its place. These should be planted two feet apart in good soil. A bed of forty by three and a half feet will supply the table with delicious asparagus, during a part of April, and the whole of May and June, if kept in good order. For this the ground should be dug deep and made rich. The seed, which will cost a shilling, should be sown in drills ten or twelve inches apart, about the first of May; the bed should be kept free from weeds, and the ground forked in the spring. The third year it will be fit to cut. Or, roots may be bought at fifty cents the hundred, which will give a crop the second year. Plant them six inches apart in the drills. About two hundred and fifty plants will fill a bed of the given dimensions. Among the perennials, we may also class some medicinal plants and sweet herbs which are useful and necessary in the economy of a family, such as sage, thyme, hyssop, bam, rue, tanzy, wormwood, &c. which it requires ten times the labor to beg from more provident neighbors that it does to raise in our garden. The annual products, which go towards subsisting a family, and which are seldom produced but in the garden, are numerous, as the onion, beet, carrot, parsnip, cabbage, peas, beans, pot herbs, sallads, radishes, squash, cucumber, melon, &c. Some of these are in use most of the season, and most of them afford valuable winter stores.

These productions of the garden which we have named, and the list might be greatly extended, are all useful in the economy of a family, they afford a grateful variety, and tend to lessen, in no inconsiderable degree, the quantity of more solid and expensive food, which would be required without them—and yet they may all be produced in sufficient quantities for an ordinary family, upon a quarter of an acre of ground, and without seriously abstracting from the ordinary labors of the farm. A garden is truly a matter of economy in a pecuniary point of view; but when we add to this consideration, the comfort and pleasure which it affords, we are persuaded we are in the line of duty, in commending the subject to the particular consideration of our readers.

It is not our purpose at present to prescribe rules for laying out or managing a garden; yet we cannot forbear to suggest, that the first step should be, to enclose it with a good substantial fence, and to keep that at all times in repair, so as effectually to exclude hoof and hog. We have said nothing of the sale of the surplus products of a garden, although hardly any location is without a market for such products; nor have we noticed the ornamental department; because the wife or daughters will see to this—they *will* have their shrubbery and their flower border.

ON IMPROVED FARMING.

The method of farming that has heretofore been generally adopted in this country, was to cultivate that kind of crop which gave temporarily the most profitable returns, utterly regardless whether, by a succession of exhausting crops, the soil became impoverished or not. Indeed, it was not till of late years even thought necessary to aid its fertility by such a thing as a rotation of crops, or the regular application of manures. The manner was, to crop it as long as a particular kind of grain could be made to grow, in a given field, and when every particle of fertility was at length extracted from the soil, that lot was thrown away as worthless. A new clearing was made, and then the same bad practice was continued. In the south, they complain of the barrenness of their land; that it yields scarcely a tenth of the produce it did when it first came under culture; that they can now raise but a moiety of the quantity of cotton, tobacco, wheat or corn, per acre, they did formerly; that the farming population are in consequence impoverished, and they are now obliged to sell their farms for a trifle; and to improve their circumstances, many are ready to move off to the west, in quest of a more productive soil. But suppose these persons effect their object—sell their exhausted farms, and go to the most fertile regions of the world—let me ask, how long will it be before these same people must again move from the same cause that made a first removal necessary, viz. that they have once more worn out their lands? No matter how fertile land is, you may, by raising crop after crop from it, if you do not in some way manure it, make it in time utterly worthless. In that respect it is like your ox,—no matter how vigorous, well-conditioned and fit for labor he may be, if you work him to excess, and give him scanty fare, he becomes at length broken down and valueless. But it is not in the south alone where this species of bad management has prevailed: The north comes in for her full share; and, strange as it may appear, for all intelligent farmers now acknowledge the necessity for occasional manuring, and a judicious rotation of crops, this suicidal practice still obtains upon some of what is the finest land in New-York.

The western part of this state is noted for raising large crops of wheat, and we often hear farmers from that portion of it boast of the wheat crops they have successively taken from particular fields. This for a time may do very well, but according to every principle of correct farming, it is miserable management; and although the occupant now is rich, he will leave a legacy of an exhausted farm to his son or successor. There is no such thing as an inexhaustible soil. It is contrary to every principle of reason and experience. The valley of Egypt, from the time of Moses, has been celebrated for its fertility, but remember even in his time it already required the overflowing waters of the Nile to make it produce its usual crops. If a dry season intervened, and the waters, the cause in part of its fertility, did not rise to their usual height, that season was one of suffering for want of bread. The farming history of western New-York, as to the fertility of the soil, has been the history of every portion of the state, as it was successively cleared of its timber, and put to the purposes of cultivation. What is now called the old settled part of the state was formerly thought the best of land; for a succession of years wheat crops were raised from it until it became exhausted, and wheat could be raised no more. This it took years to accomplish; but no matter how rich the virgin soil, it was ultmately effected, and what was once thought the finest land in the world, was at last, by this miserable management, made almost worthless.

Emigration to our western country owes much to this circumstance, and many of its present possessors must follow the example of our predecessors and former neighbors, and remove, or adopt some other mode of farming, by which the errors of former years can be remedied. We have now found out, that it requires all of the intelligence, judgment and skill that we can command, to bring back in part, our farms to the state of fertility which nature gave them; and to accomplish this, we feel the necessity of the most judicious and systematic management. To begin, we find ourselves deficient in all the requisite information upon which a correct judgment can alone be formed; we find that we ought to know the nature of the soil we cultivate, what plants grow the most vigorously in it, and what artificial aid we can give to make it the most productive. But are we competent to this? Can we analyze the different soils without a due course of education? Can we know what plants do best upon particular locations without we understand their nature? Can we provide the best and cheapest food for them, until we learn what enters into their combination, what they take up and what they leave behind? The sciences unquestionably throw great light upon these as yet to us hidden laws of nature, and until farmers derive collateral aid from them we can only follow in the footsteps of our fathers. They, however, had advantages which we do not possess; they had a virgin soil to repay them for their agricultural labor. We have the exhausted fields which we are endeavoring to restore to fertility, and at the same time provide bread for our families.

Thus far we have met with some little success, for we see indications that our efforts have not gone entirely unrewarded; that our land begins to yield more bountifully, and that it can be made capable to do much more. It is not long since it was a general observation, that land did not yield over three per cent interest; and if we could not believe the veracity of those who made the assertion, we had at least numbers to endorse it. It was unquestionably true, land at that time was not as productive a source of revenue as money at interest. Could the price of land at that time be otherwise than low, when it did not yield a sufficient return for the investment? No man bought it unless he was by occupation a farmer, or compelled to take it in payment of a debt. But since a better, and of course a more productive system of farming partially obtained, land has risen in price. It is more sought after, and it is becoming more fashionable for gentlemen to cultivate small farms. Formerly grain was almost the only source of revenue derived from a farm, and, as the most of these had become impoverished by bad husbandry, the quantity raised was of course small, and the per centage profit bore no proportion to its first cost. This management was in time found very unprofitable. A different system has been introduced, and the good effects from it are already decisive. To stock your farm, feed up your hay, straw and offal, and thus realize two profits—the first upon the increased value of your stock, the second from the sale of your grain. By this practice you are enabled to make a much larger quantity of manure; and from this, again, not only raise an increased quantity of grain, but enrich your fields, and thus extend the number of your stock. Our best farmers adopt this practice, and the success that has attended it in the county of Dutchess is the strongest proof of its correctness.

It may be inquired, however, what kind of stock is the most profitable. That must depend in a great measure upon the adaptation of the soil to raise natural or artificial grasses, and the nearness of the farm to a good market. On some, a dairy may do best; on some the fattening of cattle; on others, the raising of sheep: but the last is attended with the least trouble. The market for the carcass or the wool is almost always at hand, and upon the whole, particularly in the interior, generally the most profitable. A farm costing $30 per acre, and adapted to the raising of grass as well as grain, will support sheep enough to pay the interest on the investment, and all expenses, besides raising about as much grain as if there were no sheep upon it. This is not idle assertion. We have abundant evidence of the fact, and can cite chapter and verse to substantiate it. It is this practice that makes the Dutchess county land sell for $70 per acre, while other land, equally as good, but not so well cultivated, and whose capabilities have not been so well ascertained, will not sell for half the price. A farm cultivated in this way is constantly improving. The hay raised on it is not sold, but it is fed to the sheep, who in return give a large quantity of manure, so that as much grain as was formerly raised upon the whole, is, by this course of tillage, grown upon half or one-third of the ground. Of this method of farming, we have had some experience, and every ton of hay fed out upon a farm to this kind of stock, is worth to the farmer at least $20—how unprofitable then for them, for want of this stock, to sell their hay for $5 per ton, for in this way they meet with a double loss: they do not get the full value of their hay, and the manure it would produce from their not feeding it, is an entire loss. The growing of wool in this country cannot in many years be overdone. There are large quantities annually imported, and must be for some time to come. We have over thirteen millions of inhabitants, and raise but about fifty millions of pounds of wool, which is not four pounds to each inhabitant. A much larger quantity than this is required for our present population, and with all our facilities for keeping sheep, the low price of our lands, and a climate that seems to suit their constitution, we ought to make it an article of exportation, and not of importation.

Salt to Farm Stock.—That salt is beneficial to domestic animals, seems to be universally admitted, by the general practice of giving it to them at shorter or longer intervals. We have abundant evidence that it tends to preserve health, and even to restore it in many cases, when it has been impaired. Its effects upon the animal system are believed to be pretty uniform upon man and beast. What then is the form in which *we* prefer it? With our daily food.

Why is it not then equally grateful and beneficial, if administered daily to our cattle? If at all times accessible they will never take it to excess; at least I have never known them to do so in twelve years experience: for during this period I have had troughs with salt in them constantly under my sheds, to which the stock have had daily access;—and no disease, not even the black tongue, has shown itself among them. Gen. Barnum, of Vergennes, I think has stated, that salt, with an occasional admixture of salt petre, is not only a preventive of the latter disease, but a cure where it has commenced its attack.

To divest milk and butter of the taste of turnips, cabbage, &c. upon which cows have fed, put into each pail of milk, when fresh drawn from the cows, one pint of boiling water. The heat of the water dispels the odor of the turnip, which becomes volatile as the temperature of the milk is increased. This has been practised and proved to be effectual, by the writer, in cases where cows have been fed two or three months in the year upon Swedish turnips. Marshall states that hot water is equally effectual, when thus applied, in removing the taste of wild onions and leeks.

Mildew.—When wheat becomes badly mildewed, the grain ceases to derive further nourishment from the root—the ascent of the sap to the head is wholly obstructed; and the sooner it is cut the better. Although the grain will be more or less shrivelled, it will nevertheless retain a good colour.

The Hoven in Cattle, is caused by their eating too abundantly of green succulent food, as clover, turnips, &c. and under bad management, often proves fatal. A pint of weak ley has been found to give relief. The Norfolk practice, according to Marshall, is to give a beast salt and water; and if this fails, a horn of salt and grease, warm. The Annals of Agriculture directs, as a specific cure, even in the most desperate cases, the following dose: three-quarters of a pint of olive oil, and one pint of melted butter or hogs lard, to be administered by means of a horn or bottle. As a preventive, cattle should not be turned into rank clover while the dew is upon it, nor suffered to continue more than an hour or two in it at a time, when uncropped.

Economy of Manure.—Cattle fattened upon turnips and straw, or hay, are estimated in England to produce eleven and three-fourth tons manure each. *See Bordley.* If every horse and bullock upon our farms produced a like quantity, and the whole was judiciously applied, our crops would be increased at least ten per cent. Manures are the means of substantial wealth to the farmer; but to be productive, they must be regularly deposited in the soil.

Manure.—Arthur Young took five equal portions of a field, one portion of which he manured with dry cut straw; a second with straw soaked five hours in fresh urine; a third with straw soaked in like manner fifteen hours: a fourth with straw soaked three days; and to the fifth portion he applied nothing. The whole was tilled alike, and sown with grain. The product, in grain, of the first was thirty-nine, of the second fifty, of the third sixty-three, of the fourth one hundred and twenty-six, and of the undunged portion nine. In weight of grain and straw, the product of the several portions, in the order above named, were found to be, 100, 120, 130 300, and 48. This experiment affords a pretty conclusive demonstration of the value of vegetable matter as food for plants, and particularly of the fertility imparted by the urine of animals, which latter, to us, is generally lost to all useful purposes. It indicates the propriety of so constructing our cattle yards and stable floorings as to concentrate this liquid; and, where there is no cistern to retain it, of applying straw and other litter to absorb it ere it is wasted. Another fact is worth noting: the rotting process took place wholly in the soil;—the fertility was induced by long manure, and the liquids which it held,—and not by muck.

Gypsum.—An interesting series of experiments made with gypsum, by one of the most intelligent and observing farmers of our country, will be found under our miscellaneous head. This mineral effects wonders upon certain soils and upon some crops, while upon other soils and crops it seems wholly inoperative. It is only by a course of careful experiments, like that which we copy, that we can learn to apply it with judgment and economy.

G. W. in the American Farmer, vol. iii, p. 413, states, that he doubles his corn crop, by putting into each hill, after the seed is dropped, a clam shell full of two parts of leached ashes, and one of plaster. Although this sounds much like the poetry or fiction of agriculture, it will cost but little to try it; and if the benefit is a tenth part of what is stated, the cost of the experiment will be amply remunerated.

Alternate husbandry, has been a principal means of converting one of the poorest counties of England, the county of Norfolk, into one of the most productive and wealthy. Most of this county possesses a sandy soil. Sixty years ago summer fallows, according to Young, were common there, and fields were left in grass three years. At the close of the last century, according to the same writer, no such things as summer fallows were known, and grass was left but two years. The number of horses were lessened, ploughings were not so frequent, often but one for barley; and some trusted to mere scarifying, and succeeded well. This change of system had the effect to increase the product one-quarter and one-third. The same system is coming into operation upon our sandy soils, and with equal if not greater advantage.

AGRICULTURAL SCHOOL.

The joint committee of the Senate and Assembly have *reported* a bill for establishing an Agricultural School. As this bill *may be* discussed, the following account of a visit to an agricultural school in Switzerland, the first we believe ever established, cannot be considered devoid of interest. We copy it from the October number of the Penny Magazine.

In the month of August, 1832, I travelled into Switzerland for the purpose of making myself acquainted with the schools and institutions at Hofwyl. Situated about three leagues from the picturesque capital of Bern, amidst a beautiful scenery, composed of a cultivated vale, the Jura ridge of mountains, a pine forest, a small lake, and the glaciers of the Bernese Alps, stand the extensive buildings of the establishment, surrounded by about two hundred and fifty acres of farm land. Upon my first arrival, before I could obtain an opportunity of presenting my letters to the benevolent founder, I wandered about in various directions,—all was business and activity. Here was a troop of lads cutting the ripened corn, while another troop was engaged in conducting it to the barns. Here was the forge in activity, and there some little gardeners performing various operations in small plots of ground that were portioned out; here were a group of little girls gleaning, there others carrying water, most of them singing while thus employed. But my atttention was peculiarly arrested by about one hundred men, who in a large open building, erected in a recess of the garden, appeared to be engaged like boys in a school-room; over the entrance was inscribed this motto, "The Hope of their Country."

I was at last fortunate enough to be admitted into the study of M. de Fellenberg,—a man somewhat advanced in years, with a countenance beaming with intelligence and kindness. De Fellenberg was, by birth, one of the ancient aristocracy of the country, and in possession of the hereditary property of his family. He determined upon devoting his fortune and the labor of a life, in the endeavor to effect the regeneration of his native land, by the means of education. "I will infuse good habits and principles into the children," said he, "for in twenty short years these children wil be the men, giving the tone and the manners to the nation." For thirty-two years has he pursued his steady course, increasing in influence, and extending his establishment as his scheme grew upon him, until it has become what he described to me. "This," said he, pointing to a large building, "is the institute for the boys of the higher classes. Here are their dining-rooms;—arranged on each side of yonder galleries are their dormitories. Here you see their gardens, their museum, their work-shops, their school-rooms: here their gymnasium, where they exercise themselves in wet weather; here their stream of running water where they bathe every day: study is their employment, bodily labor their recreation,—but bodily exertion I insist upon. There is no health, no vigor of mind, no virtue without it. Those persons grown to manhood, who are mixing with the boys, are placed by me to observe every action, and catch every expression. My grand object is to comprehend thoroughly the character of my pupils, in order that I may work more efficaciously upon them. These persons are by no means considered as spies by the boys; they are their companions. At Hofwyl all that is not in itself wrong is permitted. I never like to forbid a thing when I am unable to assign a reason for doing so: it creates a confusion in young minds with regard to principle, a thing most dangerous to their future happiness. We have no boundary mark, yet my boys stay at home: we interfere not with their pleasures, yet they cling to their duty.

"Within this enclosure is my eldest daughter's poor school for girls. She has about a hundred under her direction, who are fed and clothed by the establishment. To these she devotes her entire time. They learn all that in after-life will be of service to them:—to clean the house—to cultivate the garden—to sew—to make all those little necessaries which are of so much importance in the cottage; to read, to sing—to be cheerful and to be happy. Unless our women be brought up in modesty, and with industrious and religious habits, it is in vain that we educate the men. It is they who keep the character of men in its proper elevation.

"Here is my school for the middling classes—here all instruction has reference to practical purposes. Man was born to have dominion over the earth and to subdue it, but it is by the intellect alone that he can do so. His unassisted strength, what is it? To conquer Nature, he must understand her. Look in here, and you will see the laboratory of the chemist, and the lever and the pulley of the mechanic.

"In these two buildings are my poor schools for boys, who are boarded and clothed by the establishment. And well they earn their maintenance, for the little fellows work ten hours a-day in the summer; and the expense that I incur in their behalf is nearly repaid by their exertions. They study for two hours each day, and this I consider sufficient. The case here is the reverse of the Institute, for bodily exertion is the labor and study the recreation. The habits I bring them up with are those which I desire should continue with them through life; they consequently have reference to their probable position in society. The habit of continued study would ill-become a person destined to gain his livelihood by his hand. Although there are now one hundred boys assembled here, mine were but small beginnings. I had but one pupil at first. It was long before I could find a master in whom I could confide. Do you observe those little patches of garden ground? Each poor lad has one to himself; and the produce belongs exclusively to him. They usually dispose of it to the establishment, which either pays them the money at the time or lodges it for them in a little bank I have founded. Many of them have very considerable sums there. It is here that they obtain a habit of passing the greater portion of their time in continued and patient labor; they become acquainted with the value of labor by the produce of their little gardens. The instruction that I give them, although somewhat more elevated than what is generally obtained by persons of their rank in life, is directed to the rendering perfect the senses and reflection—to make them better practical men; drawing, the sciences of arithmetic and geometry, a useful selection from the other sciences, all taught in the most unostentatious manner: the history of their native country, and an acquaintance with the different natural objects around them, together with music, form the extent of their literary instructions.

"Religion is inculcated in every way. Public prayer, both at church and at school, is regularly performed in common with the schools of other countries. Besides this, these poor lads are taught to see the Creator in his works. When their admiration is roused by a natural object, they are accustomed to direct their thoughts to its Maker.

"But here," said my venerable companion, "is the engine upon which I rely for effecting the moral regeneratien of my country (and my attention was directed to the men whom I had before seen in the morning;) these are masters of village schools, come here to imbibe my principles and to perfect themselves in their duty. These men have *six thousand* pupils under them; and if, by the blessing of God, I can continue the direction of them, success is certain."

To insure success M. de Fellenberg spares no pains—no expense. There are no less than thirty-two professors solely devoted to his establishment, who inhabit a house to themselves upon the premises.

In all, there are about three hundred and fifty individuals in this little colony. Despite of his enemies, the spirit of De Fellenberg is spreading throughout Switzerland; and after having seen the parent institution, I visited several of his establishments in some of the remotest cantons.

A week closed my short sojourn at Hofwyl. I quitted it with a heavy heart; and the recollection of the moral beauty of what I there witnessed will remain riveted on my memory for ever.

Tillage Husbandry.

REMARKS ON PUTTING IN SMALL GRAIN ON STUBBLE GROUND.

The worst system in cultivation in common practice seems to be stubbling in; or annually putting in crops of small grain on stubble grounds. This is too generally practised every where, but especially in the back-woods, until weeds and poverty of soil united, reduce the product so much that the crops fall far short of remunerating the cultivator for the labor bestowed on them. When this happens, he generally resorts to a naked fallow. This is too often badly executed. Still, many of the weeds that would have choked and robbed the plants of much nutriment, are destroyed; consequently, the product is increased in proportion to the food remaining in the soil, and the cultivation bestowed on it.—*Loraine.*

A DEGREE OF MERIT IS JUSTLY DUE TO A NAKED FALLOW EXECUTED IN THE USUAL WAY.

A naked fallow is certainly a very laborious and injurious practice. It is also equally certain that any soil may be much better prepared for a succeeding crop of wheat, or any other small grain, by a fallow crop properly ordered. Still, a naked fallow should be allowed all the merit justly due to it; especially by those who mean to controvert that practice.

When it is well executed, the soil is finely divided. The animal and vegetable matter, which was before locked up in the hard clods of earth, impervious to the roots of the plants, is brought into more immediate use. The enriching and fertilizing matter floating in the atmosphere is more freely absorbed, and better secured, by an open, free soil, than when it rests on one of a contrary description. The roots of the plants are also enabled to dip deeper and spread wider through the soil in search of the nutriment provided for them. It is true, if the ground be very sandy, a naked fallow, by opening the texture, makes it less fit for the roots of plants, and causes much injurious evaporation from it; likewise, when an adhesive clay has been finely pulverized, heavy rains, succeeded by a hot sun, or drying winds, causes it to bake, and become impervious to the roots of plants; but, except the advantage derived from the shade of the fallow plants, the same happens both in clay and sand, when the soil is prepared for small grain by a fallow crop cultivated in the usual way.

Jethro Tull, the ingenious inventor of the drill husbandry, grew exhausting crops annually on the same ground, without the aid of manure, although his soil seems to have been thin.

Sir H. Davy says, "Jethro Tull, in 1733, advanced the opinion, that minute earthy particles supplied the whole nourishment of the whole vegetable world; that air and water were chiefly useful in producing these particles from the land." If Sir H. had quoted the words of this truly great, but very mistaken agriculturist, the question would have been determined. Some years have elapsed since I read Mr. Tull's book on agriculture. If my memory be correct, he atttaches more consequence to the depositions from the atmosphere than Sir H. seems to imagine; and appeared to believe they were conveyed to the soil by the dews. However, Mr. Tull's practice alone is sufficient to determine, that vegetation is greatly promoted by finely dividing the soil; particularly when the cultivation is extended to the growing crops. The practice of ages clearly shows, that much more is to be expected from a naked fallow than too many advocates for fallow crops seem to believe. Still, if Mr. Tull had lived until he had divided the soil sufficiently often to have extracted the animal and vegetable matter that the undivided clods contained; also, to have decomposed the hard vegetable substances which are always more or less seen, in greater or smaller quantities, in all soils; his opinion respecting enriching manures would have been greatly altered; as was that of Mr. Duhamel, a distinguished agriculturist of the same school, but who lived long enough to see the fallacy of this inconsiderable theory, and also to abandon it.—*Ib.*

THE DISADVANTAGES ARISING FROM THAT PRACTICE CONSIDERED.

Having candidly stated every advantage that seems to be derived from a naked fallow, I will enumerate the very serious disadvantages and injurious consequences arising therefrom.

It is an expensive practice, First, the loss of one full year's rent of the soil. Secondly, it must be frequently ploughed, harrowed and rolled. After this, it often happens that much manual labor is necessary to break the clods, especially when they are firmly bound together with the roots of the grasses and weeds. These are pushed about by the plough, dragged by the harrow, and sunk into the soil by the roller, but not sufficiently separated by any of them. The remains of them, together with the more finely divided grasses and weeds, are dragged up into heaps by the harrow throughout the whole field. These are raked up into larger heaps and burned by some cultivators. Others suffer them to remain, and when the seed is sown, the harrow, by dragging the heaps, drags up much of the seed with them; and vegetation is destroyed wherever they may happen to lie. In either case, a great waste of vegetable matter takes place; for when it is not burned, its best properties are exhaled by the sun, or scattered in the air. Numbers of men, women and children are sometimes seen in England, breaking the hard matted clods into pieces, raking them up into heaps, and burning this very valuable vegetation, which, without any of this enormous waste of labor, might have been very profitably applied to the growth of the crops, and improvement of the soil. After the utmost care has been taken to prepare a naked fallow in the usual way, a multitude of the roots and tops of the grasses and weeds remain so intimately mixed within the soil, that they will grow in sufficient numbers to do great injury to the crop; especially if the weather happens to be dripping during the process of cultivation. In that case, the moisture preserves the vegetative powers of the grasses and weeds, and the crop is sure to be much injured by them.

The seeds of the weeds are as often turned under as uppermost, by the usual mode of cultivation; consequently, many of them do not vegetate during the process; and those that are not buried beyond the power of germination, when the small grain is sown, will grow and injure the crop. If dung is applied for the small grain, it is generally spread previously to seeding, and turned under by a shallow furrow; of consequence it produces a plentiful crop of weeds, for although the cookers of dung say that the fermentation of it destroys the vegetative property of seed, practice and observation determine the contrary.

In fact, if nature had not calculated seeds in general to withstand much more than the heat of a fermenting dunghill, the earth would long since have been stripped of vegetation, particularly where ploughers and croppers reside. Like the locust in Egypt, they would soon destroy every green thing, if nature had not reserved seeds for ages unhurt, with which she carefully counteracts so much of the injury done by this class of farmers, as to prevent actual sterility from taking place in the grounds cultivated by them.—*Ib.*

THE USUAL MODE OF CULTIVATING FALLOW CROPS CONTRASTED WITH THE PRACTICE RECOMMENDED BY THE AUTHOR.

Although it is granted, that a naked fallow prepares much food for plants, by finely dividing the soil, frequent ploughing and harrowing are calculated to scatter much animal and vegetable matter in the air; especially while the soil is continually exposed to the injurious effects of the sun and air; and unless the bad effects produced by this process be counteracted by excellent management in other respects, it will eventually ruin the soil. If this practice be pursued, under the best mode of management, that superior talents can devise, the improvement in the soil will be slow indeed, when compared with that which may be readily effected, by the practice of fallow crops properly ordered. It is also evident, that in the latter case the grounds are profitably employed, while in the former they yield nothing; although the farmer is spending much money in the very laborious cultivation of them.

No improvement made in agriculture has promoted the interest of it so extensively as the introduction of fallow crops. Yet it seems evident, that the various different modes which have been generally pursued in the cultivation of these crops, as well as in that of the cultivated crops following them, are by no means calculated to promote the product of either, or to enrich the soil, to any thing like that extent, which might be readily effected with much less labor and expense, if a proper system of cultivation were pursued. If, however, distinct parts of the very numerous and discordant systems of cultivation be selected from the different practices, that are commonly pursued by different cultivators, it appears that nothing is offered by me, which has not been more or less sanctioned by the actual practice of others. Therefore, the merit of my system of husbandry does not consist in overturning what the practice and observation of ages have introduced: but in uniting into one system such practices as are consistent with nature, reason and common sense, rejecting those only that seem to be inconsistent with either. The undertaking is arduous, especially when ventured upon by a plain practical farmer, who depends not on science, but on nature, reason, practice and observation. In a work of this sort, errors are to be expected; still, as these errors cannot be capital, but little injury is to be expected from them, before they may be corrected by those who are better informed.—*Ib.*

OBSERVATIONS ON THE VALUE OF GRASS LAYS, AND THE PROPER CULTIVATION OF THEM.

Agriculture will never reach its zenith, until the value of grass lays is sufficiently appreciated, and the cultivation of them much better understood. The value of a clover lay, when applied for wheat, is well known. Still, most farmers continue frequent mowing, or close pasturing, until the clover is nearly run out. This greatly impoverishes the lay, and unless the soil be rich, the wheat crop is light. The clover plant cannot withstand frequent cutting, even during the first season it is mown. This causes the lateral roots of the plants to become weak, and incapable of holding the tap-roots in the ground; and they are thrown out by the frosts of the ensuing winter and spring. The same happens if red clover be pastured, unless a well grown covering of the tops of the grass be preserved; especially to defend the roots and crown of the plant, from the frosts of the ensuing winter and spring. If this plant be thus defended, it will far better withstand, not only the frosts in winter and spring, but also the injurious heat of the sun.—*Ib.*

THE RED CLOVER PLANT IS DESTROYED BY FREQUENT MOWING AND CLOSE PASTURING.

Both red clover and speargrass lays are very justly esteemed by many farmers, as the best preparation for a fallow crop of maize. Some, either to save labor or from a just conviction that the value of the crop is also greatly increased, do not turn the sod in the cultivation of the fallow plants. Too many of them, however, as well as other cultivators, believe the health and vigor of the plants are greatly promoted by harrowing over them while they are young. Some, also, use harrows with sharp cutting tines, for the purpose of cutting through the sod deeply, and as near to the stems of the plants as may be conveniently done, without cutting or tearing up. These practices are certainly opposed to the economy of nature, and the enlightened reason of man. None of these gentlemen would wound, bruise or mangle a young animal, to increase the health and vigor of it; neither would they rend and tear the choice trees in their nurseries to make them grow better; although less evil would arise from mangling them, as trees are calculated much better to withstand and outgrow this very manifest injury. The practice of mutilating the tops, and separating the roots of plants from their stems, for the express purpose of causing them to grow much more luxuriantly, is not confined to maize; potatoes and other hardy plants, that are capable of withstanding this truly barbarian practice, are too often subjected to it.—*Ib.*

FERMENTATION, PROPERLY DIRECTED, IS THE MAIN SPRING OF VEGETATION.

Although some farmers do not turn up the sod in the cultivation of maize, all of them, so far as my observation extends, plough it up previously to seeding the small grain that follows this plant. This exposes the rich matter arising from the fermentation of the roots and tops of the grasses, and the dung also, if that has been applied, to a serious waste. It is exhaled by the sun, scattered in the winds, and washed away by the rains and melting snows. Fermentation, which is the main spring of vegetation, is checked. None of these evils happen when the small grain is put in by a superficial cultivation; as the rich fertilizing matter remains securely buried within the soil. This, nature applies, with the least possible loss, to the use of the cultivated crops, and the grasses following, and with the overplus she enriches the soil. The fermentation and decay of this enriching matter, more effectually expands, and minutely divides, the soil, than can be done with the plough. The plough, harrow and roller, with, too often, the addition of very expensive manual labor, are capable of pulverizing the soil to any desirable extent. After this has been done, it settles, and too often becomes impervious to the roots of the plants, unless the ground be so rich, that it is not materially affected by the loss of the animal and vegetable matter which always takes place, when the soil is cultivated in the usual way.

It should, also, be recollected, that every crop which is sown broad cast, principally depends on the expanding force of fermentation, to keep the soil open and mellow, for the ready admission of the roots of the plants; likewise, that when the grain is filling the plants require the most nutriment; and that previously to this the soil is considerably consolidated by time, unless it has been kept open and mellow by the fermentation of the animal and vegetable matter contained in it, or consists principally of sand. In the latter case, the lack of animal and vegetable matter causes much injurious evaporation of moisture. This, if the season does not happen to be dripping, greatly reduces the product of the grounds.—*Ib.*

From the Northern Farmer.

MANURES.

Manures to a farm are what blood is to the human body. The first object of a farmer should be to obtain, and preserve in the best manner, all the animal, vegetable and compost manures, which can be made upon his farm, or procured elsewhere; but unless properly preserved, much of his labor is wasted and his lands are less productive. Fair experiments have clearly proved that the manure of cattle, preserved under cover or in vaults under barns, possesses a third more value at least, than the same kind which has remained exposed to rains and the action of the atmosphere. This will not be doubted by any one who has any correct information upon the subject, or has by experiment ascertained the difference. We cannot well explain the reason of this great difference, without adopting the style and terms of the chemist; but as our object is not to enlighten the learned, we therefore reject technical terms, and use language more familiar.

Vegetation is caused not so much by the quantity of manure mixed in the soil, as by its nutritious qualities. Should all farmers understand the fact, that none of the earthy or solid part of manure enters into plants, or in other words, that it is *only the liquid parts, or that portion of manure which combines or unites with water, which produces vegetation*, or causes the corn to grow, they would then perceive the necessity of preserving animal manure in vaults, under cover. The only value which the earthy part of the manure has, is to keep the soil into which it is ploughed, in a loose, pulverized state, so as to render it capable of retaining, after rains, a greater quantity of moisture.

Some farmers have expressed an opinion, that the urine of cattle promotes vegetation as much as their manure. But whatever may be the differences in value, it is surely very important that the urine should be preserved in vaults mixed with the manure.

In the spring, when the manure is conveyed into the field, it should be ploughed in immediately, and spread no faster than becomes necessary for ploughing; because at this season the warmth of the sun produces a rapid fermentation, the most valuable or liquid part of the manure escapes in the form of gas, as it is often expressed, by evaporation.

Should a heap of manure at this season be covered with earth two feet deep, in a short period the whole mass of earth would be enriched by the gas, arising from the fermented manure. Hence the utility of covering fresh barn-yard manure with earth, straw, litter, weeds, street and door-yard scrapings, mud from swamps, and all kinds of decomposed vegetable matter. Skillful farmers will always make as large a quantity of compost manure as possible. It is a very certain way to enrich a farm and ensure abundant crops. If these truths are conceded, then it conclusively follows that the general practice of our farmers in respect to manure is injudicious. They let the the manure lie in large yards, or the open field, exposed to heavy rains and the action of the atmosphere. A large portion of the nutritive qualities escapes in gas, or is washed away by the heavy rains. The greater the exposure to the atmosphere, the greater the loss. Therefore the practice of carting out the barn-yard manure in the fall, and spreading it in small heaps upon the soil intended for ploughing in the spring, is still more censurable. But the fall manure is often carted into the fields and deposited in one or two large heaps to rot, for the purpose of manuring the corn and potato hills in the spring; and strange as it may seem, many old farmers yet believe that old rotted manure promotes vegetation better than fresh, or unfermented manure! They appear to be ignorant of the fact, that the longer manure remains exposed to rot, the less nutriment, or food for the plants it retains; and the more it becomes assimilated to mere earth.

To put either fresh or rotted manure in the hill, in the season of planting potatoes and corn, as a general practice, is injudicious. But half the quantity of fresh, unfermented manure, in the hill, well mixed in the soil, would afford probably more nutriment than double the quantity of old rotted manure.

The moisture, necessary to vegetation, is conveyed to the roots of young trees, or the corn, or other plants, through the medium of earth. If any light or dry material is in contact with the roots, it tends to cut off the regular and natural supply of water, and the plant must either extend its roots through the dry substance to draw its supply of moisture or else become feeble, and perhaps perish. Hence, in a dry season, more particularly, manuring in the hill, often proves very injurious to the growth of plants. If manuring the corn hill is ever judicious, it is only on a cold, moist and sterile soil, or swarded land deeply ploughed, where a farmer has not a sufficient quantity of manure to mix in the soil. The surest method to enrich the soil for future years, is to plough in the manure. The roots of corn, extending several feet around the hill, will find whatever nourishment the soil contains; and it is far better to afford a sufficient supply when the corn is coming to maturity, than merely to force the kernel to vegetate a few days earlier by means of a hot-bed.

Our preceding remarks show the importance of covering manure well with earth, previous to its fermentation. Hence the common practice of spreading the manure upon the surface, and "harrowing it in," is attended with great loss, as a large portion will remain dry upon the surface, and for no other use than to enrich the atmosphere.

Manure being the life of a farm, every exertion should be used to procure all kinds of it. Compost, soot, ashes, lime, gypsum, burnt clay or soft bricks pulverized, decomposed vegetable substances, weeds, leaves of trees, coarse grass, &c. &c. will all tend to fertilize the soil. None are ignorant that such as is taken from the vaults, afford the greatest quantity of nutriment to plants. On farms it ought never to be lost. The yards for swine ought always to be excavated, or be in the form of a basin, so that this manure, in richness next to the last, should be preserved in a moist state. The same remark applies to the barn-yard for other cattle, except that the latter ought to have a level and dry margin for feeding cattle occasionally. Soon after planting in the spring, a farmer ought to commence hauling into these yards the different substances we have enumerated, and any others within his reach, which can be converted into manure. These substances will become incorporated with the manure of the cattle, and also absorb their urine, and the whole mass will be less liable to dry up and waste in the summer season.

A good farmer will be careful to yard his cattle at night as much as practicable through the warm, and in the day time, in the winter seasons. It has been found to be very beneficial to keep the cattle yards in a moist state by means of aqueducts, whenever practicable. In fine, farmers should spare no labor or expense to obtain a plentiful supply of manure to fertilize the soil. The liberality to "Mother earth" will be repaid with equal abundance.

In England nothing is lost, which can be converted into manure. And some English farmers fertilize their fields, in part, with the pulverized bones of animals; and for this purpose, have been gathered human bones from the plains of Waterloo.

W. CLAGGETT.

Portsmouth, January 16, 1834.

From the Genesee Farmer.

NAKED FALLOWS NOT NECESSARY.

I am well aware that it is a hopeless task to undertake to persuade many of my brother farmers, that naked fallows are in no case necessary, and generally prejudicial; but such being my belief, and I may add my experience, I shall endeavor to point out the benefits of fallow crops, and I trust there are some among the readers of the Genesee Farmer, who will be open to conviction.

The principal reasons offered by farmers in favor of naked fallows, are, that weeds are thus more effectually destroyed; that the soil is sweetened by exposure to the sun and air; and that it is more thoroughly pulverized.

I shall undertake to show that they are mistaken in every point, and in so doing I shall state my own experience.

In the autumn and winter of 1829, I had $13\frac{1}{2}$ acres ploughed to the depth of seven or eight inches. The work, owing to frost, was not completed till Christmas. In ploughing this depth, two or three inches of solid clay was turned up, which had never before been disturbed. My neighbors predicted that it would not produce a good crop of corn. In the spring of 1830, I found that the harrow completely fitted the ground for sowing and planting. I sowed 3½ acres with oats, 4 with peas, planted 5 acres with corn and one with potatoes. My crops were the best in the neighborhood, especially the peas and corn. In the fall I prepared the whole for wheat, the oat ground by two ploughings, (harrowing in place of the first would have been better,) the residue by one; found the pea and corn ground finely pulverized and clean, and sowed it, some as late as the 10th October.

In the course of the summer I had prepared a naked fallow of 16 acres adjoining the above, which was in the best possible state, being ploughed to the depth of eight inches, and sowed it before the other. In the autumn and spring the wheat on the 16 acres had the most promising appearance; but as the season advanced, that on the pea ground had the superiority. At harvest the result was as follows: The wheat on the pea ground was too stout, as much of it was down and had to be reaped. That on the corn ground filled the best of any, and was very handsome; I think it yielded more than 25 bushels per acre. The naked fallow was the next best, and the oat and potato ground produced the poorest crop, but this was owing principally to a considerable part of the ground being too wet.

If farmers on stiff soil would draw all their manure to their corn and potato grounds in the fall, and *then plough deep* for their spring crops, and sow wheat after crops of peas, barley and corn, I most fully believe that their fields would be as clean, and their crops as good, as if sowed on naked fallows; if so, their spring crops would be clear gain. ONTARIO.

Cattle Husbandry.

THE MIDDLE HORNS.

Of these there are many varieties or mixtures, of which the Devon, the Hereford and the Sussex cattle are most noted. Of these, the Devon only are found in any numbers among us. We shall therefore proceed to quote, from the Farmers' Series of the library of Useful Knowledge, a description of Devon cattle.

THE DEVON BULL—(*A middle horn.*)

The horn of the bull ought to be neither too low nor too high, tapering at the points, not too thick at the root, and of a yellow waxy color. The eye should be clear, bright and prominent, showing much of the white, and it ought to have around it a circle of variable colour, but usually a dark orange. The forehead should be flat, indented and small; for by the smallness of the forehead the purity of the blood is estimated. The cheek should be small, and the muzzle fine: the nose should be of a clear yellow. A black muzzle is disliked, and even a mottled one is objected to by some who pretend to be judges of the true Devon. The nostril should be high and open; the hair curled about the head, and giving, at first appearance, an idea of coarseness, which soon wears off. The neck should be thick, and that sometimes almost to a fault.

Excepting in the head and neck, the form of the bull does not differ materially from that of the *ox*. The head of the ox is small, very singularly so, relative to the bulk of the animal, yet it has a striking breadth of forehead. It is clean and free from flesh about the jaws. The eye is very prominent, and the animal has a pleasing vivacity of countenance, plainly distinguishing it from the heavy aspect of many other breeds. Its neck is long and thin, admirably adapting it for the collar, and even for the more common and ruder yoke.

The want of the beautifully arched form of the neck, which is seen in the horse, has been considered as a defect in most breeds of cattle. It is accounted one of the characteristics of good cattle that the line of the neck, from the horns to the withers should scarcely deviate from that of the back. In the Devonshire ox, however, there is a peculiar rising of the forehead, reminding us not a little of the blood horse, and essentially connected with the quick and free action by which this breed has ever been distinguished. It has little or no dewlap depending from its throat. The horns are longer than those of the bull, smaller and fine even to the base, and of a lighter colour, and sometimes tipped with yellow. The animal is light in the withers; the shoulders a little oblique; the breast deep, and the bosom open and wide, particularly as contrasted with the fineness of the withers. The fore legs are wide apart, looking like pillars that have to support a great weight. The point of the shoulder is rarely or never seen. There is no projection of bone as in the horse, but there is a kind of level line running on to the back.

These are characteristic and important points. Angular and bony projections are never found on a beast that carries much flesh and fat. The fineness of the withers, the slanting direction of the shoulder, and the broad and open breast, imply both strength and speed, and aptitude to fatten. A narrow chested animal can never be useful for working or grazing.

With all the likeness of the Devonshire ox, there is a point about him, disliked in the blood or riding horse, and not always approved in the horse of light draft—the legs are far under the chest, or rather the breast projects far and wide before the legs. We see the advantage of this in the beast of slow draft, who rarely breaks into a trot, except when he is goaded on in *catching times*, and the division of whose foot secures him from stumbling. The lightness of the other parts of his form, however, counterbalances the appearance of heaviness here.

The legs are straight, at least in the best breeds. If they are in-kneed, or crooked in the fore legs, it argues a deficiency in blood, and incapacity to work; and not only for work, but for grazing too, for they will be hollow behind the withers, a point for which nothing can compensate, because it takes away so much from the place where good flesh and fat should be thickly laid on, and diminishes the capacity of the chest, and the power of creating arterial and nutritious blood.

The fore arm is particularly large and powerful. It swells out suddenly above the knee, but is soon lost in the substance of the shoulder. Below the knee the bone is small to a very extraordinary degree, indicating a seeming want of strength; but this impression immediately ceases, for the smallness is only in front—it is only in the bone. It is the leg of the blood horse, promising both strength and speed. It may perhaps be objected that the leg is a little too long. It would be so in an animal that is destined only to graze; but this is a working animal, and some length of leg is necessary to get him pleasantly and actively over the ground.

There is a trifling fall behind the withers, but no *hollowness*, and the line of the back is straight from them to the setting on of the tail. If there is any seeming fault in the beast, it is that the sides are a little too flat. It will appear, however, that this does not interfere with feeding, while a deep, although somewhat flat chest, is best adapted for speed.

Not only is the breast broad, and the chest deep, but the two last ribs are particularly bold and prominent, leaving room for the stomach and other parts concerned in digestion to be fully developed. The hips, or huckles, are high, and on a level with the back, whether the beast is fat or lean. The hind quarters, or the space from the huckle to the point of the rump, are particularly long, and well filled up—a point likewise of very considerable importance both for grazing and working. It leaves room for flesh in the most valuable part, and, like the extensive and swelling quarters of the blood horse, indicate much power from behind, connected with strength and speed. This is an improvement quite of modern date. The fullness here, and the swelling out of the thigh below, are of much more consequence than the prominence of fat which is so much admired on the rump of many prize cattle.

The setting on of the tail is high; it is on a level with the back, rarely much elevated, and never depressed. This is another great point in the blood horse, as connected with the perfection of the hind quarters. The tail itself is long, and small, and taper, with a round bunch of hair at the bottom.

The skin of the Devon, notwithstanding his curly hair, is exceedingly mellow and elastic. Graziers know that there is not a more important point than this. When the skin can be easily raised from the hips, it shows that there is room to set on fat below. The skin is thin rather than thick. Its appearance of thickness arises from the curly hair with which it is covered, and is curly in proportion to the condition and health of the animal. Good judges of these cattle speak of these curls as running like little ripples of wind on a pond of water. Some of these cattle have their hair smooth, but then it should be fine and glossy. Those with curled hair are somewhat more hardy, and fatten more kindly. The favorite colour is a blood red. This is supposed to indicate purity of breed; but there are many good cattle approaching almost to a chesnut hue, or even a bay brown. If the eye is clear and good, and the skin mellow, the paler colours will bear hard work, and fatten as well as others; but a beast with a pale skin, and hard under the hand, and the eye dark and dead, will be a sluggish worker, and an unprofitable feeder. Those, however, that are of a yellow colour, are said to be subject to *sleat* (diarrhœa.)

Science of Agriculture.

OF THE USES OF THE SOILS TO VEGETABLES.

Soils affords to plants a fixed abode and medium of nourishment. Earths, exclusive of organized matter (animal and vegetable substances,) and water, are allowed by most physiologists to be of no other use to plants, than that of supporting them, or furnishing a medium by which they may fix themselves to the globe. But earths and organic matters, that is, soils, afford at once support and food.

The pure earths merely act as mechanical and indirect chemical agents in the soil.—The earths consists of metals united to oxygen, (a constituent of the atmosphere) and these metals have not been decomposed; there is consequently no reason to suppose that the earths are convertible into the elements of organized compounds, that is, into carbon, hydrogen and azote, (three substances which make up the bulk of all plants.) Plants have been made to grow in given quantities of earth. They consume very small portions only; and what is lost may be accounted for by the quantities found in the ashes: that is to say, it has not been converted into any new product. The carbonic acid united to lime or magnesia, if any stronger acid happens to be found in the soil during the fermentation of vegetable matter, which will disengage it from the earths, may be decomposed; but the earths themselves cannot be supposed convertible into other substances, by any process taking place in the soil. In all cases the ashes of plants contain some of the earths of the soil in which they grew, but these earths, as has been ascertained by the earths afforded by different plants, never equal more than one-fiftieth of the weight of the plant consumed. If they be considered as necessary to the vegetable, it is as giving hardness and firmness to its organization. Thus it has been mentioned that wheat, oats, and many of the hollow stalked grasses, have an epidermis [outer bark] principally of silicious earth; the use of which seems to be to strengthen them, and defend them from the attacks of insects and parasytical [which grow and feed upon others] plants.

The true nourishment of plants is water, and decomposing organic matter, [rotted vegetable and animal substances]; both these exist in soils, not in pure earths: but the earthy parts of the soil are useful in retaining water, so as to supply it in the proper proportions to the roots of the vegetables, and they are likewise efficacious in producing the proper distribution of the animal or vegetable matter. When equally mixed with it they prevent it decomposing too rapidly, and by their means the soluble parts are supplied in proper proportions.

The soil is necessary to the existence of plants, both as affording them nourishment, and enabling them to fix themselves in such a manner as to obey those laws by which their radicles are kept below the surface, and their leaves exposed to the free atmosphere. As the system of roots, branches, and leaves, are very different in different vegetables, so they flourish most in different soils; the plants that have bulbous roots require a looser and lighter soil than such as have fibrous roots; and the plants possessing only short fibrous radicles demand a firmer soil than such as have tap-roots or extensive lateral roots.

The constituent parts of the soil which give tenacity and coherence are the finely divided matters; and they possess the power of giving those qualities in the highest degree when they contain much alumina. A small quantity of finely divided matter is sufficient to fit a soil for the production of turnips and barley; and a tolerable crop of turnips has been produced on a soil containing eleven parts out of twelve sand. A much greater proportion of sand, however, always produces absolute sterility. Vegetable or animal matters, when finely divided, not only give coherence, but likewise softness and penetrability; but neither they nor any other part of the soil must be in too great proportion; and a soil is unproductive if it consists entirely of impalpable matters. Pure alumina or silica, pure carbonate of lime, or carbonate of magnesia, are incapable of supporting healthy vegetation; and no soil is fertile that contains as much as nineteen parts out of twenty of any of these constituents.

A certain degree of friability or looseness of texture is also required in soils, in order that the operations of culture may be easily conducted; that moisture may have free access to the fibres of the roots, that heat may be readily conveyed to them, and that evaporation may proceed without obstruction. These are commonly attained by the presence of sand. As alumina possesses all the properties of adhesiveness in an eminent degree, and silex those of friability, it is obvious that a mixture of these two earths, in suitable proportions, would furnish every thing wanted to form the most perfect soil as to water and the operations of culture. In a soil so compounded, water will be presented to the roots by capillary attraction. It will be suspended in it, in the same manner as it is suspended in a sponge, not in a state of aggregation, but minute division, so that every part may be said to be moist, but not wet.—[*Grisenthwaite.*

The power of the soil to absorb water by cohesive attraction depends in great measure upon the state of division of its parts; the more divided they are, the greater is their absorbent power. The different constituent parts of soils likewise appear to act, even by cohesive attraction, with different degrees of energy. Thus vegetable substances seem to be more absorbent than animal substances; animal substances more so than compounds of alumina and silica; and compounds of alumina and silica more absorbent than carbonates of lime and magnesia; these differences may, however, possibly depend upon the differences in their state of division, and upon the surface exposed.

The power of soil to absorb water from air is much connected with fertility. When this power is great, the plant is supplied with moisture in dry seasons; and the effect of evaporation in the day is counteracted by the absorption of the aqueous vapor from the atmosphere, by the interior parts of the soil during the day, and by both the exterior and interior during the night. The stiff clays approaching to pipe clays in their nature, which take up the greatest quantity of water when it is poured upon them in a fluid form, are not the soils which absorb most moisture from the atmosphere in dry weather. They cake and present only a small surface to the air; and the vegetation on them is generally burnt up almost as readily as on the sands. The soils which are most efficient in supplying the plant with water by atmospheric absorption, are those in which there is a due mixture of sand, finely divided clay, and carbonate of lime, with some animal or vegetable matter, and which are so loose and light as to be freely permeable to the atmosphere. With respect to this quality, carbonate of lime, and animal and vegetable matter are of great use in soils; they give absorbent power to the soil without likewise giving it tenacity; sand, which also destroys tenacity, on the contrary, gives little absorbent power. The absorbent power of soils, with respect to atmospheric moisture, is always greatest in most fertile soils; so that it affords one method of judging of the productiveness of land.

As examples of the absorbent powers of soils: One thousand parts of a celebrated soil from Ormiston, in East Lothian, which contained more than half is weight of finely divided matter, ot which eleven parts were carbonate of lime, and nine parts vegetable matter, when dried at two hundred and twelve degrees, gained in an hour by exposure to the air saturated with moisture, at a temperature of sixty-two degrees, eighteen grains. One thousand parts of a very fertile soil from the banks of the river Parret, in Somersetshire, under the same circumstances, gained sixteen grains. One thousand parts ot a soil from Mersea, in Essex, gained thirteen grains. One thousand grains of a fine sand, from Essex, gained eleven grains. One thousand of a coarse sand gained only eight grains. One thousand of a soil of Bagshot Heath, gained only three grains.

Household Affairs.

Mr. Cultivator—As household economy comes within the purview of your duties, I hope you will permit me to trouble you with an occasional communication upon this subject; for farmers wives, as well as farmers, are capable of deriving benefit and instruction from each other's experience. I shall begin with.

My method of Cooking a Calve's-head.—First of all get the head, pluck and trotters of a *good* calf, and have them nicely cleaned, so that there is not a hair to be seen upon them. Cut open the head and take out the brains. Then boil the head, feet and haslet, till all the bones will freely separate from the flesh, in a goodly quantity of water, and without salt. After which, take out the bones, and divide the meat, &c. into three parts, in the proportions that may be desired. Take one portion, cover and set it by the fire, where it will keep warm, to be served up plain, and to be eaten with drawn butter and vegetables. Chop fine some fat salt pork and veal from the leg, in the proportion of four of veal to one of pork, season with sage and pepper, and fry well in butter. Take also a pound of fat pork, cut into shreds, and fry brown; then in the fat which the pork produces, fry thoroughly a quart of sliced onions. A second portion of the head, &c. is then to be fried in butter, which is to serve, with a part of the forced meat balls, as a second dish. The third portion of the meat is then to be chopped fine, and put into the liquor in which the head has been boiled, together with the brains and fried pork and onions, the whole seasoned with pepper, cloves, thyme and marjoram, or such of these as are at command, and boiled briskly at least an hour and a half. The soup may be served up with a part of the meat balls, and the yolks of half a dozen eggs boiled hard, and epicures may add lemons or claret if they have them. The fried dish may be garnished with parsley and eggs. In this way, from materials which may be produced on every farm with the exception of a fippenny-worth of spices, may be made four or five gallons of as rich and grateful a soup as ever graced an alderman's board, and boiled and fried enough to dine Maj. Jack Downing's brigade of militia.

I like *our* yankee *Johnny-cakes* well; but as I like them of the south better, I have obtained, and successfully practised, the following Virginia method of making the latter. Take one quart of milk warm from the cow, two eggs, a tea-spoonful of salaratis, and Indian meal sufficient to make a batter of the consistence of pancakes. Bake quick, in pans previously buttered, and eat warm.

I will trouble you with only one other receipt, at this time, for a farmer's dish, and that is for what is called

A Bird's-nest Pudding.—Pare and core six or eight good tart apples, so as to leave them whole, and place them in a pudding dish. Take a quart of milk, nine eggs and sufficient wheat flour to make a thin batter; pour on to and cover the apples; bake in an oven till done; and eat with a sauce of sugar and butter, either cold or melted.

A FARMER'S WIFE.

Miscellaneous.

EXPERIMENTS WITH GYPSUM.

BY THE LATE JOHN TAYLOR, OF VIRGINIA.

A few of the experiments I have made with gypsum, are mentioned, to take a chance for adding a fact to your information on that subject.

1803, March 15th. Oats and clover, both just up, plastered them at one bushel to the acre; three weeks after, plastered them again with the same quantity. Upon both occasions left the richest portion of the plat unplastered. This only produced one-third, both of oats and clover, of the plastered lands.

April. Mixed or rolled a bushel of plaster with as much seed corn, keeping it wet whilst planting. With such rolled seed planted a field of 40 acres, except eight rows through the centre which were unplastered. The land poor. The inferiority of these eight rows was visible, from the moment the corn was up, to its being gathered.

1804. April. Rolled the seed corn of two hundred acres in like manner, leaving eight rows across the field, so as to intersect with flat, hilly, sandy, stiff, rich and poor land. Their inferiority was so visible, that from an eminence in the field, a stranger could point out the eight rows from the time the corn was three inches high, until it was all in tassel. In this, the eight rows were a week later than the plastered corn. The plastered corn stood the best, was forwardest, and produced the greatest crop. Its fodder dried about ten days sooner.

1805. April. Plastered as above, the seed corn of 30 acres of rich *moist* land, leaving eight rows. Corn injured by too much rain. No difference between the eight rows and the rest.

May 7th. Replanted my corn on high land, which had been much destroyed by mice, moles and birds, mixing two quarts of tar well with one bushel of seed corn, and then plastering it as above. The best remedy I ever tried againts those evils, and the plaster as usual accelerated and benefitted the corn.

April 25th. Plastered three bushels on three acres of clover just up, sown alone on land half manured with coarse manure. A good crop.

May 9th. Seven bushels on seven acres or forward wheat and clover. Wheat heading; land thin; the clover exceeded what such land had usually produced. No benefit to the wheat.

May 10th. Six bushels on six acres of very bad clover sown last spring. Clover just beginning to bloom. The season became moist and it improved into a fine crop.

May 10th. Last spring I left an unplastered strip of 20 feet wide quite across a field of clover. It was all cut except this strip, which was so bad as not to be worth cutting. This spring on this day, (clover beginning to bloom,) the strip was still much inferior to the adjoining clover, which was good. I plastered it at a bushel to an acre, leaving the rest of the field unplastered. It equalled the adjoining clover in one month.

May 16th. Sowed 23 bushels on 23 acres of corn in a large field. Ploughed in part immediately, harrowed in part, and left part on the surface ten days before it was worked in. Corn four inches high. Weather moist. No difference between the three divisions. The seed of the whole field had been rolled. These 23 acres exceeded the adjoining corn 25 per cent: its blades and tops also dried sooner.

June 15th. Plastered at three bushels to the acre, a strip of goose grass or English grass—no effect on land or grass.

August 10th. Sowed 50 acres of thin sandy land, in corn at the time, in clover, and 40 bushels of plaster on the seed, harrowing both lightly in. A moderate shower in four days, succeeded by a severe drought. Clover sprouted and chiefly perished. A good cover of bird-foot clover followed; land so visibly improved, that a stranger could mark the line of the plastering by the growth. That and the adjoining land in corn in 1808. The difference visible in favor of the plastered land.

September 17th, to the 5th of October. Sowed 88 bushels of yellow latter bearded wheat; 171 of forward, mixing half a bushel of plaster with one of wheat, a little wetted. One bushel of forward, and three pecks of latter wheat were sown to an acre. All among corn. Two slips of 30 feet each were left across the field, in which unplastered wheat was sown. Where the land was sandy, the unplastered wheat was best, owing to the great growth of bird-foot clover among the plastered. This discovered the effect of gypsum on that annual grass. Where this grass did not appear there was no difference between the plastered and unplastered wheat. From the spring of 1806 to this time, the unplastered slips have been distinctly marked, by a vast inferiority of the weeds and grass naturally produced.

November 23d. Sowed three bushels of plaster on one and a half acres of wheat, left unplastered for the purpose, in the field last mentioned, on the surface. Weather moist. No effect on the wheat, on the ground, or in the growth, to this day, though the plaster was of the same kind with that used in the last experiment.

1806, March and April. Sowed 200 acres of clover with plaster, at different times when the weather was dry, moist, windy, and still, part at three pecks—a bushel and five pecks to the acre, leaving a slip of 20 feet wide across the field, to ascertain the goodness of the plaster, which was of a hard white kind, that hitherto used being soft and streaked. The clover in this strip was bad, on each side of it fine. No apparent difference was produced by weather, quantity or times of sowing. The whole crop far surpassed in goodness whatever such lands had produced before, except the slip, as to which Pharaoh's dream seemed reversed.

April and May. Rolled all my seed corn as usual, leaving slips unplastered. An excessive drought. No difference between these slips and the rest of the field. The following year when that grass grew, tufts of luxuriant bird-foot clover designated the exact spots where the plastered corn had been planted.

April 23d. Sowed 16 bushels of plaster on eight acres of oats and clover, just up, intending to have a great crop, and leaving a slip. Land naturally fine and highly manured. Drought as above excessive. Oats bad. No difference between the slips and the rest. Clover killed. Land ploughed up in September and put in wheat. Clover sown in 1807 on the wheat. A heavy crop of wheat, clover plastered in March 1808, at a bushel to the acre; crop very great. No inferiority in the slip unplastered in 1806.

1807, March 1st to 12th. Sowed clovor seed on one hundred acres in wheat, and 80 bushels of plaster, the sowers of the latter following those of the former. Left a strip of 20 feet. Weather dry, moist, windy or calm, and for two days of the sowing a snow two inches or less deep on the ground. Land stiff, rich, poor or sandy, and of several intermediate qualities. The clover came up better than any I ever sowed on the surface; the strip was a little, and but a little, inferior to the adjoining clover, which I attribute to its receiving some plaster from the effect of a high wind.

The whole field received three pecks to the acre in 1808, and was the best piece of high land grass of the size I ever saw. The wheat received no benefit.

March 10th. Sowed 40 bushels of plaster on 60 acres of poor land, cultivated in corn (Indian) last year, and well set with bird-foot clover, leaving an unplastered slip. Weather dry and windy. Effect vast. Strip visible to an inch, as far off as you could distinguish grass. The bird-foot clover died, and a crop of crab grass shot up through it, and furnished a second cover to the land.

1807 and 1808. In these two years all my corn ground as it was broken up or listed, has been plastered broad cast, with from three pecks to a bushel to the acre, and directly ploughed in, and both the seed corn and seed wheat have been rolled bushel to bushel. In both, the crops have greatly exceeded what the fields have ever before produced. That cultivated last year has doubled any former product. But they have been aided in spots with manure, and the years were uncommonly fruitful. All the manure carried out in these two years, has been sprinkled with plaster when spread before being ploughed in, and several fields of the bird-foot clover have been plastered. The results conform to those already mentioned.

1808, February. Plastered four ridges of highland meadow oat at a bushel to the acre. No effect.

Some of the inferences I make from these experiments are, that gypsum should be worked into the earth; that half a bushel or less to an acre, worked in, will improve land considerably; that drought can defeat its effects upon corn, but not upon the land, if it is covered; that the weather is of no consequence at the moment it is sown, though the subsequent season is of great; that it may vastly improve red clover even as late as May; that it increases the effects of coarse manure; that a quantity less than half a bushel to an acre, is in some cases as effectual as a much larger one; that excessive moisture or excessive drought destroys its effects; that its effect is more likely to be destroyed, when sprinkled on the surface, than when mixed with the earth; that sowing it broad-cast among Indian corn after it is up, may improve the crop 25 per cent; that sown in June, it may not improve English grass; that sown in August and covered, it may improve the land, though drought succeeds; that sown on wheat in November, it may neither benefit the wheat nor land: that about three pecks to the acre immediately sprinkled on clover seed sown on the surface, may cause it to come up, live, and thrive better; that a similar quantity sown on the surface in March, may treble the burden of bird-foot clover; that sown broad-cast from the 1st of January in breaking up or listing corn ground, the same quantity will probably add considerably to the crop; and that it may not improve the high land meadow oat if sown in February.

Young Men's Department.

ON THE FORMATION OF CHARACTER.

Fix upon a high standard of character. Or as it has sometimes been expressed, *determine to be somebody in the world.* To be *thought* somebody is not sufficient: the point you are to aim at, is to *be so.*

As a motive to this, let me urge in the first place, a regard to *your own happiness.* To this you are by no means indifferent at present. Nay, the attainment of happiness is your primary object. You seek it in every desire, word, or action. But you sometimes mistake the road that leads to it, either for the want of a friendly hand to guide you, or because you refuse to be guided. Or what is most common, you grasp at a smaller good, which is near, and apparently certain: and in so doing cut yourself off from the enjoyment of a good which is almost infinitely larger, though more remote.

Let me urge in the second place, a regard for the family to which you belong. It is true you can never fully know, unless the bitterness of ingratitude should teach you, the extent of the duty you owe to your relatives; and especially to your parents. You *cannot* know —at least till you are parents yourselves,—how their hearts are bound up in yours. But if you do not *in some measure know it,* till this late period, you are not fit to be parents. Hence, then, one evidence of the need in which you stand of the lessons of experience.

In the third place, it is due to society, particularly to the neighborhood or sphere in which you move, and to the *associations* to which you may belong, that you strive to attain a very great elevation of character. Here, too, I am well aware that it is impossible, at your age, to perceive fully, how much you have it in your own power to contribute, if you will, to the happiness of those around you; and here again let me refer you to the advice and guidance of aged friends.

But fourthly, it is due to the nation and age to which you belong, that you fix upon a high standard of character. This work is intended for American youth. *American!* did I say? This word, alone, ought to call forth all your energies, and if there be a slumbering faculty within you, arouse it to action. Never, since the creation, were the youth of any age or country so imperiously called upon to exert themselves, as those whom I now address. Never before were there so many important interests at stake. Never were such immense results depending upon a generation of men as upon that which is now approaching the stage of action. These rising millions are destined, according to all human probability, to form by far the greatest nation that ever constituted an entire community of freemen, since the world began. To form the character of these millions involves a greater amount of responsibility, individual and collective, than any work to which humanity has ever been called. And the reasons are, it seems to me obvious.

Now it is for you, my young friends, to determine whether these weighty responsibilities shall be fulfilled. It is for you to decide whether this *greatest* of free nations shall, at the same time, be the *best.* And as every nation is made up of individuals, you are each, in reality, called upon daily, to settle this question: "Shall the United States, possessing the most ample means of instruction brought within the reach of all her citizens, the happiest government, the healthiest of climates, the greatest abundance of the best and most wholesome nutriment, with every other possible means for developing all the powers of human nature, be peopled with the most vigorous, powerful and happy race of human beings which the world has ever known?"

There is another motive to which I beg leave for one moment to direct your attention. You are bound to fix on a high standard of action from the desire of obeying the will of God. *He* it is who has cast your lot in a country—which all things considered—is the happiest below the sun. *He* it is who has given you such a wonderful capacity for happiness, and instituted the delightful relations of parent and child, and brother and sister, and friend and neighbor. I might add, *He* it is too, who has given you the name *American,*—a name which alone furnishes a passport to many civilized lands, and like a good countenance, or a becoming dress, prepossesses every body in your favor. So that all the foregoing motives unite in one to swell the appeal to your feelings and increase the weight of your responsibility.

He who only aims at *little,* will *accomplish* but little. *Expect great things, and attempt great things.* A neglect of this rule produces more of the difference in the character, conduct, and success of men, than is commonly supposed. Some start in life without any leading object at all; some with a low one; and some aim high:—and just in proportion to the elevation at which they aim, will be their progress and success. It is an old proverb that he who aims at the sun, will not reach it to be sure; but his arrow will fly higher than if he aims at an object on a level with himself. Exactly so it is, in the formation of character.

Let me repeat the assurance that as a general rule, *you may be whatever you will resolve to be.* Determine that you will be something in the world, and you *shall be.* Young men seem to me utterly unconscious of what they are capable of being and doing. Their efforts are often few and feeble, because they are not awake to a full conviction that any thing great or distinguished is in their power.

But whence came an Alexander, a Cæsar, a Charles 12, or a Napoleon? Or whence the better order of spirits,—an Alfred, a Luther, a Howard, a Franklin, a Washington, a Rush? Were not these men once like yourselves? What but self-exertion, seconded by the blessing of heaven, ever placed their names high on the catalogue of human fame? Rely upon it,—what these men once *were* you *may be.* Not that the same individual may successfully imitate them all; but those of you who fix upon any one of them as a model, may be pretty sure of rising to the same, or a higher eminence. Resolution is almost omnipotent. These little words, *try,* and *begin,* are sometimes great in their results. "I cant," never accomplished any thing;—"I will try," has achieved wonders.

The positions I have here taken, in reference to human capabilities might be proved and illustrated by instances almost innumerable; but one only may suffice for the present.

A young man who had wasted, in a short time his patrimony, in profligacy, while standing, one day, on the brow of a precipice from which he had determined to throw himself, formed the sudden resolution to regain what he had lost. The purpose thus formed was kept; and though he began by shovelling a load of coals into a cellar, for which he only received twelve and a half cents, yet he proceeded from one step to another till he more than recovered his lost possessions, and died worth sixty thousand pounds sterling.

I have thus treated, at greater length than I intended, of the *motives*, which ought to persuade young men, especially of the present generation, *to set a high standard of action*. On the *means* by which you are to attain this elevation, it is the purpose of this little work to dwell plainly and fully. These *means* might be classed in three great divisions; viz. *physical, mental, and moral*. Whatever relates to the health, belongs to the first division; whatever to the improvement of the mind, the second, and the formation of good manners and virtuous habits, constitute the third.—*Young Man's Guide.*

ON THE PLEASURES AND ENJOYMENTS CONNECTED WITH THE PURSUITS OF SCIENCE.

Man is a compound being; his nature consists of two essential parts, body and mind. Each of these parts of the human constitution has its peculiar uses, and is susceptible of peculiar gratifications. The body is furnished with external senses, which are both the sources of pleasure and the inlets of knowledge; and the Creator has furnished the universe with objects fitted for their exercise and gratification. While these pleasures are directed by the dictates of reason, and confined within the limits prescribed by the Divine law, they are so far from being unlawful, that in the enjoyment of them, we fulfil one of the purposes for which our Creator brought us into existence. But the pursuits of sensitive pleasures is not the ultimate end of our being; we enjoy such gratifications in common with the inferior animals; and in so far as we rest in them as our chief good, we pour contempt on our intellectual nature, and degrade ourselves nearly to the level of the beasts that perish.

Man is endowed with intellectual powers, as well as with organs of sensation,—with faculties of a higher order, and which admit of more varied and sublime gratifications, than those which the senses can produce. By these faculties we are chiefly distinguished from the lower orders of animated existence; in the proper exercise and direction of them, we experience the highest and most refined enjoyments of which our nature is susceptible, and are gradually prepared for the employments of that immortal existence to which we are destined. The corporeal senses were bestowed chiefly in subserviency to the powers of intellect, and to supply materials for thought and contemplation; and the pleasures peculiar to our intellectual nature, rise as high above mere sensitive enjoyments, as the rank of man stands in the scale of existence above that of the fowls of the air, or the beasts of the forest. Such pleasures are pure and refined; they are congenial to the character of a rational being; they are more pemanent than mere sensitive enjoyments; they can be enjoyed when worldly comforts are withdrawn, and when sensual gratifications can afford no delight; they afford solace in the hours of retirement from the bustle of business, and consolation amid the calamities and afflictions to which humanity is exposed; and the more we acquire a relish for such pleasures, the better shall we be prepared for associating with intelligences of a higher order in a future world.

THE IGNORANT MAN.

Before proceeding to the more particular illustration of this topic, let us consider the state and enjoyments of the man whose mind is shrouded in ignorance. He grows up to manhood like a vegetable, or like one of the lower animals that are fed and nourished for the slaughter. He exerts his physical powers, because such exertion is necessary for his subsistence; were it otherwise, we should most frequently find him dosing over the fire, or basking in the sun, with a gaze as dull and stupid as his ox, regardless of every thing but the gratification of his appetites. He has perhaps been taught the art of reading, but has never applied it to the acquisition of knowledge. His views are chiefly confined to the objects immediately around him, and to the daily avocations in which he is employed. His knowledge of society is circumscribed within the limits of his parish, and his views of the world in which he dwells are confined within the range of the country in which he resides, or the blue hills which skirt his horizon. Of the aspects of the globe in other countries—of the various tribes with which they are peopled—of the seas and rivers, continents and islands which diversify the landscape of the earth—of the numerous orders of animated beings which people the ocean, the atmosphere, and the land,—of the revolutions of nations, and the events which have taken place in the history of the world, he has almost as little conception as the animals that range the forest, or bound through the lawns. In regard to the boundless regions that lie beyond him in the firmament, and the bodies that roll there in magnificent grandeur, he has the most confused and inaccurate ideas; and he seldom troubles himself with inquiries in relation to such subjects. Whether the stars be great or small, whether they be near us or at a distance, or whether they move or stand still, is to him a matter of trivial importance. If the sun give him light by day, and the moon by night, and the clouds distil their watery treasures upon his parched fields, he is contented, and leaves all such inquiries and investigations to those who have little else to engage their attention. He views the canopy of heaven as merely a ceiling to our earthly habitation, and the starry orbs as only so many luminous studs or tapers to diversify its aspect, and to afford a glimmering light to the benighted traveller. Of the discoveries which have been made in the physical sciences in ages past, of the wonders of creation which they have unfolded to view, of the instruments which have been invented for exploring the universe, and of the improvements which are now going forward in every department of science and art, and the prospects that are opening to our view, he is almost as entirely ignorant as if he had been fixed under the frozen pole, or chained to the surface of a distant planet. He considers learning as consisting chiefly in the knowledge of grammer, Greek and Latin; and philosophy and astronomy as the art of telling fortunes and predicting the state of the weather; and experimental chemistry, as allied to the arts of magic and necromancy. He has no idea of the manner in which the understanding may be enlightened and expanded, he has no relish for intellectual pursuits, and no conception of the pleasures they afford; and he sets no value on knowledge but in so far as it may tend to increase his riches and his sensual gratifications. He has no desire for making improvements in his trade or domestic arrangements, and gives no countenance to those useful inventions and public improvements which are devised by others. He sets himself against every innovation, whether religious, political, mechanical or agricultural, and is determined to abide by the "good old customs" of his forefathers, however irrational and absurd. Were it dependent upon him, the moral world would stand still as the material world was supposed to do in former times; all useful inventions and improvements would cease, existing evils would never be remedied, ignorance and superstition would universally prevail, the human mind would be arrested in its progress to perfection, and man would never arrive at the true dignity of his intellectual nature.

It is evident that such an individual (and the world contains thousands and millions of such characters) can never have his mind elevated to those sublime objects and contemplations which enrapture the man of science, nor feel those pure and exquisite pleasures, which cultivated minds so frequently experience; nor can he form those lofty and expansive ideas of the Diety which the grandeur and magnificence of his works are calculated to inspire. He is left as a prey to all those foolish notions and vain alarms which are engendered by ignorance and superstition; and he swallows, without the least hesitation, all the absurdities and childish tales, respecting witches, hobgoblins, spectres, and apparitions, which have been handed down to him by his forefathers in former generations. And while he thus gorges his mind with fooleries and absurdities, he spurns at the discoveries of science as impositions on the credulity of mankind, and contrary to reason and common sense. That the sun is a million of times larger than the earth, that light flies from his body at the rate of two hundred thousand miles in a moment of time, and that the earth is whirling round its axis from day to day, with a velocity of a thousand miles every hour, are regarded by him as notions far more improbable and extravagant than the story of the "Wonderful Lamp," and all the other tales of the "Arabian Nights Entertainments." In his hours of leisure from his daily avocations, his thoughts either run wild among the most grovelling objects, or sink into sensuality or inanity, and solitude and retirement present no charms to his vacant mind. While human beings are thus immersed in ignorance, destitute of rational ideas, and of a solid substratum of thought, they can never experience those pleasures and enjoyments, which flow from the exercise of the understanding, and which correspond to the dignity of a rational and immortal nature.

THE LEARNED MAN.

On the other hand, the man whose mind is irradiated with the light of substantial science has views and feelings, and exquisite enjoyments to which the former is an entire stranger. In consequence of the numerous and multifarious ideas he has acquired, he is introduced as it were, into a new world, where he is entertained with scenes, objects and movements, of which a mind enveloped in ignorance can form no conception. He can trace back the stream of time to its commencement; and, gliding along its downward course, can survey the most memorable events which have happened in every part of its progress, from the primeval ages to the present day—the rise of empires, the fall of kings, the revolutions of nations, the battles of warriors, and the important events which have followed in their train—the progress of civilization, and of arts and sciences—the judgments which have been inflicted on wicked nations—the dawnings of Divine mercy towards our fallen race—the manifestation of the Son of God in our nature—the physical changes and revolutions which have taken place in the constitution of our globe—in short, the whole of the leading events in tho chain of Divine dispensation, from the beginning of the world to the period in which we live. With his mental eye, he can survey the terraqueous globe in all its variety of aspects; contemplate the continents, islands, and oceans which compose its exterior, the numerous rivers by which it is indented, the lofty ranges of mountains which diversify its surface, its winding caverns, its forests, lakes, sandy deserts, ice-lands, whirl-pools, boiling springs, glaciers, sulphuric mountains, bituminous lakes, and the states and empires into which it is distributed, the tides and currents of the ocean, the icebergs of the polar regions, and the verdant scenes of the torrid zone. He can climb, in imagination, to the summit of the flaming volcano, listen to its subterraneous bellowings, behold its lava bursting from its mouths, and rolling down its sides like a flaming river—descend into the subterranean grotto—survey, from the top of the Andes, the lightnings flashing and the thunders rolling far beneath him—stand on the brink of the dashing cataract and listen to its roarings—contemplate the ocean rearing its billows in a storm, and the hurricane and tornado tearing up forests by their roots, and tossing them about as stubble. Sitting at his fireside, during the blasts of winter, he can survey the numerous tribes of mankind, scattered over the various climates of the earth, and entertain himself with views of their manners, customs, religion, laws, trades, manufactures, marriage ceremonies, civil and ecclesiastical government, arts, sciences, cities, towns and villages, and the animals peculiar to every region. In his rural walks, he can not only appreciate the beneficence of Nature, and the beauties and harmonies of the vegetable kingdom, in their exterior aspect, but can also penetrate into the hidden processes which are going on in the roots, trunks and leaves of plants and flowers, and contemplate the numerous vessels through which the sap is flowing from their roots through their trunks and branches, the millions of pores through which their odoriferous effluvia exhale, their fine and delicate texture, their microscopical beauties, their orders, genera and species, and their uses in the economy of nature.

FORMATION OF HABITS.

Success in life depends, in a great measure, on the early formation of our habits. Whether our grand object be wealth or fame, or that nobler one, exalted virtue, we must shape our habits to that object, or we shall fail. What enabled Franklin to obtain the highest honors of philosophic fame; to stand, as he expresses it, "before kings," and what is better, to live in the memory of his countrymen? The early formation of good habits. The perusal of his auto-biography, which no young man should omit, will show what those habits were. What made Girard the richest citizen of our country, and the benefactor of his race? The formation of early habits of frugality, disinterestedness and self-denial. Such habits are not formed in a day, nor will they result from a few faint resolutions. They are the result of continued effort.

Whatever is of value must, in most cases, be sedulously pursued. Seldom can it be caught in a moment, like a prize in the lottery, or brought to perfection like a mushroom in a few hours. Character most certainly is of slow growth. No method can force it, or hasten its ripening; like asparagus, so treated, it is sickly and without flavor. Only by long continuance, and unvaried, uninterrupted care, can this jewel be obtained, polished and set, so as to show itself to the best advantage. Not by accident, nor by fits and starts, but by regular, judicious and permanent habits, may a youth hope to obtain this important qualification, character.

Habit is either an insidious enemy, or a firm friend. We had need be much on our guard concerning its influence; rather let us enlist it and employ it judiciously; it will render us much assistance in forming a character useful, estimable and efficient.

THE CULTIVATOR—MAY, 1834.

TO IMPROVE THE SOIL AND THE MIND.

THE GARDEN.

Though we do not intend to enter into the minute details of gardening, nor to say much of the ornamental portion of the art; yet we would fain encourage a taste for this branch of labor, which does much to multiply our comforts, and refine our manners, and proffer such occasional directions as may tend to benefit the generality of our readers. We go upon the principle that we all ought to look for our chief happiness *at home*; and that the more this home is embellished, and provided with the varied productions of the soil, the stronger will our attachments be to it, and the more multiplied will be our enjoyments. At all events, there are many productions of the garden which are, in a measure, indispensable in every family; and the farmer can raise them with more economy than he can buy them. It is in relation to the culture of these that we intend to offer some brief remarks.

Among the general rules which ought to be regarded in the management of a garden, and which in some measure apply to the management of a farm, we may particularize the following:

1. A garden should be enclosed by a secure fence—otherwise an unruly animal may destroy in a night the fruits of many a day's toil.

2. A garden should be rich; for here the maxim particularly applies—that it is better to cultivate a small piece of ground well, than a large one slovenly and bad. "*Well* done" is the only "*good enough*" for a garden.

3. Do not plant your roots and vines in the shade, or under the drippings of trees, but in an open exposure. Appropriate these situations to medicinal plants and herbs. Trees impoverish the ground, and their shade is baleful to most crops. Plant trees upon the north, east and west borders, where their shade will be but partially prejudicial, or along a main alley.

4. Alternate your crops; that is, do not plant your onions or other vegetables two successive years on the same quarter. This rule is as important to the garden as it is to the farm; and every farmer, at least every good farmer, knows, that alternating his farm crops is of the first importance to profit.

5. Plant your seeds when the ground is fresh dug or ploughed, when it is filled with atmospheric air, and moist and permeable to heat, three indispensable requisites to the vigorous germination of the seeds. They will then sprout quick, and grow luxuriantly.

6. Seeds require to be kept moist till their roots have got firm hold of the earth, and their leaves have expanded above it. To ensure this, the soil must be brought in close contact with them, and they sufficiently covered. A good precaution is to tread the fresh dug soil on the line where the seeds are to be planted, which retards evaporation from below; or, when the seeds are covered to a sufficient depth, to compress the earth upon them with a hoe, spade or board, which not only tends to retain the moisture, but to break the soil and to bring it in close contact with them. Seeds often fail to grow, or, having began to germinate, are dried and lost, for the want of moisture. And many small seeds with husky coverings, particularly flower seeds, have been declared bad, because they have been planted without due reference to this rule.

7. As soon as the plants are firmly rooted, the more the earth is stirred about them the better. This facilitates the preparation of the vegetable food in the soil, and greatly promotes growth. Next to the destruction of weeds, nothing concentrates the effects of drought so much, in garden or field, as stirring the surface of the soil.

8. Different seeds require different temperatures to induce germination; and if they are put into the ground when it is too cold, they are liable to rot. Wheat, rye, barley, &c. will germinate at 45°, corn at perhaps 55°, while the melon probably requires a heat of 60 to 70 degrees. The common bean will vegetate in a

cold temperature, while the Lima bean will rot in a cold or wet soil. Hence, in planting, regard is to be had to the hardiness of the plant which is to be sown.

The present month is an important one in the operations of the garden. If not already done, no time should be lost in sowing the seeds of onions, sallads, early cabbage, peas, radishes, and in planting some early corn and potatoes. The beet, carrot, parsnip, and summer squash may also be sown. Cabbages for winter use may be sown in time, from the 20th to the 30th. As soon as the soil and the season are warm enough to bring up corn, which here is generally from the 15th to the 20th, plant your melons, pumpkins, and cucumbers, though it will do equally well to plant the latter, for pickles, in the early part of June. The 15th will ordinarily do for Lima beans, which are the best of the bean family. Soak the seed of these in warm water, a few hours, and cover them slightly. My practice is to save this crop for winter use. They afford a great product. When frost is apprehended, the beans are all picked, the unripe ones shelled and dried; and, if soaked before cooking, are nearly as good as when first gathered from the vines. An acquaintance digs a large hole, in which he deposites a barrow of dung, which he covers with six inches of earth, and plants the Lima beans, and puts down poles upon the border of the manured circle. In this way they are said to grow luxuriantly, and to produce in great abundance. Of the pumpkin, there are several new and much esteemed varieties, as the Valparaiso, Porter and acorn squashes. These are rather later in coming to maturity than the old yellow kind; though they have been successfully cultivated among corn. We would commend the planting out, or sowing seeds of parsley, balm, wormwood, tanzy, garlick, hyssop, rue, sage, thyme and other herbs which are often required in a family. B.

The Plum Tree is subject to a disease called canker, cancer and by various other names, which destroys thousands. It is a kind of vegetable gangrene, if the term may be allowed, which, if not timely arrested, generally proves fatal to the tree. It is a vegetable excrescence, upon the stock or limbs, at first green, and afterwards becoming black. The affected branch soon dies, and the whole tree gradually perishes. It is generally supposed to be caused by some insect whose poison, injected into the tree, vitiates the sap. The only preventive known to prove successful, is to cut off all the diseased parts, as soon as it appears, and commit it to the fire. This plan has been adopted in the writer's garden, and in the Albany nursery, for some years; and hardly an instance of the disease occurs in a season.

The Peach Tree is often destroyed by a grub which preys upon the bark of the root, the eggs of which are said to be deposited about midsummer. The maggot works a passage down through the inner bark, below the surface of the ground, where it remains secure for the winter. There are two ways, and perhaps more, of preventing or remedying this evil; one is to surround the collar of the tree with something which will destroy the insect; the other, to cover the lower part of the tree, during summer, so that the fly cannot deposite its eggs near the ground. Lime and ashes laid around the tree at the surface of the ground, have been found efficacious in destroying the grub, as the rains, which saturate these, become strongly impregnated with alkali, find a passage into the holes and kill the insect. The other is most readily effected by straw, the buts buried in the ground, set upright round the tree and secured to it by two or more straw bands. If the egg is deposited above this, and the straw removed in autumn, the grub, not having reached the ground, is destroyed by the cold of winter.

Lucerne, (*medicago sativa*,) sometimes called French clover, may be advantageously cultivated on farms adapted to its growth, to be used either in *foiling* farm stock, as cows, horses, pigs, &c. that is, to be cut and fed green in the yard or stable, or as auxiliary to pasture. No crop gives so great a product of forage during the summer, and all domestic animals are fond of and thrive upon it. It is in condition to cut from the 15th to 20th May, and will give three or four cuttings in a season. An acre of good lucerne will keep six cows well from the first cutting; and as soon as the whole has been cut over to supply this number with food, the earliest mown will be fit to cut a second time. I have cultivated lucerne ten or a dozen years, and it has been almost my whole dependence for the summer support of my cows and a yoke of oxen. An acre has been worth to me fifty dollars a year. But to ensure a profitable crop, certain requisites are necessary, some of which I will name.

Lucerne must be sown on a dry soil. The roots penetrate four to six feet, and these will neither grow nor live where there is water. Sand, gravel or loam are the best soils for it.

It should be sown on a rich and clean soil. Without the first the crop will be diminutive; and if weeds abound, they will rob and choke the young lucerne, which is feeble during its early growth. The best preparation for it is a crop of potatoes, well manured and well cleaned in tilling.

Sow 16 pounds to the acre, broadcast, with half a bushel of winter rye, early in May, in ground well pulverized, harrow in the seed, and follow with the roller. Or the seed may be put in with a drill barrow, at 12 to 18 inches between the drills, at the rate of 10 lbs. the acre, and in this case the intervals should be kept clean with the hoe, or otherwise. The duration of lucerne is 6 to 10 years; though it sometimes, like clover, suffers from the winter. The seed may be had at the seed shops in our cities at 25 to 30 cents per pound.

To make lucerne into hay, it should lie in the swath to wilt and then be put into small grass cocks, with a fork (not rolled) to cure. After standing a day or two, the cocks may be opened two or three hours, under a bright sun, the hay turned, and soon after housed. If spread, like ordinary grass, the leaves dry and crumble ere the haulm or stalks are cured, and thus the best part of the fodder is lost. I have mixed lucerne, partially cured, in alternate strata with dry barley straw, on the mow, and found that cattle greedily consumed both, in winter, when fed out in the yard. B.

THE DRUNKEN FARMER.

It is important to every young farmer to establish habits of industry and sobriety. The former will lead to wealth, and the latter ensure its enjoyment. Our habits, for good or evil, are easily formed, but when once established, are very difficult to change. In early life is the time to guard against a propensity for drinking; for a taste for liquor once acquired, the fruits of the past are squandered, and the prospect of the future is only poverty and suffering. No matter how fortunate the man has been in life, in the acquisition of wealth or reputation—no matter how strong and numerous are the ties of friendship or connexion, nor with what endearments he is surrounded and blest—the habit of intemperance once formed, he may bid an eternal farewell to all that has heretofore constituted his highest enjoyment—to all that has made toil a pleasure and himself the envy of the malignant, and the boast of his friends—he has now had to the full his draught of felicity—he has nothing hereafter to anticipate, but a life of degradation for himself—a trial of endurance and suffering for his family—and, to his friends he has now become an object of painful reflection and remark. It is right it should be so. The act on his part is voluntary. He has renounced all these ties and enjoyments, for the most beastly intoxication; and if the world and friends desert him, he deserves his fate, because he has rendered himself unfit to associate with those whose reason has not been impaired by so gross an indulgence. Farmers, avoid intemperance as you would the approach of cholera; for as certainly as you become its victim, your farms will be taken from you, and your wretched families become the dependants of others. You have only to lood around you, and see these observations exemplified in numerous instances: for you can sit by your firesides, and soon name this man and that man, and yet another and another, who started in life perhaps with much better prospects than yourselves, but who are now laborers for others, or, what is still worse, dependants upon your alms-houses for their bread and shelter. The establishment of little groceries, or taverns, in a small neighborhood of farmers, has a most injurious tendency. Often have we known sober men, ignorantly, and apparently innocently, plead for them as a convenience; but as often have we seen these same men become their most willing but unsuspecting victims. As soon as one of these establishments is opened in a small but thriving agricultural community, it becomes the scene of revelry for the young, and the place of resort of the old. There they congregate to spend their evenings, to hear the news, to attend trifling lawsuits, to buy small necessaries for their families, and the thousand other occasions that they can find excuses for;—but at each time they meet a friend, and they must either treat or be treated. The taste for liquor and company is soon acquired, and then their ordinary business becomes irksome; they lose their relish for labor; the farm is neglected; the family is badly provided for; and in the lapse of a few years debts have accumulated, creditors become pressing, and the homes of their wives and little ones, and perhaps of their fathers, must be given up to strangers for ever. Besides the personal injury these establishments are the causes of, they are of the most demoralizing tendency in a neighborhood; they soon become places of Sunday resort, and men who had previously been in the habit of attending divine service in the nearest meeting-house, will soon lose their taste for these goodly observances, will make this the place of their Sunday gatherings, and as vice or virtue is always progressive, in the course of a little time they will forget that the Sabbath was made as a day of rest. At first they engage in conversation and drinking; from drinking they go to pitching quoits, to ball playing, to horse racing and gambling. Fishing and gunning are amusements too innocent, when compared with the others, even to be named. These are evils not ideal;—again and again have we seen them exemplified in all their reality; and however diversified the pursuits of those who engaged in the practices, one result, that is ruin, has happened to all. We will illustrate these observations by only a single one out of many cases, and if the narration should interest any of our readers sufficiently to make the story impressive, we hope its effects will not be lost upon them or their neighbors.

We knew a farmer who in early life came into possession, partly by industry and partly by inheritance, of a farm of 300 acres of first rate land. He married a woman well adapted to his business and prospects, and who faithfully and affectionately discharged all her duties. He became the parent of a numerous family, principally sons, but his farm afforded all an ample maintenance, and by his industry, good temper and prosperity, his life appeared to be one, if possible, of perfect contentment, for every want seemed to be supplied, and every desire gratified. The earth yielded to him of her abundance, and the appearance of his house, farm and family, every thing around him, betokened comfort and future wealth. As to creditors there were none. Years passed in this way, his sons began to approach manhood. An unnecessary tavern was now established in his neighborhood, under pretence of accommodating travellers, but in reality to draw in the unthinking. He called occasionally to see his neighbor the landlord, and when he called found the host so sociable that he could not hastily leave him, and certainly not without giving him something for the entertainment he had afforded him. At times too, when he called, he found a few of his neighbors there, and they must sit down together, to talk upon religion, politics, or the news of the day, and be sure not to forget to pay the landlord for putting up a sign for their accommodation. Thus evenings were occasionally spent, and they afforded subjects for reflection the following day, but when evening came again there was a desire to spend it in the same place. The inclination was at first only occasionally indulged, but it soon settled down into a habit, and if one was now and then omitted, it was not from a want of desire. These evening sittings became by degrees later and later; the family were kept up by them, and to make them shorter a son was often sent to remind his father that it was late, and all the family in bed, except the messenger and his anxious mother, who was waiting his return. Still he would linger; he could not yet leave his interesting companions; he must have another talk and its necessary accompaniment, another glass; the night was long and he could sleep enough before morning. In this way he would beguile time, persuade his son to stay a little, and yet a little longer—urge him too to taste the landlord's good cheer, until the son from his oft-repeated visits to the tavern to fetch his father home, became pleased with the company, and took his share of the evening's good cheer. As the eldest son in time proved recreant to the mother's injunctions, and did not shorten his father's visits to the tavern, a younger was selected to supply the place of the first, who, from his tender years and habits of going early to bed, and urgent entreaties, might persuade the father, at a more seasonable time, to return to his home. He too was detained by a thousand artifices, until either the lateness of the hour, or his importunities, at last prevailed. The father permitted him too to taste until liquor became not unpleasant, nor the effect forgotten. A few years rolled on in this way; the father became a confirmed drunkard; the whole business of the farm devolved on the wife, for the eldest son had by this time become almost worthless. The constitution of the parent was at length broken down. He became sensible that intemperance had taken a fatal hold upon him—he resolved to break up the habit—he persevered for a short time, gave evidences of reform and returning health; but alas! he once more gave way, and was soon after laid in the grave. Before his death, he frequently spoke of the cause of his ruin; "that his example might be fatal to his sons; of the injury he had done to all his children; and the sufferings he had occasioned his unhappy wife." By his neglect too of his business, a debt had been entailed on his estate. All these were painful reflections, and his own conduct the cause of them. Some time before his death, his whole manner towards his family had become changed; instead of being the kind and affectionate husband and parent, of which we had often been the witness, how did our soul shudder, when once in a state of intoxication, we saw him transformed into a demon of meditated cruelty. It was on a cold day of December, when of all times in the year, home feels the most comfortable, we saw this man just returned from the tavern, pursuing his submissive wife with one child in her arms, and another following, around his own house, with an axe in his hand, threatening and swearing he would kill them all. How terrible the effects of intemperance! The kindest temper it endues with the ferocity of the tiger—the best friends become objects of hatred and vengeance; and after having deprived us of all that is dear in life, the relish for it still increases, until it strikes down its victims, and whole families become beggared by the fatal indulgence. Within one short year, the eldest son was laid in the grave by the side of his father. The taste for liquor had been so early cultivated, that he soon gave way to the temptation, and as he was yet in the green tree, his constitution was the sooner undermined. But the effects of early initiation did not end here: a third victim was preparing, and in two more years the second son, who was coming into manhood, and who, when a boy, had been sent too often to the tavern to bring home an inebriated father, he too had acquired the fatal propensity, and was now in a due course of preparation for the tomb. The anxious mother had one time hopes of reform, and she said it was at that time some comfort to her that he drank daily *only* two quarts of cider brandy. These were her own words, and she spoke them in the sincerity of her feelings. In a little time this son became to all but her an object of filth and loathing, for an uncontrollable diarrhœa rendered his room and presence insupportable. The end need not be told. Up to this period it was often thought necessary for these sufferers to have the occasional use of liquor, It had become, therefore, almost a family store, and two younger sons, from having been frequently sent to procure it, became somewhat familiar with its use and effects. The last victim had hardly been sacrificed, before another brother gave indications that he too had acquired a passion for drinking, and as his constitution was different from the others, it soon changed him into a maniac, and he is now confined in the asylum of the insane. The faithful wife and mother has struggled on through all these trying difficulties with a patience that was never exhausted, and a feeling and fidelity worthy of all commendation. By her industry and good management, she has been enabled in a measure to keep the estate, and make the rest of her family comfortable.

The above narration is literally true. The misfortune is, that with similar scenes we are all too familiar. A.

Drain-Plough.—We have received a communication from *John S. Greene*, of Utica, recommending that a subscription of $200 be raised, and awarded as a premium to the inventor of the best drain-plough which shall be exhibited at the Albany Cattle Fair, in October, and authorizing us to subscribe two dollars in his behalf towards such fund. For ourselves we are free to say, that we consider underdrains better, and in the end cheaper, than open drains, to free wet and springy soils from water; and that where open drains are necessary to carry off a large quantity of water, they should be made with the spade, and well made. Underdrains cause no waste of land; open drains occasion much waste, and are, particularly if opened with a plough, unsightly upon a farm.

The Caterpillar, which is so unsightly in our orchards at this season of the year, to say nothing of the injury it does to the foliage, and consequently to the tree—is easily destroyed, if taken in time, and at the proper time. Early in the morning, and in wet weather, at this season they may be found concentrated in a small compass, under their web. If within reach, the whole colony may be crushed in a moment with the hand. To reach the more elevated webs, wind the end of a pole with rags, and with this destroy them. Or, what is better, affix a Pickering brush to the end of the pole, and with this remove and destroy them. This brush is round and conical, somewhat resembling a battle brush. A man or boy will clear an orchard of this pest before breakfast; and the operation may be repeated, if necessary, without expense, or much loss of time.

Tillage Husbandry.

ON THE CORN CROP.

From the Proceedings of the N. Y. State Agricultural Society.

BY J. BUEL.

There is no crop more beneficial to the American farmer than Indian corn. An eminent agriculturist, the late John Taylor of Virginia, called it the "meal, meadow and manure" of the farm. It is convertible into human food in more forms than any other grain; its value in fattening domestic animals is not exceeded by any product of the farm; and no crop returns more to the soil than this does in the form of manure. There are two important requisites, however, to its *profitable* cultivation. The first is, that the soil be adapted to its growth; and the second, that the crop be well fed and well tended; for food and attention are as important to the plant, as to the animal. Ordinarily speaking, it costs less to take care of a good crop of corn, on proper corn land, than it does of a bad crop on land not adapted to its culture. The first is light and dry. The latter stiff, wet or grassy. I put the average expense of cultivating and securing an acre at $15, *(a)* including a fair rent, though it ordinarily exceeds this sum. The farmer, therefore, who obtains thirty bushels from the acre, estimating the grain at 50 cents per bushel, gets a fair compensation for his labor, and the use of his land. Whatever the product falls short of this is an absolute loss; and whatever it may exceed it is nett gain. Thus the man who gets but twenty bushels from the acre, loses, upon this estimate, $20 worth of his labor, on four acres. He who raises 80 bushels an acre, on the other hand, realizes a nett profit of $100 from four acres—making a difference in the profits of the two farmers in the management of four acres of corn, of *one hundred and twenty dollars!* These data are sufficiently accurate to show the importance of the two requisites I have suggested, and the value of a little calculation in the business of farming. The habit of noting down the expense, as well as the product of a crop, and thus ascertaining the relative profit and loss, is highly advantageous to the practical farmer, and one which cannot be too strenuously inculcated. It will perhaps be said, that I ought to add the value of the manure which is employed in the large crop; but I reply, that I offset this against the increased forage which this crop furnishes. Besides, by applying the manure in the unfermented state in which it is generally found in the spring, it will be as beneficial to the succeeding crops, as though it had lain and fermented in the yard, and been applied in the usual way in the autumn.*(b)*

The soils adapted to the culture of Indian corn, are such as are permeable to heat, air,(c) and the roots of the plant, and embrace those denominated sandy, gravelly and loamy. Corn will not succeed well on grounds that are stiff, hard or wet. The roots grow to as great length as the stalks, and the soil must be loose to permit their free extension.

The manures used are generally yard and stable dung, and plaster of Paris, (*sulphate of lime.*) The first ought to be abundant; as upon the fertility which it induces, depends the profit of the crop. Long or unfermented manure is to be preferred. It decomposes as the wants of the plant require it; while its mechanical operation, in rendering the soil light and porous, is beneficial to the crop. It should be equally spread over the whole surface, before it is ploughed under. It then continues to afford fresh pasture to the roots till the corn has matured, and is in its place to benefit the succeeding crop. If put into the hills, the roots soon extend beyond its influence, it does not so readily decompose, and the subsequent crop is prejudiced from its partial distribution in the soil. In a rotation of four or five years, in which this crop receives the manure, twenty-five or thirty ordinary loads may be applied to *one* acre with greater profit, than to *two* or *three* acres. Every addition tells in the product; and there is scarcely any danger of manuring too high for this favorite crop. Gypsum is applied broadcast before the last ploughing or harrowing, or strewed on the hills after hoeing. I pursued the first method, at the rate of a bushel to the acre. *(d)*

The best preparation for a corn crop is a clover or other grass lay, or lea, well covered with a long manure, recently spread, neatly ploughed, and harrowed lengthwise of the furrow. A roller may precede the harrow with advantage. The time of performing these operations depends upon the texture of the soil, and the quality of the sod. If the first is inclining to clay, or the latter tough or of long continuance, the ploughing may be performed the preceding autumn; but where sand or gravel greatly preponderate, or the sod is light and tender, it is best performed in the spring, and as near to the planting as convenient. The harrow at least should immediately precede planting. All seeds do best when put into the fresh stirred mould. Stiff lands are ameliorated and broken down by fall ploughing; but light lands are rather prejudiced by it. When corn is preceded by a tilled crop, the ground should be furrowed, and the seed deposited in the bottoms of the furrows. Where there is a sod, the rows should be superficially marked, and the seed planted upon the surface. Where the field is flat, or the sub-soil retentive of moisture, the land should be laid in ridges, that the excess of water which falls may pass off in the furrows.

The time of planting must vary in different districts and in different seasons. The ground should be sufficiently warmed by vernal heat to cause a speedy germination. Natural vegetation affords the best guide. My rule has been to plant when the apple is bursting its blossom buds, which has generally been between the 12th and 20th of May.

Preparation of the seed. The enemies to be combated are the wire-worm, brown grub, birds and squirrels. Of these the first and two last prey upon the kernels, and against these tar offers a complete protection. I soak my seed 12 to 20 hours in *hot* water, in which is dissolved a few ounces of crude salt petre, and then add (say to 8 quarts of seed) half a pint of tar, previously warmed and diluted with a quart of warm water. The mass is well stirred, the corn taken out, and as much plaster added as will adhere to the grain. This impregnates and partially coats the seed with the tar. The experience of years will warrant me in confidently recommending this as a protection for the seed.

The manner of planting is in ordinary hills, from two and a half to six feet apart, according to the variety of corn, the strength of the soil, and the fancy of the cultivator. The usual distance in my neighborhood is three feet. Some, however, plant in drills of one, two and three rows, by which a greater crop is unquestionably obtained, though the expense of culture is somewhat increased. *(e)*—*The quantity of seed* should be double, and may be quadruple *(f)* what is required to stand. It is well known that a great difference is manifest in the appearance of the plants. Some appear feeble and sickly, which the best nursing will not render productive. The expense of seed, and the labor of pulling up all but three or four of the strongest plants in a hill, it is believed will be amply remunerated by the increased product. If the seed is covered, as it should be, with fine mould only, and not too deep, we may at least calculate upon every hill or drill having its requisite number of plants.

The after culture consists in keeping the soil loose and free from weeds, which is ordinarily accomplished by two dressings, and in thinning the plants, which latter may be done the first hoeing, or partially omitted till the last. The practice of ploughing among corn, and of making large hills, is justly getting into disrepute: for the plough bruises and cuts the roots of the plants, turns up the sod and manure to waste, and renders the crop more liable to suffer by drought. The first dressing should be performed as soon as the size of the plants will permit, and the best implement to precede the hoe is a corn harrow, adapted to the width of the rows, which every farmer can make. This will destroy most of the weeds and pulverize the soil. The second hoeing should be performed before or as soon as the tassels appear, and may be preceded by the corn harrow, a shallow furrow of the plough, or what is better than either, by the cultivator.*(g)* A slight earthing is beneficial, providing the earth is scraped from the surface, and the sod and manure not exposed. It will be found beneficial to run the harrow or cultivator a third, and even a fourth time, between the rows, to destroy weeds and loosen the surface, particularly if the season is dry. *(h)*

In harvesting the crop one of three modes is adopted, viz: 1.—The corn is cut at the surface of the ground, when the grain has become glazed, or hard upon the outside, put immediately into stooks, and when sufficiently dried, the corn and stalks are separated, and both secured. 2. The tops are taken off when the corn has become glazed, and the grain permitted to remain till October or November upon the buts. Or, 3. Both corn and stalks are left standing till the grain has fully ripened, and the latter become dry, when both are secured. There are other modes, such as leaving the buts or entire stalks, in the field, after the grain is gathered; but these are so wasteful and slovenly as not to merit consideration. The stalks, blades and tops of corn, if well secured, are an excellent fodder for neat cattle. If cut, or cut and steamed, so that they can be readily masticated, they are superior to hay. Besides, their fertilizing properties, as a manure, are greatly augmented by being fed out in the cattle yard, and imbibing the urine and liquids which always there abound, and which are lost to the farm, in ordinary yards, without an abundance of dry litter to take them up. By the first of these methods, the crop may be secured before the autumnal rains; the value of the fodder is increased, and the ground is cleared in time for a winter crop of wheat or rye. The second mode impairs the value of the forage, requires more labor, and does not increase the quantity, or improve the quality, of the grain. The third mode requires the same labor as the first, *may* improve the quality of the grain, but must inevitably deteriorate the quality of the fodder. The corn cannot be husked too promptly after it is gathered from the field. If permitted to heat, the value of the grain is seriously impaired.(*i*)

Sowing seed. The fairest and soundest ears are either selected in the field, or, at the time of husking, a few of the husks being left on, braided and preserved in an airy situation till wanted for use.

In making choice of sorts, the object should be to obtain the varieties which ripen early, and afford the greatest crop. I think these two properties are best combined in a twelve rowed kind which I obtained from Vermont some years ago, and which I call Dutton corn, from the name of the gentleman from whom I received it. It is earlier than the common eight rowed yellow, or any other field variety I have seen, and at the same time gives the greatest product. I have invariably cut the crop in the first fourteen days of September, and once in the last week in August. The cob is large, but the grain is so compact upon it, that two bushels of sound ears have yielded five pecks of shelled grain, weighing 62 lbs. the bushel.

In securing the fodder, precaution must be used. The buts become wet by standing on the ground, and if placed in large stacks, or in the barn, the moisture which they contain often induces fermentation and mouldiness. To avoid this I put them first in stacks so small, that the whole of the buts are exposed upon the outer surface; and when thoroughly dry they may be taken to the barn, or left to be moved as they are wanted to be fed out—merely regarding the propriety of removing a whole stack at the same time.

NOTES.

(*a*) *Estimated expense of cultivating an acre of Indian Corn:*

One ploughing, (suppose a clover lay,)	$2 00
Harrowing and planting,.........	2 00
Two hoeings, 4 days and horse team, ...	3 75
Harvesting, 2 days,.........................	1 50
Cutting and harvesting stalks,...............	1 50
Rent,......................................	5 00
	—— $15 75

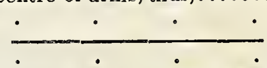
(*b*) Stable and yard manures lose 50 per cent by the fermentation they undergo in the yard during the summer. This loss consists of the gases which are evolved in the process of rotting, and of the fluids which sink into the earth, or are carried off by the rains. Plants receive their food either in the gaseous or liquid form. If manure rots in the soil, neither these gases or fluids are lost: the earth retains, and the roots of the plants imbibe them. Yet recent manures are not proper to be applied to small grains. They cause too rank a growth of straw, and are apt to induce rust and mildew. Thus a crop of corn, potatoes or ruta baga may be *fed* and *fattened*, if I may use the expression, upon the dung which is destined to nourish the wheat crop, without deteriorating its value for the latter purpose, if it is applied to the corn, &c. before it has fermented.

(*c*) We are on the northern border of the maize zone, and should make up for defect in climate by selecting soils into which the heat readily penetrates. Air, besides conveying warmth in summer, imparts fertility by the vegetable food which is always suspended in it in the form of gases. Dews are also charged with these properties of vegetable nutriment, and when the soil is porous, they settle down as in a sponge, and impart fertility to the roots, (the true mouths,) of plants.

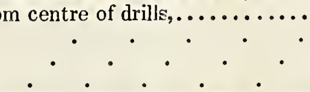
(*d*) I adopt the opinion of Davy, as the *modus operandi* of plaster of Paris, that it forms a necessary constituent of plants which it benefits, and is of no direct benefit to plants which do not afford it on analysis. Among the first are the clovers, corn, potatoes, and generally such plants as have broad or succulent leaves; while the latter embrace culmiferous grains and grasses, as wheat, rye, timothy, &c. Critical observation for years has confirmed me in this conclusion. Gypsum must be rendered soluble before it can be taken up by the mouths of plants, and it requires 600 parts of water to dissolve one of this mineral. I infer from these facts, that by burying it in the soil, it more readily dissolves, and is more accessible to the mouths of plants, than if spread upon the surface of the ground. I am induced, from these views of the subject, to sow plaster, on grass grounds, in March, and upon corn and potato grounds before the last ploughing for these crops. The latter was recommended and practised by the distinguished agriculturists, the late Mr. Taylor of Virginia, and Judge Peters of Pennsylvania.

(*e*) The following table exhibits the difference in product of various methods of planting, and serves also to explain the manner in which large crops of this grain have been obtained. I have assumed in the estimate, that each stock produces one ear of corn, and that the ears average one gill of shelled grain. This is estimating the product low; for while I am penning this (October,) I find that my largest ears give two gills, and 100 fair ears half a bushel of shelled corn. The calculation is also predicated upon the supposition, that there is no deficiency in the number of stocks, a contingency pretty sure on my method of planting.

	Hills.	bush.	qts.
1. An acre in hills, 4 feet apart, each way, will produce	2,722	42	16
2. The same, 3 by 3 feet,........	4,840	75	20
3. The same, 3 by 2½ feet,....................	5,808	93	28
4. The same, in drills at 3 feet, plants 6 stalks, inch apart, in the drills,..................	29,040	113	14
5. The same in do. 2 rows in a drill, 6 in. apart, and the plants 9 inches, and 3 feet 9 inches from centre of drills, thus,................	30,970	120	31



6. The same in do. 3 rows in a drill, as above, 3 feet from centre of drills,..................	43,560	170	5



The fifth mode I have tried. The ground was highly manured, the crop twice cleaned, and the entire acre gathered and weighed accurately the same day. The product in ears was 103 baskets, each 84 lbs. nett, and 65 lbs. over. The last basket was shelled and measured, which showed a product on the acre of 118 bushels 10 quarts. I gathered at the rate of more than 100 bushels the acre, from four rods planted in the third method, last summer; the result ascertained in the most accurate manner. Corn shrinks about 20 per cent after it is cribbed. The sixth mode is the one by which the Messrs. Pratts, of Madison county, obtained the prodigious crop of 170 bushels per acre. These gentlemen, I am told, are of opinion, that the product of an acre may be increased to 200 bushels.

(*f*) I am told the Messrs. Pratts, above alluded to, used seven bushels of seed to the acre, the plants being subsequently reduced to the requisite number.

(*g*) The cultivator is made in the form of a triangular harrow, with two bulls; or if intended to be graduated to different width, a centre bull is added, to which the exterior ones are attached by hinges. Iron slats, fixed to the exterior bulls, pass through a mortice in the centre one, perforated with holes, through which an iron pin passes to hold them at the graduated width. The teeth may be in any approved form, or reasonable number. The cultivator I use has five teeth, two in each of the outward, and one upon the centre timber. The teeth have a stout shank, with a duck's foots termination, four inches broad, somewhat cylindrical, rounded at the point, and inclined forward in an angle of 30 or 40°. This implement is useful for other purposes; and may be used, like Beatson's, as a substitute for the plough, in preparing light soils for a crop. The handles are attached to the centre piece. The teeth have a shoulder, on the under side of the timber, and are fastened with screws and nuts above.

(*h*) Some entertain a mistaken notion, that it is prejudicial to stir the soil among corn in dry weather, and others that weeds serve to prevent the evaporation of moisture by a hot sun. The reverse of these opinions is true. The exhaustion of moisture by a plant is in the ratio of the surface of its leaves and stocks presented to the sun and air.

(*i*) The leaves are the necssary organs for elaborating the food of plants, and when these are taken away the plant must cease to grow. The sap is useless until it undergoes elaboration in the leaves. Hence, when corn is topped in the usual way, the supply of food is cut off from the grain, except what may be elaborated in the husks. On comparing corn gathered by the first and second modes, it was the opinion of those who assisted in husking, that the first was soundest, brightest and heaviest. The third mode I have not tried. But it seems probable, that the grain might acquire an increase of volume, though it would lose again by depredation and waste. The first method has these further advantages that it preserves the cob from being saturated with rains, and secures the fodder, when it is in its highest perfection and greatest quantity.

Science of Agriculture.

PLOUGHING.

Ploughing is justly considered the most important of agricultural operations, as on the manner in which this is performed, depends the facility of executing all succeeding operations on the same piece of land. The manual operation of holding the plough in a proper position, and directing the horses or cattle which draw it at the same time, is only to be acquired by experience; when once attained it is perhaps one of the most agreeable and healthy of agricultural exercises, the body being kept upright, the arms and legs being brought into action, and also the eye and the mind, to keep the furrow straight, and of regular width and depth, and the voice to speak to the horses.

Three different points require particular attention in ploughing: 1st, The breadth of the slice to be cut; 2d, its depth; and 3d, the degree in which it is to be turned over;—which last circumstance depends both upon the construction of the plough, particularly the mould-board, and the care of the ploughman.

The breadth and depth of the furrow-slice are regulated by judiciously placing the draught on the nozzle or bridle of the plough; setting it so as to go more or less deep, and to take more or less land or breadth of slice, according as may be desired. In general, the plough is so regulated that, if left to itself, and merely kept from falling over, it would cut a little broader and a little deeper than is required. The coulter is also placed with some inclination towards the left or land side, and the point of the stock or share has a slight tendency downwards.

The degree to which the furrow-slice turns over, is in a great measure determined by the proportion between its breadth and depth, which for general purposes, is usually as three is to two, or when the furrow is nine inches broad it ought to be six inches in depth. When the slice is cut in this proportion, it will be nearly half turned over, or recline at an angle of forty or forty-five degrees; and a field so ploughed will have its ridges longitudinally ribbed into angular drills or ridglets. But if the slice is much broader in proportion to its depth, it will be almost completely overturned, or left nearly flat, with its original surface downwards; and each successive slice will be somewhat overlapped by that which was turned over immediately before it. And finally, when the depth materially exceeds the width, each furrow-slice will fall over on its side, leaving all the original surface bare, and only laid somewhat obliquely to the horizon.

Ploughing with the breadth and depth nearly in the proportion of three to two, is best adapted for laying up stubble land after harvest, when it is to remain during winter exposed to the mellowing influence of frost, preparatory to fallow or turnips.

The shallow furrow of considerable width, as five inches in depth by eight or nine wide, is understood to answer best for breaking up old lays, because it covers up the grass turf, and does not bury the manured soil.

Ploughing with the depth of the furrow considerably exceeding the width, is a most unprofitable and uselessly slow operation, which ought seldom or never to be adopted.

The most generally useful breadth of a furrow-slice is from eight to ten inches, and the depth, which ought to be seldom less than four inches, except in soils uncommonly thick and fertile. When it is necessary to go deeper, as for carrots and some other deep rooted plants, a trench ploughing may be given by means of a second plough following in the same furrow.

Shallow ploughing ought always to be adopted after turnips are eaten on the ground, that the manure may not be buried too deep; and also in covering lime—especially if the ground has been pulverized by fallowing, because it naturally tends to sink in the soil. In ploughing down farm-yard dung, it is commonly necessary to go rather deep, that no part of the manure may be left exposed to the atmosphere. In the first ploughing for fallow or green crops, it is advisable to work as deep as possible, and no great danger is to be apprehended, though a small portion of the sub-soil be at that time brought to the surface.

The furrow-slices are generally distributed into beds, varying in breadth according to circumstances; these are called *ridges or lands*, and are divided from one another by gutters or open furrows.—These last serve as guides to the hand and eye of the sower, to the reapers, and also for the application of manures in a regular manner. In soils of a strong or retentive nature, or which have wet, close subsoils, these furrows serve likewise as drains for carrying off the surface water, and being cleared out, after the land is sowed and harrowed, have the name of *water-furrows*,

Ridges are not only different in breadth, but are raised more or less in the middle, on different soils. On clayey retentive soils, the great point to be attended to is the discharge of superfluous water. But narrow ridges or *stitches* of from three to five feet, are not approved of in some of the best cultivated counties. In these a breadth of fifteen or eighteen feet, the land raised by two gatherings of the plough, is most commonly adopted for such soils; such ridges being thought more convenient for manuring, sowing, harrowing, and reaping, than narrower ones; and the water is drained off quite as effectually.

Ridges on dry porous turnip soils, may be formed much broader; and were it not for their use in directing the laborers, may be, and sometimes are, dispensed with altogether. They are often thirty or thirty-six feet broad, which in Scotland are called *ban-win* ridges, because reaped by a band of shearers, commonly six, served by one binder. If it be wished to obliterate the intermediate furrows, this may be done by casting up a narrow ridgelet, or single bout ridge, between the two broad ridges, which is afterwards levelled by the harrows.

The mode of forming ridges straight, and of uniform breadth, is as follows: let us suppose a field perfectly level, that is to be laid off into ridges of any determinable breadth. The best ploughman belonging to the farm conducts the operation, with the aid of three or more poles, shod with iron, in the following manner: The first thing is to mark off the head ridges, on which the horses turn into ploughing, which should in general be of an equal breadth from the bounding lines of the field, if these lines are not very crooked or irregular. The next operation, assuming one straight side of the field, or a line that has been made straight, as the proper direction of the ridges, is to measure off from it with one of the poles, half the intended breadth of the ridge, if it is to be gathered, or one breadth and a half, if to be ploughed flat; and then the ploughman sets up a pole as a direction for the plough to enter. On a line with this, and at some distance, he plants a second pole, and then in the same manner a third, fourth, &c. as the irregularity of the surface may render necessary, though three must always be employed—the last of them at the end of the intended ridge, and the whole in one straight line. He then enters the plough at the first pole, keeping the line of poles exactly between the horses, and ploughs down all the poles successively; halting his horses at each, and replacing it at so many feet distant as the ridges are to be broad; so that when he reaches the end of the ridge, all his poles are again set up in a new line parallel to the first. He returns, however, along his former track, correcting any deviations, and throwing a shallow furrow on the opposite side of his former one. This mode has a decided preference over the common practice, of laying the two furrows *first* towards each other. By *first* throwing them from each other, and then reversing them, the whole ground is ploughed; and, if the first furrows are shallow, the ridge has but a slight elevation in the centre. These furrows, when reversed, form the crown of the ridge, and direct the ploughmen who are to follow. The same operations are carried on until the whole field is marked out.

The direction and length of ridges are points which must evidently be regulated by the nature of the surface, and the size of the field. Short angular ridges, called *butts*, which are often necessary in a field of irregular boundaries, are always attended with a considerable loss of time, and ought to be avoided as much as possible.

In ploughing steep land, it is advisable to give the ridges an inclination towards the right hand at the top, by which, in going up the acclivity, the furrow falls more readily from the plough, and with less fatigue to the horses. Another advantage in forming ridges in a slanting direction on such land is, that the soil is not so likely to be washed down from the higher ground, as if the ridges were laid at right angles. Wherever circumstances will permit, however, the best direction is due north and south, by which the grain on both sides of the ridge enjoys nearly equal advantages from the influence of the sun.—*Enc. Britanica.*

In ploughing relatively to season, it is well known, that clayey or tenacious soils should never be ploughed when wet; and that it is almost equally improper to let them become too dry; especially if a crop is to be sown without a second ploughing. The state in which such lands should be ploughed is what is commonly indicated by the phrase "atween the wet and the dry,"—while the ground is slightly moist, mellow, and the least cohesive.—*Enc. Ag.*

Cattle Husbandry.

MIDDLE HORNS—DEVON COW.

"There are few things more remarkable about the Devonshire cattle than the comparative smallness of the cow. The bull is a great deal less than the ox, and the cow almost as much smaller than the bull. This, however, is of some advantage, and the breeders are aware of it; for although it may not be necessary to have a large bull, and especially as those of any extraordinary size are seldom handsome in all their points, but somehow or other present coarseness or deformity, it is almost impossible to procure large and serviceable oxen, except from a somewhat *roomy* cow. These cows, however, although small, possess that roundness and projection of two or three of the last ribs, which make them actually more *roomy* than a careless examination of them would indicate. The cow is particularly distinguished for her full round clear eye, the gold coloured circle round the eye, and the same colour prevailing on the inside skin of the ear. The countenance cheerful, the muzzle orange or yellow, but the rest of the face having nothing of black, or even white about it. The jaws free from thickness, and the throat free from dewlap. The points of the back and the hind quarters different from those of other breeds, having more of roundness and beauty, and being free from most of those angles by which good milkers are sometimes distinguished."

QUALITIES OF THE DEVONS.

"Their qualities may be referred to three points; their working, fattening and milking.

"Where the ground is not too heavy, the Devonshire oxen are unrivalled at the plough. They have a quickness of action which no other breed can equal, and which very few horses exceed. They have also a degree of docility and goodness of temper, and also stoutness and honesty of work, to which many teams of horses cannot pretend. Vancouver, in his survey of Devonshire, says, that it is a common day's work on fallow land, for four steers to plough two acres with a double furrow plough. Four good Devon steers will do as much work in a field, or on the road, as any three horses, and in as quick, and often quicker, time, although many farmers calculate two oxen as equal to one horse. The principal objection to the Devonshire oxen is, that they have not sufficient strength for tenacious clayey soil: they will, however, exert their strength to the utmost, and stand many a dead pull, which few horses could be induced or forced to attempt. They are uniformly worked in yokes, and not in collars. Four oxen, or six growing steers.

"There is a peculiarity in driving the ox-team, which is very pleasing to the stranger, and the remembrance of which, connected with his early days, the native does not soon lose. A man and a boy attend each team; the boy chants that which can scarcely be regarded as any distinct tune, but which is a very pleasing succession of sounds, resembling the counter-tenor in the service of the cathedral. He sings away with unrivalled lungs, as he trudges along almost from morning till night, while every now and then the ploughman as he directs the movements of the team, puts in his lower notes, but in perfect concord. When the traveller stops in one of the Devonshire valleys, and hears this simple music from the drivers of the ploughs on the slope of the hill on either side, he experiences a pleasure which this operation of husbandry would scarcely be supposed to be capable of affording. This chanting is said to animate the oxen somewhat in the same way as the musical bells that are so prevalent in the same country. Certainly the oxen move along with an agility that would scarcely be expected from cattle: and the train may be watched along time without one harsh word being heard, or the goad or whip applied. The opponents of ox-husbandry should visit the valleys of North or South Devon, to see what this animal is capable of performing, and how he performs it.

"The profit derived from the use of oxen in this district, arises from the activity to which they are trained, and which is unknown in any other part of the kingdom. During harvest time, and in catching weather, they are sometimes trotted along with the empty wagons, at the rate of six miles an hour, a degree of speed which no other ox but the Devon has been able to withstand.

"They are usually taken into the work at about two years, or twenty-six months old, and they are worked till they are four, or five or six; they are then grazed, or kept on hay, and in ten or twelve months, and without any further trouble, they are fit for the market. If the grass land is good, no corn, or cake, or turnips, are required for the first winter; but, of course, for a second winter these must be added. The grazier likes this breed best at five years old, and they will when usually taken from the plough, fetch as much money as at six. At eight or nine years, or older, they are rapidly declining in value.

"Lord Somerville states, that after having been worked lightly on the hills for two years, they are bought at four years old by the tillage farmer of the vales, and taken into hard work from four to six; and, what deserves consideration, an ox must thus be worked in order for him to attain his fullest size. If he his kept idle until he is five or six, he will invariably be stinted in his growth. At six he reaches his full stature, unless he is naturally disposed to be of more than ordinary size, and then he continues to grow for another half year.

"Their next quality is their disposition to fatten, and very few rival them here. They do not, indeed, attain the great weight of some breeds; but, in a given time, they acquire more flesh, and with less consumption of food, and their flesh is beautiful in its kind. It is of that mottled, marbled character, so pleasing to the eye, and to the taste. Some very satisfactory experiments have been made on this point.

"Mr. Carpenter a very intelligent farmer, informs us, that the Duke of Bedford had some prime Hereford oxen sent to his Tavistock estate in the month of April, and he ordered some Devons to be bought at the latter end of the same month. The Devons were not in so good condition as the Herefords when they were put to grass, and cost about £5 a head less than the Hereford; but at the latter end of December, when they were all sold to the butcher, the Devons were superior in fatness and weight.

"A more satisfactory experiment was made by the same nobleman. Six oxen were selected in Nov. 16, and fed until Dec. 10, the following year, and the following was the result:

	1st weight. cwt.qrs.lb.			2d weight. cwt.qrs.lbs			Gained. cwt qrs lbs			stone.	Oil cakes. lbs.	Turnips lbs.	Hay lbs.
1 Hereford,	17	0	1	18	3	0	1	2	27	24 3		2700	437
2 do	18	1	0	21	0	25	2	3	25	41 5	432	2712	432
3 Devon,	14	1	7	17	2	7	3	1	0	45 4	433	2668	295
4 do	14	2	4	19	1	0	4	2	14	64 6	442	2056	442
5 Susses,	16	2	0	19	3	0	3	1	0	45 4	432	2655	392
6 Leicester,	15	2	14	18	2	0	2	3	14	40 2	434	2652	400

"An experiment of the same nature was made, in order to compare the fattening properties of the Glamorgan with the Devon.—They were fed from Jan. 6 to Dec. 1, and the following was the result:

	First weight cwt. qrs. lbs.			Sec. weight. cwt. qrs. lbs.			Gained. cwt. qrs. lbs			or stone.
1 Devon, -	13	1	7	17	3	7	4	2	0	63
2 do - - -	16	0	10	20	3	14	4	3	2	67
3 Glamorgan, -	16	3	0	16	0	14	3	3	18	54 6

"We are aware that experiments have been instituted with different results.

"For the dairy, the North Devons must be acknowledged to be inferior to several other breeds. Their milk is good, and yields more than average proportion of cream and butter;* but it is defi-

*The difference in the richness of milk in oleaginous properties often amounts to one-third. The writer of this note tested the milk of five cows, about the same time, with the lacotmeter. The cream was found to vary from nine to fifteen per cent.

cient in quantity. There are those, however, and no mean judges, who deny this, and select the North Devons even for the dairy.

"Mr. Conyears, of Copt Hall, near Epping, a district almost exclusively devoted to the dairy, preferred the North Devons, on account of their large produce, whether in milk, butter, or by suckling. He thought that they held their milk longer than any other sort that he had tried; that they were liable to fewer disorders in their udders; and that being of small size, they did not eat more than half what larger cows consumed. He thus sums up his account of them: 'Upon average, ten cows gave me five dozen pounds of butter per week in the summer, and two dozen in the winter. A good North Devon cow fats two calves a year. My 30 North Devon cows have this year upon an average, produced a profit of £13 14 0 per cow.' [About $61.] As nurses they are excellent; and the calves thrive from their small quantity of milk more rapidly than could possibly be expected."

Miscellaneous.

CANADA THISTLES.

Although we gave an abstract of the following communication, which we copy from the Genesee Farmer, in our first number, yet from the high character of the gentleman who wrote it, Thomas Hillhouse, Esq. as a citizen and a farmer, the importance of the subject, to our agriculture,—and a perfect conviction, arising as well from a conversation with Mr. Hillhouse, as from the laws which govern vegetation, that the mode here recommended, if strictly attended to and persevered in, is the most effectual mode of destroying this noxious cumbrance of the ground,—we are induced to copy it entire.

I have recently noticed in the Genesee Farmer several articles on the destruction of the Canada thistle; but none of them seem to reach the *root* of the evil. I am, however, pleased to see the public attention drawn to the subject.

The extermination of this pest of our plough fields, is an object of great importance to all farmers, who are unfortunate enough to have them on their lands; and it is therefore, in a measure, incumbent on them to communicate to each other whatever methods they have taken for that purpose, and particularly such as have had the desired effect.

I have no expectation that this thistle is to be totally and entirely eradicated, and banished from the country, as it is a perennial plant, and is to be found on the road sides, in woods, and in all unoccupied lands, (at least in this vicinity.) All that can be done with such, if near at hand, is to cut them off and prevent their seeding. But being possessed of another manner of propagating themselves, more sure and certain, by their side or horizontal roots, which the cutting of the tops of the plant does not affect or check; they therefore must be permitted to remain, in such places, by a sort of compromise, that they are to be prevented from scattering their seeds on to our plough fields, from which I am confident they may be expelled, and after which, easily kept out; any further than this I shall not attempt doing or advise others to do.

Some enactments of the legislature, as recommended in the Farmer, would undoubtedly be of use. Such as obliging the owners of land (at least such as is under improvement,) to cut them at the proper time—imposing a penalty for neglect—and making it the duty of overseers of highways to have this done on the margin of roads. It would likewise have the effect of calling the public attention to the thing, and spread the alarm.

In articles of this sort, intended to guide the operations of others, unless one goes somewhat into detail, the object is in a measure lost; for those (if any there should be,) who may be induced to adopt the method recommended, will have a wish to know all the particulars of the process before they commence. I shall therefore be compelled to make this of greater length than I supposed at first setting out would be necessary. What is here stated, however, is all from my own knowledge; nothing is given on hearsay.

When I purchased the farm which I now occupy, about thirty years ago, excepting some meadow lands, near a river, and some other small pieces, there were little or no improvements on it; being thrown out to commons, and mostly covered with small sapling wood and bushes—or as my Dutch neighbors expressed it, "*it had run out to bush.*" In open spots in this *bush*, the Canada thistle was sprinkled pretty liberally; and after clearing and ploughing they began to spread to an alarming extent, and threatened to overrun the whole premises. The first led me (but not in time by many years) to adopt some method more effectual than cutting off the tops to stop their progress.

It is well known to all farmers as well as botanists, that the roots of no tree or plant, whether annual, biennial or perennial, can long survive, if prevented from vegetating, and coming to the light of day. My theory was based on this principle. I commenced operations about eight years ago on some small patches in a field planted with corn, as soon as any thistles appeared after planting, cutting them off twice a week at first: and was very particular never to have it neglected. It would take but a few moments to go over a patch two or three rods square, with a hoe; at the same time being very careful to leave none: and to be sure of this I generally went over the ground, row by row, a second time. The deeper they are cut off with the corner of the hoe, the longer time of course it will require the new shoots to reach the surface again. I followed them up in this way, and about the middle of August they began to come up thin and scattering, and appeared of a sickly, yellowish hue.—This was encouraging, and we continued the operation, (though I found it was not necessary to look to them quite as often as at first,) to about the first of October, or until no more appeared, and none have since shown themselves in these spots.

By digging down to the main roots in August or September, they were found in a state of decay, being of a blackish colour. The result of this first attempt, is already given; but I will give something more of the details of the operation. That there should be no difficulty in finding the several patches when the corn had attained its full height, I placed high poles at each spot so that they could be seen over the tops of the corn, and kept a hoe on the ground to be ready at hand whenever I happened, in walking over my premises, to take them in my way, and cut them off if any were to be seen. In this way, but little time was spent; in fact none worth noticing. And as early as the first of October, as before observed, they were completely conquered. I ascribe the early season at which these patches were subdued, to their being allowed no breathing spell, and no omission being made through the season of operation, of cutting them off as fast as they appeared.

I have sometimes in lieu of, or rather for the want of a hoe, used a piece of hard wood, flattened to two or three inches wide at one end, and sharpened; or what is still better, a piece of iron or steel, like a chisel, fastened to the end of a stick or walking cane. It is proper to have some kind of tool in hand, or at the spot, otherwise some might escape, when one was accidentally passing near them.

Although the actual labor and time spent to destroy thistles in this way, is but trifling, at least in small patches: still it requires considerable patience and much diligence, that the thing may never on any account be neglected during the season of their growth; and I would caution all such as may have an inclination to try the experiment, that unless they are fully determined to persevere, and have full confidence that they can do it for at least four months, not to attempt it; because by any neglect during the season, the previous time spent, is in part lost; as by allowing the plants a breathing spell in the sun and air, now life and vigor is communicated to the roots, which is the thing intended to be destroyed.

As an evidence of this, in the season of 1828, I undertook to kill the thistles on a field of about fifteen acres planted with corn; and on which there were near twenty patches. Having placed the poles as before, I began cutting them as soon as any appeared after planting. They were followed up without any neglect, and as fast as they appeared, until about the 20th of August, when they appeared nearly subdued or in a fair way for it, beginning to come up scattering and yellow. At this time I was called away on a journey. and was absent nearly four weeks, leaving strict injunctions on my men not to neglect the thistles in my absence. How far they attended to it, I cannot say, for immediately on my return, I was taken sick, and was confined until after corn harvest. The thistles of course were forgotten. To make the matter still worse, the ground instead of being planted again as it should have been, was sown with barley and peas, and in September following with wheat, and the next spring stocked with clover for pasture. The same patches of thistles having revived, began to show themselves, on the barley and peas, but being few in number and scattering, no attention was paid them. They have since continued to increase and spread by their horizontal roots, so that there is nearly or quite as many on the field as at first; although they have been regularly mowed off every year, and sometimes a second time, and have not seeded. This failure was evidently owing to the business not being attended to as it should have been the latter part of the season; but might have been remedied had the ground been planted with corn the second year, and which I shall do soon, and hope to avoid a like neglect, by which our labor in experimenting this season was lost.

The season of 1830, I planted another field with corn of about the same size of the last mentioned. There were on this field a number of patches of the thistle, some of them large, say over half an acre, some small. It was calculated that altogether they would have covered two and a half acres of ground. Having as usual marked the spots with poles stuck in the ground, we commenced cutting them at the proper time. The labor required on this field was more than on any I had yet taken in hand—the patches being large, and the thistles thick and strong. At first, and while vegetation was quick and rapid, the labor to go over them was equal to two men a day; but in a short time one man would do it in the same time, and towards the close of summer, in three or four hours. Some of these patches were very obstinate, so that we were obliged to follow them up into October; others gave up sooner. On the whole, they were totally destroyed. None escaped, and none are now to be found in any part of the field that has been ploughed.—Although we succeeded in destroying the thistle on this field the first year, I should advise, where killing them is the great object, to plant with corn two years in succession, (although this in other cases might be bad management,) that should any thistles escape the first, they may be finished the second year.

I cannot state the expense of this experiment, as I kept no memorandum; but should think it would amount to not more than twenty dollars, if men had been hired for that express work: but as it was done mostly by boys, with myself, or some careful hand to overlook, I paid out nothing extra for labor that season on account of this job, and there was no neglect of other farming operation. But twenty or even forty dollars, would be nothing compared with the object attained, by clearing a good plough field of this nuisance. Had they been left to their natural course, they would in a few years, by the running of their horizontal roots, and scattering with the plough and harrow, have spread over the whole field and ruined it for tillage.

The last season I planted with corn a small piece of about four and a half acres, much infested with thistles. It was planted with the express view of killing them—they were spread over a great part of the ground, but were small, the land having laid in pasture 12 years without ploughing, and had become what is termed sward-bound, which checks the growth, although it does not kill the thistle. The same course was pursued as in former years, and the business was well and regularly attended to. But few appeared after the first of September, but they were not neglected as long as one was to be found. I think they are all destroyed; but to make the thing doubly sure, I intend to have it planted next season.

A small piece at one end of this ground was planted with potatoes, on which I had never noticed any thistles. They however made their appearance, and were cut off with the rest. But when the tops of the potatoes began to fall on and cover the ground, it was with difficulty that the thistles could be found, and probably enough has escaped to keep the roots alive, and more or less will make their appearance another year. I therefore would advise never to plant potatoes where, and when, the great object is to destroy the thistle. On another account, I consider corn much the best crop to plant with this view. The roots of this plant, if it grows strong, run through and fill the ground with small fibres, which has a tendency to keep the ground dry and hard; at the same time the tops form a shade, and altogether seem to have the effect of checking the growth of the thistle, and aid in the operation of destroying it.

To prevent the necessity of going over the ground as often as was required with the hoe, I last spring had made some iron tools not unlike a small light crowbar, flattened at the lower end to about a hand's breadth and length, and steeled. With this tool, in soft mellow ground, the thistle may be taken up to the depth of six to twelve inches; but the process is much slower, and perhaps the time employed in killing them in this way, although the operation is not so often to be performed, is equal to doing it with a hoe, with which the ground is much quicker gone over.

The horizontal root of this plant, so often mentioned as its principal instrument of propagation, will be found at various depths, according to soil. In lands under the plough, and in other rich mellow ground, they push themselves along, in every direction from the main patch, and at every few inches send up a branch to the surface. On carefully uncovering a space several feet square, I have found them in a manner connected and tied together with this root. Whenever they can be taken up below the horizontal root, they are mostly destroyed with once going over, and with the iron tool before described this is frequently done; and where there may be a very small patch in a distant field, the inconvenience of looking to it as often as would be necessary with a hoe, might be avoided by taking this course. In wet rainy seasons, like the two last, I find they spread themselves much fasten than in dry ones. The ground being soft, and the roots strong and vigorous, and meeting less resistance, they will push along a considerable distance in one summer.

About nine years since, I had made a string of half stone fence, with posts, and boards on top. The ground on which the wall was placed, was rich bottom, and was set there to withstand the spring floods. It was made on the line of one of my neighbor's land, on which at a small distance was a large patch of Canada thistles. In a short time they pushed along and reached the wall, and have run along in, and under it, more than thirty rods, or fifteen each way, in about seven years. Having heard that salt and strong brine would kill them, I procured, three years ago, a quantity taken from fish barrels, and taking off the top stones of the wall so as to come nearer the roots, the brine and salt was put on very bountifully. It had the effect of killing the tops of the thistles, and wilted them down; but the next summer they came up through the wall as thrifty as before. I see no remedy in a case like this, but to remove the wall, otherwise they will travel to each end of it, and from this lodgment spread over the adjoining field. And I have no doubt, that if a strip of rich mellow land, reaching a distance of twenty miles, could be had, unobstructed by rivers, swamps, &c. a low stone wall placed thereon, and a family of thistles set a going at one end, but that they would in course of time reach the other, and without the agency of any seed.

On my mowing and pasture lands, such as are wet and never ploughed, there are some patches of the thistle, which have for twenty-five years past remained nearly stationary. They are always mowed off in July, before the seed is ripe, and if necessary, a second time, to prevent their seeding. In this kind of hard sward land, they are small and puny, and compartively give but small trouble and annoyance.

Whenever we have succeeded in expelling the thistle from our tillage lands, which is the extent of my expectations, in respect to my own, and all that I would at present advise to others to attempt doing, they may, I am confident, with little care and no expense, be easily kept off afterwards. The seeding thistle is very small, and as easily destroyed as a pigweed, should they happen to be observed. It requires several years for them to form any considerable patch—their greatest security is their not being noticed, until by their side or horizontal roots they have run out in a different directions. Small patches may be killed by a deep covering of anything that will keep them under, and prevent them from shooting up to the surface. This I have done with pummice put on to some very small bunches near my cider mill. Salting cattle and sheep often on small pieces will have the like effect; but this must be done very often and through the season of growing. The salt itself does not have the effect of destroying the roots, because it cannot reach them, but the frequent licking of the spot by the cattle takes off the shoots as fast as they come above the ground, which is the same in its effects, as hoeing them off. All these methods, however, cannot be practised except on a very small scale.

I know of no plant or bush, with which the Canada thistle so nearly compares in its habits and modes of propagation, as the common elder. This, like the thistles, has its seed, and its horizontal roots with which to form patches; and like it, also, in not being to be destroyed by cutting off the tops once, or even twice a year, but must be rooted out. The same treatment which kills the thistle would have the like effect on the elder: but this would be attended with too much trouble, for the same number usually on ours farms,—the better way, therefore, is to dig and root them out at once. But I think it is as great an absurdity for a farmer to say that he will not attempt to destroy the clumps of elder on his mowing land, because his neighbor lets them alone to seed, as to refuse to kill the thistle on his plough land for the like cause. Since in either case, when they are once eradicated they are easily kept out; let his neighbors' practice be what it may.

In my various experiments, I have tested this method of destroying the thistle sufficiently to convince myself at least that it is very practicable, and attended with but little expense, if pursued with due care and preseverance. If no failures had happened in my several and yearly attempts, another year would have completed the routine of my ploughing fields, but it will now take three—and as I am less than that, from three score and ten, and have a wish to complete what I have undertaken, I must be careful to avoid the like errors in future. I close this long article with the hope that it may be of use, by inducing some of my brother farmers, who have a good stock of resolution and perseverance, and a plenty of Canada thistles on their land, to try the experiment, at first, if they please, on a small scale. I shall be pleased to be informed of the results, and particularly of their success. In the interim, I would inform them that I have allotted and set off for the ensuing year, a pretty large job of the same sort. The ground on two fields being already once ploughed for corn, on which there are patches of thistles in plenty, enough to cover three and a half or four acres, of which, provided my health is spared, I hope to be able to give a good account at the close of another year. A SUBSCRIBER.

NOTE.—I would add one more remark, that no grass or weeds of any kind, must be permitted to grow on the spots or patches during the season of the operation, as they conceal the thistle sprouts, which may consequently escape the hoe. I have usually, on spots where the thistles were thick and intermixed with weeds, hoed the ground well all over as often as was necessary to destroy the weeds, and at the same time the thistle was taken off also.

[*From the Farmer and Mechanic.*]

CULTURE OF SILK.

The committee appointed by the Hamilton County Agricultural Society, for the purpose of preparing some instructions in regard to the rearing of the white mulberry tree, and the silk-worm, having consulted the most approved works on the subject that could be obtained in Cincinnati, respectfully submit the following brief report upon this important department of the American System—

That the soil and climate of the United States are well adapted to the growth of the white mulberry tree (morus alba,) and the silk-worm, has been satisfactorily proved by the various experiments, which within the last fifty years, had been made upon that subject, in different parts of the Union. That the culture of silk in this country will be found highly profitable to those engaged in it is equally certain. Facts might easily be multiplied on this subject, but the following are deemed sufficient:

Four acres of ground planted in mulberry trees, near Boston, have afforded enough food, in one season, for the support of as many silk-worms as produced four hundred and twenty pounds of silk, worth three dollars and fifty cents per pound—amounting to fourteen hundred and seventy dollars. All the labor necessary in producing this result was performed by four girls, whose attention was required but for a small portion of the year.

Before the culture of silk was introduced into the less fertile parts of Languedoc, in France, the peasantry were miserably poor,—they are now among the richest in the kingdom. In some parts of France, a single mulberry tree has been known to yield a guinea annually to the owner from the sale of its leaves. When it is recollected that the cultivation of the mulberry tree is neither difficult or laborious, and that the collection of the leaves, the feeding of the worm, and the reeling of the cocoons, can all be advantageous performed by women, children, and decreped persons, it will certainly require no arguments to induce the farmers of the Miami country to turn their attention to the culture of silk. The results of this business are much more immediate than is generally supposed. By procuring, during the present season, a supply of eggs, and feeding the worms upon the leaves of the common black mulberry of our woods, which are found to be a pretty good substitute for the white, a return in profits may be had next year. If the seed of the white mulberry be sowed this season, the young trees will next year afford leaves for the worms.

There are three modes pursued in the cultivation of the white mulberry tree: The first is, to sow the seed broadcast, and, when wanted for food, to mow down the young trees annually, commencing on the second year. The second is to transplant them from the nursery, and suffer them to attain the size of trees. The third, and perhaps more preferable mode, is to sow the seed in drills, and allow the shrubs to attain to the height only of three or four feet, which may be done by cutting off the top limbs, the tender parts of which will answer as food for the worms. More mulberry foliage may be produced in this way, from the same quantity of ground, than can be obtained if it were occupied by full grown trees. The labor of gathering the leaves is also much less than is required after the trees have attained their full size.

From the experiments made in France, it has been ascertained that ground which has a sandy or gravelly soil, is best adapted to the growth of that kind of mulberry leaves which affords the finest quality of silk. The leaves of those mulberry trees which grow in a very rich soil are found to be too luxuriant and too full of juice for the production of the better kinds of cocoons.

The mulberry seeds may be sown at any time from the last week of April until the first week of June. The safer plan is to sow the seeds at different periods, say the last of April, the middle of May, and the first of June. When the ground is properly dressed and drills prepared, the seed is to be sowed after the manner of sowing lettuce seeds, and should be covered with fine light dirt.

Those of the young shrubs which it is wished should attain the size of trees must be transplanted from the drills the second year, and the most suitable time for this removal is immediately after the fall of the leaf in autumn. The side buds should be stripped off, leaving only such as are necessary in the formation of a suitable head for the tree. At the time of removal of the young trees, they should be cut off within seven or eight inches of the ground, and if they do not shoot well, the first year after they are transplanted, they should be cut in a similar manner the following season. The ground around the roots of both those in the drills and those transplanted, should be dressed several times a year, which will greatly assist their growth. It is advisable to plant out a few of the trees in sunny situations, that a supply of the leaves may be had for the worms of such eggs as may happen to hatch before the usual season.

The heads of such as are intended to attain the size of trees, should be hollowed out in a manner that will render it easy to collect the leaves, and such branches as may be broken in that process should be carefully removed. It may be proper to remark, that in France the cultivation of the mulberry tree for the sale of the leaves is a separate business from the rearing of the worms; and it is particularly recommended to the farmers of the Miami country to lose no time in filling some portion of their farms with this valuble tree, inasmuch as the day is not distant when the demand for its foliage will give them annually a handsome profit. It has been ascertained that the second crop of leaves which comes out after the first have been stripped off for the worms, furnishes a nutritious food for sheep, and is eaten by them with greediness. When intended for this object, the leaves should be stripped off a little before the time they would naturally fall, and laid by for use in the winter season. This experiment is worthy of a trial by our farmers, inasmuch as, after the first year, the mulberry tree required little or no attention, thus annually yielding a supply of food, without any cost save that of gathering it.

Silk—The raising of silk properly commences with the hatching of the worms. This will take place when the mulberry foliage is sufficiently matured for their consumption; or when the spring is advanced enough to make the temperature from 70 to 80 deg. of Fahrenheit. The first preparation to be made for them is that of a *dry, airy* room, or small building, in which stages of a convenient height and breadth for feeding them should be erected. Care should be used to exclude the enemies of the worms, viz: cats, poultry, rats, mice, and ants, from the room and stages in which the worms are placed. The former may be excluded by ordinary precautions, and the ants by keeping hot lime around the posts of the stages.—The eggs must not be brought out for hatching till the weather is settled; and if afterwards there should be a change to cold, a little fire may be kept in the room, to preserve the temperature at its proper height. The eggs when brought out, may be laid on the stages or tables, and no smoke, or effluvium of any description, permitted to enter the apartment, as the worms are very sensitive.

When the worms first appear they will be *black:* those which are *red* are bad, and should be thrown away, for they will produce no cocoons.

In *four days* most of the worms will be hatched, and those which come out after that time are generally too weak to produce silk.—The productions of each day should, when large quantities are raised, be kept separate, in order that they may form cocoons at the same time. When they are first hatched, they must be fed with fresh and tender leaves of the mulberry; not more than half a dozen leaves to one thousand worms will *then* be required; but afterwards they will each devour a leaf. When the leaves become dry, or are eaten up, fresh ones must be given them, taking care not to put on so many as to smother the worms or obstruct their motions. For the first twenty days, they must be fed three times a day, and after that as often, day and night, as their food is destroyed or wilted.

The worms must be kept free from dampness, whether in their food or rooms; and they must not be too much crowded; a thousand full grown ones will be sufficient for a table three feet by twelve.

About the sixth, tenth, sixteenth, and twenty-second days, the worms will shed their skins and become sickly. At these periods they abstain from food, and should be fed scantily at first, and then not at all, till they recover. Sometimes they become afflicted with incurable diseases; in these cases they will be known by voiding a yellow liquor, and must be immediately separated, and, as well as the dead ones, thrown away. The disease is infections, and therefore particular care should be used in preventing its progress.

Throughout the whole period of feeding them, their *litter* should be carefully taken away: at first, this need not be done often; but during the last stage of their growth it must be done as frequently as possible. Indeed, the utmost care should always be taken to keep them *clean*, and give them fresh food, and pure air.

When the worms are ready to spin, they will cease to wander about, becoming of the color of a new egg, nearly transparent, and will search for things upon which to fasten their cocoons. When a considerable number have this appearance, branches, twigs, and leaves, must be put up around the stages or table, upon which they will mount and spin their balls. This generally happens from the thirtieth to the thirty-sixth day. Various substances are used for the worms to spin upon, but Mr. G. B. Smith (from whose circular we have taken much valuable information) considers *chesnut leaves* the best. These, when dry, curl up, and thus form a place of deposite for the silk ball. Twigs must be broken off, with the leaves on them, and placed around the stage.

The worms, after beginning to spin, require no further attention till the cocoons are completed. The worms that begin to spin each day should be kept separate, and in eight days from the commencement of spinning the cocoons, they should be removed. Those from which eggs are expected, must be placed in a dry room, upon white paper, in rows about a foot apart. The worm will remain in its chrysalis state ten or twelve days, and then come out a grey miller. In a short time the females will commence laying upon the paper, each one laying about 450 eggs, which are at first of a sulphur color, but soon turn to a dark lilac; those which remain of a yellow hue are useless, and may be thrown away. The good ones must be kept in a dry, cool place, in a temperature of forty or fifty degrees.—In a high temperature, they might hatch.

The cocoons, from which silk is to be obtained, must be stripped of the *floss*, or loose outer coating, and the insect destroyed; otherwise it would soon pierce the ball and destroy the silk. The insect may be killed either by baking the balls for half an hour in an half heated oven, or, which is the better mode, by steaming them for a few minutes in a common kitchen steamer. Af er the cocoons are thus prepared, from thirty to fifty of them, in proportion to the size of the thread to be spun, may be placed in a kettle of water heated to such a degree that the hand may be barely kept in without scalding, at which temperature it must be constantly kept—Twigs are then to be stirred about in the vessel till a sufficient number of fibres is caught to make the thread you wish; and as the fibres break they are to be renewed, so as to keep the thread even. In this manner the silk may be reeled off with a common reel, and afterwards twisted in the manner required, by a common spinning wheel. After this, it should be boiled four or five hours in soap and water, and rinsed with clear water, to discumber it of the *gum*, which naturally adheres to it. The silk is now ready for use, and may be dyed any colour to suit the consumer.

In this report, the committee have not aimed to make an elaborate or novel treatise on the cultivation of the mulberry, or the rearing of the silk-worm; but merely to exhibit, in plain language, the more general and important directions in relation to those subjects, for the aid of the farmer and beginner, who may desire to embark, on a limited scale, in this, to our country, new and profitable branch of business. Other more minute rules will be easily learned by experience, and others of a more nice and more abstruse character, may be gathered from books written upon the subject in other countries.

B. DRAKE,
E. D. MANSFIED,
CHARLES FOX, } *Committee.*

Young Men's Department.

THE PLEASURES AND ENJOYMENTS CONNECTED WITH THE PURSUIT OF SCIENCE.—*Continued from page* 35.)

With the help of his microscope he can enter into a world unknown to the ignorant, and altogether invisible to the unassisted eye. In every plant and flower which adorns the field, in every leaf of the forest, in the seeds, prickles, and down of all vegetables, he perceives beauties and harmonies, and exquisite contrivances, of which, without this instrument, he could have formed no conception. In every scale of a haddock he perceives a beautiful piece of net-work, admirably contrived and arranged, and in the scale of a sole a still more diversified structure, which no art could imitate, terminated with pointed spikes, and formed with admirable regularity. Where nothing but a speck of *mouldiness* appears to the naked eye, he beholds *a forest of mushrooms* with long stalks, and with leaves and blossoms distinctly visible. In the eyes of a common fly, where others can see only two small protuberances, he perceives several thousands of beautiful transparent globes, exquisitely rounded and polished, placed with the utmost regularity in rows, crossing each other like a kind of lattice-work, and forming the most admirable piece of mechanism which the eye can contemplate. The small dust that covers the wings of moths and butterflies, he perceives to consist of an infinite multitude of feathers of various forms, not much unlike the feathers of birds, and adorned with the most bright and vivid colours. In an animal so small that the naked eye can scarcely distinguish it as a visible point, he perceives a head, mouth, eyes, legs, joints, bristles, hair, and other animal parts and functions, as nicely formed and adjusted, and endowed with as much vivacity, agility, and intelligence, as the larger animals. In the tail of a small fish, or the foot of a frog, he can perceive the variegated branching of the veins and arteries, and the blood circulating through them with amazing velocity. In a drop of stagnant water he perceives thousands of living beings, of various shapes and sizes, beautifully formed, and swimming with wanton vivacity like fishes in the midst of the ocean. In short, by this instrument he perceives that the whole earth is full of animation, and that there is not a single tree, plant, or flower, and scarcely a drop of water, that is not teeming with life, and peopled with its peculiar inhabitants. He thus enters, as it were, into a new world, invisible to other eyes, where every object in the animal, vegetable, and mineral kingdoms presents a new and interesting aspect, and unfolds beauties, harmonies, contrasts, and exquisite contrivances, altogether inconceivable by the ignorant and unreflecting mind.

In the invisible atmosphere which surrounds him, where other minds discern nothing but an immense blank, he beholds an assemblage of wonders, and a striking scene of Divine Wisdom and Omnipotence. He views this invisible agent not only as a *material* but as a *compound* substance—compounded of two opposite principles, the one the source of flame and animal life, and the other destructive to both, and producing by their different combinations, the most diversified and beneficial effects. He perceives the atmosphere, as the agent under the Almighty, which produces the germination and growth of plants, and all the beauties of the vegetable creation—which preserves water in a liquid state—supports fire and flame, and produces animal heat, which sustains the clouds, and gives buoyancy to the feathered tribes—which is the cause of winds—the vehicle of smells—the medium of sounds—the source of all the pleasures we derive from the harmonies of music—the cause of that universal light and splendor which is diffused around us, and of the advantages we derive from the morning and evening twilight. In short, he contemplates it as the prime mover in a variety of machines—as impelling ships across the ocean, blowing our furnaces, grinding our corn, raising water from the deepest pits, extinguishing fires, setting power-looms in motion, propelling steam-boats along rivers and canals, raising balloons to the region of the clouds, and performing a thousand other beneficent agencies without which our globe would cease to be a habitual world. All which views and contemplations have an evident tendency to enlarge the capacity of the mind, to stimulate its faculties, and to produce rational enjoyment.

Again,—the man of knowledge, even when shrouded in darkness, and in solitude, where other minds could find no enjoyment, can entertain himself with the most sublime contemplations. He can trace the huge globe on which we stand flying through the depth of space, carrying along with it its vast population, at the rate of sixty thousand miles every hour, and, by the inclination of its axis, bringing about the alternate succession of summer and winter, spring and harvest. By the aid of his telescope he can transport himself towards the moon, and survey the circular plains, the deep caverns, the conical hills, the lofty peaks, the shadows of the hills and vales, and the rugged and romantic mountain scenery which diversify the surface of this orb of night. By the help of the same instrument he can range through the planetary system, wing his way through the regions of space along with the swiftest orbs, and trace many of the physical aspects and revolutions which have a relation to distant worlds. He can transport himself to the planet Saturn, and behold a stupendous ring, 600,000 miles in circumference, revolving in majestic grandeur every ten hours around a globe nine hundred times larger than the earth, while seven moons, larger than ours, along with an innumerable host of stars, display their radiance, to adorn the firmament of that magnificent world. He can wing his flight to the still more distant regions of the universe, leaving the sun and all his planets behind him, till they appear like a scarcely discernable speck in creation, and contemplate thousands and millions of stars and starry systems, beyond the range of the unassisted eye, and wander among suns and worlds dispersed throughout the boundless dimensions of space. He can fill up, in his imagination, those blanks which astronomy has never directly explored, and conceive thousands of systems and ten thousands of worlds, beyond all that is visible by the optic tube, stretching out to infinity on every hand,—new creations incessantly starting into existence—peopled with intelligences of various orders, and all under the superintendence and government of the "King Eternal, Immortal, and Invisible," whose power is omnipotent, and the limits of his dominions past finding out.

It is evident that a mind capable of such excursions and contemplations as I have now supposed, must experience enjoyments infinitely superior to those of the individual whose soul is enveloped in intellectual darkness. If substantial happiness is chiefly seated in the mind, if it consists in the vigorous exercise of its faculties, if it depends on the multiplicity of objects which lie within the range of its contemplation, if it is augmented by the view of scenes of beauty and sublimity, and displays of infinite intelligence and power, if it is connected with tranquility of mind, which generally accompanies intellectual pursuits, and with the subjugation of the pleasures of sense to the dictates of reason—the enlightened mind must enjoy gratifications as far superior to those of the ignorant, as man is superior in station and capacity to the worms of the dust.

In order to illustrate this topic a little further, I shall select a few facts and deductions in relation to science which demonstrate the interesting nature and delightful tendency of scientific pursuits.

Every species of rational information has a tendency to produce pleasing emotions. There is a certain gratification in becoming acquainted with objects and operations of which we were formerly ignorant, and that, too, altogether independent of the practical tendency of such knowledge, of the advantages we may expect to reap from it, or the sensitive enjoyments with which it may be accompanied. A taste for knowledge, a capacity to acquire it, and a pleasure accompanying its acquisition, form a part of the constitution of every mind. The Creator has implanted in the human mind a principle of curiosity, and annexed a pleasure to its gratification to excite us to investigations of the wonders of creation he has presented before us, to lead us to just conceptions of his infinite perfections, and of the relation in which we stand to him as the subjects of his government. We all know with what a lively interest most persons peruse novels and romances, where hair-breadth escapes mysterious incidents, and tales of wonder are depicted with all the force and beauty of language. But the scenes detailed in such writings produce only a momentary enjoyment. Being retraced as only the fictions of a lively imagination, they pass away like a dream or a vision of night, leaving the understanding bewildered and destitute of any solid improvement. In order to improve the intellectual faculties while we gratify the principle of curiosity, it is only requisite that we direct the attention to *facts* instead of fictions; and when the *real scenes* of the universe are presented in an interesting aspect, they are calculated to produce emotions of wonder and delight even superior to those excited by the most highly-wrought tales of fiction and romance. The following facts and considerations will perhaps tend to corroborate this position.

In the first place, *the number of effects produced by a single principle in nature* is calculated to excite emotions of admiration and delight. From the simple principle of *gravitation*, for instance, proceed all the beauties and sublimities which arise from the meandering rills, the majestic rivers, and the roaring cataracts—it causes the mountains to rest on a solid basis, and confines the ocean to its appointed channels—retains the inhabitants of the earth to its surface, and prevents them from flying off in wild confusion through the voids of space—it produces the descent of the rains and dews, and the alternate flux and reflux of the tides—regulates the various movements of all animals—forms mechanical powers—gives impulsion to numerous machines—rolls the moon round the earth, and prevents her from flying off to the distant regions of space—extends its influence from the moon to the earth, from the earth to the moon, and from the sun to the remotest planets, preserving surrounding worlds in their proper courses, and connecting the solar system with other worlds and systems in the remote spaces of the universe. When a stick of sealing wax is rubbed with a piece of flannel, it attracts feathers or small bits of paper; when a long tube of glass, or a cat's back, is rubbed in the dark, it emits flashes of fire, accompanied with a snapping noise. Now, is it not delightful to a rational mind to know, that the same principle which causes wax or amber to attract light substances, and glass tubes or cylinders to emit sparks of fire, produces the lightnings of heaven and all the sublime phenomena which accompany a violent thunder-storm, and, in combination with other agents, produces also the fiery meteor which sweeps through the sky with its luminous train, and the beautiful coruscations of the aurora borealis? There are more than fifty thousand different species of plants in the vegetable kingdom, all differing from one another in their size, structure, flowers, leaves, fruits, mode of propagation, internal vessels, medicinal virtues, and the odors they exhale. Who would imagine that this immense assemblage of vegetable productions which adorns the surface of earth in every clime, with such a diversity of forms, fruits and colours, and the result of the combination of four or five simple substances variously modified by the hand of the Creator? Yet it is an undoubted fact ascertained from chymical analysis, that all vegetable substances, from the invisible mushroom which adheres to a spot of mouldiness, to the cedar of Lebanon and the banian-tree, which would cover with its shade an army of ten thousand men—are solely composed of the following natural principles—caloric, light, water, air, and carbon.

Again, is it not wonderful that the invisible atmosphere should compress our bodies every moment with a weight of more than 30,000 pounds without our feeling it, and the whole earth with a weight of 12,043,468,800,000,000,000 *pounds*, or five thousand billions of *tons*; that this pressure is essentially necessary to our existence, and that a small quantity of air within us, which would not weigh above a single ounce, by its strong elastic force counteracts the effects of this tremendous pressure upon our bodies, and prevents our being crushed to pieces—that the same cause prevents our habitations from falling upon us and crushing us to death, without which our glass windows would be shattered to atoms, and our most stately edifices tumbled into ruins?—that this atmosphere is at the same time performing an immense variety of operations in nature and in art—insinuating itself into the pores and sap-vessels of plants and flowers—producing respiration in all living beings, and supporting all the processes of life and vegetation throughout the animal and vegetable creation—that its pressure produces the process of what is called *suction* and *cupping*—causes snails and periwinkles to adhere to the rocks on which they are found—gives effect to the adhesion of bodies by means of mortar and cement—raises water in our forcing-pumps and fire-engines—supports the quicksilver in our barometers—prevents the water of our seas and rivers from boiling and evaporating into steam—and promotes the action of our steam-engines while raising water from deep pits, and while propelling vessels along seas and rivers?

In the next place, science contributes to the gratification of the human mind *by enabling us to trace, in many objects and operations, surprising resemblances, where we should least of all have expected them.* Who could at first sight, imagine that, the process of breathing is a species of combustion, or burning—that the diamond is nothing else than *carbon* in a chrystalized state, and differs only in a very slight degree from a piece of charcoal—that water is a compound of two invisible airs, or gases, and that one of these ingredients is the principle of flame!—that the air which produces suffocation and death in coal mines and subterranean grottos, is the same substance which gives briskness to ale, beer, and soda water, and the acid flavor to many mineral springs—that the air we breathe is composed of the same ingredients, and nearly in the same proportions, as nitric acid or aquafortis, which can dissolve almost all the metals, and a single draught of which would instantly destroy the human frame—that the colour of *white* is a mixture or compound of all the other colours, *red*, *orange*, *yellow*, *green*,, *blue*, *indigo* and *violet*, and consequently, that the white light of the sun produces all that diversity of colouring which adorns the face of nature—that the same principle which causes our fires to burn, forms acids, produces the rust of metals, and promotes the growth of plants by night—that plants breathe and prespire as well as animals—that carbonic acid gas, or fixed air, is the product both of vegetation, of burning, of fermentation, and of breathing—that it remains indestructible by age, and in all its diversified combinations, still preserves its *identity*—that the air which burns in our street-lamps and illuminates our shops and manufactories, is the same which causes a balloon to rise above the clouds, and likewise extinguishes flame when it is immersed in a body of this gas—that the leaves of vegetables which rot upon the ground, and appear to be lost forever, are converted by the oxygen of the atmosphere into carbonic acid gas, and this *very same carbon* is, in process of time, absorbed by a new race of vegetables, which it clothes with a new foilage, and again renews the face of nature—and that the same principle which causes the sensation of *heat* is the cause of fluidity, expands bodies in every direction, enters into every operatiou in nature, flies from the sun at the rate of 195,000 miles in a second of time, and by its powerful influence, prevents the whole matter of the universe from being converted into a solid mass!

What, then, can be more delightful to a being furnished with such powers as man, than to trace the secret machinery by which the God of nature accomplishes his designs in the visible world, and displays his infinite power and intelligence—to enter into the hidden springs of nature's operations, to follow her through all her winding recesses, and to perceive from what simple principles and causes the most sublime and diversified phenomena are produced! It is with this view that the Almighty hath set before us his wondrous works, not to be overlooked, or beheld with a "brute unconscious gaze," but to be investigated, in order that they may be admired, and that in such investigations we may enjoy a sacred pleasure in contemplating the results of his wisdom and intelligence.—*Dick.*

Pleasure.—Neither is it enough to avoid sloth; you must likewise fly the excesses of that enchantress, pleasure. Pleasure, when it becomes our business, makes business a torment; and it is as impossible to pursue both, as to serve God and Mammon. You may perhaps think this lesson hard to learn; but it is nevertheless the reverse of the prophet's roll; and, if bitter in the mouth, is sweet in the belly.

To explain ourselves more fully on this head; do not imagine we mean by this, that though you must live by the sweat of your brow, you must not reap the harvest of your own labors. No man exacts it of you, nor would nature submit to the ungrateful dictate, if he did. We speak only of pernicious or unlawful pleasures, such as are commonly ranged under the word intemperance, such as prey on the body and purse, and in the end destroy both.—*Young Man's Own Book.*

Temperance.—But, that your integrity may be permanent, it must be founded on the rock of temperance. First, therefore, banish sloth, and an inordinate love of ease; active minds only being fit for employments, and none but the industrious either deserving, or having a possibility to thrive; which gave occasion to Soloman to exclaim, "The sluggard shall be clothed with rags; because he cries, Yet a little more sleep, a little more slumber!" But the folly of sleeping away one's days, is obvious to the dullest capacity, it being so much time abated from our lives, and either returning us into a like condition with what we were in before our births, or anticipating that which we may expect in the grave. In short, sleep is but a refreshment, not an employment; and while we give way to the pleasing legarthy, we sacrifice both the duties and employments of our being. —*Ib.*

Excess.—Excess is a deceitful evil, that smiles and seducess, enchants and destroys. Fly her very first appearance, then: it is not safe to be within the glance of her eye, or sound of her voice; and if you once become familiar with her, you are undone. Let us further add, that she wears a variety of shapes, and all pleasing; all accomodated to flatter our appetite and inflame our desires.

To the epicure she presents delicious banquets; to the bacchanal, store of exquisite wines; to the sensualist, his seraglio of mistresses; to each, the alurement he is most prone to; and to all, a pleasing poison, that not only impairs the body, but stupifies the mind and makes us bankrupts of our lives, as well as our credits and estates.—*Ib.*

THE CULTIVATOR—JUNE, 1834.

TO IMPROVE THE SOIL AND THE MIND.

SANDY LANDS NEAR ALBANY.

That so large a portion of the sandy land near Albany, the capital of the State, should be left waste and uncultivated, is to the stranger a matter of surprise, and to the citizen a cause of regret. In travelling west as far as Schenectady one way, or for a few miles on the western turnpike on the other, the eye is pained with the general appearance of waste and barrenness with which it is surrounded. The destruction of timber, which has left nothing but a few stinted pines, the continuous route of sand and sand-hills, the few enclosures one meets with, and the slovenly manner in which those enclosures have been made and the fields cultivated, show either that the soil does not admit of profitable cultivation, or that the owners of the land are too lazy or not competent to give it the opportunity. That the nature of the soil is entirely unsusceptible of cultivation, is contradicted by the fact that here and there industrious and enterprising men have made good farming investments, and are now beginning to realize a proportionate return. The example of these men show that even this land may be converted into good farms, and that industry and intelligence will ultimately accomplish it. Land so near to a good market, where its productions are so much called for, ought not to be permitted to lie waste. It is a reflection upon the whole community that thousands of acres are left in a state of worse than nature, because hitherto man has done little else than purloin and destroy the timber, its only production. I assume it as an established fact, that this land may be profitably cultivated. The success that has attended the few examples alluded to, is sufficient proof of it, and if even these examples in that location were wanting, similar soils have been most successfully cultivated elsewhere. So long have we been satisfied of this fact, that as early as 1815, we made application to the agent of the owner for the purchase of the fee simple of 1,000 acres of what, from general appearances at that time, we presumed was thought almost valueless. Obstacles, however, intervened, and a purchase was not consummated; but our opinion formed of the capacity of this soil at that time, has not changed by subsequent experience, and we hope the time will soon come that will bring all this land under the use of the plough; that time, however, cannot soon come, unless the fee simple of the soil is parted with. Men will not buy land that at present produces nothing, which is apparently useless to the owner, and will cost much to the occupant to improve for the ultimate benefit of others. They must have the encouraging thought, that what they expend upon it is for their own or their children's benefit, and the course of improvement consequently adopted, will be such as to give permanent value to their labors and wealth to society. The cultivation of these lands, from their nearness to, would be extremely beneficial to Albany. It would make a residence there more desirable—property more valuable—afford employment to its poor population, and ensure the most extensive as well as varied collection of vegetable productions. This is the kind of soil that wants intelligence and enterprise to cultivate it successfully. Your hum-drum farmer will not do here. He must be willing to expend as well as to receive if he expects to prosper, and the evidences of his success will soon be seen in the appearance of his fields. Upon a rich soil any one can farm successfully if he is only industrious—there nature has done all, and, like his ox, he has only to labor and live—but not so here, nature at present looks unpropitious, all the improvements of husbandry must be called to our aid, and in time stertility will be turned into fruitfulness, and what is now waste, into profitable culture. The bare and low sand-hills that occasionally show themselves when the wood is removed, give a desert appearance to the land; they are not very numerous, but sufficiently so to repel an ordinary purchaser. Could these hills be brought under cultivation it would be a great desideratum—of these knolls, however, I do not despair. In the first place the wood upon them ought to have been suffered to remain; but where they have been already cleared, and clover and plaster applied in the ordinary way, and will not cover them with vegetation because the sand is too loose to permit the clover to remain long enough to take root, other means ought to be brought into use to effect the purpose. What the sand wants is adhesion, that the high winds do not shift it. The remedy for this looseness of texture is to create a vegetable mould, and to effect this, after sowing it with a spring crop, and a mixture of clover, timothy, with subsequently plaster, we would cover these knolls with straw raised in the valleys and saved for that purpose; they are not so numerous and large on a farm, but this may be easily done, for the intervening spaces between these hillocks of sand would now yield an abundance of it for that purpose. The straw once applied, and it is done without much expense or labor, would not only keep the sand from shifting, but would materially aid the succeeding crop; a sward once obtained, ought to be permitted to remain for some time, for the future cohesion of the soil would be much aided by the thousand decomposing fibrous roots of the grass. Where straw for a covering could not be obtained, I would suggest whether lime, incorporated with the soil by being put in with a crop, would not form a chemical combination with the sand, (as it does if you please, in mortar,) enough after the first rain to make it adhere sufficiently for the purpose of cultivation. Lime would likewise act as a valuable manure, and when applied with unfermented stable dung, aid very much to obtain the desired object. Again, wood ashes, by the alkali in them may be most usefully applied—on these sands they would, in our opinion, be invaluable—acting chemically on the sand and stimulating its vegetable productions, they would soon cover it with a growth that would prevent the wind from agitating its surface, if not make that surface more cohesive. Providence has, however, placed a remedy within the reach of every settler, and that is, as this has a substratum of clay, draw a little of this upon the bleak places, and by its intermingling with the sand, it will be sure to give the soil sufficient firmness to secure vegetation. To a practical and intelligent farmer located there, many remedies would suggest themselves to obviate the difficulty, and that once overcome, from the abundance of water running between these hillocks, and the fertility of the little and numerous valleys, this land to the grain farmer would be particularly desirable. This soil now will not bear frequent cropping. It appears to be this kind of farming on those places from which the stinted pines have been removed, that has so much injured it in the estimation of a prudent man, for every thing like vegetable remains has been abstracted from it, and left nothing but a bed of loose and drifting sand. Each grain crop ought to have been succeeded by a covering of grass until sufficient tilth was given to it to admit of successive grain, corn, or root crops. Were we to clear up a piece of this ground for cultivation, on the first, which would be a crop of wheat, (as we think it would bear it,) we would at once sow in the spring, clover, timothy and plaster. The few bushes and roots that might be left after a first ploughing, in places where the soil is very sandy, would be a sufficient protection against the influence of the winds. It should lie to grass one or two years, according to circumstances, then plough again, put in a spring crop and seed immediately again to grass, and so cultivate until there was a sufficient vegetable mould created to give cohesion to the soil, and leave nutriment enough in it to bring any crop to perfection. This soil, when brought into a proper state, is considered admirably adapted to turnips. The root culture will, in process of time, be a source of great profit, and come in as a necessary rotation, The county of Norfolk, in England, is said to contain 140,800 acres of light sand—formerly this was considered useless, but within the last fifty years it has been brought under the most successful and profitable husbandry, and is now one of the best, least expensive and most sought after tracts that an English farmer can settle on. If we adopt their management, making due allowance for the influence of climate, this land near Albany will soon be as valuable as theirs. A.

ON THE CULTURE OF CLOVER,

Few things have contributed more largely to the modern improvement of husbandry, than the introduction of clover, in connexion with the rotation of crops. This plant serves to ameliorate and fertilize the soil, and at the same time it affords an abundance of wholesome food for every description of farm stock. Whether cut for winter stores, for soiling in the yard, or fed off by stock, but few crops surpass it in the quantity of cattle food which it affords.—Although cultiuated in Holland and Flanders from an early period, with great advantage, it was not introduced into Great Britain till the 16th century. At present, clovers enter largely into the succession of crops there, on all soils, and in every productive course of management. They were principally instrumental in giving to Flanders its high celebrity, as an agricultural country, greatly in advance, in improvement, of the states around it. The clover system has converted some of the poorest districts in England into the most productive and profitable. In the United States it is comparatively of recent introduction; and even at this day its benefits are but partially appreciated or applied as they ought to be. In connection with gypsum, clover first became a subject of notice and culture in the counties about Philadelphia, and in the county of Dutchess, some forty years ago; and we are much indebted to the example and writings of Chancellor Livingston, Judge Peters, and other gentlemen of learning, wealth and enterprize, for the improvement and wealth which it has conferred on our land. Many of our farmers have yet much to learn, before they can realize the full benefits which it is capable of affording in the profits of the farm. Although botanists enumerate nearly fifty species of the clover family, our present remarks are intended to apply merely to the common red kind (*trifolium pratense.*)

There are three faults in the management of clover which we design briefly to notice, in reference to alternate husbandry. These are,

1. *Too little seed is usually sown.* The object of the clover crop is to procure a cheap food for animals and plants. Few if any crops surpass it in the quantity which it affords of these,—and few exhaust the fertility of the soil less. One farmer sows four or six pounds of seed to the acre, and gets in return a thin but coarse crop of hay or pasture. Another sows ten to fourteen pounds, obtains double the burthen of the first, and at a trifling extra expense of less than a dollar to the acre for seed, while his land is doubly benefitted by the green crop to be ploughed in. From ten to fourteen pounds of seed shuold be sown to the acre, whether the object be to benefit the stock or the land. The product will be somewhat in the ratio of the seed sown; and the advantages of heavy stocking, both in the hay and to the soil, will far out balance the cost of the extra seed.

2. *Clover lays are permitted to remain too long before they are brought under the plough.* The common clover is a biennial, or at most a triennial plant; and if not ploughed under before the third year, its advantages to the soil, as a green crop, are mostly or wholly lost; while after the second year, it adds very little to the crop of hay. But if turned under the first or second year, it furnishes to the soil a great quantity of vegetable matter, the true food of plants. It not only serves as manure, but it benefits mechanically. Its tap roots penetrate and divide the soil, and, as they decay, render it friable, and permeable to heat, air, and moisture. A well set clover lay imparts to the soil as much benefit, in our opinion, as ten loads of yard manure to the acre. When a broadcast crop is to be followed by a tillage crop, as corn, potatoes, or small grain, there is manifestly a decided advantage in stocking it with clover, though it is to be turned under the ensuing fall or spring. We estimate its value, as manure, to say nothing of the pasture it affords, at from five to ten dollars per acre, while the cost of the seed does not ordinarily exceed one dollar. I have rye and clover, upon a piece of poor sandy land, for which I had no manure to spare, three years in succession, with manifest advantage.

3. *The common method of curing clover hay is bad.*—The object to be obtained is, to cure the hay in the *cheapest* and *best* manner.—The common practice of spreading clover from the swath, causes the leaves and blossoms to dry and crumble, ere the haulm or stocks are sufficiently cured. Thus either the finer parts of the hay are lost, or the crop is housed with so much moisture, as to cause it to heat, and often to spoil. Clover should only be spread when it has become wet in the swath, and should be gathered again before the leaves dry and crumble. Both these evils may be avoided, and labor saved withal, by curing the grass wholly in swath and cock.—After experiencing the serious disadvantages of the old method, I adopted the one I am about to recommend, and have pursued it satisfactory ten or a dozen years. My practice has been, to leave the

clover to wilt in the swath, and when partially dried, either to turn the swaths, or to make grass cocks the same day, so as to secure the dried portions from the dew. That which is not put into cocks the first day, is thus secured the second day, or as soon as it has become partially dried. These grass cocks are permitted to stand one, two or three days according as the weather is, and as the curing process has progressed, when they are opened at nine or ten o'clock on a fair dry, the hay turned over between eleven and three, and soon after turning gathered again for the cart. Thus cured the hay is perfectly bright and sweet, and hardly a blossom or leaf wasted. Some care is required in making the cocks. The grass is collected with forks and placed on dry ground, between the swaths, in as small a compass as convenient at the base, say two or three feet in diameter, and rising in a cone to the heighth of four or five feet.

The advantage of this mode of curing clover are.

1. The labor of spreading from the swath is saved.
2. The labor of the hand rake is abridged, or may be wholly dispensed with, if the horse rake is used to glean the field when the hay is taken off—the forks sufficing to collect it tolerably clean in the cocking process.
3. It prevents, in a great measure, injury from dew and rain—for these cocks, if rightly constructed, (not by rolling) will sustain a rain of some days—that is, they have done this with me,—without heating or becoming more than superficially wet.
4. Clover hay made in this way may almost invariably be housed in good condition; and if rain fails after the grass is mown, the quality of the hay is infinitely superior to what it would be under the old process of curing.

The *rationale* is this: The outside of the clover parts with much of its moisture while in swath; and what is called sweating, in cock, is merely the passage of moisture remaining in the succulent stocks, to their exterior, and to their leaves and blossoms—it is a diffusion—an equalization of the remaining moisture in the cock.—When this has taken place, evaporation is greatly facilitated, and the whole mass acquires a uniform dryness, on opening the cocks to the influence of the sun and winds, if too long an exposure is guarded against. Evaporation progresses in the cocks, after the hay is gathered for the cart, and during the operation of loading and unloading. B.

RUTA BAGA—OR SWEDISH TURNIP.

The turnip culture is beginning to arrest the attention of our husbandmen, and it will acquire new interest as its advantages come to be better appreciated, and its practice better understood. Its introduction into Britain forms one of the most important eras in the improvement of British husbandry; and its introduction into our country will ultimately prove highly beneficial. Of the various species of the turnip, the ruta baga is decidedly superior for the nutritious properties which it possesses, and for its hardy late keeping qualities. Having had some years experience in its culture, we submit the following considerations as the result of our practice.

The *soil* best adapted to the Swedish turnip is one of loose texture and dry, inclining to sand, gravel or loam. It should be rich, well pulverized and clean. A clover ley, covered with yard manure previous to its being ploughed under, is to be preferred.

The *preparation* for the crop consists in one perfect ploughing, if a ley, a faithful harrowing, and the roller may be applied between the ploughing and harrowing, with benefit.

The *season* for *sowing* is from the 25th June to the 5th July. A cutting of early clover may be first taken off the ground.

The best *method of sowing* is with the drill barrow, an implement which costs ten to twelve dollars, and which comes in use for other purposes, in drills two and a half feet apart. With this a man will put in four or five acres a day. The crop may also be sown broadcast, or drilled in with a line and hoe, though the operation is more tedious, and when sown broadcast, the expense of cleaning and thinning materially increased.

The *quantity of seed* requisite for the acre is one pound—cost six to eight shillings—though if well drilled, half this quantity will suffice.

The *after culture* consists in thinning the plants and keeping the crop free from weeds. The plants should be thinned to eight or ten inches, as soon as they show their second or third pair of leaves, and it is important to have the first weeding performed early, as this not only benefits the crop, but saves subsequent labor.

The *implements* best adapted to the turnip culture are the cultivator, or horse hoe, and turnip hand hoe. The first is passed between the drills as soon as the plants show their second pair of leaves, and may be repeated at intervals with little expense and manifest advantage. It destroys the weeds, if applied in time, except on a strip of two or three inches where the plants grow, pulverizes the surface, and renders the soil permeable to atmospheric and solar influence. The operation of cleaning is finished with the hand hoe, the cutting part of which may be likened to the blade of a thin case knife, the two extremities of which are drawn out, turned up, united, and form the shank to attach the hoe to the handle. The advantages of this hoe are, that it does not gather the dirt and weeds, and may be drawn along the drills as far as the arms extend without being raised, and across the drill, between the plants to be retained, and almost wholly supersedes hand weeding. Two cleanings with the hoe generally suffice.

Gathering the crop is performed with the greatest economy of labor, by drawing the turnips by hand, and laying them separately across the drills, the roots of two adjoining rows towards each other, and then with a heavy knife, bill-hook, or like implement, strike off the tops with a blow as they lay, which is managed with great expedition. The roots are first gathered, and taken to the pit or cellar, and the tops, which are abundant, are then raked into small heaps, and taken to the yard for the farm stock as they are wanted.

To secure for winter, pits are made in the field, upon dry ground, two and a half feet broad, and as long as may be convenient, and of two to four feet in depth. These are filled, and the roots piled above the surface, in a roof-like form, till they terminate in a ridge. A slight covering of straw is then given, and the whole covered with earth, two feet or more in depth. A salutary precaution is then to make holes, with a bar, at intervals of three or four feet, upon the ridge, through the covering, that the rarified air which will be generated may escape. This may be partially closed with a wisp of straw. Another precaution is to cover the mound with a coat of yard manure early in December, the better to exclude the frost.

The product, under good mangement and on a suitable soil, is seldom less than six hundred bushels per acre, and often much more, of roots, besides a heavy burthen of tops, of which neat cattle are very fond.

Use.—This turnip is far more nutritious than the common turnip, keeps much longer, and is greedily devoured, cooked or raw, by horses, cows, sheep and hogs; and is withal a very excellent vegetable for the table, particularly from January to June. We are still feeding to cows and oxen (May 23) of the crop of last year. Our cows have ate them daily for nine weeks, and yet the turnip taste has not been perceptible either in their milk or butter—*the cows having daily access to salt.* To the sheep husbandman this root will be found peculiary serviceable, if fed to his flock in winter and spring, particularly ewes with lamb.

Of all root crops, if we except the common turnip, this is the least exhausting, occupies the ground the shortest time, is cultivated with the least expense, is saved with the least care, and we think makes the greatest return in food for animals.

THRASHING MACHINES.

Within a few years these instruments have come into use in this section of the country, and they have in a great measure superseded the old mode of thrashing by the flail or with horses. They have their advantages and disadvantages, but are upon the whole, useful instruments. I have seen tried a variety of different kinds, but the farmers here have settled down to the use of two kinds—one invented here, and called "the Vosburgh machine," for which a patent has never been obtained, but is nevertheless a good machine—and the other is "Allen's patent thrashing machine." Vosburgh's is a cylinder, working horizontally over a concave, and in both are teeth; the horse power is fixed and permanent. Allen's is likewise a cylinder and concave, and both are likewise armed with teeth.—The teeth are so set that in the turning of the cylinder, they pass between those in the concave, and the straw, with the grain in, is shoved in between them and carried through by the motion of the cylinder; the grain is thus separated from the straw. The cylinder is much smaller than Vosburgh's—the horse power is differently constructed, and portable, so that the machine, when in use, is only slightly fastened to the barn floor. It may, together with the horse power, be carried from barn to barn. The cost of a machine, requiring the power of two horses to use it, is from $70 to $80, finished and complete for thrashing. For those requiring one horse power, the price is less, and for those requiring the strength of three horses, the pricee is proportionately increased.

Both of the machines above spoken of do their business well and with despatch, but the preference is generally given to Allen's. It is certainly an excellent instrument, and is extensively used. It thrashes quick and clean, and I think promises to be durable. I found that my men would thrash out 100 sheaves with it in from 10 to 15 minutes, and remove the straw; but the machine was stopped when the 100 sheaves were thrashed, to clean up the floor and to throw more from the mow. This last operation took up as much time as the thrashing. With a sufficiency of hands and a relief of horses, I think from 1,500 to 2,000 sheaves of wheat or oats might be thrashed during a day, and not hurry much—but in any event, hurry or not, the grain would be thrashed clean: if there was loss it would be in the carelessness of the men, in not raking out the straw carefully. If the machine is not too much hurried, the work is not hard for two horses, as mine seldom sweat; but they were always rested at the end of thrashing 100 sheaves. There can be no complaint that the machine does not work fast enough. The greatest labor is to remove and house the straw. To thrash off your grain as quick as you are enabled to, is one of the disadvantages of a machine; the straw is, in a measure, wasted, scattered and lost, and the farmer finds that he is minus at the end of the year several loads of manure. By slow thrashing this is avoided; then it is gradually thrown into the barn yard, becomes soaked with offals, and trod under foot by the cattle—the consequence is a good rich bed of manure at the end of the year. It is not so when the crop is thrashed off at once in the fall. The large quantity of straw collected in heaps around the barn is too often suffered to remain as it is thrown out, and becomes rotten straw, but not good manure. If some better plan of managing the straw to convert it into manure is not adopted, the introduction of thrashing machines will ultimately be an injury.

Another disadvantage inthe use of the thrashing machine is, that cattle do not eat the straw as readily as when the grain is thrashed out by the tread of horses; the machine beats off the blade and leaves the straw hard and stiff, and it is only when they can get nothing else that they will touch it. The farmer can obviate the difficulty of wasting his straw from thrashing his grain at once, by mowing it or scattering it carefully in his yard, and perhaps he can the second, by sprinkling it with salt, so that the cattle would eat it readily. These two objections overcome, and the thrashing machine is all that we could reasonably desire it. There is a great advantage in being enabled to get your grain to market in a short time; you can commonly obtain the highest price for it; and this to a farmer is an important consideration. For the last six years I have taken as accurate a note of this loss as possible, as in that time I have sometimes had a machine and sometimes not. My estimate would be 75 cents an acre for the size of my farm: at least it has operated so with me, and the loss has been, that when I have thrashed my grain in the ordinary way, the process was so slow that it was never ready for sale at the proper time, and sometimes, which is always bad policy, had to be kept over. The saving of time, to a farmer, is a great consideration, and is one of the great benefits he derives from the use of this instrument. When the spring comes he is then ready for the labor of the season; his old crop is entirely out of the way, and he can devote his whole time towards the attainment of another; besides, during the winter, from the time gained by the use of the thrashing machines, he has collected all the materials for his fencing and fire wood, done off all his chores, and his necessary visiting, so that during the summer season he can with ease keep ahead of his work, and have every thing done in due season—the gain in this way is at least equal to the gain in the increased price of the grain sold, so that he is twice paid for the cost of his thrashing machine. Such a man requires hire less during the season, and makes a saving that way, while at the same time he keeps his farm in the best possible order. The life of the farmer is at best a busy one, but when he gets behind his work, it is very slavish and unpleasant. So much for the advantages and disadvantages of the thrashing machine; but we will sum up and say it is upon the whole a decided improvement. A.

PASTURES.

It is now a well settled opinion, among good farmers, that lands, generally, cannot be profitably improved, for a course of years, either for meadow or tillage crops alone; but that the product and profits in both cases are materially increased, by changing from one to the other alternately. Constant tillage exhausts more than the manure of the farm can restore; while in the meadows the burthen of the hay annually diminishes, the soil becomes compact and hard, the benign influence of heat and air are partially excluded from it, the finer grasses run out, and their place is naturally usurped by moss and a stinted herbage. Besides, alternation seems to be among the primary laws of nature. We all know the importance of alternating our tillage crops; that a field will not carry the same grain, or kind of roots, two or more years in succession, without great expense in manuring, or constant diminution in product; and that meadows, after two or three years from being laid down manifestly decrease in their product.

The same law that renders alternation of grain and grass essential, applies with equal force to our pastures, although the opinion has prevailed, and with most persons is still popular, that old pastures are the best. To satisfy any farmer of the error of this opinion, let him appropriate an acre of old, and an acre of new pasture, recently laid down, to hay. If the land is of similar quality, he will find, that the new will give him two, three, and probably four times as much hay as the old. The same difference that we find in the hay, must exist in the pasture. The disparity appears not only in the quantity but in the quality and duration. From the soil being more permeable to heat and air, the active agents of vegetable decomposition and nutrition, the grass starts earlier in the spring, when in most demand, and continues to grow longer in autumn, in the new than in the old pasture. The plough and the harrow, and a change of crops, are as necessary to renovate pasture as they are to renovate meadow grounds. In noticing the modern system of Scotch farming in a recent work, we observed that on a farm of 500 acres, there was not an acre of grass, in pasture or meadow, which had been laid down more than two years.

As pertinent to the subject, we make the following extracts from a communication of Mr. Main, in the March No. of the Edinburgh Quarterly Journal of Agriculture. B.

"Struck, when a boy, with delight at the evergreen meadows of Doncaster, and the freshness, in the dead of winter, of the fields near London, I could not, in settling in the north, help contrasting these—with a feeling almost bordering on disgust—with our whity-brown *grass parks* of Scotland, wearing, in many places, a pale blue tint till the beginning of June, or puffed off in the newspapers, as affording "a full bite" in the middle of May. I said to myself, "cannot industry and exertion produce a change in our grass lands? Perhaps we cannot expect to vie with Doncaster or London, but still something may be done.' So doffing the gay soldier's coat, and putting on the hodded grey, I set to work, to try if fine pasture could not be got in Scotland. Long did I toil at top-dressing,—all the never-failing, oft recommended recipes of this compound and that compound, I tried in vain,—peat-earth in all the varied shapes of mixture with lime and dung, soot, composts with scrapings of ditches or other matter—all these I tried in various ways. I exhausted the pharmacopeia of agricultural quacks; and soon found out, that without the aid of plough and harrow, nothing could be done—in other words, that the ground must be put in *good heart* before you can have *good grass*.

"Well, that being done, I had fine grass; but it grew bad again; it was not fine *permanent pasture*. I had recourse, once more, to the old system of top-dressing, and of course improved the pasture, but again it fell off. By this time I had before my eyes the palpable fact, that new laid down grass was good, and that, do what I would, old grass could not be made to bring the same rent."

"It appears to me, that only on certain soils and situations, that pasture can be allowed to remain without great loss; that such situations are flat meadows, or the neighborhood of rivers or streams, rich in alluvial soil, and the natural habitat of the pasture plants, or in the vicinity of large towns, where manure has been applied till the ground could not bring a grain crop to maturity; and that on all other situations, recourse must be had to the plough, as soon as a failure in the grass crop takes place; and the breaking up will entirely depend on the quality of the land and manner in which it has been treated, there being no such true *unerring* guide to the *quality* of the land, as the length of time it can be profitably left in pasture."

"Little need be said on the unprofitableness of old pasture to the actual farmer. There is little old grass to be found on the farm of a man who has rent to pay. Have you never remarked the difference of rent that is given by a grazier or butcher, for a field of new and a field of old grass? Have you ever put the question to yourself, Why is this? I shall give you the answer: Let both fields be shut up and cut for hay, weigh the produce, see the great difference in favor of the new grass, and the secret is out. Still keep the cattle from the field; look at the new grass, how soon the aftermath springs! Well, then, is not the overplus of the hay that which would have fed so many more cattle? and yet people prate about old grass."

"Not only is the produce of an acre of new grass far greater than that of an acre of old, but it is more palatable to the cattle, and, as far as I have been able to observe, exactly in the ratio of the age of the grass. An example of this came lately under my eye: A tradesman occupied a field which he cultivated regularly—breaking up a bit, green cropping it the following year, and then sowing it down, after which he pastured it by wethering his beasts. The man having the place, I caused some hurdles (fence) to be put around the bit not in grass, and left the rest of the field in pasture. The cattle, during the whole of summer, ate the new grass to the very earth, and did not taste the older, until the force of hunger made them do so. Next season, the bit which had been hurdled off was sown out, and was allowed to go with the rest of the field. The very same thing took place—the new grass was first eaten, and then that which was older. I had an opportunity of observing last summer the marked preference which sheep give to young grass, compared with old, by putting cattle into two fields, separated by a fence only,—one very fine grass of some years standing, the other only three years old, and, pulling out some of the lower rails of a communicating gate, permitted forty sheep to pass through, and pasture in whichever field they pleased. The result was, they were constantly to be found in the field of younger grass, and very seldom went into the old grass enclosure. At last I was forced to shut them into the old grass, finding they were reducing the feed in the one, and leaving too much in the other. Be it always remembered that land must be well laid down. If grass, however new, be growing on poor land, or wet, or on land that has been badly cleared, cattle do not relish it. I have seen frequent instances of this. More particularly do they dislike pasturing on foul land."

"Having now broached the subject, I would not for the present at least, pursue it any further; but ere I take my leave, I would in the first place, state in corroboration of what I have been endeavoring to maintain, that by following the breaking up system instead of the top-dressing one, I have not only altered the verdure, but I have increased the rent of the old grass lawn on my farm from three to five fold. In conclusion, I would make a brief recapitulation of my sentiments: I maintain that except a few favored spots, as banks of rivers, &c. no ground can, without loss, be left long in pasture: that it appears to me four or five years is, generally speaking, the longest period land should be allowed to lie in grass; that if pasture be the object, at the end of that time, the ground should be broken up and returned to grass again. I maintain that *without grass* severely cropped land cannot be restored to full fertility; and *without cropping*, grass cannot be made to continue at the maximum point of utility and verdure."

Information wanted.—The inquiry is often made, where fine animals, new and improved farm implements, and rare and choice agricultural seeds, can be procured, and at what prices respectively. The Publishing Committee are desirous of collecting informations upon these subjects, with a view of publishing it, in a condensed form, in their September number of the Cultivator, in time to have it disseminated preparatory to the October fairs. And as the State Agricultural Society have appointed a State Cattle Fair to be held at Albany on the first Wednesday and Thursday of October next, they are also desirous of notifying buyers, before hand, through the Cultivator, of the choice animals, implements, and seeds, which will be offered for sale at said fair, and as far as practicable, the names of owners, and the prices which will be demanded. They invite information upon both these subjects any time before the 20th August; and as the information will be gratuitously published, it is hoped our correspondents will not subject us to the charge of postage.

Editors of newspapers will aid us in our object, and we think render an acceptable service to their customers, by inserting the preceding notice in their journals.

Old Apples.—Mr. Lewis Tucker, of Cummingham, Mass. has sent us three Roxbury russets, which have been kept through two winters and one summer,—*in dry sand.* The fruit was sound, and but little shrivelled, and had the freshness and flavor of last year's crop. Might not this mode of preserving winter apples and pears be adopted on a large scale with profit? It certainly might if they commanded the price here they do in the London market. The Gardener's Magazine for April quotes Newton pippins at 10, to 12s. ($2.22 to $2.86) per bushel—Nonpareils at 1l. to 2l. 10s. ($4.44 to $11.10.) per bushel, and pears at 4 to 6s. per dozen.

Young Farmers Associations.—We have received a letter from a young man in Decatur, who states that he is yet in his teens, soliciting our advice as to the formation of *a Young Farmers Society*, for mutual and self-instruction, which he and the neighboring youth are anxious to establish. The object is praiseworthy, and the zeal of our young correspondent is so highly commendable, that we consider it a duty and a pleasure to comply with his request.

The plan we would recommend is this: that the objects of the society be limited, for the present, to the procurement of an agricultural library, and to the discussion, at stated terms, during the winter months, of subjects of common interest, relating to the business of husbandry, or the relative and social duties of life. We will suppose that a district or neighborhood contains twenty young men who would be willing to associate—and we would fain believe this number, between the ages of fourteen and twenty-four years, would be found almost any where—and who would agree to contribute six cents a week to this object; their joint contributions would amount in a year to sixty-five dollars. The same contribution from ten, or of three cents a week from twenty, would give $32.50 per annum; and even this latter sum would suffice to purchase all the agricultural periodicals of our country, and to buy annually some of the standard works on husbandry. The three or six cents weekly, might, be *earned* by an hour or so of extra labor, or *saved* by curtailing some needless expense. The maple yields its sap only by drops, and yet its daily droppings soon amount to pails-full, and produce the sugar for our tables. The prudent employment of time and money is no less surprising and certain in its results and its benefits. These periodicals and books might be read in succession by every member of the association, and thus each individual would reap the full benefit of the contributions of the twenty; or in other words, by paying three dollars and a quarter a year, he might enjoy the perusal of sixty-five dollars worth of books and agricultural papers;—and from these he might learn the practices and management of the best farmers in every department of husbandry, and acquire by degrees, more or less knowledge of the principles, or science, upon which good farming is based. The hours of ordinary relaxation from labor would afford ample time for acquiring this knowledge, during the years of youth and incipient manhood; and every day's labor would serve to illustrate, and render it subservient to profit and pleasure. These hours of relaxation, applied to useful study, have often done more to inspire a laudable ambition, to improve the intellect, and to elevate humble worth, than an uninterupted habit of study. And our young friends may rely upon the fact, that this reading, accompanied by the good habits which it tends to beget and confirm, will as surely lead to pleasure and profit—to respectability and distinction—as the seed deposited in a well prepared soil will yield its accustomed increase. He that would gather a harvest in manhood, *must* sow the seed in youth.

Young men greatly err who suppose, and the error is but too common, that either a good reputation, or talent, or, I might venture to add, fortune, are hereditary, and descend from father to son as matters of course. Every young man has in a measure to fix the standard of these for himself. Parents may educate, may inculcate good habits, and may confer wealth—but after all, these are but the foundation—the superstructure of character,—be it for usefulness or sloth,—for virture or vice,—must be reared and receive its finish from the son himself. The richer the soil, the greater vigilance is required to keep it from weeds. What happens to the soil will happen to the mind: without culture it also will run to weeds.

Our young readers are doubtless familiar with the names of Franklin, Fulton and Rittenhouse, and know the pride with which their names are ever pronounced by Americans.—These, as regards fame and fortune, were self-made men. They all spent their youth in habitual labor, without wealth or influence, and with but the ordinary advantages of education; yet they found ample time to enrich their minds by study. They had no better prospects ahead than hundreds, and we hope thousands, of farmers' boys, who may read these remarks, save what was afforded them by a fixed resolve, to win and wear a good and great name. By study, industry and perseverance, they achieved their object; and they have left examples worthy the aspirations of our youth, however humble be their condition in life.

We are highly pleased with the suggestion which has drawn forth these remarks. We hope the plan may be matured and go into successful operation, and that other towns may be induced to adopt the example. Associations of this kind are not only calculated to make two blades of grass grow where but one grows now, but to raise the standard of our character for intellectual and moral worth. We intend, in behalf of the society whose interest we represent, to send our young correspondent the Cultivator; and should the association be matured, we shall feel bound to give a further evidence of our good wishes for its success. B.

"THE 'CULTIVATOR.'

"We have received the two first numbers of a new agricultural periodical, which will be issued monthly at Albany, New-York. It is published by the New-York State Agricultural Society, under the immediate direction of a committee of publication, composed of Messrs. J. Buel, J. P. Beekman and J. D. Wasson. Thus set on foot by the patronage of government, and sustained by editorial talents of the first order, and bestowed gratuitously, the "Cultivator" is furnished at the remarkably low price of fifty cents a year, or at twenty-five cents each for a subscription for twenty or more copies. The monthly sheet has sixteen pages large octavo. Its matter, so far, is good—and it cannot well be otherwise, while it has its present zealous and able conductors. We will take pleasure in receiving and transmitting subscriptions for this work.

"The price of this publication is fixed at this very low rate, for the purpose of inducing, if possible, every tiller of the soil in the state of New-York to buy, and to read it. This is a noble object—and the steps taken to reach it, cannot but have consequences highly useful to the agricultural community. But while this acknowledgment is made, and notwithstanding the high opinion expressed of the work, and the abilities of its conductors, we will venture to add our fears, that this good will be effected by the destruction of another of equal, if not of greater value—the excellent agricultural papers already established in the western part of N. York, by individual enterprise and capital, and which have rendered essential service to agriculture, at a very cheap rate—though not so cheap as to be able to compete with the *Cultivator*. It remains to be seen, whether this is the best mode of aiding the diffusion of agricultural knowledge, even putting aside the consideration of all losses of individuals. We are decidedly in favor of 'free trade'—and consider that it is as unjust, and as impolitic, for government to injure any employment of capital and industry, by competing with, and underselling individual laborers or traders, as it is to commit the more common error of enabling them to make exorbitant profits, by indirect bounties, or restraints which destroy fair and general competition.

"Besides—however great the amount of talent, zeal and influence with which the Cultivator is now conducted, it cannot be expected that such services are to be retained in steady operation, without the incentive of reward or emolumen . The conductors would be more than men, if they can toil without flagging, in so humble a vocation, merely from the impulse of patriotism. And if, indeed, they should become weary, it will take place after all the other agricultural papers of New-York have sunk, and the whole business of periodical instruction will be to re-construct.

"It may be thought that our fears are, in truth, for the Farmers' Register. This is not the case—for, though it may be mistaken, it *is* our opinion, that no periodical publication in New-York, can lessen the circulation of one in Virginia; nor can the latter injure one of the former. Any good agricultural journal, will be found instructive and useful to farmers of every other country; but still, the climate and system of husbandry of the state of New-York, differ so much from those of Virginia, that no such injurious competition can be maintained, no matter by what difference of price. On the contrary, the circulation of any such journal in a distant region, will increase the readers' inclination for similar supplies nearer home, and more generally suited to their wants. We should be pleased if the Cultivator could be seen and read by every farmer in Virginia: and believe, if such was the case, that but few subscribers of the Farmers' Register, would be thereby induced to give up the latter work—and very many others would be induced to become subscribers, by learning from so good a work, the great value of an agricultural journal, more particularly suited to their wants and habits."

The above article is from the "Farmers' Register, a monthly publication devoted to the improvement of the practice, and support of the interests of Agriculture," published at Richmond, Virginia, by Edmund Ruffin, Esq. The Register was commenced in 1833, has reached its twelfth number, and we understand, has an extended and numerous list of subscribers, to which it is constantly making additions. We have seen the numbers of the Register as they have successively appeared, and giving our judgment for as much as it is worth, would call it a publication of the first order for the kind. With its editor, we hope it will not be thought that we bandy compliments, when we say, that we think him peculiarly qualified for the work he has undertaken, and his publication for variety, clearness and interest, will compete with any thing of the kind, foreign or domestic, we have ever seen.

The Register in itself is very respectable in appearance, and its typographical execution is every way commendable. Virginia has reason to be proud of the work, and in due time it will produce a most salutary and decided influence upon its agriculture. We take it for granted it will succeed, for, in despite of the general unwillingness of the farmers to read, its own inherent force, conducted by its present editor, will ensure its circulation. Upon the subject of the Cultivator, we would inform the editor of the Register, that it is not under the patronage of government, and derives no aid from state munificence. The Cultivator must pay its own way. It has thrown itself upon the beneficence of the friends of agriculture, and hopes that from its enlarged subscription it will be enabled to maintain itself. Time must determine the result. At all events, if it does not meet with success, it will at least try to deserve it. Farther, it is but the mouth-piece of the New-York State Agricultural Society, without the promise of a cent from its treasury, or a name to its list; the only capital it draws from that source is its good will, which, as far as it goes, may assist it to trade more largely. Its resources, then, are in its subscribers; if they fail, the committee of publication alone are answerable. This committee would extremely regret that the Cultivator should, directly or indirectly, have an injurious effect upon any other agricultural journal, particularly those in this state. They have been the pioneers that have opened the way, and *created* a taste for agricultural reading, in which the committee, as individuals, in common with others, have largely participated; personally, therefore, we consider ourselves deeply indebted to those publications, and their editors must do us the justice to say that we are not prompted by avarice, because we have not the hope of its reward.

We thank Mr. Ruffin, and accede to his offer to take up subscriptions for the Cultivator, and would cheerfully reciprocate the good will, in transmitting names for the Farmers' Register.

THE CATERPILLAR.

J. Buel, Esq.—As much complaint is annually made of the ravages of the Caterpillar among the farmers' fruit trees, and particularly in apple orchards, I feel desirous of rendering some service to the public, by furnishing a remedy, which, from actual experiment, I am satisfied is effectual.

Place a sponge, or swab made of rags, on the end of a pole, saturate it with ley made from common wood ashes; with this preparation, give their nests a thorough washing early in the morning, before these mischievous animals have gone abroad for their food. This will instantly prove fatal to them. Be careful to break the web of the nest, because they are so constructed as to shed the rain and dews, and the animals will thus escape. Not one of them can live a minute after being wet with this liquid.

Yours respectfully,

Geneva, May 17. DAVID HUDSON.

J. Buel—I see you have an article in the Cultivator, directing how to destroy the caterpillar.

I will state what I know to be a fact, that is, take a pail of soap suds, and with a swab attached to the end of a pole, swab the nest in the morning, and it will kill the worms and destroy the eggs. It is the best remedy I ever saw, and the quickest and cheapest.

A. BRIDGES.

Milford, May 17.

It is better to bind men by kind offices than by fear.—*Livy.*

CANADA THISTLES.

The suggestions of our correspondent, in the following communication, that frequent ploughing will destroy the Canada thistle, is in confirmation of the practice of Mr. Hillhouse, as related in the May number of the Cultivator. The object of both gentlemen was the same—to prevent the plant from vegetating; whilst the one used the plough, the other substituted the hoe for that purpose, and both it appears were effectual; these communications contain important suggestions, and we have no doubt they will be acted upon by some of our farmers the coming season.

We have this moment been called upon by a neighbor to the gentleman who sent us the following communication, who says the practice of killing the thistle in the following instance, as related by our correspondent, was so completely successful, that where any are now left, this plan to subdue them is invariably resorted to—that a small farm in the vicinity was sold a few years ago at the modesate price of not more than $25 per acre, because the ground was almost covered with the thistle—that the method of frequent ploughing was adopted by the purchaser, and the thistles are so perfectly subdued, that hardly a single one can now be seen, and this same farm would now readily sell at double the original price. We cannot for a moment doubt the correctness of the above statements; and if frequent ploughing is the remedy to destroy the thistle, a knowledge of the fact ought to be most extensively diffused. A.

[*For the Cultivator.*]

I am happy to perceive the attention of a Subscriber is drawn to the destructipn of the Canada thistle. What he writes is from actual experience, the best school extant. The gentleman's mode of destroying that most noxious of all weeds, (the Canada thistle,) I conceive to be based upon just principles, viz. that of totally depriving it of a top through one summer. This is an effectual mode of eradicating them; but I think we may pursue a system of management, where there are large quantities of this thistle, in a more sure and effectual way, than the one in your May number of the Cultivator, signed a Subscriber. What I here state is also from actual experience. For the last four years, I had two farms which were harrassed more or less with the above named thistle, one of them being a small farm, was almost overrun with it, so much so, as to almost ruin both the grass and grain crops. My mode of treatment is, to plant the field one year; that will suhdue the sod. The next year commence as soon as the thistles come up in the spring, to plough them, and continue to plough them, say once in two or three weeks, or as often as they come up or appear, until it is time to sow the field with winter grain. By this time the thistles, if attended to as directed, will be totally destroyed. I have killed, last season, full ten acres in this way; the season before, as many more, and three years ago, from one to two acres. Small spots may be wholly kept down, in pasture fields, by salting stock upon them, and at the same time see to them as often as once a week, that there are no tops left. If there are, strong brine, when the ground is moist, poured on them will kill them, but if you kill all there are in sight to-day, in one week, examine and you will find more, so that it requires attention, or else you will lose your labor; there is no half-way work about it; when they are bad in a stone wall, the best way is to remove it to some other place not infected with them. The number of times of ploughing required to kill mine, has varied from five to ten times, and when the ground is bare you can plainly see whether you have destroyed them or not.

If the above article should be the means of assisting the destruction of one square rod of ground, covered with the Canada thistle, the writer will be fully recompensed. A SUBSCRIBER.

Chatham, Columbia county, N. Y. May 12, 1834.

Cattle Husbandry.

MISCELLANEOUS NOTICES.

Before we proceed in our extracts in relation to the Short Horns, we will state some facts which may be interesting to the cattle farmer, in a brief way, which we glean from much that would be uninteresting to him in the work before us.

The Hereford, Sussex and Glamorganshire cattle, noticed in the above tables, have probably sprung from the same origin as the North Devons. They are considered as belonging to the same general class: The Herefords are larger than the Devons, have generally white faces, throats and bellies, are of a dark red, sometimes brown or brindled. The Sussex are also larger but coarser, than the Devons, generally of a bright chesnut colour. The Glamorganshire is a Welch stock, smaller than the Devons, owing to the scanty food which the mountains yield. None of these breeds are considered equal to the Devons for the plough. The Herefords are far worse milkers than the Devons, and the same remark will apply to the other two kinds. The Leicester belongs to the class of *long horns*. of which we shall have occasion more particularly to speak hereafter.

Various attempts to improve the Devons in weight have been attempted, as with the Hereford, Sussex and Durham breeds: but with one exception they seem to have been unsuccessful: a single cross with the Herefords, obtained by stealth, is said to have produced some of the most perfect of the Devon family. A cross with the Guernsey has been thought to improve their quality for the dairy. The Devon stock sells high. They have sold as high as 100 guineas, and a lot of twelve cows, the stock of Mr. Rogers, averaged at public sale, £30 or $133 each.

Calves are preferred to be dropped late. They are permitted to suck three times a day for a week. They are then used to the finger, and warm new milk is given for three weeks longer. For two months after they have plenty of warm scalded milk, mixed with a little finely powdered linseed cake, (for which corn meal offers an excellent substitute) and entirely weaned at four months old.

"The grand secret of breeding is to suit the breed to the soil and climate." The Devons deteriorate in some counties, and improve in others.

Clouted Cream, considered in Devonshire a great luxury with coffee, tarts or strawberries, is thus prepared: The milk stands in a bell-metal vessel twenty-four hours, when it is placed over a small wood fire and heated gradually. In an hour and a half, when it is approaching a state of *simmering*, the vessel is struck every now and then with the knuckle, or is very carefully watched. As soon as it ceases to ring, or the first bubble appears, and before it boils, it is taken off and set by twenty-four hours more. At the end of this time, the cream will have become wholly separated, will be thick enough to cut with a knife, and may be skimmed off. The dairy people say there is economy in this process:—that five pounds of butter can be obtained in this way where only four could be obtained in the ordinary way, and that the butter is more saleable, on account of its pleasant taste.

To keep up in size and proof a good growth, it is deemed necessary to change the bull every two years. The Somerset farmers think that frequent bleedings, in small quantities, accelerate the process of fattening. The calves in this county are principally fed, if not intended to be fattened, on cheese-whey. The Herefordshire farmers insist, as the result of experience, that the breeding qualities of a cow are materially lessened, and that even her form is deteriorated, by her being inclined to give a large quantity of milk.

We find no comparison between the North Devons and the Short Horns, as to their facilities of fattening, in ordinary or extraordinary feeding. We insert, however, the following comparison of the latter, with the Herefords, a branch of the Devon or middle horned stock;

"Three Herefords and three Short Horns were selected; they were put together in a straw yard on the 27th December, 1827, and were fed in the open yard, at the rate of one bushel of turnips per beast per day, with straw only, until May 2, 1828, when their weights were taken, and they were sent to grass.

No.	cwt.	qrs.	lbs.	No.	cwt.	qrs.	lbs.
1 Hereford,....	8	3	0	1 Short Horns,	9	2	0
2 do	7	3	0	2 do	8	2	0
3 do	7	0	0	3 do	9	0	0

On the 3d November, they were taked from grass, and put into the stable, when their weight was as follows:

No.	cwt.	qrs.	lbs.	No.	cwt.	qrs.	lbs.
1 Hereford,. ..	11	3	0	1 Short Horns,	12	3	14
2 do	10	2	0	2 do	12	2	0
3 do	10	3	0	3 do	12	3	0

From that time to the 25th March, 1829, they consumed the following quantities of Swedish turnips and hay:

	Turnips, lbs.	Hay, lbs.
The Herefords,.....................	46,663	5,065
The Short Horns, ...	59,430	6,779

They then weighed—

No.		cwt.	qrs.	lbs.	No.		cwt.	qrs.	lbs.
1	Hereford,....	13	0	14	1	Short Horns,	14	2	0
2	do	12	0	0	2	do	14	1	14
3	do	12	0	0	3	do	14	2	14

being an increase of weight in favor of the Short Horns, of 17 2 0
and in favor of the Herefords, of...................... 13 3 14

and making a difference in favor of the Short Horns, of 3 2 14
but then the Short Horns had consumed 12,775 lbs. more of turnips and 1,714 lbs. more of hay.

"When they were all sold together at Smithfield, on the 30th March, the heavier Short Horns fetched £97, and the lighter Herefords £96, being an overplus of only £1, to pay for the enormous difference in the food consumed, and the greater price given on account of the heavier weight of the Short Horns at the commencement of the experiment."

In *Gloucester*, celebrated for its cheese, and where the dairy is the great object, a great mixture prevails, though the *middle horn* varieties preponderate. The cows yield from four to six gallons of good milk per day. The calves are reared here pretty much in the same way as in Devonshire, as already noted—on skimmed milk, whey and linseed tea. Manured pastures are considered prejudicial to the dairy. The milk from them may be more abundant, but is not so rich. A farmer had two adjoining fields, one of them richly manured. His cows were put in each in alternate weeks. When running in the manured ground, the cheese was rank, heavy and hollow, and unfit for the market: when in the other, excellent cheese was made. Frequent changes in pasture are beneficial; as nothing is more conducive to the general health of the animal, as well as the abundant supply of milk, as the first flush of grass in the spring, after mowing, or in fresh pasture.

Our hilly lands are adapted to permanent pasture, to the dairy and sheep husbandry. Neither will ultimately be found to succeed well upon heavy wheat land, or upon the lighter soils adapted to alternate husbandry. The counties upon the head waters of the Hudson, Mohawk, Susquehannah, Delaware and Allegany rivers, are destined to be our great sheep and dairy districts.

As the *double* Gloucester cheese is in great repute, we shall briefly describe the process of making it, merely premising, that the cause of its superior quality is not satisfactorily known—some ascribing it to the soil, or rather pasture grasses, and others to the process of manufacture.

The milk is set at a temperature of 85 deg. which it is desirable should be natural, that is, from the cow, rather than artificial, by heating. The colouring matter and rennet are then added—the rennet old and free from smell. The process of cutting and breaking the curd follows next; and when it is sufficiently broken it is put into vats, and pressed well down. These vats are here, or rather in New-England, termed *cheese hoops.* The vats are filled as closely as possible—the cheese cloth placed over all, and a little hot water is poured over the cloth, *to harden the outside of the cheese*; the curd is then turned out into the cloth, and this being carefully folded round it, the cheese is returned once more into the vat. All the vats which are to be filled are to be placed one upon another, and are subjected to the action of the press. Here they remain twenty-four hours, the vats of the next meal being placed underneath, and those of the preceding meal raised a tier, and dry cloths occasionally applied. In many dairies there is a second breaking of the curd, which, after having been reduced as small as possible, is scalded with a mixture of water and whey. The second and more perfect breaking down of the curd has been imagined to be the grand cause of the soft uniform substance of the cheese when it is fully made. The practice is, however, getting somewhat into disuse; for it is reasonably urged that this scalding and washing must extract a portion of the oleaginous part of the cheese, as washing in water dissipates this and the aroma of butter; therefore a great deal more care is taken in sufficiently reducing it with the knife, rapidly worked about the tub before the curd is put into the vat. The old farmers, however, maintain, that the whole art of making Gloucester cheese depends on the scalding process; that the salty matter of the milk and curd is thus disposed to develop itself, and to be brought so far out, as to form afterwards the uniform rich substance for which the Gloucester cheese is celebrated. No salt seems to be put into the curd: but after twenty-four hours, the cheeses are well rubbed with salt; and this is repeated daily for four days.—The cloths are now taken away, and the cheeses regularly returned to the press for four, or five, or six days, according to the state of the weather. They are then put upon the shelf, and turned twice in the day, for two or three days; and then placed in the cheese room, where they are turned once in a day for a month. They are then scraped clean, and painted red or brown, which in a few days is rubbed from the edges and the cheese is continued to be turned once or twice every week. To prepare the rennet *two months before it is to be used,* 12 pounds of salt are boiled in 12 gallons of water till the liquid will bear an egg; then strained, and 24 "vells," or stomachs, and 12 lemons with the rinds on, but incisions made into them, and two ounces of cloves and cinnamon, are then put into the liquor. The "single Gloucester," is *skim-milk cheese!* and it is common to take cream enough from the "double" to serve the family.

We cannot refrain from intruding here, honorable mention of an Otsego dairy woman. Mary Brown, the worthy consort of Lemuel Brown, of Edmeston, made the last summer, forty-seven hundred pounds of cheese from thirteen cows. The quality of this cheese is not excelled by hardly any that comes to market. It sold at nine cents the pound. But what is worthy of particular notice is, that Mrs. Brown's cheese was not "single Gloucester," made of skim-milk, nor "double Gloucester," deprived of a part of the cream, but real "*double Otsego,*" with every particle of the cream incorporated with the curd. Mrs. B. remarks that every pound of butter made from cheese milk, diminishes the cheese two pounds in weight, and one or two cents in price. Mrs. Brown's example should be commended by every lover of good cheese.

In Sussex, stall feeding is much practised. Lord Egremont has his milch cows tied up the greater part of the year, alleging that he thereby saved one-third of the food—that the cows were fed with a fourth part of the usual trouble—that more dung was made—and that there was no poaching the ground. Mr. Glynde, a skilful farmer, found that nine oxen fed loose in the yard, ate and destroyed as much as twelve oxen that were tied up. The average weight of the Sussex ox, when fitted for market, is stated at 16 and 17 cwt. and they have gone as high as 3,000 lbs. Oxen are worked three days in a week, in winter, and fed upon straw: and when they will not bear hard work, and hard food, they are turned off to fatten. The bull is changed every two years by the best breeders, from the supposition that the breeding *in-and-in* will cause the stock to degenerate.

In Glamorganshire and Cardiganshire, butter is the main object, and good cows average one hundred weight in the dairy season.

Science of Agriculture.

PULVERIZATION.

The mechanical division of the parts of soils is a very obvious improvement, and applicable to all in proportion to their adhesive texture. Even a free silicious soil will, if left untouched, become too compact for the proper admission of air, rain and heat, and for the free growth of the fibres; and strong upland clays, not submitted to the plough or spade, will in a few years, be found in the possession of fibrous rooted perennial grasses, which form a clothing on their surface, or strong tap rooted trees as the oak, which force their way through the interior of the mass. Annuals and rementaceous-rooted herbaceous plants cannot penetrate into such a soil.

The first object of pulverization is to give scope to the roots of vegebles, for without roots no plant will become vigorous, whatever may be the richness of the soil in which it is placed. The fibres of the roots take up the extract of the soil by introsusception. The quantity taken up, therefore, will not depend alone on the quantity in the soil, but on the number of absorbing fibres. The more the soil is pulverized, the more the fibres are increased, the more extract is absorbed, and the more vigorous does the plant become. Pulverization, therefore, is not only advantageous previous to planting and sowing, but also during the progress of vegetation, when applied in the intervals between the plants.

[Hence the utility of using the harrow and cultivator, in rowed crops, as corn, potatoes, ruta baga, &c. even when there are no weeds to be destroyed, or hilling required—and hence the utility of using the harrow, in spring upon winter grain.]

Pulverization increases the capillary attraction, or sponge-like properties of soils, by which their humidity is rendered more uniform. It is evident this capillary attraction must be greater where the particles of the earth are finely divided; for gravels and sands hardly retain water at all, while clays not opened by pulverization or other means, either do not absorb water, or when, by long action it is absorbed, they retain too much. Water is not only necessary to the growth of plants, as such, but it is essential to the production of extract from vegetable matters which they contain; and, unless the soil, by pulverization or otherwise, is so constituted as to retain the quantity of water requisite to produce this extract, the addition of manures will be in vain. Manure is useless in vegetation till it become soluble in water, and it would remain useless in a state of solution, if it so abounded as wholly to exclude air, for then the fibres or mouths, unable to perform their functions, would soon decay and rot off. Pulverization in a warm season is of great advantage in admitting the nightly dews to the roots of plants. Chaptal relates the great benefit he found in the practice in this respect to his corn crops; and shows of what importance it is in the culture of vineyards in France.

The temperature of a soil is greatly promoted by pulverization.—Earths, Grisenthwaite observes, are also among the worst conductors of heat with which we are acquainted, and consequently it would be a considerable time before the gradually increasing temperature of spring could communicate its genial warmth to the roots of vegetables, if their lower strata were not heated by some other means. To remove this defect, which always belongs to a close compact soil, it is necessary to have the land open, that there may be a free ingress of the warm air and tepid rains of spring.

Pulverization contributes to the increase of vegetable food. Water is known to be a condenser and solvent of carbonic acid gas, which, when the lands are open can be immediately carried to the roots of vegetables, and contribute to their growth; but if the land is close, and the water lies on or near the surface, then the carbonic acid gas, which always exists in the atmosphere, and is carried down by the rains, will soon be dissipated. An open soil is also most suitable for effecting those changes in the manure itself, which are equally necessary to the preparation of such food. Animal and vegetable substances, exposed to the alternate action of heat, moisture, light and air, undergo spontaneous decomposition, which would not otherwise take place.

By means of pulverization a portion of atmospheric air is buried in the soil. This air, so confined, is decomposed by the water retained in the earthy matters. Ammonia is formed by means of the hydrogen of the water with the nitrogen of the atmosphere; and nitre by the union of oxygen and nitrogen: the oxygen may also unite with the carbon contained in the soil, and form carbonic acid gas, and carburetted hydrogen. Heat is given out during the process, and hence, as Darwin remarks, the great propriety of cropping lands immediately after they have been comminuted and turned over; and this the more especially, if manure has been loose, and the interstices filled with air, than afterwards, when it becomes compressed with its own gravity, and relaxing influence of rains, and the repletion of the partial vacuums formed by the decomposition of the enclosed air. The advantage of the heat thus obtained in exciting vegetation, whether in a seed or root, especially in spring, when the soil is cold, must be very beneficial.

The depth of pulverization, Sir H. Davy observes, must depend upon the nature of the soil and subsoil. In rich clayey soils it can scarcely be too deep; and even in sands unless the subsoil contains some principles noxious to vegetables, deep comminution should be practised. When the roots are deep, they are less liable to be injured either by excessive rain or drought; the radicles are shot forth into every part of the soil; and the space from which this nourishment is derived, is more considerable than when the seed is superficially inserted in the soil.

Pulverization should, in all cases, be accompanied by the admixture of the parts of soils, by turning them over. It is difficult, indeed, to pulverize without effecting this end, at least by the implements in common use; but if it could be effected it would be injurious, because the difference of gravity between the organized matters and the earths has a constant tendency to separate them, and stirring a soil only by forks and pronged implements, such as cultivators, would, in a short time, leave the surface of the soil too light and spongy, and the lower part too compact and earthy.—*Enc. Ag.*

The *Primitive Earths*—are four, viz: clay, sand, lime, and magnesia. These are the only earths which enter into the composition of soils; they also enter in very minute portions into the organization of plants. Sand and clay are by far the most abundant; lime is required but in small proportion: every soil, however, is defective without it. Magnesia is found but in a few soils; its place is well supplied by lime; its entire absence, therefore, is not considered any defect.

Miscellaneous.

"THE USE OF LIME IN AGRICULTURE.

"*Bennington, Vt. April 7th*, 1834.

"Sir—I saw it stated in your report to the New-York State Agricultural Society, that Dr. Wm. Darlington, of Penn. had made a communication to the society on the 'use of lime in agriculture.'

"If it has been published, I would thank you to send it to me, if you can do it without too great inconvenience. I find it exceedingly difficult to obtain the necessary information upon this point; indeed all that I have, has been obtained from English publications, not entirely suited to this country. I am fully convinced that lime is as necessary upon our lands, especially those which have been highly manured, as the manure itself, and if properly manufactured, will cost much less and be more durable. I began with one or two loads per year, but increased the quantity each year, and shall probably use twenty loads the present season.

"Excuse me, if you please, for troubling you. I know of no other way to obtain the communication. Yours, &c.

"HAMILTON GAY.

"J. P. Beekman, *Cor. Sec'y N. Y. S. A. Society.*"

The communication to which our correspondent refers in the foregoing letter, was published in the proceedings of the New-York State Agricultral Society for 1833, and as it was printed at the expense of the society, but a few hundred copies were stricken off for the use of its members. As extensive a circulation has not been given to the communication of Dr. Darlington, on the use of lime in agriculture, as its intrinsic merits and the wants of the public require; it being now called for, we are happy in having an excuse for its re-publication in the columns of the Cultivator, to diffuse it more extensively, in hopes our readers will avail themselves of the information contained in it, to make a more general use of lime as a manure. Lime, as an agent in fertilization, has been, in this country, comparatively but little used; all, however, who have tried its powers, unite in ascribing to it a strong and quickening influence on vegetation, and the letter of Dr. Darlington will be the more useful to the public, because he avails himself as well of the experience of his practical neighbors, as his own, to treat of this subject in a most clear and satisfactory manner. The publishers of the Cultivator would be pleased to receive the result of their Vermont correspondent's future observation, on the use of lime as a manure, should he be induced to give it a thorough trial; and they will now add this general observation, that in those districts of country where it has been extensively, and for some time used, the per acre price of land has been greatly, and we presume proportionately increased. Hereafter, we must again take up this subject, because it is an extensive field for investigation, in which farmers, as well as men of science are interested, and both will be most amply rewarded, should any farther lights be elicited on so important and useful a topic.

Letter from Dr. William Darlington, of Pennsylvania, on the use of Lime in Agriculture.

Westchester, (Penn.) Dec. 17, 1832.

Dear Sir,—Your etter, containing a number of *queries* relative to the operation and utility of *lime*, in the process of agriculture, was received in the arly part of June last: But as I have been much engaged, during the past summer, with duties which required all my attention,—and, as your letter intimated that answers furnished "any time during the present year" would be in season for your purposes,—I have taken the liberty to postpone my reply until now.

I proceed then, with great pleasure, to furnish you with such facts and remarks as my opportunities for observation have enabled me to offer. With a view to render the answers more explicit and satisfactory, I will annex them, *seriatim*, to your several inquiries.

Query 1. "*Upon what lands does lime operate most beneficially,*—1. *In regard to geological formation,—as primitive, transition, secondary, and alluvial?*

2. *In reference to the soil,—as sand, clay, lime, and vegetable matter?*
3. *As indicated by natural growth of timber and plants?"*

Answer. My residence has always been in a *primitive* region, and my observations very much limited to agricultural processes in soils upon that formation. The prevailing rock here is gneiss,—with occasional beds, or veins, of hornblende, greenstone and sceinite. About five miles to the north of us, is the great valley of transition limestone, stretching from northeast to southwest; and immediately on the northern side of this valley, running parallel with it, is a broken ridge of hills, formed of mica slate,—with beds of serpentine rock and hornblende, on the side next to the gneiss rock, on the southeast. Over the gneiss rock, and among the hornblende, the soil is generally a stiff loam; and there, I think, the best effects are perceptible from a given quantity of lime. On the soil overlaying the schistose rock, the good effects of lime are sufficiently obvious, under the management of skilful farmers; but the benefits seem to be less permanent. On the serpentine rock the soil is extremely sterile,—and neither lime nor barnyard manure can be used with much advantage. In the limestone soil of the great valley, where one would suppose it was already redundant, lime is used with advantage; and much heavier dressings are put on, than in the adjacent districts. I cannot furnish the *rationale* of this practice; but I believe the fact is established, that more lime is required to produce the same beneficial effect on soils resting on limestone rock, than upon those overlaying gneiss,—and perhaps some other primitive rocks.

I have had no opportunity to witness the effect of lime upon *secondary*, and strictly *alluvial*, formations; but the above circumstances has led me to suspect, that the *same quantity* of lime would not be so signally beneficial in secondary, as it is in certain primitime formations.

Lime, undoubtedly, has a good effect in soils which are *sandy*,—even where sand predominates; but I believe its meliorating properties are most conspicuous in a *clay* soil,—or rather in a *stiff loam*.—A good proportion of decomposed vegetable matter adds greatly to the beneficial effects of lime; and hence our farmers are desirous to mingle as much barnyard manure as possible with their lime dressings,—and to get their fields into what is called a good sod, or turf, —full of grass roots. *Then* a dressing of lime has an admirable effect.* The soils indicated by a natural growth of black oak, (*quercus tinctoria*) walnut, (*juglans nigra*) and poplar, (*liriodendron*)—and those in which such grasses as the *poas* and *festucas* best flourish, are generally most signally benefitted by the use of lime. In short, I may observe, that lime has been found more or less beneficial in every description of soil in this district. It is most so on hilly, or rolling lands, where clay predominates,—less permanently, so among the mica slate;—and least of all, on the magnesian rocks. The soil on these last is rarely worth cultivating.

Query II. "*What quantity of lime applied to the acre, upon different soils, at a single dressing, and during a period of years?"*

Answer. The quantity of lime, per acre, which can be used advantageously, varies with the condition and original character of the soil. Highly improved land will bear a heavier dressing than poor land. On a soil of medium condition, the usual dressing is 40 to 50 bushels per acre. A deep, rich soil, or limestone land in the great valley, will receive 70 to 80—(and I am told even 100,) bushels to the acre, with advantage. On very poor land, 20 to 30 bushels per acre, is deemed most advantageous to commence with. It is usually *repeated* every five or six years—i. e. every time the field comes in turn to be broken up with the plough; and as the land improves, the quantity of lime is increased. The prevailing practice here, is to plough down the sod, or *lay*, in the fall or early in the spring,—harrow it once—and then spread the lime (previously slaked to a powder) preparatory to planting the field with Indian corn. Every field, in rotation, receives this kind of dressing; and as our farms are mostly divided into about half a dozen fields, the dressing of course comes once in six years, more or less according to the number of the fields. Some enterprising farmers, however, give their fields an *intermediate* dressing, *on the sod*, after they come into grass, which I consider an excellent practice,—tending rapidly to improve the condition of the land.

Query III. "*Is it applied in a caustic or an effete state?"*

Answer. It is usually obtained in a caustic state from the kiln,—deposited in heaps in the field where it is to be spread, and water sufficient to slake it to a powder, is then thrown upon it. As soon as slaked, it is loaded into carts, and men with shovels distribute it as equally as possible over the ground. It is generally considered best to put it on the ground whilst it is fresh, or *warm*, as the phrase is; and it is certainly easier to spread it equally, while in a light pulverized state, than after it gets much wet with rains. I am inclined to think, too, it is better for the land when applied fresh from the kiln.

Query IV. "*To what crops is it most advantageously applied, and at what season?"*

Answer. It is usually applied, as already intimated, to the crop of *Indian corn*, in the spring of the year—say the month of April. Occasionally it is applied preparatory to sowing wheat in autumn. When used as a *top dressing*, on the sod, it is generally applied in the fall—say November. The prevailing impression is, that it is most advantageously applied to the Indian corn crop; and hence the general practice. But the truth is, it is highly advantageous at any, and at all seasons; and our shrewd old farmers have a saying—"*Get your lime on for your corn, if you can,—but be sure to get it on the land, some time in the year."*

Query V. "*How is it incorporated with the soil—by the plough or the harrow? and is it applied in any case as a top dressing to grass and to grains, and with what effect?"*

Answer. As already stated, after the sod is ploughed down for Indian corn, it is usually harrowed once, to render the surface more uniform. The lime is spread as equally as possible over the field,—and then the ground is well harrowed in different directions, in order to incorporate the lime with the soil. Soon afterwards the field is marked out, and planted with corn. The plough is rarely, if ever used for the purpose alluded to. I have mentioned above, that lime is occasionally used as a top dressing for grass. It appears to be particularly beneficial to that crop; and answers extremely well when applied in that manner. The practice of applying it to Indian corn, as above related, is however, chiefly followed; and the application of a dressing to each field, in rotation, causes as much labor and expense every year, as our farmers generally are willing to incur. Lime has rarely been used as a top dressing to *grain* crops, within my knowledge.

Query VI. "*What is the ordinary cost, per acre, of liming, and the relative profits, in increased products of a period of years?"*

Answer. Quick lime, at the kilns, usually costs twelve and a half cents per bushel. The farmers generally haul it with their own teams; and the additional expense depends, of course, materially upon the *distance*. It is frequently hauled by them a distance of eight, ten, and even twelve miles. The average, perhaps, is about five or six miles. It is delivered to me by the lime burners, (a distance of near 6 miles,) at 18 cents per bushel. At the rate of 40 bushels to the acre, the cost, at 18 cents, would be $7.20 cents per acre. It is difficult to estimate, with precision, the relative profits in increased products: But I can safely say, from my own experience, on a small farm of middling quality, that two dressings of lime at the above rate, in the course of 8 or 9 years, have more than trebled the products of the land to which it was applied, both in grain and grass. It is to be understood, however, that the system of *ploughing only so much ground as could be well manured*, was adopted at the same time. I may also observe, generally, that the farmers of this distict, (who are shrewd economists) are so well convinced of the beneficial effects of liming, that costly as its application seems to be, they are unanimous in sparing no effort to procure it. Lime has been found to be peculiarly favorable to the growth of pasture, when the farm is otherwise well managed; and as our farmers are mostly in the practice of feeding cattle, they resort to liming as an indispensible auxiliary to successful grazing.

Query VII. "*Is lime applied with yard manures, or earthy composts, and with what results?"*

Answer. I have already intimated that vegetable matters, and especially yard manures, are highly important in conjunction with lime. Both are valuable, even when used separately; but when *combined*, the effect is most complete. If to this be added, the great secret of good farming, viz. to plough only so much ground as can

* The yard manure is not usually mingled with the lime, when the latter is first applied. The practice is, to lime the *Indian Corn* ground prior to planting that grain on the inverted sod,—and, the ensuing spring, to manure the same field for a *barley* crop,—or, to reserve the manure until the succeeding autumn, and apply it to the *wheat* crop. It is not well settled which of these is the better practice. Each has its advocates; but it is most usual to reserve the manure for the wheat.

be well manured,—the state of agriculture may be considered nearly perfect.

Lime is, in some instances, added to earthy composts, preparatory to distribution on the fields: But it is doubtful whether the extra labor of this method is compensated by any peculiar advantages. It is not generally practised.

Query VIII. "*Is powdered limestone (carbonate of lime) applied to soils; and if so, does it induce fertility otherwise than by mechanically ameliorating their texture?*"

Answer. No instance of powdered limestone being applied to soils has come under my notice. I can, therefore, form but a very imperfect opinion of its utility. If it were even as beneficial as quick lime (which I doubt) I apprehend it could not be procured and applied with less cost and labor.

Query IX. "*On what soils, if any, in your neighborhood is lime found to be inoperative, as a fertilizing application; and the cause of its failure?*"

Answer. There is no soil in this district deemed worthy of cultivation, on which lime is *wholly* inoperative as a fertilizer. On some sterile, slaty ridges, and on magnesian rocks, it has indeed but a slight effect; and even the benefits of barnyard manure are very transient. In low, swampy grounds, also, unless they are previously well drained, the labor of applying lime is pretty much thrown away. There seems to be something in the constitution of magnesian rocks peculiarly unfriendly to the growth of the more valuable plants. Indeed there are patches of the soil perfectly destitute of all vegetation. Repeated attempts have been made to cultivate the bases of our serpentine banks; but neither lime, nor manure, will enable the farmer to obtain more than a light crop of small grain. Neither clover, nor the valuable grasses can be induced to take root and flourish in the ungenial soil. It is, therefore, almost universally neglected.

I have thus endeavored, (in rather a desultory manner, I confess) to answer your queries according to my best judgment. If what I have furnished shall in any degree tend to make the subject better understood, I shall be amply gratified.

With great respect, I have the honor to be, your ob't servant,

WM. DARLINGTON.

JESSE BUEL, Esq. *Cor. Sec'y, &c*

[*From the Memoirs of the Board of Agriculture.*]

REMARKS ON CUTTING OATS AND INDIAN CORN—MAKING AND APPLYING MANURES—ROTATION OF CROPS, &C.—BY PHILEMON HALSTED, OF WESTCHESTER.

To JESSE BUEL, Esq.—Dear Sir—Being honored with a circular from the Board of Agriculture, I will offer a few experiments which have proved to me of great advantage.

In the first place, every landholder who tills the ground should be very careful to provide and make manure by all possible means in his power; and this he may do to a considerable extent. He should provide himself with as much fodder as will winter more cattle than he can summer; and this is done in the following manner: Cut your oats when the straw is green in part; let them lay and cure in the swath until they are sufficiently dry not to mould; bind them in sheaves, and stack them. When they are thrashed, the farmer will find that his oats will thrash to greater advantage. The light oats sticking to the straw, makes it good fodder, and I consider it of as much value as will pay the expense of raising the oats.

Secondly, give up the old method of cutting your top-stalks; and when your corn is sufficiently hard, or when you cannot find an ear soft enough to boil and eat, then proceed to cut and stout your corn in the field, in the following manner: Bring the tops of two hills together, without cutting: bind them with a few spears of straw: then cut and set up about enough to make four sheaves, if bound; then put on a band of straw about the top; and then you may add as many more, and bind the whole with two bands, always keeping the bottom of the stout open, so as to admit the circulation of air. At the proper time of gathering corn, you may proceed thus: Throw down the stout, unbind and begin to gather the corn; when you have stalks enough for a sheaf, bind them and lay it aside until you have enough for a stout. By this you save all the silk and small husks and under leaves of the corn, which were all lost by the former pactice of topping and gathering corn. I will recommend that the stalks be stacked on a hovel, or poles laid on crotches, and foddered in the yard. I have been particular as to the time it takes in this process, and can say I am satisfied it takes no more time than in the old method.

The farmer should embrace every open spell in the winter to collect from his milking yard the scrapings, and also from the pond, holes and hollows in his woods the leaves and dirt, and draw and spread them in his yard or yards. This will enable him to make, (by the help of twenty head of cattle) one hundred loads of manure; which will be fit to put on the ground the next autumn, at the rate of twenty loads to the acre; which, if ploughed in, and the land sowed with wheat or rye, and seeded with timothy seed at the same time, and clover the next spring, it will produce a burden that will be satisfactory to the owner, and the ground will be in better condition than when first ploughed.

It may not be amiss to mention what kind of cattle a farmer can winter on such fodder as I have spoken of. I would recommend that he buy, in the fall, young heifers of good quality, and good looking young cows; and if his situation permits, a pair or two of steers broken to the yoke; all of which are in demand in the spring, and will advance in price sufficient to pay for the wintering, and leave for his advantage a yard full of good manure. I will also recommend attention to be paid to the hog-pen, and as much litter, weeds and refuse from the gardens and yards, as can be procured, and by a careful mixture of some good black earth, the quantity of manure may be swelled to a large amount. As almost all landholders have on their farms ponds or swamps, that are miry, I will recommend that they draw out, in the month of August, when most of swamps are dry, a large quantity, and put it in a heap, and there let it lay until the next spring, when it will be fit to put on corn in the hill, and will have a very great effect. If, after the operating of the frost on the heap, the compost should crumble, and have a proportion of dust, it is then good. If it should dry hard and lumpy, like clay, it is only fit to be put in the barn-yard or hog-pen, and be trodden in with the compost. By application of pond manures as above, I have been enabled to make some poor land become very productive.

As I have given some practical remarks on the making of manure, I shall now proceed to state my process of culture. I break the ground in the month of April, and have the sod turned under by one of Freeborn's ploughs, about eight inches deep; (and here it is that many make great blunders, and much to their disadvantage, by not attending in person, and having their ground ploughed deep and well;) and then harrowed with an iron tooth harrow, or wood will do, if it be heavy, and the teeth made of good hickory, and kept sharp. Harrow the same way you have ploughed, until your ground is well mellowed; then, when you see the earliest apple-tree begin to drop its blossoms, furrow your ground three feet apart at right angles, and plant four grains of corn in a hill.

Almost every farmer has some method of steeping his corn before planting, and rolling it in either plaster, ashes, lime, or tar; all of which, at some times, are an advantage, and at other times a disadvantage. After my corn comes up, and is sufficiently large to be seen in rows, I commence ploughing and hoeing, and continue it until the corn begins to shew signs of setting for ears, being particular to keep the plough a going in dry weather. By the above culture, I have been enabled to collect from fifty to eighty bushels per acre; and by mixing pumpkin seed, and planting it with the corn, I have raised four ox cart loads to the acre.

I have already described my method of collecting and preserving the tops and bottom stalks for fodder. I shall proceed to my next crop, the next spring, which shall be corn, and a proportion of potatoes; giving the preference to corn, on account of the great quantity of fodder. And this year tilling, I break up the sod which laid last year beneath the furrow of corn plough; thereby I am enabled again to raise a good crop of corn, and subdue all the wild grass, roots and weeds which laid at the bottom of the furrow. Third year, I split the corn hills with a plough, harrow the ground well, then plough, harrow again, and sow my oats and flax. My oats will produce about forty bushels, and upwards, per acre, depending on the season for their yielding; and my flax will average sixteen bushels of seed, and three hundred weight to the acre. I will observe, that where the ground is strong, and the oats very forward, they ought to be fed off to the ground, before they have a joint. This prevents their lodging, and gives the under oats an opportunity to come forward, which will much increase the quantity. The oat stubble and flax ground should soon be ploughed, harrowed and cross-ploughed; then draw on your manure, about twenty ox cart loads to the acre; spread and plough it in as soon as possible. If you intend to sow rye, put it in about the first of September, and sow your timothy seed after the harrow, eight quarts to the acre; then use a roller, which breaks the lumps. It may be fed off during the fall, by calves, colts, or sheep, without any disadvantage. If you intend it for wheat, sow it about the twenty-fifth of September, and follow the same method as with the rye: sow clover in the spring, when the ground is open in cracks, about six pounds to the acre. By following the above directions, I have always realized a good crop of grain, and a great crop of grass; and the ground may and ought to remain in sod six years, before ploughed again.

[*From the Memoirs of the Board of Agriculculture*]

REMARKS ON THE CONSTRUCTION AND MANAGEMENT OF CATTLE YARDS.

By J. Buel, of Albany.

Vegetables, like animals, cannot thrive or subsist without food; and upon the quantity and quality of this depends the health and vigor of the vegetable, as well as of the animal. Both subsist upon animal and vegetable matter—both may be surfeited with excess—both may be injured by food not adapted to their habits, their appetites, or their digestive powers. A hog will receive no injury, but great benefit, from free access to a heap of corn or wheat, where a horse or cow will be apt to destroy themselves by excess. The goat will thrive upon the boughs and bark of trees, where the hog would starve. The powerful robust maize will repay, in the increase of its grain, for a heavy dressing of strong dung; for which the more delicate wheat will requite you with very little but straw. The potato feeds ravenously, and grows luxuriantly, upon the coarsest litter; while many of the more tender exotics will thrive only on food upon which fermentation has exhausted its powers. But here the analogy stops: For while the food of the one is consumed in a sound, healthy, and generally solid state, the food of the other, before it becomes aliment, must undergo the process of putrefaction or decomposition, and be reduced to a liquid or æriform state.

I have gone into the analogy between animals and vegetable thus far, to impress upon the minds of our farmers the importance of saving, and of applying, the food of their vegetables with the same care and economy that they do the food of their animals. How scrupulously careful is the good husbandman of the produce of his farm, destined to nourish and fatten his animals; and yet how often careless of the food which can alone nourish and mature his plants! While his fields are gleaned, and his grain, hay and roots carefully housed, and economically dispensed to his animals, the food of his vegetables is suffered to waste on every part of his farm. Stercoraries we have none. The urine of the stock, which constitutes a moiety of the manure of animals, is all lost. The slovenly and wasteful practice of feeding at stacks in the fields—where the sole of the grass is broken, the fodder wasted, and the dung of little effect—is still pursued. And finally, the little manure which does accumulate in the yards, is suffered to lay till it has lost full half of its fertilizing properties, or rotted the cills of the barn; when it is injudiciously applied, or the barn removed to get clear of the nuisance. Again—none but a slothful farmer will permit the flocks of his neighbors to rob his own of their food; yet he often sees, but with feeble efforts to prevent it, his plants smothered by pestiferous weeds, and plundered of the food which is essential to their health and vigor. *A weed consumes as much food as a useful plant.* This, to be sure, is the dark side of the picture; yet the original may be found in every town, and in almost every neigborhood.

It is surprizing, that under such management, our arable grounds should grow poor, and refuse to labor its accustomed reward? Can it be considered strange, that those who thus neglect to feed their plants, should feel the evil of light purses, as well as of light crops? Constant draining or evaporation, without returning any thing, would in time exhaust the ocean of its waters. A constant cropping of the soil, without returning any thing to it, will in like manner exhaust it of its vegetable food, and gradually induce stertility. Neither sand clay, lime or magnesia—which are the elements of all soils—nor any combination or part or all of them, is alone capable of producing healthy plants. It is the animal and vegetable matter accumulated upon its bosom, or which art deposites there—with the auxiliary aid of these materials diffused in the atmosphere—that enables the earth to teem with vegetable life, and yield its tribute to man and beast.

I will now suggest a cheap and practicable mode of *providing food for vegetables,* commensurate to the means of every farmer of ordinary enterprise; and that my suggestions may not be deemed theoretical, I will add, that I "pactice what I preach."

The cattle-yard should be located on the south side of, and adjoining the barn. Sheds, substantial stone walls, or close board fences, should be erected at least on the east and west sides, to shelter the cattle from cold winds and storms—the size proportioned to the stock to be kept in it. Excavate the centre in a concave form, placing the earth removed upon the edges or lowest sides, leaving the borders ten or twelve feet broad, and of a horizontal level, to feed the stock upon, and from two or five feet higher than the centre. This may be done with a plough and scraper, or shovel and hand-barrow, after the ground is broken up with the plough. I used the former, and was employed a day and a half, with two hands and a team, in fitting two to my mind. When the soil is not sufficiently compact to hold water, the bottom should be bedded with six or eight inches of clay, well beat down, and covered with gravel or sand This last labor is seldom required, except where the ground is very porous. My yards are constructed on a sand loam, resting on a clay subsoil. Here should be annually deposited, as they can be conveniently collected, the weeds, coarse grass, and brake of the farm; and also the pumpkin vines and potato tops. The quantity of these upon a farm is very great, and are collected and brought to the yard with little trouble by the teams returning forom the field. And here also should be fed out, or strewed as litter, the hay, stalks and husks of Indian corn, pea and bean haulm, and the straw of grain not wanted in the stables. To still further augment the mass, leached ashes and swamp earth may be added to advantage. These materials will absorb the liquid of the yard, and, becoming incorporated with the excrementitious matter, double or treble the ordinary quantity of manure. During the continuance of the frost, the excavation gives no inconvenience; and when the weather is soft, the borders afford ample room for the cattle. In this way the urine is saved, and the waste incident to rains, &c. prevented. The cattle should be kept constantly yarded in winter, except when let out to water, and the yard frequently replenished with dry litter. Upon this plan, from ten to twelve loads of unfermented manure may be obtained every spring for each animal; and if the stable manure is spread over the yard, the quality of the dung will be improved, and the quantity proportionably increased. Any excess of liquid that may remain after the dung is removed in the spring, can be profitably applied to grass, grain or garden crops. It is used extensively in Flanders and in other parts of Europe.

Having explained my method of procuring and preserving the food of vegetables, I will proceed to state my practice in feeding or applying it. It is given, every spring, to such hoed crops as will do well upon coarse food, (my vegetable hogs and goats.) These are corn, potatoes, ruta baga, beans and cabbages. These consume the coarse particles of the manure, which would have been lost during the summer in the yard; while the plough, harrow and hoe eradicate the weeds which spring from the seeds it scatters. The finer parts of the food are preserved in the soil, to nourish the small grains which follow. The dung is spread upon the land as evenly as possible, and immediately turned under with the plough. It is thereby better distributed for the next crop, and becomes intimately mixed and incorporated with the soil by subsequent tillage. Thus, upon the data which I feel warranted in assuming, a farmer who keeps twenty horses and neat cattle, will obtain from his yards and stables, every spring, 200 loads of manure, besides what is made in summer, and the product of his hog-sty. With this he may manure annually ten or twelve acres of corn, potatoes, &c. and manure it well. And if a proper rotation of crops is adopted, he will be able to keep in good heart, and progressively to improve, sixty acres of tillage land, so that each field shall be manured once every four or five years on the return of the corn and potato crop.

From the New-York Farmer.

CULTIVATION OF TARES AND SWEDISH TURNIPS.—BY S. HAWES.

Mr. Fleet,—Having grown during the past season some tares and Swedish turnips, favorite crops with English farmers, I venture to send you some account of the culture and produce of both. About an acre of land in good condition, not having been recently cropped, was ploughed once, harrowed and then sown with three bushels of spring tares and half a bushel of oats on the 1st of May last. I had not the seed early enough, or the tares should have been sown by the middle of April.

They grew most vigorously, and by the end of June, were in flower, producing quite as much herbage as I ever saw them produce in England—indeed abundant; more than twice as much as any clover

I had growing at the same time. From the time they were in flower they were cut as wanted, and given to horses, cattle and pigs, all which ate them readily. Yet I did not think the stock did so well upon them as in England, possibly from the mode of their growth, which, either owing to the soil or climate, was different to what I had before seen. These went on growing freely after the pods were formed, though, commonly, when pods are formed, the whole strength of the plant is directed to perfect the seed, and the stalks soon cease to grow. They grew till the first week in September, when all were cut down, cured and stacked. The haulm or straw was abundant, and is excellent food for sheep. The seed a poor crop, as from half an acre I had only five bushels, which, even allowing for much waste by fowls whilst growing, was too little, as half an acre ought to produce at least fifteen bushels. I intend to sow an acre with them this spring, and hope they may yield better.

For Swedish turnips I had five acres of land, a good sandy loam, ploughed and harrowed repeatedly till clean, then manured with about twelve good two horse loads of half rotten manure per acre, which was ploughed in, and the turnips sown at different times, from the fifteenth of June to the 6th of July.

The seed was drilled on the flat surface twenty-two inches from row to row, and on the 6th of July we began to hoe out those drilled the 15th June. But those drilled on the 6th of July we began to hoe on the 20th, being only fourteen days from the time of sowing. In England I do not recollect any fit for the hoe in less than three weeks. But here vegetation is more rapid, both of turnips and weeds. In hoeing they were left about ten or twelve inches from plant to plant in the rows. They were hoed again in twelve or fourteen days, and afterwards a third time.

The plants soon covered the ground, the tops meeting, and the crop was an excellent one, equal to any I ever had in England. Part of the ground, which was low and not well drained, produced large turnips, but not so sound or sweet as those grown on high ground in the same field.

The whole were pulled early in November and thrown in heaps, then the tops were cut off and thrown to cattle, the turnips carted home and thrown into piles about six or seven feet wide at the bottom, and gradually coming to a point, which was about five feet from the ground. Mould a foot thick was thrown over them, leaving at every eight or ten feet a small hole to allow the warm moist vapor to escape, which always arises from the slight fermentation that takes place. No straw was used. The piles have been opened as wanted for use, closing the aperture with an old door and some litter for the time, and we have lost none. Fifteen or sixteen loads were put into an old ice-house for a few weeks, but the stock did not eat them so readily as those which came out of the piles. I doubt whether any cellar will keep roots so well or so sweet as earth alone. The crop was excellent, both in quantity and quality, but no account was kept, even of the number of loads, yet there must have been more than three thousand bushels. Cattle from the first were extremely fond of them; a lot of native wethers were a long time in learning to eat them, but at length did well upon them. My own Southdown ewes having been fed on them, had abundance of milk in January, and thus my early lambs will go to grass in good condition. Pigs, old and young, are fond of them, and they need no cooking. In England many store pigs are kept on scraps and bits of Swedish turnips left by cattle.

Of the expense I can give no account, nor have I much faith in such accounts generally. The preparation of the ground, and the sowing, were interrupted by repeated rains, so in pulling them up the men were repeatedly stopped by frosts, and had to get them secured as they best could. The culture of tares is nothing, but hoeing turnips is expensive, yet more and better food is yielded by turnips than by any other crop on this loam. On strong soils mangold wurtzel would be a better crop, as such soils seldom grow good turnips; but beets, to do well, should be sown in May, and are very liable to be hurt by early frost. Swedish turnips are not injured by even severe frosts, if used quickly after; but freezing and thawing will spoil them.

Yours respectfully,
S. HAWES.

Albany, March 11, 1834.

Young Men's Department.

PLEASURES DERIVED FROM THE CONTEMPLATION OF NATURE.

Nature, with maternal kindness, offers to all her children the most delightful and universal, as well as the least expensive, of all pleasures. Such our first parents enjoyed in Paradise, and it is only depravity which leads men to delight in other recreations. Mankind are accustomed to despise the blessings they daily enjoy, and seek for amusements that afford them pleasure from their variety, and a succession of delight from their novelty: while the pleasures of nature exceed all others, are open to every one, and their enjoyment never leaves behind it the sting of remorse, or the tears of repentance. But we are so selfish as to disregard the charms of nature, because they are alike open to the eyes of the poor as to those of the rich; and so foolish as to despise them, because of their cheapness: whereas nothing should gratify us more than to know, the same objects which cause our delight constitute the happiness of millions. Compared with the noble and affecting pleasure such a consideration excites, how frivolous and deceitful are all those costly amusements and magnificent entertainments, which delight the rich and please the foolish! their enjoyment often ends with disgust, and leaves as its portion a painful vacancy of soul; whilst nature, ever rich and bountiful, continually varies her charms, and offers new beauties to the admiring observer.

All the pleasures which are the effects of art are of short duration, and fleeting as the dream, the illusions of which vanish when we awake. But the exercise of reason, and the ever-varying pleasures of the imagination, last forever, and derive new strength from contemplating the works of nature, which call forth all the finer feelings of the heart. To see the starry heavens, the earth variegated with flowers, a thousand different landscapes, and prospects vying with each other in beauty; and to listen to the evening song of the nightingale wafted on the breeze, whilst all nature is retiring to repose, will ever fill our souls with delight, and gratify all our feelings. If any one is insensible to these beauties, and unaffected by their charms, it must be owing to his depravity, or the stupidity which he has acquired from inattention. The great science of Christianity, consists in the innocent enjoyment of every good which surrounds us; and he who practises this, possesses the art of deriving the means of happiness from every circumstance that does not injure his virtue, his intellect, or his feelings. Beneficent Creator! thou art mindful of us in this beautiful season, and providest us with abundant sources of pleasure! Thou continually causest new springs of delight to open, and our hearts are filled with joy and gladness! If we desire to elevate our hearts to thee, to indulge in holy meditation, and to enjoy celestial bliss, nature often offers us the most ample means. May we ever prefer this exalted satisfaction before all the pleasures of sense? In these sweet days of spring, may the enjoyments of nature's purer pleasures be more grateful to us than the allurements of sensual gratifications, which neither dignify the mind nor purify the heart! Teach us, O Lord, to acknowledge thy divine power and goodness; for it is by seeking to know thee in the varied and numerous works of thy creation, that we open to ourselves a pure and inexhaustible source of delight, and are enabled to enjoy, in this state of existence, a foretaste of the felicity which the righteous shall experience in thy presence for ever and ever!—*Sturm.*

THE CULTIVATOR—JULY, 1834.

TO IMPROVE THE SOIL AND THE MIND.

The unprecedented cold weather which we experienced between the 12th and 15th May, seems to have extended its influence from the Mississippi to the Atlantic, and from Canada to the Potomac; and what is uncommon, the injury which it produced was less in cold and elevated situations than in those of warmer temperature. In the valley of the Hudson, fruit of most kinds has been destroyed; and if some districts have been more favored than others, it has been those where vegetation has been most backward, and in high situations. A few scattering pears, peaches, plums and cherries are seen upon the trees. Some apples that were late in coming into flower, and grapes that had been kept back, or had dormant buds, show indications of fruit. Fifteen miles west of this city, where vegetation is ordinarily ten days later than upon the river, the apple blossom was not sufficiently developed to be injured, and *there* is the promise of a good crop of apples. We presume this was also the case in Schoharie, Otsego, and in the counties to the north. Their apples and cider are likely to find a good market in the autumn. Not only the fruit, but the trees, seem to have been seriously injured, and in some cases destroyed, by the loss of their leaves. Their growth has since been languid and sickly, and we have noticed some peaches and pears, and many grapes, the foliage of which was completely killed by the frosts, that have not yet pushed forth a new leaf, and which are apparently dead. Such were most advanced in growth, when cut down by the frost.

We perceive by the Ohio papers, that wheat and rye have been seriously injured in that state. Although these crops retained their green appearance, it was found, on splitting the stem, that the head of the grain, although enveloped by the sheath, was killed by the frosts. Some farmers were cutting down their grain for fodder, with the view of procuring a new growth from the roots, a method which is said to have been found to succeed, although the crop comes to maturity some weeks later than usual.

We do not pretend to assign a natural cause for this phenomenon in our seasons; but it is worthy of notice, that immediately after the cold spell which we annually experience in May or June, we hear of polar ices being met with in our latitude upon the coast; and in the present instance we have seen mention made of icebergs having been met with about the 12th or 15th May, as low as lat. 36, which, if correctly stated, is an occurrence, we believe, unprecedented. On the 8th May, 1802, snow fell at Pougkeepsic, and through the northern parts of the union generally, two to six inches in depth; the cold weather continued to near the first of June, and yet, from the uninterrupted fine weather, with occasional showers, which followed, garden vegetables were earlier at table that summer than usual. I saw squashes on the 28th June, and green corn on the 6th July. B.

COMPOSTS.

Much has been said and written in favor of compost manures; and under many circumstances they really afford a valuable accession to the fertilizing materials of a farm. But when the object to be obtained is not fully understood, they sometimes occasion a useless expenditure of labor. Composts are a mixture of animal dung, lime, ashes, vegetable matter, and earths,—two or more of them. The economy of composts consists in, first, saving the gaseous matter which escapes from manure while undergoing fermentation, and the liquids which flow from the dung-heap; and second, in rendering vegetable matter soluble, and food for plants, which was before inert and useless. Thus, if earth is mixed with and spread over a pile of dung while it is fermenting, it imbibes the volatile and liquid parts of the manure, which would otherwise be lost, and thus becomes almost as fertilizing as the manure itself. This fact shows that manure loses much in fermenting, for it loses all the earth gains. If peaty or swamp earth is employed, a double object is gained; for while it prevents waste in the manure, it is of itself converted into manure, (being composed of vegetable matter,) by the process of fermentation. But when the object is merely to prevent waste in the dung, the process is most economically effected *in the soil*, where both the gases and liquids will be retained, and by which the transportation of the earth to and from the dung yard is saved. When the manure cannot be conveniently used upon *hoed crops*, before fermentation, then a bedding and covering of earth for the pile is matter of economy, and should not be omitted. So if it is desired to convert the vegetable deposite of swamps into manure, it may be readily and profitably done by alternating it in layers with hot dung. In this case one part of dung to three parts of swamp earth will suffice. A layer of dung, five or six feet broad, and as long as necessary, is first deposited on a proper piece of ground, then a layer of earth over it; and in this way alternate layers should be added until the pile is five or six feet high. As soon as the mass gets into a state of fermentation, which may be ascertained by plunging into it a stick for a few moments, and ascertaining thereby its heat, the compost is fit for use. This will require weeks or months, according to the temperature of the weather.

It will be perceived that composts in which no fermentation takes place, can be of little advantage. There is no volatile matter to be given off, and no tendency exists to break down and render soluble ligneous and woody matter. Lime operates more powerfully than dung in inducing fermentation in vegetable matter, though it is not prudent to use it in combination with stable dung: I have fouud by experience, that it causes a too violent action, and dissipates nearly all its fertilizing properties. Composts are particularly adapted to all the family of small grains, and for top-dressing grass grounds, where this latter practice is tolerated. Mere earthy matters add nothing to the compost pile; they merely prevent the waste of other materials which compose it. In making composts, therefore, for field use, earths should be preferred which abound in vegetable matter; and the litter, vegetable refuse, urine, soap suds, ashes, &c. should be added, which are ordinarily wasted, and which form annually a large aggregate upon a farm. B.

PROPER TIME FOR CUTTING GRAIN.

We find an interesting article upon this subject in the Farmers' Register, which details the result of the writer's observation and practice for twelve or fourteen years, on an extensive farm. The length of the communication, and our restricted limits necessarily limit us to a brief notice of this communication. The writer admits, that if we could be sure of good weather, it would be best to omit reaping till both grain and straw are ripe; but as this cannot be the case, and as the crop suffers and loses greatly if not cut and secured as soon as it is ripe, he is sure that a great saving will be found in reaping wheat *as early as the state of the grain will permit*. He considers that "wheat is fit for the scythe when the grain is in the *dough state*.—no matter how soft, provided it is clear of milk, or when no fluid comes out separate from the dough, when the grain is mashed between the fingers. But no one square yard of wheat can be found, in which all the heads have reached this state at one time; and, therefore, when not more than one-tenth part of the grains contain milk, I think it safe to begin to reap." "My green reaping when first commenced (in 1821) was fully *nine* days earlier than was usual—and it was pronounced then that I was destroying my crop, by reaping it so green. My practice is still condemned by many, who, however, have gradually, and perhaps unconsciously, advanced the commencement of their harvests, until they are not more than two or three days behind mine." The saving made in one season, by early reaping, when a long spell of rainy weather followed, which destroyed more than one-half of his neighbor's crops, was enough to pay for all the loss incurred by that plan in twenty years. The writer does not believe that any thing is lost either in the weight or bulk of grain cut in the dough state; and as to the quality of the grain for making flour, he believes it generally conceded, that the wheat reaped green is the best.

The truth of the foregoing remarks is corroborated by the opinions and practice of many of our best farmers. These observations apply equally to other small grains, particularly to rye. The great objection to the practice is, that the grain is not fit to be bound, as it should be to prevent waste and save it from rain, soon after it is cut. This objection is obviated by making small sheaves, and putting them in "stooks" of about six sheaves each, by setting the stubble ends of the sheaves far enough apart to give sufficient base, and letting the heads of all lean together so as to form a point.—These throw off a light rain, and will dry as they stand if made wet by heavy rain. When dry they may be put into shocks.

THE VINE.

"Observations on the character and culture of the European vine, during a residence of five years in the vine-growing districts of France, Italy and Switzerland, by S. T. Fisher,—to which is added, the manual of the Swiss Vigneron, as adopted and recommended by the agricultural societies of Geneva and Bern, by M. Brun Chappins, and the art of wine-making, by M. Bulos." The above is the title of a neat 12mo. volume which has been sent to us for examination.

It has become matter of serious doubt, whether the European vine can be successfully or profitably cultivated in the United States, for the purpose of making wine,—or even for table use, in this latitude, without the protection of walls or glass. It is subject to blight and mildew, and our September frosts are liable to overtake it, ere the fruit attains maturity. Mr. Fisher, however, thinks it may be acclimated, at least in Pennsylvania. The vine, he says, is not indigenous in Switzerland. It has been frequently found, he says, that the plants of foreign cuttings, though arrived at the proper age, and possessing a vigorous maturity, have refused to unfold a solitary flower. Cuttings from such plants have produced blossoms, which, however, proved abortive. "From the plants of succeeding cuttings other cuttings have been cultivated, following up the system for several seasons, till in the end a complete success has crowned the experiment; and it has been found that the process of acclimating the stranger plant has not reached its full accomplishment, until it has passed through four, and sometimes five generations of the vine."—p. 62.

To show that good wine does not always depend upon fertility of the soil, but rather the reverse, we quote the author's remarks upon the vineyards of St. Julien, celebrated for the fine flavor and delicacy of their wines.

"The vineyards of St. Julien occupy the sides of the most barren rocks of that country, [Italy,] and I was at a loss to discover the necessary soil for the support of the plants. The vines were not more than six inches in height; of short stunted growth, and crowded together in a confused mass, without order, the space intervening being scarce sufficient to allow the weeding them. It is to the peculiarity of this stony *locale*, the reflected heat of the sun, and the absence of humidity from springs in the vine ground, that the delicate flavor of the wines of St. Julien is to be ascribed."—p. 78.

Mr. Fisher evidently took much pains to acquire such information in regard to the culture of the vine as might prove useful to his countrymen; and in this we think he has been successful: for if the foreign vine does not ultimately succeed with us, we have native varieties which, with the care bestowed by the European vigneron, will thrive, and produce as good wine as we ordinarily import. Mr. Fisher's book affords much needed information in regard to the culture of the grape, and the process of manufacturing it into wine. We recommend the work with confidence to such as stand in need of this information, as one of the best guides that has fallen under our observation. B.

Protecting Seed Corn from Birds, &c.—We record the following fact now, lest it may be forgotten at a more proper time, and as affording demonstrative proof, that tar will protect seed corn from crows and other birds.

In planting my corn, the seed was prepared as described in the second number of the Cultivator. Some days after planting, it was discovered that an entire row had been omitted. This was planted with untarred seed. On hoeing the crop, it was found that almost every spear of grain in this row had been pulled up by the birds, while not a hill of the tarred corn, on each side of it, had been touched. I do not employ *scare-crows*, or other expedients, to keep the birds from my fields. B.

Dairy Husbandry.—We have received an interesting letter from Ephraim Perkins, of South Trenton, upon this subject; and he has proffered a detailed statement of this branch of husbandry for publication in the Cultivator, which we respectfully solicit him to forward. The dairy district to which Mr. Perkins refers, consists of the second tier of towns lying north of and running parallel with the Mohawk river, in the counties of Herkimer and Oneida. Such has been the progress of the dairy business in that section of country, occasioned in a measure by the facilities of transportation offered by the canal, that the quantity of cheese sent to foreign markets, has increased, since the completion of the canals, from 70 to 1,300 tons; and a district, which was before nearly stationary in improvement and wealth, has advanced in nearly a like ratio in population and improvement. We should be pleased to receive from Mr. Perkins a detailed statement of the process of making the different sorts of cheese, and his estimate of the profits of the dairy business. Many of our counties upon the head waters of our streams are well adapted to the dairy and cattle husbandry, and will be thus profitably appropriated, as soon as the lumber has been got rid of. Lumbering and fishing are incompatible with good farming, and too often with good habits. Exclusive reliance upon the artificial products of the farm, begets a salutary competition, and leads rapidly to improvement and wealth.

Hay-Spreading Machine.—We have just seen in operation, at the farm of Gen. Van Rensselaer, a machine for spreading, stirring, and turning hay, invented and patented by Capt. Joab Centre, of Hudson, once of the ocean, but now of the land, and for some years an excellent practical farmer. The machine is of simple construction, is attached to a pair of wheels, and drawn by a horse. It seemed to do its work well, and promises to be a valuable acquisition, in saving labor, and in facilitating the curing of hay. The machine may be seen in operation during the haying season, at General Van Rensselaer's farm, and at the Captain's farm, near Hudson.

We shall hereafter be more particular in noticing this machine, and in describing other new farm implements which have fallen under our notice, calculated to facilitate the labors of the farm.

CORRESPONDENCE.

Buffalo, May 26, 1834.

My Dear Sir—I have for a long time intended writing you on more subjects than one, connected with our State Agricultural Society, the establishment of an agricultural institute, &c. &c. but my engagements have been so continual and pressing for the last six months, that I have had far too little time to spare on the subject so near my mind as the improvement of our state agriculture. I did indeed hope, after reading with much pleasure Governor Marcy's sentiments on the establishment of a permanent institution for the improvement of our farmers, that some decisive measures would be taken by both branches of the legislature, to place the subject in a right view, and to act upon it; but I confess to you my utter disappointment, on reading the reports of the committees to whom the subject was referred. But we must not despair. Another effort may be attended with success; and if so, much of it will result from *your* own long and continued efforts to attain it.

I observe by the published proceedings of the State Agricultural Society in February last, that they have chosen me one of its vice-presidents, an honor to which I have little claim, and am indebted vastly more to the kind feelings and confidence of my friends in the society than to any merit of my own. My agricultural *experience* has been as yet limited, although my observation has been constant and somewhat varied; and if I can in any way render my humble mite of service to the cause of the farmers, I shall be happy. I fear our influential men, and those of capital and large landed estates, take too little interest in the subject. In order to set the minds of the great body of our husbandmen upon inquiry, the subject must be brought home to every farmer of influence and observation. Example is every thing, and unless those who lead will take a strong and vigorous hold, I fear little will be done in this very necessary work.

I have received a few numbers of "The Cultivator," which pleased me much. It cannot be too highly recommended, and it is got up in a form and at a price so perfectly unobjectionable, and withal so useful and appropriate to the common farmer, and indeed to every one who cultivates even a garden, that it should readily commend itself to the attention of all. I enclose you five dollars to pay my arrears as a member of the State Agricultural Society, and for a copy of the Cultivator, which please to order directed to me from the commencement. I truly feel ashamed that I have not sooner ordered it, and taken a deeper interest than I have done to procure it subscribers and circulation; but I have only to plead as before my extreme confinement to business. I hope hereafter to have more leisure to attend to those matters, which, though apparently trifling in themselves, yet may, and do often lead to important results.

I have spent a considerable share of the past winter and spring on Grand Island, which you will probably recollect, a few gentlemen of Boston and myself purchased last fall. I have been busily employed with a large number of men in erecting a steam saw-mill to cut up the immense quantity of valuable white oaks which grow there, for the eastern market, for which they will afford many years supply. We have built up a snug little *log* city on the eastern shore, which we call Whitehaven. It stands on a pretty bluff immediately on the bank of the Niagara, a bold, sweeping, clear stream, and directly opposite the Erie canal. We have also got out, and they are now about being shipped by the canal, the frames and timbers of three large merchant ships, to go to Boston, there to be put up and finished. Thus you see that the oaks of our western forests, which were a few years since consumed as a worthless incumbrance on our soil, are now an article of export more valuable than the soil on which they grow. We have on the island about 16,000 acres, nearly the whole of it, and I think the finest body of land lying together that I have seen in the state.

We are clearing up and getting under cultivation a large, and what will be in a few years, a very fine farm. It lies upon the river where it makes out in a large bay, and within sight of the villages of Black Rock and Waterloo. Here we are laying down a considerable quantity of meadow by stocking with oats, peas, wheat, barley, &c. Our lands here are very strong, and will retain the grasses sowed upon them and turn off heavy crops for many years without ploughing. I spend as much of my time as possible at the farm, (and I confess to you by far the pleasantest portion of it,) in setting the fruit trees, regulating the fences, looking at my cattle and pigs. I have three beautiful Devon cows and a bull, all full bred, and a fine calf; also a Holderness heifer and calf, good ones too; and a splendid bull of the "improved short horns." When I first obtained him last fall, our own folks and others who saw him did not see much to admire in the animal, although "he came all the way from Boston," and generally preferred the Devon, who I had of our friend Bement in Albany. But their prejudices to the Durham short horns are now removed, for he has wonderfully improved in his appearance, and is considered the finest animal they ever saw. I have had my doubts, and so have expressed them, whether for *our* country the Durhams were superior for general use to the Devons; but I must say that further observation continually convinces me that for *all* the purposes of the farmer, *taken together*, the Durhams bear the palm. Yet the Devons are a beautiful, hardy and good race of cattle, of the best possible colour, and much superior to the common stock of the country. I intend, as soon as practicable, to obtain a full bred cow or two of the "short horns," and get as rapidly into the stock as possible. With a number of the native cows now on hand we shall soon have a tolerable stock of half bloods.

When in Albany last fall, I bought a fine pair of spotted China hogs of Mr. Bement. The female soon after brought me a beautiful litter of pigs, crossed with a long bodied white English breed, which Dr. Hosack sent Mr. B. from his farm at Hyde-Park. I think it the finest cross I ever saw. I gave away three of the male pigs to my friends in distant parts of the country; three females I keep, and two barrows I am fatting in a pen to see what they will amount to. They are the most perfect animals of the hog kind I ever saw. They are continually fat and live on absolutely *almost nothing*. They have lived all the spring in a wild pasture, and have not been up to feed for a fortnight past, while a few of the real *woods breed*, which I bought of the former occupant of the farm, eat all the slops and butter-milk of the house, and actually appear to grow poorer with their keeping. It is surprising that people will pay so little attention to the breed of their hogs and cattle, when such different results are constantly before them.

In clearing up the lands I often have little clumps, and occasionally single trees left, where they grow thrifty and of a good kind, as shag-bark hickory, black-walnut, white-oak, sugar-maple, &c.—They soon grow up to beautiful shades, adding value to the soil and beauty to the landscape. It would indeed give me much pleasure to have you occasionally at my elbow to aid me with your valuable advice in all these matters. A little attention to things of general utility in the beginning, such as the proper selection of shade and timber trees, in proper locations on the farm often saves great expense and waste of time in after years.

But I must close, having written much more than I expected when I sat down. Rest assured, my dear sir, you have my best wishes in the useful employment you have so liberally undertaken, of disseminating and conducting this journal; and if my time and opportunity will hereafter permit me to drop you any thing acceptable for your paper, I shall take a pleasure in doing it.

Very truly, and respectfully yours,

J. Buel, Esq. L. F. ALLEN.

Burlington, June 17th, 1834.

Sir,—Among the spurs of the Green Mountains, and elsewhere in Vermont, there exist extensive deposites of land or fresh water shells. They occur in beds of several feet thickness, generally two or three feet below the surface, and often partially covered by small ponds. A great proportion of the mass is reduced to an impalpable powder; and the few shells, whose forms are discernable, are very small, and completely friable. They are generally free from any admixture of earth, or other foreign substance, and of a very white colour. They have been sometimes burned for lime, but have not, to my knowledge, been used for agricultural purposes.

These deposites constitute, I suppose, what agriculturists call *shell marl*, and the object of this communication is, to ask you to give your Vermont subscribers, through the Cultivator, some information, respecting,

1. The *value* of this substance as a manure-
2. The *mode* and *time* of its application.
3. The *sort of soil* to which it is best adapted.
4. The *quantity to the acre*.
5. Whether it should be used *by itself, or with stable manure*.
6. And whether its valuable properties would be increased by *burning it to lime*, or whether on the contrary, any increase of its activity by burning, would not be counterbalanced by the *destruction of such animal matter* as may exist in the mass. S. X.

J. Buel, Esq. *Editor of the Cultivator*.

REMARKS.

We have had no practical experience in the use of shell marl, but have employed argillaceous or clay marl in husbandry, with manifest advantage. Both kinds, we believe, are similar in their effects: both are valuable on account of the calcareous matter, or carbonate of lime, which they contain; and they are deemed rich in proportion as this is found to abound. Marls benefit chiefly by their mechanical operation in the soil, rendering clays more porous, and sands more compact and retentive of moisture. They are analagous in their operation to chalk or powdered limestone. They do not, like quick-lime, accelerate the decomposition of vegetable or animal matter; yet they tend to correct sour soils, abounding in sorrel, and to bring in white clover in its stead. From these considerations it will be perceived, that shell marl is best adapted to improve stiff soils, and clay marl to improve sand soils; and that in both cases, these benefits will be permanent. We suspect our correspondent is mistaken in his supposition, that these shells are free from any admixture of earths, (other than calcareous) a fact which can best be determined be analysis. This analysis may be readily obtained at Burlington, from whence our correspondent dates; and it is also necessary to determine the value of the marl. In the mean time we proceed to answer our correspondent's queries in the order which they present:

1. The value of marl is in proportion to the quantity of carbonate of lime which it contains, and the distance to which it has to be transported for use. This proportion is sometimes 80 or 90 per cent, and should amount to at least 50. If it abounds in animal matter, as is suggested, its value is enhanced.
2. Marl is best applied in summer, because it is then dry, light, and most easily reduced to powder; though it may be advantageously spread during the winter frosts. It should be completely incorporated with the soil. Hence it should be evenly spread, and ploughed and harrowed in; and its benefits are developed in proportion as its admixture with the soil becomes perfect.
3. Marl benefits most soils—but most those which are either too porous or too compact for tillage crops.
4. From 200 to 800 bushels of marl are applied to the acre;—the common quantity 250 bushels. There should be at least a thin coat over the whole surface.
5. Marl may be used with or without stable manure, as neither has any injurious action upon the other.
6. *Marl* is not benefitted by calcination or burning. When burnt, shells become quick-lime; and if they abound in animal or vegetable matters, these are destroyed by fire, without any diminution of earthy matters. B.

Mr. Buel,—I have this year commenced farming on a small scale, and think of turning my attention principally to grazing and dairying; hence I am anxious to see something from practical dairymen, on the best mode of keeping cows, making and preserving butter and cheese, the quantity of salt to the pound of butter,—and whether loaf sugar or sal nitre, or both, may be used to advantage in preserving butter. M. BARKER.

Borodino, June 17.

☞We solicit answers to the above questions from some of our practical dairymen and graziers.

J. Buel,—I am glad to see the correspondents of the Cultivator alive to the subject of destroying the Canada thistle, as it is high time that something is done to arrest their progress, particularly in the western districts of our state. And seeing a communication in your last number requesting practical knowledge on any subject that may interest the farming community, I felt willing to throw in my mite, though with diffidence, on this all important subject. We last year had a strip extending quite through a field, where we intended to sow barley, which we did not sow; but as the thistles appeared, turned them under with a plough pretty deep at first, and in the course of the summer ploughed the piece seven times, and harrowed as many more, which has effectually destroyed them, there being now not one to be seen. After the three first ploughings they sprung up very soon; after that, they began to appear sickly, and of a yellowish cast, and after the fifth ploughing they appeared no more. This year we are managing thirty acres in the same way, and several of our neighbors, seeing the beneficial effects of the experiment, are now pursuing the same method. Planting the piece with corn the first year, if it be sod, I think preferable, as that subdues the sod, which otherwise would be much in the way of early cross ploughing.

Some have contended that much ploughing hurts the land: but experience has confirmed me in the opinion that it is very beneficial to it: first, because it kills every thing foul in it, and secondly, by the act of pulverization, renders the soil light and loose, and by that means pervious to heat and water. We have wheat now growing on the piece, which is beginning to tumble down, and my greatest fear is, that it will be too large to fill well, and no manure put on it, while the wheat adjoining is not equal to it, though heavily coated with stable manure.

I perfectly agree with *A Subscriber*, in your last number, that keep down the top of any plant one summer, and it will effectually destroy it. Such being the fact gained by experience, (the best school extant,) I think a knowledge of it ought to be more generally diffused.

Skaneateles, Onondaga co. N. Y. 5th mo. 18th, 1834. G. W

Homer, June, 5th 1834.

Sir,—I have observed several communications in the Cultivator on the destruction of the Canada thistle, all of which are stated to be the result of actual experience, and founded on good reasons. What I am about to communicate has not been tested thoroughly, but the experiment has been tried two or three times, and the discovery was wholly accidental and in the following way. Some four or five years since, our farmers got into a rage for raising hemp, and appropriated their richest soil to it. A farmer in this town took a piece of land, covered literally with the Canada thistle; he took this ground because it was less worn and more rich than any he had on the farm; he sowed the hemp quite thick, but was fearful that the thistle would injure the crop; but on examination, after the crop had sprung up some six to eight inches, he found the thistle to turn yellow, and as the hemp advanced, he saw that the thistle wholly disappeared where the hemp was thickest, and where it was more thin, there were a few sickly stinted plants of the thistles standing, which were easily pulled up by the hand, bringing the root for some depth; and after the crop of hemp, to this time, (about four years,) he has had no thistles there. He communicated this experience to a gentleman near this village who was much troubled with the thistle, and he tried it two years since with the same effect, and has no doubt of its being an effectual remedy. He observes that the land should be made rich by manures, and the hemp sown quite thick, so as to effectually choak the thistle and draw from it all moisture or nutriment. These men had tried all other ways recommended in the Cultivator; but think hemp the surest and most profitable remedy which can be tried, without any loss of labor or crop. For one, I am desirous of seeing the experiment tested, and hope that through the medium of your Cultivator I shall hear the result of several experiments. It is too late to make one this season; therefore, because men are forgetful, it will be well to mention it the ensuing spring. I have great confidence in it, but I may be wrong; at any rate, the trial of the remedy proposed is unlike many new things, if it does no good it will do no injury.

There are two things which will particularly suggest themselves in this experiment, viz: 1st. Whether the plant is destroyed by the hemp taking up all the nourishment from the root? or, 2d. Whether the plant is in effect smothered by the surrounding herbage? From the two experiments of which I have spoken, I am of the opinion that the greatest injury the plant receives is from the latter. I have ineffectually tried to root up the thistle, and instead of diminishing them in that way, they have increased; but by cutting the tops close by the ground, or pulling them, I have in a measure succeeded, leaving the root undisturbed; but I do not doubt that constant ploughing will destroy them; they must have atmospheric nourishment or die, and in this way hemp destroys them. It, I think, wholly cuts off atmospheric nourishment, or allows it to be communicated in so exhausted and unhealthy a state, that the thistle dies by exhaust on.

Yours, &c. A SUBSCRIBER.

A Plough Farmer, whose communication we cannot now insert entire states, that he completely eradicated the Canada thistle upon two acres, where they were very thick, by sowing clover upon it: the clover got the start in the spring, grew luxuriant, and smothered the monsters. He proposes a premium for the best method of extirpating quack grass.

Tillage Husbandry.

West-Springfield, June 11th, 1834.

J. Buel, Esq.—As an earnest friend of the agricultural interest of the community, permit me to recommend to your notice, the publication Mr. Wm. Clark Jr. of Northampton, in the 10th Vol., No. 38, of the New-England Farmer, as well as your own observations on it, in No. 40 of the same volume. If you view them in the same favorable light, as well as consequence to the public, in which I did, and many others also in this vicinity, could you do a more acceptable service to the public, than by inserting them in your excellent Cultivator? and to have any effect this seasan, they ought to be put in the number for July or August. Mr. Clark, I learn, is an enlightened, practical agriculturist. If he is correct in his statements, his observations cannot be too widely extended.

I am, sir, with respect and esteem, your ob't servant,

JUSTIN ELY.

CUTTING CORN STALKS.

Mr. Fessenden,—I have made a small experiment the past season, to ascertain the damage, if any, that results to the corn crop, from topping the stalks in the usual way. And influenced by the request of several individuals, and the thought that, perhaps it might *lead* to a better knowledge of this important branch of agriculture, (the growing of corn,) I am induced to forward the particulars to you for publication. Although I am aware that *guessing* enters largely, and perhaps necessarily, into the calculation and business, of the farmer, I am also aware that experiment cannot be conducted with too much precision; indeed that experiment to be relied on, must be conducted entirely without guessing Therefore, I have been somewhat particular in conducting this. And lest some of your readers may be a little sceptical in regard to the result, and perhaps unwilling to allow that the course which has been pursued by our ancestors, from time immemorial, is not the best course, I will give the details; and if an apology be deemed necessary, for being so very minute, I can merely say, that as the experiment seems to me so deeply to involve the interests of corn growers, it may be well to give a detailed statement of the case, so that any interested may be able to draw their own inferences. And if, in your opinion, it is worthy a place in your useful Journal, or likely to promote the interest of New-England farmers, you are at liberty to publish all, or a part, as you shall think best.

For a few years past, I have not cut my corn stalks until the corn was harvested, *guessing* that it was a course preferable to the one commonly pursued in this part of the country, of topping the stalks while in a green state. But for the purpose of settling this point more clearly, and with as little trouble as the case would admit, I selected, about the 5th of September, a row of corn in a field of about five acres, intending to take one that would average in quality equal to the field throughout, that I might at the same time be able to ascertain with tolerable certainty, the product of the whole field. The manure having been spread on the surface of the ground and harrowed in lengthwise of the furrows, and the corn planted across the furrows, made it apparently less difficult to select an average row. On this row I cut the stalks from half the hills; beginning at one end and cutting the first hill, then leaving the next uncut, and so proceeding alternately, cutting one and leaving the next uncut, through the row. I had intended to confine the experiment to this row, but finally was led to extend it so far as to include four rows, and numbering them agreeably to the order in which they were standing tn the field, this row may be called No. 2. There were ninety-two hills in the row, and the stalks were cut from forty-six hills, all of them in the manner that is here termed jointing (i. e.) cut off between the ear and the first joint above the ear. I thought they were somewhat more ripe than is usual at the time of cutting; a few of them were nearly dry. The soil was a sandy or gravelly loam, anciently covered with pine, oak and chesnut. In hoeing the corn no hills were made, but some care was taken that the surface of the ground should remain as level as possible, through the season.

My estimate of the number of hills on an acre, was made in the following manner, and if I am wrong in my calculations, I shall be corrected by some of your readers.

In an area of 200 feet square, (or 40,000 square feet,) there were sixty-two rows, with fifty-four hills in a row, making 3,348 hills. This is equal to 3,646 hills per acre, each hill occupying nearly twelve square feet of surface. There were about four stalks of corn in a hill. In estimating bushels, I have allowed the lawful weight of fifty-six pounds to the bushel.

At the time of harvesting, the corn was husked in the field. The forty-six hills from which the stalks had been cut, gave forty-eight and a half pounds of ears: and the forty-six hills on which the stalks had not been cut, gave sixty-two pounds of ears. The number of ears in the two cases was about the same; those from the uncut hills were evidently the best filled out and the most hale; on a large proportion of them the kernels were so closely wedged in, as to make it difficult to bend the ear at all without breaking it. There was very little mouldy corn in either case, a few ears were gathered, mostly from the cut stalks, but the whole quantity was so small as to make it questionable whether cutting the stalks had much effect in this particular.

Both parcels were carefully laid aside in a dry chamber for about six or eight weeks, at the expiration of which time they were again weighed, and the parcel of ears from the uncut hills had lost in drying about two per cent more than the other; affording some evidence that the sap continued to circulate for a greater length of time, in the uncut than in the cut stalks. The uncut hills, gave 42 lbs. 8 oz. dry shelled corn, equal to 14 oz. 12½ grs. per hill, or 60 bushels and 8 pounds per acre. The parcel from the cut hills gave 33 lbs. 7 oz. equal to 11 oz. 10 grs. per hill, or 47 bushels and 18 pounds per acre; making a loss of 12 bushels and 46 pounds per acre, by cutting the stalks. Conclusive evidence, that while the sap is in circulation, nature does not assign the stalks an unprofitable office. The product of this whole row, taken together, cut and uncut hills, was equal to 53 bushels and 41 pounds per acre.

The product of row No. 3, taken by itself, (containing ninety-two hills, on one-half of which the stalks were cut on the same day the others were,) would not show the practice of cutting stalks quite so destructive in its effects, as that exhibited in row No. 2, its whole produce was 77 lbs. 9 oz. dry corn, equal to 55 bushels and 10 pounds per acre, or 1 bushel and 25 pounds per acre more than row No. 2.

Not satisfied with resting the experiment here, I gathered the corn on rows Nos. 1 and 4, (i. e.) the rows each side, next adjoining No. 2 and 3, and on which none of the stalks had been cut. These rows, taken together, contained 186 hills, and their product of dry shelled corn was 171 lbs. 13 oz. equal to 14 oz. 12½ grs. per hill, or 60 bushels and 8 pounds per acre, precisely the same average yield as that part of row No. 2, on which the stalks had not been cut; this *exact* coincidence, however, I think may be numbered among those cases which rarely happen.

The difference between the two rows on which half the stalks were cut, and the two rows on which none of the stalks were cut, was 5 bushels 38½ pounds per acre. If this difference arose from cutting half the stalks, (and I know of no other reason,) then cutting the whole, would have reduced the crop 11 bushels and 21 pounds per acre, or from 60 bushels and 8 pounds to 48 bushels and 43 pounds per acre.

To recapitulate, row No. 2, on which the experiment was commenced, taken by itself is as follows, viz: 46 hills on which the stalks had *not* been cut, gave 42 lbs. 8 oz. dry shelled corn,

equal to, per acre, ...	60 bush.	8 lbs.
46 hills from which the stalks *had* been cut, gave 33 lbs. 7 oz. dry shelled corn, equal to, per acre, ...	47 "	18 "
Loss by cutting the stalks, per acre, ...	12 bu.	46 lbs.

The four rows taken together, stand as follows:

Nos. 1 and 4, on which no stalks were cut, gave an average of, per acre, ...	60 bu.	8 lbs.
No. 2 and 3, from which half the stalks were cut, gave an average of, per acre, ...	54 "	25½ "
Loss by cutting one-half the stalks per acre, ...	5 "	38½ "
		2
On cutting all the stalks, would make a loss equal to, per acre, ...	11 bu.	21 lbs.

The difference in the result of the two cases, is 1 bushel and 25 pounds per acre; or, in the two experiments, (if it may be so termed,) there is an average loss by cutting the stalks, of 12 bushels 5½ pounds per acre; a loss quite equal to all the expense of hoeing and harvesting, especially when we consider that in hoeing, the labor of making hills was dispensed with.

If I had cut all the stalks, and obtained a crop of forty-eight bushels to the acre, the very fact of having forty-eight bushels, would, I think, be considered by farmers generally, in this section of the country, as proof positive that the stalks were cut without injury to the crop. Or if I had gone one step farther and made large hills, at an additional expense of one dollar per acre, and thereby reduced the crop to forty-five bushels per acre, the forty-five bushels would be considered sufficient proof, that making hills (which, by the way, are usually made equally large and high on wet or dry land, without regard to soil or situation,) was labor well laid out. For although you occasionally give us a *large corn story*, swollen a little, perhaps, by *guessing* it off in *baskets;* yet, judging from what we see and know about raising corn, we call forty-five bushels per acre, a good crop.

A measured bushel, from the cut hills, weighed 57 lbs. 6 oz.—one pound less than from the *uncut;* the shrinkage being very near equal to the whole loss in weight.

If this experiment is a fair test, it seems *that about twenty per cent, or one fifth part of the crop is destroyed, by cutting the stalks in the way they are usually cut.* If further experiment should establish this fact, I think there are few farmers that will hesitate long in deciding which is the most valuable, one acre of corn or five acres of top stalks. But this twenty per cent is not saved at the expense of losing the stalks; they are worth as much, and I think more, all things considered, after the corn is harvested, than they are, gathered in the usual way. If, after being bunched up in in a green state, they heat or become mouldy, (a case of frequent occurrence,) they are utterly worthless, except it be for manure; I know of no animal that will eat them. But after they have once been dried by the frost and wind, a subsequent moderate degree of mouldiness seems to be no injury.

The course which I have pursued with them, and for the present I know of no better, has been as follows:—In the first place, they are cut off near the ground, and for this purpose a short scythe is found the most convenient instrument. The expense of cutting in this manner, however, is but a mere trifle, if any, more than cutting the stub stalks in the spring, and may with propriety be entered as an item of expense against the next crop, for which it is preparing the ground. After cutting, they are gathered into bunches of suitable size for binding, and three good sheaves of rye straw, if wet, will be sufficient to bind a ton. In gathering them up and laying in bunches, an active boy will do as much as a man. In this way, the whole expense of gathering, binding and loading, will not exceed 75 cents per ton. As they are very bulky, for want of barn-room, I have them stacked near the barn-yard; and I think I may safely say, that my cattle eat more pounds of stalks from an acre gathered in this way, than they would from the same acre, if gathered in the usual way. It may be objected to this, that they are not as good and nourishing as others; as to that matter, I am not able to say; but if the cattle are good judges in the case, (and I think they ought to be admitted as such,) they are quite as good and quite as nourishing, for they are eaten apparently with quite as good a relish. In addition to this, they are obtained without breaking off ears or breaking down hills in hauling out, occurrences quite frequent in the other case. They also furnish more than double the quantity of bedding for the yard, an item of no small moment in the list of "creature comforts," during our cold winters. And last, though not least, they make more than double the quantity of manure, the value of which will be duly appreciated by every good farmer, without argument. It may be said that the butt stalks can be gathered after harvest, and furnish the same quantity of litter and manure as in this case; that is true; but the expense of gathering both parts in that way, from the butts being so short and inconvenient to bind, would be three times as much as it is to gather them whole. Thus viewing the subject in various points, I think this method of managing corn stalks is much better than the old one; and that a little observation and experience will convince the most sceptical, that this branch of agriculture is not yet brought to a state of perfection; that there is yet room for improvement.

In passing through a field of corn, about the first of September, I noticed that my clothes contracted a strong smell of smut, and not being aware that I had come in contact with any smutty ears, I was led to examine a little to ascertain the cause. I found many of the corn leaves nearly covered with rust, (something similar to that observed on the stalks of English grain, preceding a blight,) and intermingled with the rust, was an abundance of very minute blisters of smut, or something which had the appearance and smell of smut. As I had never observed any thing of the kind before, and smut is said to be injurious to cattle, I have thought that something of this nature might have occasioned the difference of opinion entertained by some of your correspondents, last fall, in regard to the utility of feeding milch cows with green corn stalks. Feeding cows with smutty stalks, even if "fed to the full," would probably tend to dry them up; while feeding them plentifully with healthy stalks in a green state, would undoubtedly increase their milk.

In conclusion, I would inquire, if you can (through the columns of the Farmer,) give us the detail or result of any experiment made to ascertain the damage sustained by pasturing or feeding English grain on mowing land. I think this an important subject of inquiry to every New-England farmer, and submit it for the purpose of obtaining information. That good crops are sometimes gathered after feeding, is well known; but facts are wanted, which will fairly exhibit the effect of feeding those lands. Although this practice is handed down to us with the claims of ancient usage for its support, and perhaps might have been expedient in former days, yet, from some years' observation, I have little doubt that accurate experiment, particularly with English grain and young clover, will prove it to be a species of farming similar to that of topping corn stalks, and equally disastrous in its effects. WM. CLARK, Jr.

Northampton, March, 1832.

Mr. Fessenden—I was highly gratified with the perusal of the leading article in your 38th number, from the pen of Mr. Clark, on cutting corn stalks. Experiments like those he has detailed, are of great value to the farming interest, and richly entitle those who make and publish them, to the appellation of public benefactors. I beg leave to suggest the cause of the difference in the product which resulted from Mr. Clark's experiments.

There is a striking analogy between the animal and vegetable kingdoms. Food taken into the stomach of animals does not nourish but is prejudicial to health, unless it undergoes the process of digestion. Nor does food nourish the plant until it has been elaborated by the leaves. Plants, therefore, without leaves cannot grow; but, on the contrary, if defoliated in hot weather, the unelaborated sap becomes stagnant, ferments and destroys the vitality of the plant. Thus when the tops of corn are cut, the supply of food to all the ears *above* the remaining leaves, is cut off, and the supply is materially diminished to those below. A diminished product must of course be the consequence.

I very much regret that Mr. Clark did not carry his experiments one step further, and ascertain the relative weight of forty-six hills cut with the entire stalks at the time he topped his No. 2. It would have decided whether the stalks afford nutriment to the grain after they are separated from the roots, and tow hat extent. This last has been my method of harvesting my crop, from an impression that I lost by it nothing in the weight of the grain, while I gained much in the quantity and quality of the fodder. The objection that the stalks mould is not tenable. They will not mould while the corn is upon them, if tied above the ears. And if not sufficiently dry when the corn is picked, they may be left in stacks till perfectly cured; and yet be housed in far better condition than they are by the ordinary mode of saving them. It is not the drying that deteriorates their value for fodder, but the *drenchings* which they get when left out till the corn is picked, and the frosts, which diminish very much their nutritive properties. If well cured, and especially if cut and steamed, cattle eat them freely, and I consider them no wise inferior to hay. The grain from the crop secured in my way, has weighed sixty and sixty-two pounds the bushel. It is a twelve rowed early variety, which I denominate the Dutton corn.

I have remarked, that the modes of planting corn, or rather the distance between the plants, is different in different states. In New-England, the distance is greater than in New-York, and greater in Pennsylvania than in the former. Mr. Clark's hills were four by three feet, which gave him 3,646 hills, or by my estimate 3,630 on the acre. Our Mr. Stimson plants at two and a half feet each way, and gets upon the acre 6,969 hills, or nearly double what Mr. Clark does. I once planted an acre in drills, two rows in a drill, the plants six inches apart in the rows, the rows six inches apart, and three feet between the centres of the drills, quincunx, and had, if there were no vacancies, 30,970 stalks, equal to 7,742 hills on the acre. The ground and entire product were accurately measured and weighed. While the Messrs. Pratts, of Madison, produced 170 bushels on the acre, by planting in drills, three rows in each, quincunx, thus, ˙ · ⁚ · and four feet from the centre of the drills. If the rows were six inches apart, and the plants nine inches in the rows, the plants amounted to 43,560, equal to 10,890 hills. Assuming as data, that in all the above cited cases each plant produced an ear of corn and that the ears averaged one gill of shelled grain, their product would be as follows, in bushels and quarts:

Mr. Clark's,	56	bushels,	13	quarts,
Mr. Stimson's,	108	"	24	"
My own,	120	"	31	"
Messrs Pratts',	170	"		

The close planting, whether in hills or drills, requires high manuring, and the two and three rowed drills, extra labor; and the ears may withal be somewhat smaller. Yet I nevertheless believe that seventy or eighty bushels may be obtained on an acre, with good manuring on a genial soil, in our mode of planting, with about as little labor as twenty, thirty or forty bushels, are obtained in the New-England or Pennsylvania open method.

I have detailed the preceding facts and calculations, not with a view to vaunt of our skill or of the fertility of our soil, but to *show how* the large crops of corn have been raised in this state, which have been noticed in the papers.

There is one fact connected with the experiment of the Messrs. Pratts, worthy of consideration; there was not a plant missing, or deficient, in their field. They quadrupled their seed: and pulled up, as the character of the plants was developed, all but the requisite number, reserving the strongest and most promising. It is common to see corn-fields very deficient in plants and even in entire hills. This deficiency often amounts to one-fourth or one-half.—The loss incident to this defect may readily be estimated, and greatly counterbalances the expense of extra seed, and the labor of thinning the plants. J. B.

Albany, N. Y. April 9, 1832.

THE CULTIVATOR, OR HORSE HOE.

This is an instrument not as much known and used as it deserves and ought to be. It is adapted for operations between the plough and harrow, and at certain times is much better than either. It is half a plough, half harrow and half hoe, and does all these operations conjointly. The first process, after corn has come up and is three or four inches high, is to use the common harrow upon it. This breaks the ground and partially clears it of the weeds or grass. It is soon performed, and is very useful to the young plant. The next step has been to pass the plough twice through each furrow, throwing the ground from the corn to the centre of the furrow. Now this is the time to use the cultivator. It ought, after a few days, to follow the harrow, and is much more useful than the plough as well as a great saving of labor, because it is necessary to go only once between the rows of corn. It cuts as deep as the corn plough and pulverizes the soil much better. It tears up and brings to the surface the roots of grass which the plough only covers, and by adapting the width of the cultivator to the space between the rows of corn, it half hoes the corn at the same time, and does the whole work most admirably. When there is much grass growing with the corn, it is an extremely useful instrument, as it pulls it up by the roots and in a great measure destroys it. For the Fiorin or Quack roots, with which our soil too much abounds, it will be of great service, and it appears to me it will be the most effectual remedy for it of any instrument we have yet tried. Corn is much sooner dressed with the hand hoe, by the half ploughing, half hoeing operation of the cultivator, when it has preceded it. The cultivator is likewise very useful for the raising of potatoes, and for ploughing between the rows of turnips, and where a clover lay has been turned over to put down to wheat, when the plough cannot be again resorted to for fear of disturbing the sod—this instrument may be used for a shallow ploughing, which it will do much better than can, by any other mode, be effected.—Corn is now raised with much less labor than formerly. It was the custom to hand hoe a crop two and often three times, and this was always an expensive and tedious process. Hoeing is now often omitted entirely, and is seldom done more than once: and still there are heavier crops of corn raised now than formerly. The process of high hilling is not only not necessary, but in a measure injurious, and our premium crops of corn have been raised with little hoeing, and of course at the least expense. The idea that corn well grown will blow over by the high winds without the ground is well raised at the foot of each hill, is erroneous. Providence has given to every plant sufficient roots and strengh of stem to secure it against accidents of this kind, and we may aid the extension and multiplication of the roots best, and thus add to its security, if necessary, by stirring the ground, which will enable the roots to penetrate it readily in every direction. High hilling to potatoes is possitively injurious. It not only turns away the rains from the plant, but by raising a mound around them, prevents the sun and air from having that influence in aiding their growth and bearing, which are both essential to the insurance of a good crop.—*Columbia Sentinel.* A.

From a communication in the Farmers' Register.

DIRECTIONS FOR BUILDING WHEAT OR OTHER GRAIN SHOCKS.

The foundation is begun with three or four sheaves set up so as to form a little cone—that is, the buts on the ground set out so as to make a base broad enough for them to stand when the heads are brought together, (as they should be,) to a point. Other sheaves are set up in the breaks of the first, placed firmly on the earth, and the heads inclined to the central point. This brings the base to a small circle, and the heap to a con cal form. The builder (and there should be only one to a shock, to secure good and equal work,) now continues to add to this, by placing other sheaves on the ground and against the breaks between the preceding coarse, and thus going round the circular heap, until the foundation is large enough. The but of every sheaf should be well pressed to the earth, when placed, and its top pressed to the central point, with increased force, as the size of the heap will bear the pressure without danger of its being moved. When the foundation is finished, instead of being flat topped, it rises to a central point, and its whole profile is somewhat in the shape of the old fashioned Dutch or "hipped" roofs of houses—the sides of the sheaves forming the lower slopes, and the heads, the upper.

For covering the shocks the smaller sheaves should be reserved, and none very large there admitted. The first course of the cover is made by striking some of the stubble ends of the straw upon the band of the outer sheaves of the foundation, so that some staws go within the band, and thus hold the sheaf where placed. The circle is completed by sheaves so placed, the buts close to each other, and the heads leaning inwards towards the middle of the shock. A second course is carried around in like manner rising on the first, and resting on and within the bands of its sheaves. The point is now nearly reached and formed; and what it wants, is given by using the smallest sheaves. The heads of the last only are exposed, and they will be generally not more than four or five sheaves: and these are protected and secured in their places by a cap, formed of a large sheaf turned with the but upward, and the heads so spread open as to hang over and all around the sides of the peak.

Cattle Husbandry.

THE SHORT HORNS.

Known as Durham, Teeswater, Holderness, Improved Short Horns, &c.

The cattle of York and Durham were long celebrated, principally for their reputation as extraordinary milkers. This property they are supposed to have acquired by a cross with a fine milk breed from Holstein, at a remote period. These were, however, different from what are now termed "*Improved Short Horns.*"

"They were generally of large size, thin skinned, sleek haired, bad handlers, rather delicate in constitution, coarse in the offal, and strikingly defective in the substance of girth in the fore quarters.—As milkers they were most excellent, but when put to fatten, as the foregoing description will indicate, were found slow feeders, producing an inferior quality of meat, not marbled or mixed as to fat and lean; in some cases, the latter was found of a dark particular hue. Such, also, are the unimproved Short Horns of the present day, and the distinction cannot be too frequently asserted, because they are in many cases considered as specimens of the improved breeds, and have actually been resorted to in trials as to the comparative aptitude of animals to fatten,—trials which it is evident they could not successfully sustain.

"A period of more than eighty years has now elapsed since the Short Horns, on the banks of the river Tees, hence called the Teeswater breed, has assumed a very different character to that contained in the foregoing description. In colour they resemble the improved Short Horns, being occasionally red, red and white, and roan, though the last named colour was not so prevalent as now. They possessed a fine mellow skin and flesh, good hair, and light offal, particularly wide carcasses, and fore quarters of extraordinary depth and capacity."

To show *how* and by *whom* the *improvement* was made in the Short Horned breed, and its extent, we extract, in full, the account before us:

"The remarkable difference which existed between the Teeswater and the old unimproved Short Horns may, with propriety, be ascribed to a spirit of improvement which had some time manifested itself among the breeders on the banks of the Tees, whose laudable efforts were well seconded by the very superior land in the vicinity of that river. No reasonable doubts can be entertained that they proceeded on a judicious system of crossing with other breeds, because it was utterly impossible to raise such a stock as the Teeswater from pure Short Horned blood. One cross to which they referred was, in all probability, the white wild breed; and if this conjecture be well founded, it will be apparent whence the Short Horns derived a colour so prevalent among them.

"It is also asserted, that about the period in question, Sir William St. Quintin, of Scampston, imported bulls and cows from Holland, which were crossed with the stock of the country. It would tend to little advantage to proceed with conjectures, as to what other breeds were resorted to, if any; this much is certain, that the great improvement was soon manifested, and a valuable variety established, as the two following instances will prove.

"Mr. Milbank of Birmingham, one of the leading improvers, bred and slaughtered an ox, which, at five years old, weighed four quarters, one hundred and fifty stones, of fourteen pounds to the stone, producing sixteen stones of tallow; and a cow bred from his stock, slaughtered by Mr. Sharter, of Chilton, at twelve years old, weighed upwards of one hundred and ten stones.

"From Mr. Milbank's time, the Teeswater cattle continued to sustain their excellence and celebrity in various hands, until Mr. Charles Colling adopted them, when he manifested a superiority of skill as a breeder, which, in a very brief period, secured him an ample fortune.

"Whatever had been the merit of the Teeswater cattle, it is certain Mr. Charles Colling greatly improved them; and though it has been asserted that his success was the result of chance, arising from the possession of an animal, with the merits of which, it so supposed, he was at one period unacquainted; the writer of this article is of the opinion that Mr. Colling's success resulted from a deliberate and well considered plan. He found the Teeswater, like all other extravagantly large cattle, frequently of loose make and disproportion. He was sensible, also, of the difficulty of breeding, with any thing like certainty, *large good* animals; and though he had declined on all occassions to throw any light on his views and proceedings, the writer thinks he can detect, in the very outset, and through the progress of his practice, a resolution to reduce the size of this breed, and at the same time, and by that means, to improve its form. This he is supposed to have effected in the first instance through the medium of a bull called "*Hubback,*" an animal, respecting which, there has been much controversy, principally touching the purity of his blood, a question now of little importance, because it is admitted on all hands that Mr. Colling adopted another cross, which prevails in a majority of superior Short Horns of the present day. It may notwithstanding, be matter of interest to state a few particulars respecting this bull.

"Without entering on an inquiry by what circumstances Hubback's title to be considered of pure blood is supported or weakened, it may suffice to say that it appears probable he possessed, on one side, the imported blood. The possessor of his dam was a person in indigent circumstances, and grazed his cow on the highways.—When afterwards she was removed to good land, she became so fat that she did not again breed, and her son, having the same feeding property in a high degree, was useful as a bull during a very short period. The quality of his flesh, hide and hair, are supposed to have been seldom equalled; and as he was smaller than the Teeswater cattle, he was eminently calculated to forward Mr. Colling's views.

"It has been remarked that we have no superior horse on the turf, which does not boast the blood of the Godolphin Arabian; so it may be asserted that we have no superior Short Horns which do not claim descent nearly, or remotely, from Hubback.

"After the use of the bull, Mr. Charles Colling proceeded, with singular success, to produce, from time to time, superior animals; and the number of bulls he disposed of by letting, was highly encouraging. But the circumstance which brought the improved Short Horns into most extensive notice, was the production of the "Durham ox," an animal which speaks volumes in favor of a single cross from this blood; for the ox was the produce of a common cow, which had been put to *Favorite*. At five years old, the Durham ox was sold to Mr. Bulmer, for public exhibition, at the price of £140. This was in February 1801. He was at that time computed to weigh 168 stones, of 14lbs. (the quarters) his live weight being 216 stones; and this extraordinary weight did not arise from his superior size, but from the excessive ripeness of the points. Mr. Bulmer having obtained a carriage for his conveyance, travelled with him five weeks, and then sold him and the carriage, at Rotherham to M. John Day, for £250.

"On the same day Mr. Day could have sold him for........ £525
"On the 13th June for.................................. 1000
"On the 8th July for................................... 2000

"Mr. Day travelled with him nearly six years, through the principal parts of England and Scotland, till, on the 19th Feb. 1807, the ox dislocated his hip-bone, and continued in that state until the 15th April, when he was obliged to be slaughtered, and, notwithstanding he must have lost considerably in weight during his eight weeks of illness, his carcase weighed—

	Stones.	lbs.
Four quarters,...........................	165	12
Tallow,..	11	2
Hide,...	10	2

To effect further improvement, Mr. Colling resolved to resort to the Galloway.

He was much favored by circumstances in promoting his object, which was to take one cross, and then breed back to the Short Horn, —the only course, by the way, in which crossing can be successfully adopted. To breed from the produce of a cross *directly among themselves* will lead to the results which have induced many persons, without due consideration, to believe conclusive against crossing; but to take one cross, and then return and adhere to one breed, will in the course of a few generations, be found to stamp a variety of sufficient certainty.

"Mr. Colling's Short Horned bull, *Bolingbroke*, was put to a red polled Galloway cow, and the produce, being a bull calf, was in due time, put to *Johanna*, a pure Short Horn,—she also producing a bull calf. This grandson of Bolingbroke was the sire of the cow *Lady*, by another pure Short Horn dam, and from Lady has sprung the highly valuable family of improved Short Horns, termed in reproach, *Alloy*.

"It will probably be admitted that the prejudice against this cross was at the highest at the time of Mr. Colling's sale. The blood had then been little, if at all, introduced to other stocks, and it was manifestly the interest, whatever might be the inclination, of the manly breeders who had it not, to assume high ground for the pure blood, and to depreciate the alloy. Under these untoward circumstances for the alloy, what said public opinion, unequivocally certified by the stroke of the auctioneer's hammer? *Lady*, before mentioned, at fourteen years old, sold for two hundred and six guineas. *Countess*, her daughter nine years old, for four hundred guineas.— *Laura*, another daughter, four years old, for two hundred and ten guineas. *Major* and *George*, two of her sons, the former three years old, the latter a calf, for two hundred guineas and one hundred and thirty; besides a number of others, more remotely descended from *Lady*, which all sold at high prices—in fact, in a sale of forty-eight lots, realizing £7,115 17*s*. *Lady* and her descendants sold for a larger sum than any other family obtained."

Vernon, Oneida co. June 3, 1834.

Dear Sir—Will you be good enough to publish in your valuable paper, the Cultivator, Bolton's recent communication, on the result of crossing the improved Short Horns and Devon cattle, and much oblige A SUBSCRIBER.

J. Buel, Esq.

[*From the British Farmers' Magazine*]

RESULT OF CROSSING THE IMPROVED SHORT HORNS AND DEVON CATTLE.

Mr. Editor—In the 27th number of your valuable Magazine, when giving an account of my two years old steer, you also gave an extract from my letter on the advantages attendant on crossing cows of different breeds with improved Short Horn bulls, and in confirmation of this opinion, (not hastily adopted, but the result of several years' practical experience, and a close attention to the experiments of several friends during the last seventeen years,) I send you the portrait and a short account of a two years old Durham and Devon heifer of mine, lately slaughtered by Mr. Wm. Daniel, of Abergavenny, and accompanying it with a few brief statements of the advantages derived from this system by several of my own personal friends.

This heifer was the second cross, and was of a light grey colour, She weighed 35 scores and 8 lbs. rough fat 98 lbs. She was allowed to be the fattest and best beast of her age, in all points, ever seen in Abergevenny. She had a dead calf about six weeks before Christmas, was dried on the 17th January, and killed the 10th of June. She sold for £19 3s. 6d.

Her live weight, on the 8th June, was		1232 lbs.
do	17th January,	840
Increase in 140 days,		392

Being aware that strong prejudice and much incredulity existed on the subject of crossing, I courted the attention of all the respectable farmers, breeders and feeders, in this neighborhood; many came to see her when first put up, and repeatedly afterwards during the five mouths she was feeding, and they all concurred in saying, she went on faster than any beast they ever had seen. She never had any oil cake.

I have seen many excellent beasts bred from *improved* Short Horn bulls and Long Horned cows; indeed, I never knew any of these bulls put to any cow where the produce was not superior to the dam. But the cross which I advocate, and with which I am best acquainted, is that with the Devon cow. I have uniformly remarked, that each succeeding cross was attended with a proportionate improvement in size, quality of flesh, and aptitude to fatten; in every instance they have shown themselves superior milkers, and stand to the pail till within six or eight weeks of calving, and several instances have come under my own knowledge where they have never been dry since they first calved. And so highly are they prized as milkers, that a friend of mine, who hired out dairies, informed me that the dairymen gave him nearly £2 per cow per year more for the half and three quarter breeds, than they would give for cows of any other breed.

A friend of mine had about a dozen North Devon cows, small in size, but nice in quality, and from these he commenced, about twenty years since, breeding with Short Horn bulls. He has since invariably used those bulls. With each succeding cross the stock have rapidly improved in every essential, and the only trace of the Devons which I could perceive when I last saw them, about two years since, was a peculiar richness in their colouring. He breeds about thirty annually, and generally sells his three years olds in the autumn, at from 17 to £22; and I have known him sell in calf, heifers to jobbers, at fairs, as high as thirty guineas each. All his stock are superior milkers. Here we have twenty years experiments, and continued improvement. Within the last eight years I have sent many North Devon heifers to Ireland, to friends residing in different counties, and some of them occupying land of very inferior quality. I also sent over two young Durham bulls, from the stock of the Rev. Henry Berry, to cross them with. They have all crossed them with Short Horn bulls at my recommendation, and the accounts they give are most satisfactory. They say the two years old half breeds are as good as the three years old Devons, and are all good milkers. One of these bulls, by Mr. Berry's Mynheer, has been four times exhibited in three different counties, and has each time taken the first prize. He was last year sold for sixty guineas, and is now serving cows at £1 each.

If any testimony were wanting to corroborate the statement, in No. 26 of your Magazine, of the benefit to be derived from Mr. Knight's methods of cultivating potatoes, I should be happy to add mine. I have for several years been in the habit of planting the entire potato, and making the rows three feet six inches apart, and have found this plan always succeed. I gave them raw to my cattle: to fatting beasts about 40lbs. per day, with hay: to store beasts, about half that quantity with straw: and to my milking cows, I allow 24lbs. daily, with hay. I have given them steamed, but found the cattle did not do well after them when put to grass. After the raw ones, they thrive rapidly on grass. I am sir, yours, very obediently,

C. H. BOLTON.

Brynderry, Abergavenny June, 30, 1833.

From the Genesee Farmer.

SHEEP.

Late in the summer of 1830, I borrowed $100, and went into the neighboring towns and purchased sixty-eight sheep, at the average cost of $1.30 per head, which left me remaining on hand $13 of my borrowed money. At this time I had on hand twelve sheep; which, with those I bought, made me a flock of eighty head. The next winter I kept them on good fine hay, without any grain, until the first of March, when as the ground was bare, I quit feeding hay and turned them out upon my old pastures and commenced feeding a little corn. The winter of 1830–31 it will be recollected, was one of uncommon severity; but notwithstanding its length and coldness, I lost but one sheep, and that by casualty. I continued feeding grain until the first of May, when, as the grass had got a considerable growth, I thought it unnecessary, and quit entirely. That season I raised 36 lambs, which increased my flock to 115. In June I sold the wool produced by my old sheep, for $150.06. I went and redeemed my note, and had *left of money I received for wool*, $44. The winter of 1831-32, I fed my sheep as before, but lost three head; consequently, in the spring, had but 112 to shear, which produced three hundred pounds; this I sold at the very low price of 35 cents the pound, or $105 for 300 pounds. The same season I raised 45 lambs, and sold 60 head of my old sheep for $78 60, making the amount of sales from my flock that season $181.60. In the winter of 1832-33 I lost 6 sheep, in the spring sheared 91; but in consequence of the great proportion of lambs, the produce of wool was small. I retained a number of fleeces for home use, and sold the remainder (176 pounds) for 50 cents the pound, or $88 for what I had to sell.

Thus it will be seen that my flock for three years has averaged 94 head, and that the *actual* sales from it have amounted to $419—The last summer I raised 30 lambs and sold none of my old sheep; consequently in August last, when the three years had expired since my purchase, I had on hand 119 sheep, which is 25 above the average for three years past, and which 25 sheep were worth at that time $2 the head—making $50 for 25. This added to my sales, would make $469 for the produce of 94 sheep for three years, or $156.33 for one—equal to $1.66 per head annually.

I have made the following estimate of the expense of keeping 100 sheep for one year. I may be incorrect, if so, I hope some of your correspondents will correct me.

Twenty acres of good land, well turfed, will keep 100 sheep a year, viz: five acres of meadow, producing two tons of hay to the acre, will winter, and fifteen acres of good pasture land will summer them. Twenty acres of land at $40 per acre would cost $800; and 100 sheep, at $2 the head, $200; making the cost of land and sheep $1,000.

Interest on $1,000 one year, is	$70 00
Cutting and securing 5 acres of grass,	5 00
Thirty bushels of corn at 4s	15 00
One barrel of salt, at 16s	2 00
Washing and shearing 100 sheep,	5 00
	$97 00

If the above estimate be correct, it will be seen that I have realized from my flock a nett profit of more than 50 per cent for three years together. W. G. B.

Genoa, March 31, 1834.

AGE OF SHEEP.

The age of a sheep may be known by examining the front teeth. They are eight in number, and appear during the first year all of a small size. In the second year, the two middle ones fall out, and their place is supplied by two new teeth, which are easily distinguished by being of a larger size. In the third year, two other small teeth, one from each side, drop out and are replaced by two large ones; so that there are now four large teeth in the middle, and two pointed ones on each side. In the fourth year, the large teeth are six in number, and only two small ones remain, one at each end of the range. In the fifth year the remaining small teeth are lost, and the whole front teeth are large. In the sixth year, the whole begin to be worn; and in the seventh, sometimes sooner, some fall out or are broken.—*Mountain Shepherd's Manual.*

Hints to Graziers.—A heifer or cow will make beef earlier than a steer. An old cow, or an old sheep, will not fatten nearly so well with hay as with grass. The longer the straw of any kind, the worse as fodder; short straw is said to be, invariably, the most nutritious. Cattle always prefer that which is fresh threshed, a day even making a difference.—*Lawrence upon Cattle.*

Science of Agriculture.

OF THE FERMENTING, PRESERVING, AND APPLYING OF MANURES OF ANIMAL AND VEGETABLE ORIGIN.

On the management of organic manures depends much of their value as food to plants. The great mass of manures procured by the cultivator are a mixture of animal and vegetable matters, and the great source of supply is the farm or stable yard. Here the excrementitous matter of horses, cattle, swine and poultry, is mixed with straw, haulm, chaff, and various kinds of litter. To what degree should this be fermented before it is applied to the soil? And how can it best be preserved when not immediately wanted?

A slight incipient fermentation is undoubtedly of use in the dunghill; for, by means of it, a disposition is brought on in the woody fibre to decay and dissolve, when it is carried to the land, or ploughed in the soil; and woody fibre is always in great excess in the refuse of the farm. Too great a degree of fermentation is, however, very prejudicial to the composite manure in the dung-hill; it is better that there should be no fermentation at all before the manure is used, than that it should be carried too far. The excess of fermentation tends to the destruction and dissipation of the most useful part of the manure; and the ultimate results of this process are like those of combustion. It is a common practice amongst farmers to suffer the farm-yard dung to ferment till the fibrous texture of the vegetable matter is entirely broken down; and till the manure becomes perfectly cold, and so soft as to be easily cut by the spade. Independent of the general theoretical views unfavorable to this practice, founded upon the nature and composition of vegetable substance, there are many arguments and facts which show that it is prejudicial to the interests of the farmer.

During *the violent fermentation* which is necessary for reducing farm yard manure to the state in which it is called short muck, not only a large quantity of fluid, but likewise of gaseous matter is lost; so much so, that the dung is reduced one half, or two-thirds in weight; and the principal elastic matter disengaged, is carbonic acid with some ammonia; and both these, if retained by the moisture in the soil, as has been stated before, are capable of becoming a useful nourishment of plants. In October, 1808, Sir H. Davy filled a large retort capable of containing three pints of water, with some hot fermenting manure, consisting principally of the litter and dung of cattle; he adapted a small receiver to the retort and connected the whole with a mercurial pneumatic apparatus, so as to collect the condensible and elastic fluids which might rise from the dung. The receiver soon became lined with dew, and drops began in a few hours to trickle down the sides of it. Elastic fluid was likewise generated; in three days thirty-five cubic inches had been formed, which, when analyzed, were found to contain twenty-one cubic inches of carbonic acid; the remainder was hydrocarbonate mixed with some azote, probably no more than existed in the common air in the receiver. The fluid matter collected in the receiver at the same time amounted to nearly half an ounce. It had a saline taste, and a disagreeable smell, and contained some acetate and carbonate of ammonia. Finding such products given off from fermenting litter, he introduced the beak of another retort, filled with similar dung, very hot at the time, in the soil amongst the roots of some grass in the border of a garden; in less than a week a very distinct effect was produced on the grass; upon the spot exposed to the influence of the matter disengaged in fermentation, it grew with much more luxuriance than the grass in any other part of the garden. Besides the dissipation of gaseous matter, when fermentation is pushed to the extreme, there is another disadvantage in the loss of heat, which if excited in the soil, is useful in promoting the germination of the seed, and in assisting the plant in the first stage of its growth, when it is most feeble and most liable to disease; and the fermentation of manure in the soil must be particularly favorable to the wheat crop, in preserving a genial temperature beneath the surface late in autumn and during the winter. Again, it is a general principle in chemistry, that in all cases of decomposition, substances combine much more readily at the moment of their disengagement, than after they have been perfectly formed. And in fermentation beneath the soil the fluid matter produced is applied instantly, even whilst it is warm, to the organs of the plant, and consequently is more likely to be efficient, than in manure that has gone through the process, and of which all the principles have entered into new combinations.

Checking fermentation by covering.—"There are reasons sufficiently strong," Grisenthwaite observes, "to discourage the practice of allowing dung-heaps to ferment and rot without interruption. It appears that public opinion has slowly adopted the decisions of chemical reasoning, and *dung-pies*, as they are called, have been formed with a view to save what was before lost; a stratum of mould, sustaining the heap, being placed to receive the fluid part, and a covering of mould being applied to prevent the dissipation of the aerial, or gaseous products. These purposes and contrivances, unfortunately, like many of the other operations of husbandry, were not directed by scientific knowledge. To cover is so commonly believed to confine, that there is no wonder that the practical cultivator adopted it in this instance from such a consideration. But it is in vain; the elasticity of the gases generated is such as no covering whatever could possibly confine. If it were perfectly compact, it could only preserve as much carbonic acid as is equal to the volume or bulk of air within it; a quantity too inconsiderable to be regarded, could it even be saved; but every particle of it must be disengaged, and lost, when the covering is removed."

Checking fermentation by watering is sometimes recommended; but this practice is inconsistent with just chemical views. It may cool the dung for a short time; but moisture, as before stated, is a principal agent in all processes of decomposition. Dry fibrous matter will never ferment. Water is as necessary as air to the process, and to supply it to fermenting dung, is to supply an agent which will hasten its decay. In all cases when dung is fermenting, there are simple tests by which the rapidity of the process, and consequently the injury done, may be discovered. If a thermometer plunged into the dung, does not rise to above one hundred degrees of Fahrenheit, there is little danger of much aeriform matter flying off. If the temperature is higher, the dung should be immediately spread abroad. When a piece of paper, moistened in muriatic acid held over the steams arising from a dung-hill, gives dense fumes, it is a certain test that the decomposition is going too far, for this indicates that volatile alkali is disengaged.

In favor of the application of farm-yard dung in a recent state, a great mass of facts may be found in the writings of scientific agriculturists. A. Young, in the *Essay on Manures*, already quoted, adduces a number of excellent authorities in support of the plan. Many, who doubted, have been lately convinced; and perhaps there is no subject of investigation in which there is such a union of theoretical and practical evidence. Within the last seven years Coke has entirely given up the system formerly adopted on his farm, of applying fermented dung; and his crops have been since as good as they ever were, and his manure goes nearly twice as far. A great objection against slightly fermented dung is, that weeds spring up more luxuriantly where it is applied. If there are seeds carried out in the dung, they certainly will germinate; but it is seldom that this can be the case to any extent; and if the land is not cleansed of weeds any kind of manure, fermented or unfermented, will occasion their rapid growth. If slightly fermented farm-yard dung is used as a top-dressing for pastures, the long straws and unfermented vegetable matter remaining on the surface should be removed as soon as the grass begins to rise vigorously, by raking, and carried back to the dung-hill: in this case no manure will be lost, and the husbandry will be at once clean and economical. In cases where farm-yard dung cannot be immediately applied to the crops, the destructive fermentation of it should be prevented as much as possible; the principles on which this may be effected have been already alluded to. The surface should be defended as much as possible from the oxygen of the atmosphere; a compact marl, or a tenacious clay, offers the best protection against the air, and before the dung is covered over, or, as it were, sealed up, it should be dried as much as possible. If the dung is found at any time to heat strongly, it should be turned over and cooled by exposure to the air.

The doctrine of *the proper application* of manures from organized substances, offers an illustration of an important part of the economy of nature, and of the happy order in which it is arranged. The death and decay of animal substances tend to resolve organized forms into chemical constituents; and the pernicious effluvia disengaged in the process seem to point out the propriety of burying them in the soil, where they are fitted to become the food of vegetables. The fermentation and putrefaction of organized substances in the free atmosphere are noxious processes, beneath the surface of the ground they are salutary operations. In this case the food of plants is prepared where it can be used; and that which would offend the senses and injure the health, if exposed, is converted by gradual process into forms of beauty and usefulness; the fœted gas is rendered a constituent of the aroma of the flower, and what might be poison becomes nourishment to animals and to man.

To preserve dung for any time, the situation in which it is kept is of importance. It should, if possible, be defended from the sun. To preserve it under sheds would be of great use; or to make the site of a dung-hill on the north side of a wall. The floor on which the dung is heaped, should, if possible, be paved with flat stones; and there should be a little inclination from each side towards the centre, in which there should be drains connected with a small well, furnished with a pump, by which any fluid matter may be collected for the use of the land. It too often happens that a dense mucilaginous and extractive fluid is suffered to drain away from the dung-hill, so as to be entirely lost to the farm.—*En. of Ag.*

[*From Hayward's Science of Agriculture.*]

ON HAY-MAKING.

Having observed that in a season when there was no rain whatever, and the hay had been made with rapidity, and carted within a short time after it had been cut, that a greater quantity was destroyed and injured by being overheated and burnt, than in a catching irregular season; that when hay had not heated in the stack, it is frequently mouldy; that as hay lost its native green colour, and approached a brown, it lost its nutritive qualities; and that altogether the making of hay, as usually conducted, was a very precarious and teasing operation; I determined on trying to arrange a system on some more regular and certain principles, in which I succeeded; and by adopting a certain and regular course of operations, was enabled to make my hay of a uniform good quality: and, let the weather be as it might, at a regular expense of labor. And considering such a process not only of importance, as it ensures a more perfect quality; but as it affords a more certain protection against the injuries usually consequent on the uncertainty of the weather, and overheating in the stack; and that it thus removes two great causes of anxiety, it may be well worth the public attention.

In the first place, as to the state of the weather, it generally happens at this season of the year that there are three or four days dry; therefore on beginning to cut the grass, as it is well known that during wet weather grass may be cut, and suffered to remain in the swarth for several days without injury; and it being desirable, where hands are plenty, to have a good quantity, or so much as will complete a stack in a day, in the same state of forwardness, I should prefer beginning to cut during the rainy weather; however, be this as it may, swarths should not be opened but on a certain fine day; and when this is done, the grass should be well shaken apart and equally spread over the ground. As soon as the upper surface is dry turn it well over; and in this operation great care should be taken to open and spread any cocks that may not have been divided in the first opening. This being done, commence raking into wind-rows, in time that the whole may be made into small cocks before night. *The second day these cocks must remain untouched, let the weather be wet or dry:* the third day, if the weather be certain and fine, throw the cocks open: but if the weather be wet and threatening, they may remain another day, or until the weather is certain to be fine for the day. The cocks should then be thrown, according to the crop, into beds of two or three rows; and after three or four hours exposure, turned over; and taking time to gather the whole into wind-rows and cocks before night, let this operation commence accordingly, *and none be left open;* the day after this, which in fine weather will be the fourth, *the cocks must again remain untouched, or not be opened, whether the weather be wet or dry.* On the fifth or next day, these cocks will only require to be opened for an hour or two, when they will be fit for the stack. The novelty of this mode consists only in suffering the hay to remain in the cock the second and third, or alternate days; and at first sight it may appear that so much time in fine weather must be lost, but this is not the case. Whilst the hay remains in cocks, a slight fermentation, or what is termed sweating, will take place, and in consequence, after it has been opened on the third and fifth days, it will prove to be just as forward as if it had been worked every day. And the advantages resulting from this, are, obviously, the following: by shortening the time of open exposure, the colour of the hay is more perfectly preserved, and consequently the quality; and the fermentations or sweatings which take place in the cocks, proved so much to have diminished that principle or inclination to prevent its heating injuriously in the stack; and the whole operation of making, whether it takes four days or eight, requires three days' labor only, and the hay being left in that state every night, in which it is the least possibly exposed to the injuries of the weather, and in which it may remain for a day or two in uncertain weather, without injurious exposure, much painful anxiety and useless attendance of laborers are obviated.

Miscellaneous.

IMPROVED SYSTEM OF BEE MANAGEMENT.

There is no branch of rural economy connected with more agreeable associations than that of bee management. The proverbially industrious habits of the insect, and its extreme ingenuity in the construction of its domicil, and the deposition of its treasures, are such as to excite the admiration of the most unobservant. The common necessity of destroying the stock, in order to obtain the produce of their labors, has been always matter of regret. Many plans have been hitherto devised for the purpose of obtaining the honey without the destruction of the bees, but they have only been attended with partial success. The object has, however, been latterly and more perfectly attained by Mr. Nutt, a practical apiarian of Lincolnshire, whose system of management has given this branch of rural economy an importance and value of which it was not before considered susceptible, both in the greater productiveness of the bees, and the much superior quality of the honey.

The first part of Mr. Nutt's plan of operation is to leave the hive, into which the stock is introduced, untouched. When it is filled with honey (the contents of which are to be reserved for the use of the bees,) the capacity of the hive is increased, by the addition of another box to the side, communicating with the hive by apertures, which give free admission to the bees in all parts of the box.

The next important object in Mr. Nutt's system is to ensure a regulated and uniform temperature in this portion of the hive, without diminishing the temperature of that which contains the stock. The ventilation necessary for this purpose is effected by the means of a perforated tin tube, extending down to a considerable distance from the top into the hive, and connected with an aperture at the bottom, which may be partly or wholly closed by a tin slide, thus modifying the circulation of the air and consequent degree of temperature. The temperature of this side box, which is indicated by a thermometer introduced into the tube, ought to be 70°, which is the natural temperature of the working hive; but, in that which contains the stock a temperature of 90° is necessary, as well for the incubation of the queen bee, as the maturity of the young. The parent hive is, then, as well the residence of the queen bee as the nursery of the young, whilst the side boxes are but additional store-houses for the reception of the superfluous honey, which may be taken away without impoverishing the stock, or robbing them of their winter sustenance.

When the thermometer, placed in the side box, rapidly rises to 90° or 100°, the necessity of again providing the bees with fresh room is indicated; and this is effected by establishing another box on the opposite side of the hive. The bees, finding an increase of room, will readily recommence their labors in this new apartment.

Then follows, in Mr. Nutt's system, the operation of separating the bees from this second hive. This is effected by the ventilator, by which the internal temperature of the hive may be reduced to that of the external atmosphere; and when, on the approach of night, the bees recoiling from the cool air, go back into the middle box, the connexion between the two may be closed, and the full hive withdrawn, without the imprisonment or destruction of a single laborer. The same arrangements are to be again renewed, as the bees continue their successful labors. In this system no provision is made for swarming, which cannot occur under this arrangement, the emigration of a part of the stock being only occasioned by a want of room in which the bees may pursue their labors.

The honey furnished under this system of management is found to be far superior, both in quality and quantity, to that obtained under any other arrangements. The honey and wax are as white as refined sugar. This superiority in quality, it owes as well to the modified temperature at which the bees secrete their products, as to its total exemption from all extraneous animal and vegetable matters, and, in particular, from the pollen or bee bread, which is taken, in considerable quantities, into the stock-hive for the support of the young. This superiority of the honey is only equalled by the quantity of the supply: the usual annual supply from one stock is about one hundred weight of honey: whilst, in the course of one season, Mr. Nutt has procured the large quantity of 296 pounds. This increase in quantity is owing to the excellent disposition of the arrangements, by which the industrious efforts of the bees are never ratarded, nor their strength weakened at the time when the fruits and flowers most abound from which their treasures are obtained.—*Penny Magazine.*

An experiment on Oats.—Having sown the same oats for several years without changing the seed, my crops became fuller and fuller every year of the *black dust head or blast,* until the loss from this cause, amounted to one-half the crop; and when threshed out, the black dust was so suffocating that the laborers were made sick by it. I determined in 1832, to change the seed, and got one hundred bushels of the purest seed that could be procured in Richmond; they did not quite hold out to sow all the land intended, and I had to use some of my own impure seed—which I washed effectually in very strong lime water, and allowing them to remain in the lime water the night before sowing. It proved an effectual remedy; the product was decidedly more clean on harvesting, than that from the seed procured in Richmond, although that was tolerable pure.—*Farmers' Register.*

Cure for the Botts or Grubs in Horses.—If you will excuse the subject, (for although graceless, it is valuable, not only to the agriculturist, but to all classes using that valuable animal, the horse,) I send a remedy I used while our coals were brought to market in road wagons, which obliged us to use a great number of horses; and I never knew it fail of giving relief in from one to five minutes. Pour out half a gill of spirit of turpentine into the hand, and rub it on the breast of the animal while suffering. Let it be applied to the hollow or pit of the stomach, just at the point where the neck joins the breast, on a space six or eight inches in diameter. The relief is certain if the grubbs have not already cut through the coats of the stomach.—*Farmers' Reg.*

Brimstone for Cattle.—Dr. Bartlett: It is probably not known, to many of our farmers, that brimstone is valuable for cattle in keeping them free from ticks. These vermin are not only filthy in their appearance, but an injury to the cattle. A piece of brimstone as large as a grain of corn, well pulverized, given in a little salt, will cause them to drop off, and prevent others from getting on for eight or ten days. I consider brimstone as necessary for a cow in summer, as salt.—*Southern Planter.*

How to destroy Moles.—Dr. Bartlett: In the last Planter it is stated that the Castor Bean will destroy Moles. I have tried the red Palma Christi (which some say is the same,) with success, merely by planting a few of the kernels in their paths or ploughed places; also calomel, by making holes in grains of corn, and inserting it in the holes and placing the corn in the ground for them. The calomel will not kill them till there comes a rain, when they will be found on the top of the ground.—*Ib.* WM. H. RAIFORD.

Clover among Corn.—A friend of mine sowed red clover among his corn after going through with the cultivator the last time; the seed was protected from the heat of the sun by the corn; it consequently vegetated very soon, and after the corn was cut off, there was a luxuriant growth of clover, which afforded fine pasture for several successive seasons. The red clover is an excellent manure. I have raised a fine crop of wheat by ploughing in the second growth after harvest.—*Am. Far.*

"Every bird thinks its own nest beautiful."—*Italian Prov.* This may be an allusion, either to the innate attachment which all living creatures feel to their home, or to the natural affection we bear towards the place of our own nativity, or that of our offspring.

"The beginning is the half of the whole."—*Hesiod.* The most appropriate illustration of this, is to be found in our own proverb, "well begun is half done."

"Emulation begets emulation."—*Latin.* A spirit of emulation excites industry and diligence: these, by their natural results, induce prosperity, and our success stimulates our neighbor to similar exertion.

Young Men's Department.

WRITINGS OF WASHINGTON.

Among these written in his own hand, is a series of maxims under the head of "*Rules of civility and decent behaviour in company and conversation.*" Of these there are 110. The only specimens published we extract, and agree with Mr. Sparks in the opinion, that "whoever has studied the character of Washington, will be persuaded that some of its most prominent features took their shape from the rules thus early selected and adopted as his guide."—*N. York American.*

1. Every action in company ought to be with some sign of respect to those present.
2. In the presence of others sing not to yourself with a humming noise, nor drum with your fingers or feet.
3. Sleep not when others speak, sit not when others stand, speak not when you should hold your peace, and walk not when others stop.
4. Turn not your back to others, especially in speaking; jog not the table or desk on which another reads or writes; lean not on any one.
5. Be no flatterer, neither play with any one that delights not to be played with.
6. Read no letters, books or papers in company, but when there is a necessity for doing it, you must ask leave. Come not near the books or writings of any one so as to read them unasked. Also, look not nigh, when another is writing a letter.
7. Let your countenance be pleasant, but in serious matters somewhat grave.
8. Show not yourself glad at the misfortunes of another, though he were your enemy.
9. When you meet with one of greater quality than yourself, stop and retire, especially if it be to a door, or any straight place, to give way for him to pass.
10. They that are in dignity or office have, in all places, precedency; but whilst they are young, they ought to respect those that are their equals in birth or other qualities, though they have no public charge.
11. It is good manners to prefer them to whom we speak before ourselves, especially if they be above us, with whom, in no sort, we ought not to begin.
12. Let your discourse with men of business be short and comprehensive.
13. In visiting the sick, do not presently play the physician, if you be not knowing therein.
14. In writing or speaking, give to every person his due title, according to his degree and the custom of the place.
15. Strive not with your superiors in argument, but always submit your judgment to others with modesty.
16 Undertake not to teach your equal in the art himself professes; it savors of arrogancy.
17. When a man does all he can, though it succeeds not well, blame not him that did it.
18. Being to advise or reprehend any one, consider whether it ought to be in public or in private, presently or at some other time, also in what terms to do it—and in reproving, show no signs of choler, but do it with sweetness and mildness.
19. Take all admonitions thankfully, in whatsoever given; but afterwards, not being culpable, take a time or place convenient to let him know it that gave them.
20. Mock not, nor jest at any thing of importance; break no jests that are sharp biting, and if you deliver any thing witty and pleasant, abstain from laughing thereat yourself.
21. Wherein you reprove another, be unblamable pourself, for example is more prevalent than precept.
22. Use no reproachful language against any one, neither curses nor revilings.
23. Be not hasty to believe flying reports to the disparagement of any one.
24. In your apparel be modest, and endeavor to accommodate nature rather than procure admiration. Keep to the fashion of your equals, such as are civil and orderly with respect to time and place.
25. Play not the peacock, looking every where about you to see if you be well decked, if your shoes fit well, and your stockings set neatly, and clothes handsomely.
26. Associate yourself with men of good quality if you esteem your own reputation, for it is better to be alone than in bad company.
27, Let your conversation be without malice or envy, for it is a sign of a tractable and commendable nature, and in all cases of passion, admit reason to govern.
28. Be not immodest in urging your friend to discover a secret.
29. Utter not base and frivolous things among grown and learned men; nor very difficult questions or subjects among the ignorant, nor things hard to be believed.
30. Speak not of doleful things in time of mirth, nor at the table; speak not of melancholy things, as death and wounds, and if others mention them, change, if you can, the discourse. Tell not your dreams but to your intimate friends.
31. Break not a jest where none can take pleasure in mirth— Laugh not aloud nor at all without occasion. Deride no man's misfortune, though there seem to be some cause.
32. Speak not injurious words, neither in jest or earnest. Scoff at none, although they give occasion.
33. Be not froward but friendly and courteous; the first to salute, hear and answer, and be not pensive when it is time to converse.
34. Detract not from others, but neither be excessive in commending.
35. Go not thither, where you know not whether you shall be welcome or not. Give not advice without being asked, and when desired to do it, do it briefly.
36. If two contend together, take not the part of either unconstrained, and be not obstinate in your opinion; in things indifferent, be of the major side.
37. Reprehend not the imperfection of others, for that belongs to parents, masters and superiors.
38. Gaze not on the marks or blemishes of others, and ask not how they came. What you may speak in secret to your friend, deliver not before others.
39. Speak not in an unknown tongue in company, but in your own language; and that as those of quality do, and not as the vulgar.—Sublime matters treat seriously.
40. Think before you speak; pronounce not imperfectly, nor bring out your words too hastily, but orderly and distinctly.
41. When another speaks, be attentive yourself, and disturb not the audience. If any hesitate in his words, help him not, nor prompt him without being desired; interrupt him not nor answer him till his speech be ended.
42. Treat with men at fit times about business, and whisper not in the company of others.
43. Make no comparisons, and if any of the company be commended for any brave act of virtue, commend not another for the same.
44. Be not apt to relate news, if you know not the truth thereof. In discoursing of things you have heard, name your author always. A secret discover not.
45. Be not curious to know the affairs of others, neither approach to those that speak in private.
46. Undertake not what you cannot perform; but be careful to keep your promise.
47. When you deliver a matter, do it without passion and in discretion however mean the person may be you do it to.
48. When your superiors talk to any body, hear them, but neither speak nor laugh.
49. In disputes be not so desirous to overcome as not to give liberty to each one to deliver his opinion, and submit to the judgment of the major part, especially if they are judges of the dispute.
50. Be not tedious in discourse, make not many digressions, nor repeat often the same matter of discourse.
51. Speak no evil of the absent, for it is unjust.
52. Make no show of taking great delight in your victuals, feed not with greediness, cut your bread with a knife, lean not on the table, neither find fault with what you eat.
53. Be not angry at the table whatever happens, and if you have reason to be so, show it not—put on a cheerful countenance, especially if there be strangers, for good humor makes one dish a feast.
54. Set not yourself at the upper end of the table, but if it be your due, or the master of the house will have it so, contend not lest you should trouble the company.
55. When you speak of God or his attributes, let it be seriously, in reverence and honor, and obey your natural parents, although they may be poor.
56. Let your recreations be manful, not sinful.
57. Labor to keep alive in your breast that little spark of celestial fire called conscience.

SELF-EDUCATION.—BY JOHN NEAL.

But who are the privileged class in our country, where all men are equal—where we have no kings, no princes, no nobility, no titles! Look about you, I say again—look about you, and judge, every man for himself. Are they not the *better educated*, every where—and the children of the better educated—throughout the land? Go abroad among your neighbors, let all you acquaintances pass in review before you—and see if those who are better off in the world, more influential and happier than the rest, *other circumstances being equal*, are not all —all, without one exception, better educated than the rest! It is not a college-education thai I speak of here; it is not even a school-education obtained before a man sets up for himself—but it is education at large, in the broadest and best sense of the term—the education that any body may give himself,—*any body at any age*. Again therefore, I do appeal to yourselves to call to mind any of your acquaintance who has got ahead of his brethren—who is looked up to, not only by them but by others—and my life on it you find him a better-educated man, self-educated, or otherwise, I care not, better informed about some things which *they* do not consider of importance. I go further—so perfectly satisfied am I of the truth of this doctrine—of the importance of things which the uneducated regard as trivial, that I would have this taught as a fundamental truth, namely, that if two persons were to begin the world to-morrow—both of the some capacity —both of the same age and same character—having the same freinds, the same prospects and the same health—he who was the best acquainted with the multiplication table, would beat the other in the long run. I would have it generally understood as another fundametal maxim in morals, if not in religion, that every sort of knowledge is of some value to every person whatever may be his character, station or prospects. I do not say that it would be of *equal* value to every person, or that every sort of knowledge is alike *necessary*. I merely say that we cannot acquire any *useless* knowledge.

But, say those who appear to have understanding and judgment in these matters, we have no time for study—we, the mechanics.—No time for study! What! have you no time, when a huge ponderous body is to be lifted—no time to fix the lever and the fulcrum—to prepare the inclined plane or hitch the takle? Is it economy of time for you to do that with your hands, which might be done with the simplest piece of machinery? Would you set your apprentices to work, your journeymen and yourselves, to lift and carry, by main strength, what a child might push forward on a roller, if you would but take time enough to fix the roller? What would you say of a man who, instead of using the plough, as others do, should persist in digging a lage field with a fire shovel, because he had never been brought up to the plough? What if a man who, instead of splitting his logs for fire-wood, with a beetle and wedge, were to saw them in two lengthwise, with a key-hole saw—declaring all the while, that as for him, he did not pretend to know much about mechanics—that a key-hole saw was good enough for him—and as for the beetle and wedge, and other out-of-the-way contrivances, for his part he had no belief in them.

Would you not laugh at him as a poor economist of *time*—and a very poor reasoner? and would he not be likely to continue a very poor man? Yet he would say no more than you say—every man of you; when you declare you have no time for reading—no time for study—no time to improve yourself, each in his own particular trade, by stepping out of the circle he was brought up in. How do you know but there is some shorter and easier way of doing *all that you do* in your workshops and factories? Be assured that there is a shorter and easier way for all us—that there is no one thing we do, in which improvements may not be made. Have you not the proof continually before your eyes? Are not the *master workman* the *owners* and the *employers* of other men—are they not those who have made the best use, not of their *fingers*, but of their *thinkers*?

Weanling calves will not fill themselves even in the best grass, but look hollow, and wander about bleating, unless they have plenty of water. In the straw yard, cattle will be more thrifty for having water at command, having on account of the dryness of their food, need of drink several time in a day.—*Lisle.*

Stalled oxen, as they grow fat, being naturally very hot, can scarcely be kept too cool, provided they are dry. Lean cattle can scarcely be kept too warm.—*Lisle.*

"It is a fraud to conceal fraud." A person concealing delinquency becomes, in some degree, an accomplice.

THE CULTIVATOR—AUG. 1834.

TO IMPROVE THE SOIL AND THE MIND.

RIBBON GRASS.

The ribbon grass of our gardens, (*Phalaris Americana*,) is likely to become of great value in our husbandry: it has been found to be better adapted to wet, boggy grounds, than any other species of grass; to propagate rapidly, either by its seeds or by its roots; to yield a very large product in hay or pasture, and to be well adapted to farm stock. The first suggestion of this fact, came to us in a letter from *Abednego Robinson*, of Portsmouth, N. H., who says the discovery was accidental.

"A neighbor," he says, "wishing to get rid of some of the roots which incumbered his garden, threw them into a bog, where they took root, and spread over a large space of ground, excluding every other plant. The water flows through the roots at all seasons.—The turf has become so solid as to bear a cart and oxen. I walked through this grass when in bloom, and never beheld a more handsome and luxuriant growth. It stood perfectly erect, full of large leaves, even, and from four to five feet high. It will produce two good crops in a season, and springs up immediately after the scythe. It produces excellent food; cattle feed it close, and appear to be more fond of it when made into hay than any other grass. I have spoken for one-half of the roots of the patch, and have ground ploughed in my meadow, into which I intend to transplant them, at about the distance of corn hills."

On a recent visit from the Hon. *E. Goodrich*, of Hartford, we were happy to receive, from that gentleman, a confirmation of the good opinion of the *phalaris*, which had been induced by Mr. Robinson's letter. It has been found as beneficial in Connecticut as in New-Hampshire. Not recollecting the particulars narrated, we would beg of Mr. Goodrich, when he sees this, to forward them to us, in order that we may publish them correctly. The subject merits further attention; and if our anticipations are not irrationally founded, the *Phalaris Americana* will yet become the gama grass of the north. It is truly perennial, spreads rapidly, and may be inoculated in the manner suggested by Mr. Robinson, especially in a soil saturated with water, with great facility, and at a trifling expense.

Hops.—There are, according to the Quarterly Journal of Agriculture more than 47,000 acres appropriated to the culture of hops in Great Britain. The duties paid to the government upon this crop, in 1826, amounted to £269,331, or $1,195.830—a small item of taxation which the American hop grower is exempt from paying.

M. Payen has made a discovery that may be of use to the farmer: It is, that polished instruments of iron and steel may be preserved from rust by keeping them in solutions of potash, soda or even lime Thus, one part of potash or soda, in two or three thousand parts of water, will preserve from oxidation, bars of iron, &c. immersed in it. Lime water will do the same.

We learn from Mitchell's recent agricultural tour in Holland, that one of the laws passed during the reign of the present sovereign, *obliges each student of divinity to attend a two years course of lectures on agriculture before being licensed.* Such a regulation is highly calculated to increase the usefulness of the clergy, and to impart to them a salutary influence over the habits and manners of society.

THE GRAIN WORM.

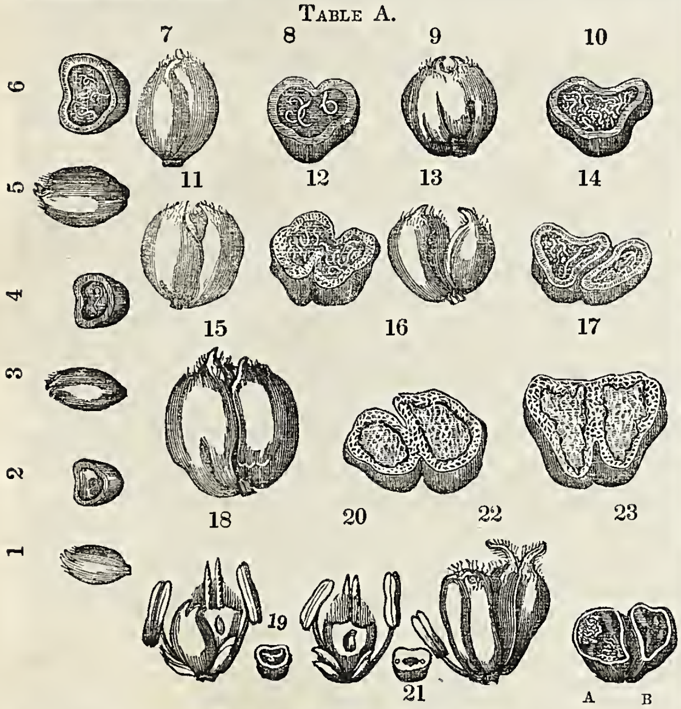
The injury to our wheat crop, this season, by this minute but destructive enemy, surpasses by far all former years. Spring as well as winter wheat is attacked by it, and it has been found in rye growing among wheat. We have taken from the sheath of a kernel of wheat, half a dozen of these worms. Although we do not pretend to accuracy, we should judge, from the information we have received, that the product is likely to be reduced one-half in this neighborhood, by their ravages, the present season. We do not learn that the grain worm has extended itself more than fifty miles west of this city, though there is reason to apprehend that it will too soon be known in the western section of our state. The evil which is already felt, and more so that which is to be feared, renders it a matter of the first importance to learn the character and habits of this insect, the better to be enabled to guard against its depredation.—With this view, we invite correspondents to communicate any facts or observations which may tend to throw light on the subject.

The common impression seems to be, that the insect is a weevil, which deposites its eggs as the grain comes into blossom; and many profess to have discovered the fly upon the wheat ear. This hypothesis should be received with caution, as it tends to discourage efforts, to arrest the evil, and because we think it is founded in error. Flies naturally resort to the haunts of insects, to feed upon the excrementitious matters which there abound; and their presence is often mistaken for the cause, when it is only the consequence of the existence of larvæ.

In the second number of the Cultivator, we made some remarks upon the wheat insect, and gave extracts from a publication of Mr. Bauer, relative to the grain worms, (*vibrio tritici.*) We are so strongly of the opinion, that the insects described by Mr. Bauer are the identical ones which are now preying upon our wheat, that we have thought it worth while to incur the expense of cuts, delineating the appearance of the affected grain, and of the worms as they appeared on different examinations. This will enable the reader to decide with greater certainty upon their identity with our wheat worm; and should this be found to exist, to apply with confidence Mr. Bauer's preventive, viz. to soak the seed grain in lime water. As the causticity of the lime is depended on to kill the nit on the seed, particular care should be had that the lime is fresh burnt, and has not become effete by air slaking. There is a double inducement to try Mr. Bauer's plan. If it does not prevent the ravages of the worm, IT WILL PREVENT SMUT.

The reader will refer to No. 2, for Mr. B.'s remarks, the whole of whose communication may be found in the London Philosophical Transactions of 1823.

TABLE A.



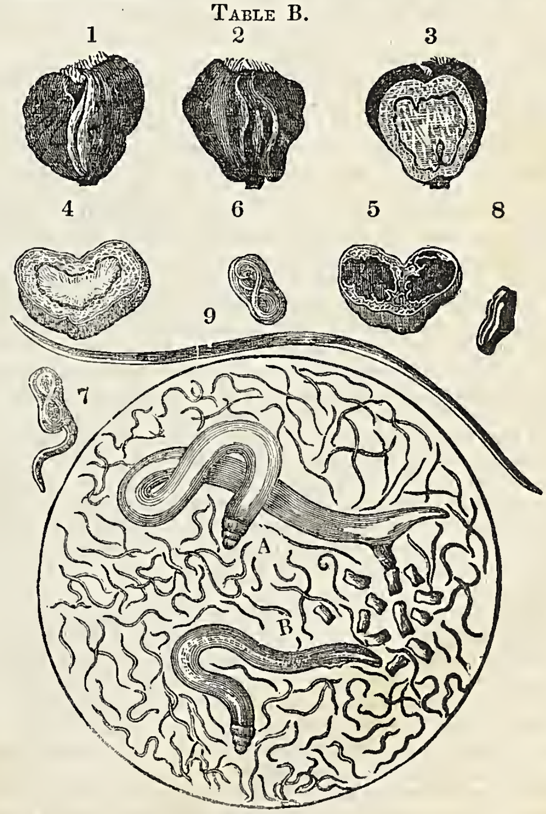
EXPLANATION OF TABLE A.

[Each of the figures in this table are magnified five times in diameter, or fifty times superficially.

Fig.

1. A germen infected with grain worms from the apex of a wheat ear, before it had emerged from its hose; examined the 5th of June, 1808.
2. A transverse section of the same, containing one single large worm, but no eggs.
3. An infected germen from the base of the same ear.
4. A transverse section of the same, containing one large single worm and some eggs.
5. A somewhat larger germen, examined the 13th of June.
6. A transverse section of the same, containing two large worms and many eggs.
7. An infected germen, examined June the 21st.
8. A transverse section of the same, containing several large worms, many eggs, and some newly hatched lively worms.
9. A somewhat larger germen or grain, examined the 27th of June.
10. A transverse section of the same, containing several large and several young worms, and a great many eggs
11. An infected grain, examined the 15th of July, 1808.
12. A transverse section of the same, containing seven large worms of different sizes, some laying their eggs, some not quite mature, many young worms, and a great many eggs.
13. An infected grain nearly divided into two parts, examined July the 15th.
14. A transverse section of the same, containing several large worms some laying their eggs, some already dead, a great many young live worms, and many eggs.
15. A full grown infected wheat grain, examined July the 30th, just beginning to change its colour.
16. A transverse section of the same, the cellular tissue divided into two cavities, filled to excess with young worms all alive, but no trace of the old worms nor of the eggs existed.
17. A longitudinal section of the same.
18. A double germen found in one floret of an inoculated plant, examined June the 5th, 1808; the seed corn was inoculated with worms, and and germen proved infected with worms and the other was perfectly sound. There were also two stunted anthers in that floret.
19. A transverse section of the infected germen which contained one large worm.
20. The sound germen, after the infected one was removed.
21. A transverse section of the sound germen.
22. Another double grain found in one floret of a plant, the seed corn of which had been inoculated with the worms and with the fungi of the smut balls; both diseases had taken effect; examined July the 18th, 1808. One grain was found infected with worms and fungi, and the other with fungi only; there was also one small anther in this singular floret.
23. A transverse section of the same; in the germen A, are two nests or groups of worms closely adhering to some remains of the cellular tissue; the other germen B, is entirely filled with the fungi of the uredofœtida or smut balls, and has no trace of the cellular tissue.

TABLE B.



10.

[*The Grain Worms—Vibrio Tritici.*]

EXPLANATION OF TABLE B.

[In this table the figures 1 to 5 inclusive are magnified five times in diameter, or 50 times superficially; figures 6 to 9 are magnified 100 times in diameter, or 20,000 times superficially; and figure 10 is magnified 30 times in diameter or 1,800 times superficially.]

Fig.

1. A front, and fig. 2, a back view of an infected ripe wheat grain, examined August the 5th, 1805.
3. A longitudinal section of the same filled with hundreds of worms cemented together, in a torpent state.
4. A transverse section of the same.
5. The transverse section of a grain nearly ripe, which was inoculated and infected with the worms and the fungi of the smut balls, containing several large and some small worms, and filled with the fungi of uredofœtida or smut balls.
6. A newly laid egg with the young worms visibly coiled up in it.
7. A young worm in the act of extricating itself from the egg.
8. An egg from which the worm is recently come out, after which the egg soon shrivels and decays.
9. A young worm which had been some time extricated from the egg.
10. A group of grain worms of all sizes, as seen under water in the field of the microscope, examined July the 15th, 1808: at A is one of the largest parent worms in the act of laying or casting its eggs; at B is a smaller parent worm not yet come to maturity; the rest are young worms all very lively.

CORRESPONDENCE.

ON THE DAIRY FARMING OF HERKIMER.

TO THE EDITORS OF THE CULTIVATOR.—*Gentlemen*—Agreeable to your request, I submit to your disposal an article on cheese husbandry, together with some statements and observations, on the rapid increase, extension and improvement in that department of agriculture, in a narrow district on the north side of the Mohawk river, and second tier of towns, and in the counties of Herkimer and Oneida. Over this district was spread a sparse population as early as the year 1800, and by 1815, it had become a tolerably well settled country. From about this time to the commencement of navigation on the eastern section of the Erie canal, there was here little advancement in improvement or wealth.

This district, in length about 20 miles, is hilly, well watered, and peculiarly adapted to grazing, but not so to wheat. From 1806 to 1815, the subscriber (bred to the use of the axe, plough and scythe.) made a cheese dairy on the farm whereon he now lives, of from 25 to 30 cows. Cheese was then not an article of export; it was a dull article, secondary to growing young cattle, horses and wool. About 200 lbs, of cheese to each cow in the season, at about 6 cts. per lb. "in trade," was considered about a fair income in those days, and is supposed to be so still in many large sections of our country. About that time, I reduced my dairy to a mere family use.—Not long after this time, some cheese speculators from Berkshire county, Mass. came into Norway in said district, bought their cheese, a few tons, at low prices, made contracts for longer or shorter periods, and by theory and practice put a few farmers on a good manufacturing course, and thus encouraged them to extend thier dairy operations, and they have been extending till last season. It is computed that about 1,300 tons of cheese were exported from this district, and that the business is rapidly extending. Whether it is soon to be overdone, time only can determine. It is now questionable if there be in any town in the state a greater proportion of opulent and independent farmers, in proportion to its population. Most of the little farms are now so amalgamated, that it is said to be difficult to sustain district schools, and open roads in winter, or hire any laborers by the day in some sections.

Of all the products of agriculture to be seen in the great markets, in none can there be found so great diversity of quality and masses of inferior qualities, as in that of cheese; none evince such general want of theory and system. I am speaking of the great mass.—Great improvements in any branch of industry usually proceed from sections where there is a community of exertion and spirit of enterprise, rivalship and emulation directed to any one given object. And we have here also at this day much advantage in sale as well as in improvement, over an insolate dairy in another section. Here the greatest cheese dealers in New-York and other cities come to select and purchase their supplies.

In 1828, *we* (myself and sons,) commenced cheese making again from 40 cows, as a prime object, and in the full conviction that there had been and might be, in that department, great improvement, both in the manufacture and management of cows to get the greatest yield; that the principles involved in cheese making might be elicited and developed, and reduced to system, if not a science, by experiments, by interchange of views with intelligent farmers, and observing their process. Here the business conversation when farmers meet, turns much on this subject. How much cheese per day, each cow? In the various seasons of the year, how much each cow through the season? are passing questions, and are put by friends remote also. Answers to these, and the theory of cheese making, the subscriber has often been called upon to put on paper, and to point out as distincntly as might be, the difference between the former and the latter process, as practised by himself and others. This has been done by saying that the yields per day at full grass in May, will range from two and a half to four pounds each cow, as they come from the press, and will shrink about ten per cent at six months maturity. The yields per cow in this section, through the season, may range from 250lbs. to 500lbs. each cow; the latter however is an extreme point, at which very few arrive; the calf being taken from the cow the first week. Last year, we made from 78 cows 32,000 lbs. Our cows, though good for so large a number, are not as select as some smaller lots. Others had greater yields.

In stating the difference between the former and latter process of making, we say that less heat on the milk and through the making process, and less salt has been applied; the cheese made soft, and preserved in shape and from spreading and cracking, and the depredations of flies, by bandaging. This is done with thin cheap cotton cloth, soon after it comes from the press, if the weather be hot.—Cheese making is a chemical operation, subject to atmospheric influences, and to know how to meet its consequent exigencies, consists in a great measure the art. The milk is "set" (rennet applied) in warm weather considerable below the warmth of milk directly from the cow. Cool weather requires more warmth, as the heat is continually passing off. The rennet should be free of taint, and made in quantity to last several weeks, that its power can be relied upon to "fetch the cheese" in three-quarters of an hour, or be sure in an hour be so congested as to be ready to "break up," which is done with the hands from bottom to top of the tub or vat, or with an utensil made of fine brass wire like a riddle, in half inch squares, a sharp rim, and two bails crossing each other higher than the milk in the tub. It is then left a short time to settle; then begin to dip off the whey, and of the first put some over the fire, and as soon as may be, gradually increase the warmth in the tub, dipping off the whey and making fine the curd, endeavoring by all means to keep the whey as green as possible; the greener the whey the richer and more cheese. For the last half hour, which we call the scalding process, we have very little more than animal or milk heat in the tub, with the curd made nearly as fine as Indian corn, which, if all works well, is ready to be dipped off into a cinque or basket in about two hours from the setting. If the whey turns whitish, and smells rank and sour in hot weather, less heat should be applied, the process hurried on, and the salt applied as soon as may be, or the cheese will be much smaller, dry and hard. Those who apply greater heat in scalding, usually cool off in the tub with cold whey or water. But as tending to be more round and adhesive, we prefer cooling by exposure to the atmosphere, in grinding up the curd in a mill, (after the whey is well pressed off in a strainer,) so as to be ready to receive the salt, which is two pounds of dry salt to 100 lbs. cheese, made so dry that very little can pass off in the whey. No injury can be sustained by severe pressing; it may as well be done in one as two days; it must be effectual.

The colouring (if any,) should be of annato, dissolved in pure strong ley, kept in a dimijohn or glass bottle. One large spoon full may colour the milk for 20 lbs. of cheese. The colouring on the outside should be the same, very much diluted, and applied with a brush as soon as the cheese comes from the press. After drying an hour, should then be ointed with butter or lard, and ever kept moist with the same to prevent cracking.

We do not darken our cheese rooms or attempt to keep out the flies, but in hot sultry weather open the windows and doors and give them air. Cool dry winds blowing directly on will crack the cheese. Black or Cayenne pepper applied to cracks or unsound places will prevent depredation by flies. In extreme hot weather, it may be well to let the cheese pass one day without turning. We keep up a generous warmth in our cheese houses spring and fall, and in all the cool damp days in midsummer, and so greatly accelerate the maturing process. The soft cheese ripens much sooner than that made dry and hard. The latter will dry sooner, but maturing and drying may be very different. Cheese will shrink in weight three to one in October that it will in August, and yet it will ripen three to one in August that it will in October; it ripens like the vegetables, in proportion to the warmth of the atmosphere. Many suppose that large cheeses require more time to ripen and mature than small ones, but we think not. Is not the ripening process of a chemical nature, rather accelerated by increased mass, as are those of the brewer and the baker in their chemical operations? A very small chesse or piece of cheese will soon become dry, but without maturity or taste. Making cheese night and morning from milk directly from the cow, has often been tried in this vicinity, but I know of no one who continues the practice. The yield is said to be greater, but the cheese rank, retaining that kine animal taste peculiar to milk directly from the cow. We carefully avoid extra heat, even on any part of the milk, as tending to prepare the oily material for a separation when coming to maturity on the shelves. In preparing the milk for the rennet, we therefore choose to heat much milk a little, rather than heat little much. Large tin vats, adapted to the size of the dairy, are coming into use; by this vat, to contain 300 galls, we had anticipated an absolute certaintay of having sweet milk in extreme hot weather; but after a severe thunder storm our milk was lobbered worse than ever. Do large metallic reservoirs attract the electricity with which the atmosphere is charged at such a season?

The modern plan of making cheese houses large, that the cheese be chiefly kept on counters, is a great improvement.

Steuben, settled by that noted Baron, being in the same range of towns, and adjoining, is almost wholly devoted to butter making. I have not the means to give any detail, or to state the amount sent to market last year.

The pine apple cheese, weighing from seven to eight pounds each, is made here to considerable extent, mostly, *now*, by the small dairies. The making process, till it is fitted for the press, is much the same as has been here detailed; some add a little more salt. The shrinkage is considerable more, and the dairy furniture more costly, and the whole labor till fit for market may be about the same. It is chiefly made under contract, from eight to nine cents, unless the purchaser finds the pressers, nets and trenchers; if he do so, seven to seven and a half cents. It is pressed in wooden semi blocks, griped together, and when taken from the press suspended in a net till so hardened as to stand on a trencher made for that purpose till fit for market. We estimate a loss of three pounds weight of cheese for every pound of butter taken from it.

Although I have already extended this article to what I fear may be considered tedious to the editors and their readers, you will, I think, pardon me for suggesting that Dr. Rodney Starkweather, of Chesterfield, Mass. has made an experiment on bee management that would be very interesting to the curious. It is a beautiful apartment in the ridge of his barn, into which two or three men can enter by a door. The time the tenement has been thus occupied, and the estimate of honey, &c. &c. I will not venture to state, but think he would do so if requested. Respectfully submitted.

EPHRAIM PERKINS.

South Trenton, Oneida county, N. Y.

Shoreham, Vt. June 23, 1834.

Sir—About a year since, as I was perusing an agricultural work, I saw an extract of yours on the culture of Indian corn, together with a description of the "cultivator," and a recommendation of the "harrow to precede the hoe," all of which I much approved. But reflecting on the variety of soils of which many of our Vermont cornfields are composed, and the sudden transition from wet to dry. which renders them crusty, and many others situated so low that in a wet season, in spite of the vigilance of the most perfect farmer, wild grass and noxious weeds will take deep root, which will be beyond the power of the harrow to remove, while the compound crusty field will be beyond the ability of the cultivator to pulverize—I was led into a series of reflections to invent a machine to obviate these difficulties and adapt itself to the wants and general interests of farmers.

I have just accomplished one, which I have the pleasure to state I have tried with equal success on crusty grassy fields, on seeded and well subdued soil, and think I may safely say, exceeds any in common use, provided the field is free from roots and stone. It is made agreeable to the description of your "cultivator" to eradicate, with three cultivator and four harrow teeth; a cultivator tooth in the centre, a harrow tooth in each extension; thus in succession throughout. It will be obvious to the practical farmer that the angling position and cylindrical form of the cultivator teeth will be directly calculated to force through crusty fields and cut up stubborn rooted noxious weeds, at the same time throwing it directly in contact with the harrow teeth, which, in addition to the common use perfects the work by pulverizing. It will also be noticed that the harrow teeth stand last in the extensions, thus permitting the machine to run nearer the plant without bruising, covering or cutting the roots. The men whom I have employed in hoeing confidently affirm that it is a great saving of manual labor.

Sir, I have been encouraged to forward this communication by the very polite invitation of the superintending committee of "The Cultivator," and should they deem it worthy a place in their columns, will highly oblige a friend to the public interest and a patron of the Cultivator. Yours respectfully,

SCIOLOUS.

Bridgewater, N. Y. July 24, 1834.

J. Buel, Esq.—It is with much satisfaction that I notice in a late number of the Cultivator an invitation to writers to give their signatures, as it gives your readers an opportunity to correspond with those writers. Also an invitation to forward for publication descriptions of new plants and seeds. I sent some time since a communication on the culture of Madder to the New-England Farmer: since then, I have planted nine acres, and as I have given in the Farmer a particular description of the article, together with the mode of cultivation, and also in the Otsego County Almanac for 1834, will not trouble myself or your readers with a very lengthy article at this time on the subject. In the circle of my acquaintance I think there may be of madder under cultivation, about twenty acres. I began the cultivation in the spring of 1831. I planted the top roots, or seeds, in hills four feet apart each way, 250 hills or about one-ninth of an acre; kept it free at all times of weeds, and for two seasons continued to throw earth on the tops, thereby increasing the quantity of top roots, and promoting the growth of the bottom. I dug the madder last fall, washed and air dried them two or three days, and afterwards perfectly in a kiln, ground them in a grist mill and weighed; the result 135 pounds, and I believe the top roots, or seed, if I had dried and ground them, would have weighed about fifty pounds, making 185 pounds, at nineteen cents, would amount to $35.15, or $316 per acre, but as I sold the top roots for seed, they brought me a far greater sum. In 1832 I planted 600 hills in one piece of ground, same distance as before—this will be dug the ensuing fall, and the seed forwarded to Albany, if any person should request me to do so. The price here in September and October will probably be about $3 per bushel, by the quantity.

In 1833 I planted eight acres in drills, scant six feet in the rows, and one foot in the drills, and should, if the ground had been free from that terrible scourge, (quack grass,) have planted forty-eight bushels. I hired this piece of ground just after a harvest of wheat, and was ignorant that it was covered with quack in the room of wheat: this circumstance, in the following spring compelled me to plant seventy bushels in room of forty-eight. The whole expense in cultivating this crop should not have exceeded $800 for four years, but in consequence, it will probably cost $1,000. The profits of other crops between the rows of madder to be deducted from the expense, the amount of the crop when fitted for market, four years cultivation, a clean and rich piece of land, calculating madder at one shilling, would be $2,000. I planted this piece of ground about the last of April or first of May, and about the first of June after I had cleaned the drills of weeds, I planted between them alternately, corn and potatoes. I had 1,070 bushels of pink-eye potatoes, sixty bushels of corn; the corn being eleven or twelve feet apart did not do very well, and the worms were very plenty; the potatoes were perhaps better for being planted at so great a distance. I consider the quantity of ground planted with potatoes and corn, each about two and a quarter acres. The ground for the potatoes was furrowed, and the potatoes covered with the plough, and hoed once. I made in this piece some experiments in the cultivation of potatoes which I shall be glad to communicate to the public through the columns of the Cultivator. 1834, this spring planted potatoes between every other drill of madder; after having wed and covered the madder tops once, the crop may be about 6 or 700 bushels. I believe the price of good Dutch madder for twelve years past, has averaged about fifteen cents through the year, and eighteen cents in the fall in the New-York market. The madder of this country is worth three or four cents more; at any rate, I have not known any sold at wholesale to merchants in the country short of twenty-three cents. The cost of raising this article is about seven cents per pound, that is, the whole expense of cultivating, washing, drying, grinding, &c. including a fair rent for land. The least quantity I have seen dug from an acre is 1,600 pounds, and greatest 2,400 pounds, four years. If I had first rate of land, and price of madder good, I should dig third year. Mr. Jefferson in one of his letters from France, says " they cultivate madder here at an immense profit, they dig it once in five or six years." I estimated that in planting the nine acres I should furnish a supply for the county of Oneida, since which time a calico manufacturer of Otsego county has informed me that he uses 100 pounds of madder per week through the year, which is more than I raise. I will now give you my reasons for thinking that it is not an impoverishing crop; the 250 hills that I planted first, was on a hemlock soil of ordinary strength, and at the depth of fifteen inches was a brown dead sand, hard pan, if I may so express it, and as the madder roots penetrate two feet or more, they could not have done so well as on a rich deep soil, still I had over 1,600 pounds. I have on the same ground an uncommon heavy crop of oats, and no manure has been put on it for six years past.

Notwithstanding I have extended this communication to a greater length than I expected when I commenced writing, still I should wish hereafter to say something more should you think the subject worth the trouble it may be to you.

With great respect, yours, RUSSEL BRONSON.

Note.—Mr. Bronson's further communications, on this or other subjects of husbandry, are respectfully solicited.—*Conductors.*

Canaan Centre, July 21st, 1834.

SIR—As I have seen but little in the Cultivator on the management of sheep, and am interested in that part of agricultural pursuits, I venture to direct to you a few thoughts in hopes it may call the attention of others to the subject, more competent than myself. It is allowed by all, as far as I am informed, that the grub in the head of sheep is caused by a fly in the hot season; to avoid the bad effects of which, I would recommend that they have better pasture in the months of July and August, so as to be able to get their supply of food without being obliged to feed in the middle of the day. I have observed that sheep will do well on very short feed early in the season, and think it best if they are to be kept short, it should be done at that time, and reserve for them good feed through the hot season. Flocks of sheep kept close are more likely to be troubled with them than those well kept, and some suppose want of strength to throw off the grub makes the difference, but I think it is being under the necessity of feeding in the heat of the day. Short keeping makes fine wool, but I believe it is best for every wool grower not to overstock, but keep well what he does keep. My practice has been, to select in the fall my poorest sheep from the others and give them better feed, so that all shall be in good condition for winter; in managing in that way, I have lost less sheep in winter than in summer—my lambs I wean the latter part of August and give them the best feed I have, till winter; about the first of November, or whenever the feed becomes injured with frost, I begin to feed them oats in the sheaf; to sixty or seventy lambs I give two bundles a day till about the first of January, and then one bundle a day till February, after which I feed no more grain. In that way, I have been able to get my lambs through the winter, strong and healthy, and out of the above number, for several years I have not lost more than to average one a year. D. S. C.

Tillage Husbandry.

EXPERIMENTS IN TOPPING CORN.

It was discovered early in August, 1810, that proper grasses for soiling my cattle would soon be very deficient; and on the 20th of that month, one row of corn, in a field of thirteen acres, was topped, to ascertain how the plant would bear early cutting. It was thought that it had received no injury. On the 31st of the same month I commenced feeding the cattle with the tops cut daily, as wanted. These lasted them until the 18th of September. After this the blades were stripped, commencing where the topping began. They fed the cattle until the 5th October.

In the process of topping and blading, one row was left entire, standing between the row which had been topped on the 20th of August, and another row that was topped on the 2d of September. These rows were cut off by the roots on the 2d of October, and hauled in and set up separately under my own inspection. They were husked and measured on the 8th of November.

Produce of the row that had not been topped and stripped, nine bushels and five-eighths of corn in the ear.

One of the rows which had been topped and stripped, measured seven bushels and six-eighths; and the other topped and stripped row measured seven bushels and three-eights of corn in the ear.

Thus it clearly appears that mutilating the corn plant before its fruit is perfected, is a very injurious practice. The injury done to my crop by this mode of management was clearly seen some time before the three experimental rows were cut off. Throughout the whole field the husks were generally dry and open, except on the row which had not been topped and stripped. On this, they still retained a greenish hue, and were close set to the ear when the plants were cut off by the roots.

In 1811 I selected three rows of maize in the middle of my field, as nearly alike as possible. The plants were then about two feet high. I cut off the tops of the middle row as low down as might be readily done without injuring the tassels, which were wrapped in their own leaves within the stalks. I could not observe that the stalks in the row which had been cut, grew any thicker, until new leaves had been formed from the crown of the plants. Before this happened, the stalks in the rows on either side of it, seemed to be as thick again as those standing in it; and the ears grown on the plants in this row, shot, filled, and ripened, about two weeks later than the rest of the field.

As several writers on agriculture had asserted that the tops of potatoes might be cut and given to the cattle, without injury to the crop, I cut off the tops from a row running through the middle of a very luxuriant patch. Care was taken to cut them in that way which was supposed least likely to prove injurious to the future growth of the plants. The debilitated appearance of the second growth of the tops, determined me not to risk a second cutting of them. When the crop was gathered, the roots in the row that had been cut did not seem to be more than half as large as those in the rest of the patch.

In fact, I have never seen any advantage arise, either from carefully trimming, or ruggedly mutilating annual plants; on the contrary, much injury certainly follows. It is, however, probable, that good housewives and ignorant gardeners will continue to tread and mutilate the tops of their onions, as long as the world may happen to last, for the express purpose of making the roots grow much more luxuriantly; unless, perchance, they may happen to reflect, that the tops would not have existed, if nature did not consider them as necessary to the well being of the plant as its roots. Certain it is, that the writings of many gentlemen, who ought to have known better, are exactly calculated to confirm them in this truly savage practice. —*Lorain.*

IMPORTANCE OF MANURE BEING FERMENTED IN THE SOIL.

Some cultivators, in order to make the soil open and mellow, turn it from the plants into the first cultivation, but after harrowing well, turn it immediately back to them, least injury might be done by leaving the roots exposed. This is a more rational practice than either of those just mentioned, but it is laborious and also imposing. The open texture of the soil is obtained at the expense of the roots of the plant and the useless waste of the animal and vegetable matter contained in it. As fermentation is greatly checked by this practice, the soil (unless it be sandy or very rich,) settles, and becomes harder than it would have been if the grounds had not been so carefully pulverized; especially if heavy rains follow this inconsiderate and laborious practice.

It should, however, be recollected, that the powerfully expanding force of fermentation cannot exist in a soil where perpetual ploughing and cropping has destroyed too much of the animal and vegetable matter that had formerly existed in it. In this case, a sufficiency of vegetation ought to be introduced, by red clover and the use of gypsum. Or if the grounds have been so often excited by that substance that it will no longer cause good crops of this grass to grow on them, without the aid of enriching manure, such other plants as the soil will grow, should be cultivated and ploughed under for manure. When as much vegetation is procured from an exhausted soil as it is capable of producing, and also as much animal matter as may be obtained from the cattle grazed on it, and the animalcula which are fed and sheltered by it, the next thing to be considered is, how this scanty product may be most advantageously used, and with the least possible expense. The quantity of inert earth is often very great in proportion to the animal and vegetable matter derived from the green crop grown on it: therefore but little comparative good is to be expected, unless this manure be so applied and ordered, that the whole expanding force and enriching matter contained in it, be expanded within the soil to the best advantage. However, if this be done, the benefit derived from it will be found much greater than has been commonly obtained from ploughing green crops under the soil, for the growth of fallow crops.

To illustrate this, I will again refer to buckwheat. That plant is too often threshed on the field where it grew, and the straw left in large heaps to perish, with but little ultimate use to the cultivator. We may observe, after the straw has been decomposed, that the remaining matter is very little, when compared with the original bulk of the heaps. This, together with the evident texture of the straw, seems to determine that water forms a very considerable proportion of the plant. It of consequence contains much less nutritive matter, than most of the plants ploughed under the soil for manure. It has however notwithstanding this, been ploughed under with very great success, for a wheat crop; especially in England. Now we all know, that although the wheat will stubble, fall, and become unproductive, when too much manure is applied for the crops, still much nutriment is required to grow a good crop of that grain. Why then does a crop of buckwheat, ploughed under the soil, supply sufficient nutriment to effect this purpose, when it clearly appears to furnish but little nutritive matter for the growth of plants? The reason is obvious, and the principle highly important to the interests of agriculture, if farmers would make a general application of it. After the buckwheat is ploughed under the soil, it remains undisturbed by folly, and the injurious and very expensive labor too generally used when fallow crops are cultivated: consequently, fermentation keeps the soil open and mellow for the roots of the plants, and decomposition supplies them with nutriment. As none of the enriching and fertilizing matter, arising from the decomposition of the green crop, is uselessly wasted in the way that has been described, the product is as abundant as could be rationally expected from the properties of the manure. It therefore seems, that quite as much, (if not more) depends on the proper use of manure, as on the quality or quantity applied; especially as we all know that a clover lay is an excellent preparation for wheat. If the ground be well stored with the roots of this plant, the crop seldom fails to be productive, even when the soil is thin, provided the seed for the grain crop be sown on one ploughing. On the contrary, if the lay be prepared by repeated ploughings, the crop is seldom good, unless the soil be rich enough to supply the great loss sustained in consequence of exposing the enriching and fertilizing matter contained in the clover roots to useless waste. The fact has been often and well confirmed, by sowing one part of the same clover lay on one ploughing, and the other part after the grounds had been oftener ploughed. Although the cause of this marked difference ought to be known, it certainly has not been sufficiently considered: especially in the different application of clover and other grass lays, or a more general and far better application and cultivation of them would have been adopted. Gypsum, even when the soil is very thin, causes the clover to grow luxuriantly. The tops we know to be very nutritive, and have every reason to believe that the roots are not less so, as far as the food for plants may be concerned. When the clover has not been injured by being too frequently mown or closely pastured, the interior of the soil is well filled with roots, and the surface of the ground is as regularly covered with the tops of the plant. As it cannot (like the spear grasses,) live after its roots have been reversed by the plough, a general fermentation quickly takes place; and this is not checked when small grain is sown on one ploughing, the crop is generally as good as might be expected from this judicious and of course rational practice.

Why then should we spend so much money in useless and very injurious labor, when it is evident, so far as the practice has been generally tried, that if we place the necessary materials properly within the soil, and subdue the grasses and weeds on the surface of it, by the very easy and effectual means that have been described, nature will keep the interior of the soil more open and mellow, for the growth of the plants than can be done by us with the plough? It should be also recollected, that by the use of this instrument, we cut and rend the roots of the plants, and by turning up the nutritive matter, expose it to much useless waste.—*Lorain.*

Cattle Husbandry.

THE SHORT HORNS.

Known as Durham, Teeswater, Holderness, Improved Short Horns, &c.

As the prices at which Mr Colling's stock sold affords the best criterion of its value, and as the names of the animals may be considered as constituting a sort of *Herd Book*, by which the pedigree of individuals may be appreciated, we give the catalogue of the sale entire, omitting only the names of the purchasers. The sale took place October 11, 1810:

COWS.

Names.	*Out of*	*Got by*	*Age.*	*Bulled by*	*Sold for gu*
Cherry	Old Cherry	Favorite	11	Comet	83
Kate		Comet	4	Mayduke	35
Peeress	Cherry	Favorite	5	Comet	170
Countess	Lady	Cupid	9	do	400
Celina	Countess	Favorite	5	Petrarch	200
Johanna	Johanna	do	4	do	130
Lady	Old Phoenix	A grandson of Lord Bolingbroke	14	Comet	206
Catheline	A daughter of the dam of Phoenix	Washington	8	Comet	150
Laura	Lady	Favorite	4	do	210
Lily	Daisy	Comet	3	Mayduke	410
Daisy	Old Daisy	A grandson of Favorite	6	Comet	140
Cora	Countess	Favorite	4	Petrarch	70
Beauty	Miss Washington	Marsh	4	Comet	120
Red Rose	Eliza	Comet	4	Mayduke	45
Flora		do	3	do	70
Miss Peggy		A son of Favorite	3	Comet	60
Magdalene	A heifer by Washington	Comet	3	do	170

BULLS.

Names.	*Out of*	*Got by*	*Age.*	*Gu.*
Comet	Phoenix	Favorite	6	1000
Yarborough		Favorite	9	55
Major	Lady	Comet	3	200
Mayduke	Cherry	do	3	145
Petrarch	Old Venus	do	2	365
Northumberland		Favorite	2	80
Alfred	Venus	Comet	1	110
Duke	Dutchess	do	1	105
Alexander	Cora	do	1	63
Ossian	Magdalene	Favorite	1	76
Harold	Red Rose	Windson	1	50

BULL CALVES—*Under one year old.*

Names.	*Out of*	*Got by*	*Gu.*
Ketton	Cherry	Comet	50
Young Favorite	Countess	do	140
Geerse	Lady	do	130
Sir Dimple	Daisy	do	90
Narcissus	Flora	do	15
Albion	Beauty	do	60
Cecil	Peeress	do	170

HEIFERS.

Names.	*Out of*	*Got by*	*Age.*	*Gu.*
Phoebe	Dam of Favorite	Comet	3	105
Young Dutchess	do	do	2	183
Young Laura	Laura	do	2	101
Young Countess	Countess	do	2	206
Lucy	Dam of Washington	do	2	132
Charlotte	Catheline	do	1	136
Johanna	Johanna	do	1	35

HEIFER CALVES—*Under one year old.*

Names.	*Out of*	*Got by*	*Gu.*
Lucilla	Laura	Comet	106
Calista	Cora	do	50
White Rose	Lily	Yarboro'	75
Ruby	Red Rose	do	50
Cowslip		Comet	25

Thus it would seem that the *true* improved Short Horns are a cross of the large Teeswater with the smaller Galloway breeds made by Mr. C. Colling, and the pedigree of these animals is traced back by the breeders to some one of the animals named in the preceding list. Robert, as well as Charles Colling, was an early breeder of this improved stock. His stock was sold in 1818, when the following great prices was obtained for some of his cattle, a sufficient proof of the estimation in which they were held;

One 2 year old cow, sold for 331 guineas.
One 4 year old cow,...do...300 do
One 5 year old cow,...do...370 do
One 1 year old bull calf,do...270 do
One 4 year old bull,...do...621 do

It appears by the catalouge, with printed prices affixed, that

34 cows....sold for....4,141 guineas.
14 heifers....do......1,287 do
6 bulls......do......1,343 do
4 bull calves,do...... 713 do

61 head of cattle do....7,484 do

The great improvement effected by the Messrs. Colling, was the symmetry of form, and the disposition to feed rapidly. Every perfection in cattle, whether it be one of form, of quality of flesh, or disposition to fatten, or to yield milk—can be retained only by the breeder's devoted attention to this particular object; and every advance towards one point has been tantamount to receding from another; because the same proceeding which tends to enhance a particular quality, will also enhance a defect, provided such defect was of previous existence. It is admitted that the improved breeds do not give such a *quantity* of milk as the unimproved, or Holderness; yet it is maintained that the milk of the former is better quality, and yields as much *butter*. Col. Powell, of Philadelphia, obtained from an improved Short Horn, at the rate of 20 lbs. of butter per week, though undoubtedly under high keeping. It is contended that the cows unite the two qualities of taking flesh and giving milk to a degree of perfection, *but not at the same time*;—they succeed to each other, and at the period when it suits the dairy woman they should. It is well to remark, that the counties of Durham and York have been the principal theatre of Short Horn excellence, whether of old or new breeds. Hence the term of Yorkshire or Durham cattle is often applied to both.

[*From the Farmer and Gardener.*]

ART OF MANAGING SHEEP.

Sir—I have been very desirous of ascertaining the particular method in which Mr. Barney, of Philadelphia, manages his sheep, that enables him so far to exceed every body else in producing fine mutton and good wool.

On his late visit to this city, I put the question to him, wherein consisted his superior management of sheep? He gave the following reply: He said a gentlemen visited him not long since, and on going to his sheep-yard, and viewing it, asked him the same question. He showed at that time, from fifty ewes, upwards of sixty lambs, all lively and brisk, with a loss, I think he said, of three or four. The gentlemen observed to him that he had his shed covered with dead lambs; and asked wherein the secret in breeding lay.—Mr. Barney observed to him, you stuff your sheep with dry food.—Yes, as much good clover hay as they will eat, was the reply. Mr. B.—You give them no water, but suffer them to go out in time of snow and eat it as they are disposed to do? Yes. Then, said Mr. Barney, there lies the secret. Your sheep fill themselves with dry hay; they get no water; and they have not a sufficient supply of gastric juice to promote the digestion of the hay in the stomach; they cannot raise it to *chew the cud;* they lose their appetites; are thrown into a fever; and cannot bring forth their young, or they bring forth a feeble, starved lamb, that falls off and dies the first exposure to the cold or rain. On the contrary, I take care to provide my sheep with good clear water in summer and winter. I feed them regularly with hay through the winter, and give them ruta baga and mangel wurtzel every day. The ewes produce me 120 per cent, increase in lambs. You cannot, says Mr. Barney, get along without ruta baga and mangel wurtzel.

This gentlemen has just sold his sheep for upwards of $17 per head to the butchers. It is his opinion that sheep are the most profitable stock that a man can raise; and it appears he makes use of no expensive food, or increased quantity of it. But the secret of raising good stock of every kind, consists in maintaining that regular and cleanly mode of proceeding, which preserves the digestive organs of the animal in a healthy state, and enables them to convert what they eat into chyle, suitable for the nourishment of the animal.

Respectfully yours, A.

[*From the Quebec Mercury.*]

A paragraph lately appeared in this paper, stating that the Lower Canada Society for the Promotion of Agriculture had received answers to certain queries proposed by them, on matters connected with cattle, to the Right Hon. Sir John Sinclair, Bart.; Wm. Aiton, Esq.; Charles Gordon, Esq. Secretary to the Highland Society, and Wm. Hamilton, Esq. Secretary to the Botanical and Horticultural Society of Plymouth. We have been favored with the answers of these gentlemen for publication; they are given below, and will be found to convey very much useful information, communicated with a readiness and in a manner to afford ample proof of the ability and willingness of these distinguished characters to promote the extension of agricultural knowledge, by every assistance they can render.

Sir John Sinclair and Mr. Aiton accompanied their answers with copies of their respective works on agriculture, which are of great value; and Mr. Hamilton rendered his letter doubly acceptable by conveying, at the same time, a further supply of the Victoria or Carraccas Wheat. The communications of these gentlemen follow [in part]:

Answers to queries put by the Agricultural Society of Lower Canada, at Quebec, to the Right Hon. Sir John Sinclair, Bart.

Query 1.—What, in your opinion, is the most celebrated breed of milch cows in Great Britain?

Answer.—The improved dairy cows in the western counties of Scotland are certainly, now, the most celebrated and valuable breed of milch cows in Great Britain, or any other part of Europe. Such is the opinion of one who has carefully inspected all the different breeds of cattle in Scotland, in many of the counties of England, as well as on the continent, from Paris to the Texel. The cows in Cheshire are not of a uniform breed, but a mixture of those in the neighboring counties, and of Scotch and Irish breeds, all crossed and blended together. And as they are not so well fed and treated as the dairy stock in Scotland, they are inferior to them in general character, and in milking. The Durham or Teeswater breed are superior, as dairy cows, to any other breed in England; and if they were as well fed and treated as the Scots dairy stock, they would equal them in beauty and good qualities. The cattle in Holland have often been mentioned as excellent dairy cows, but from the quality of their pasture, and the way they are fed in winter, the Dutch cows have strong bones, coarse shapes, and do not yield so much milk in proportion to their size, as the dairy cows in the western counties of Scotland. For the history, shapes and qualities of that breed, the Society are humbly referred to the account of the Dutch Dairy and Cattle Husbandry, in the tour through that country, sent with these answers.

Query 2.—What quantity of milk would a cow of such a breed give per day?

Answer.—There is such diversity in the quantity of milk, that some cows yield more than others of the same breed, and still more in what every cow will give under various changes of circumstances, that it is not easy to fix the proper average of the returns of any breeds. Cows sprung from the same parents, and reared and fed together, will often vary considerably in the quantity of milk they yield. Cows give less milk when young, or when they are too old, than they do from four to eight years of their age. Cows that are lean give less milk, and that of an inferior quality, than the same cows will give when they are in a good habit of body. Cows generally give more milk for two or three months after calving than they do afterwards. And the manner in which they are fed and treated has a powerful effect on the milking of cows.

But without going into particulars, or mentioning extraordinary returns that some cows have made, it may be stated, with entire confidence, that the fair average of the annual returns of milk, given by thousands of the best of the Ayrshire dairy cows, when they are in good condition and well fed, and when they drop their calves about the end of the month of April, will be nearly as under.

First	50 days,	12 Scots pints per day	600
Second	50 days,	10 pints or 20 quarts	500
Third	do	7 pints per day	350
Fourth	do	4 do do	300
Fifth	do	4 do do	200
Sixth	do	4 do do	150
			2,000

Some of these cows give still greater returns, and very many that are of inferior sizes, or worse fed, do not give nearly so much milk as stated above. But the society may depend upon the fact, that all the proper dairy cows, when in good plight, and well supplied with proper food, will, in general, yield 2,000 Scots pints, or 4,000 quarts of milk every year. And it is equally certain, that 14 or 15 quarts of that milk will generally yield 22 or 23 ounces of butter; and that from 55 to 60 pints (110 or 120 quarts,) of that milk, with its cream, will yield twenty-four pounds avoirdupois of full milk cheese.

Query 3.—What would be the price of a cow of such a breed from two to three years old, and in calf?

Answer.—The prices of milch cows vary so much from diversity of circumstances that it is not easy to fix the price for any length of time. The scarcity of fodder from a very dry summer—the failure of pasture herbage from the same cause, or from the weather being cold and stormy in the months of May and June, which frequently happens in the changable climate of Scotland, will sometimes lower the price of milch cows, ten, twenty, or thirty per cent while a more favorable season will raise prices considerable. These cattle are twenty or thirty per cent cheaper in harvest than they are in May or June. The crops having been abundant, and the summers fine for three years past, the prices of milch cows are considerably higher than they have been for several years before.—Some milch cows of the best sort and in good condition, have been sold as high as £25: but young cows, from two to three years old and in calf, may be procured of the best sort, at from £10 to £12 each, or still cheaper.

Query 4.—What would be the price of a bull of the same breed, from eighteen months to two years old?

Answer.—Bulls also vary much in price. Some of the best dairy bulls have been sold as high as from £150 to £200: while one of an ordinary description may frequently be procured for £9 or £12. It would be proper to select a bull for Canada about two years old, as the best looking calves frequently alter so much in their shapes and character before they come to maturity, as to render it unsafe to trust to what they may turn out, until they are two years old. The dairy bulls, that have most of a feminine aspect, are preferred to those that are more masculine. A dairy bull of good shape and qualities may be procured for about £14 or 16.

Query 5.—What is the most celebrated breed of cows in Great Britain or elsewhere, for the production of butter?

Answer.—The quantity of butter yielded by cows, depends more on the food given them, than on any peculiarity of the breed of cattle; and the quality of the butter is greatly influenced by the mode of feeding, and still more by the manner in which the butter is manufactured. Cows that browze on natural pasture, or what is called old turf, do not yield so much milk as the same cows would give when fed on clover, turnips, cabbages, and new herbage, but the milk of the former is of better quality, and yields more and richer butter, from any given quantity of milk, than that of cows fed on clover, &c. Some individual cows of every breed give richer milk, and of course more butter in proportion to their milk, than other cows of the same breed, and when reared and fed in the same manner. Milk, as it comes from the cows, consists of oily matter, from which butter is made, *lactic* matter, which forms cheese, and *serium* or whey: and the milk of particular cows of every breed differs considerably in the proportions it contains of these respective substances. But it is doubtful if any particular breed can be pointed out, which uniformly yield more butter than any of the other breeds except in so far as they yield more milk, or are influenced by climate, the mode of feeding, &c. Much butter, and that of a superior quality, is made in Holland, and particularly in the Province of Freiseland. This seems to proceed from the cattle being fed on meadows where the herbage is of natural growth, and very rich.—The cows in Holland give less milk in proportion to their size, than the generality of the Scots dairy cows; but the milk of the Dutch cows is richer than the other. In Holland the milk is not allowed to stand more than from 18 to 24 hours, to cast up cream, while in Scotland it stands double those periods. The consequence is, that nothing but the richest and best cream, which always rises first, is made into butter in Holland; while in Scotland, the inferior cream. which makes inferior butter, is collected and churned with the other. And, above all things, the great attention paid to cleanliness in Holland has a powerful effect on the quality of their butter.

Query 6.—What quantity of butter would a cow of such breed produce per week?

Answer.—From what has been already stated as to the diversity of the quality and quantity of milk, the society will readily perceive that it is not easy to answer this query on general principles: A cow, kept by William Cramp, of Lewis, in the county of Sussex, is mentioned in the fifth and sixth volumes of the communications to the Board of Agriculture, as having yielded, in the year 1805, 540 pounds advoirdupois of butter. In 1806, this cow gave 450 pounds of butter, in 1807, she gave 675 pounds, and in 1808, the same cow gave 466 pounds, avoirdupois of butter. The Secretary to the Board of Agriculture mentioned a cow kept by the Reverend Mr. Heckett, of Beckingham, near Newark, that yielded nineteen pounds, avoirdupois, of butter in one week. But he added, that six seven, or eight pounds per week, were the common returns of the cows in that part of England. Mr. Vancouver states, in his report of Hampshire, that a cow of an inferior size, kept by Anthony Grave, Symington, yielded from fifteen to sixteen pounds, avoirdupois, of butter, per week, for some part of the season. A cow of the Ayrshire dairy breed, kept by Mr. White, on land in Lanarkshire, situated in 800 feet of altitude above the level of the sea, yielded, for several weeks in summer, 1833, sixteen pounds, avoirdupois, of butter per week. And the Rev. Mr. Alpin, of Skarling, obtained at the rate of thirteen pounds of butter from one of his cows that year per week.

But although many such instances of produce could be pointed out, they are far above the ordinary or medium returns of dairy cows. It is certain, however, that thousands of the Scots dairy cows yield 4,000 quarts of milk in the course of one year, as has been mentioned; and it is equally certain that sixteen quarts of that milk uniformly yield, on an average, 24 ounces of butter so that the average return of these cows, when of good quality, in right condition and properly fed, is 375 pounds, avoirdupois of butter, per cow, per annum.

Science of Agriculture.

OF THE DIFFERENT SPECIES OF MINERAL MANURES.

Alkaline earths, or alkalis, and their combinations, which are found unmixed with the remains of any organized beings, are the only substances which can with propriety be called fossil manures. The only alkaline earths which have hitherto been applied in this way, are lime and magnesia; though potassa and soda, the two fixed alkalis, are both used to a limited extent in certain of their chemical compounds.

The most common form in which lime is found, on the surface of the earth, is in a state of combination with carbonic acid or fixed air. If a piece of limestone or chalk be thrown into a fluid acid, there will be an effervescence. This is owing to the escape of the carbonic acid gas. The lime becomes dissolved in the liquor.—When limestone is strongly heated, the carbonic acid gas is expelled, and then nothing remains but the pure alkaline earth; in this case there is a loss of weight; and if the fire has been very high, it approaches to one half the weight of the stone; but in common cases, limestones, if well dried before burning, do not lose much more than 35 or 40 per cent, or from seven to eight parts out of twenty.

When burnt lime is exposed to the atmosphere, in a certain time it becomes mild, and is the same substance as that preceptitated from lime water; it is combined with carbonic acid gas. Quick-lime, when first made, is caustic and burning to the tongue, renders vegetable blues green, and is soluble, [i. e. dissolves,] in water; but when combined with carbonic acid, it loses all these properties, its solubility, and its taste; it regains its power of effervescing, and becomes the same chemical substance as chalk or limestone. Very few limestones or chalks consist entirely of lime and carbonic acid. The statutary marbles, or certain of the rhomboidal spars, are almost the only pure species; and the different properties of limestones both as manures and cements, depend upon the nature of the ingredient mixed with the limestone; for the true calcareous element, the carbonate of lime, is uniformly the same in nature, in properties, and effects, and consists of one proportion of carbonic acid, 41.4, and one of lime, 55. When a limestone does not copiously effervesce in acids, and is sufficiently hard to scratch glass, it contains silicious, [sandy,] and probably aluminous, [clayey,] earths. When it is deep brown or red, or strongly coloured of any of the shades of brown or yellow, it contains oxide of iron. When it is not sufficiently hard to scratch glass, but effervesces slowly, and makes the acid in which it effervesces milky, it contains magnesia. And when it is black, and emits a fœtid smell if rubbed, it contains coaly or bituminous matter. Before any opinion can be formed of the manner in which the different ingredients in limestones modify their properties, it will be necessary to consider the operation of pure lime as a manure.

Quick-lime, in its pure state, whether in powder or dissolved in water is injurious to plants. In several instances grass has been killed by watering it with lime-water. But lime, in its state of combination with carbonic acid, is a useful ingredient in soils. Calcareous earth is found in the ashes of the greater number of plants; and exposed to the air, lime cannot long continue caustic, for the reasons that were just now assinged, but soon becomes united to carbonic acid. When newly burnt lime is exposed to air, it soon falls into powder; in this case it is called slaked lime; and the same effect is immediately produced by throwing water upon it, when it heats violently, and the water disappears. Slaked lime is merely a combination of lime, with about one-third its weight of water; i. e. fifty-five parts of lime absorb seventeen parts of water, and is called by chemists *hydrate of lime;* and when hydrate of lime becomes carbonate of lime by long exposure to air, the water is expelled, and the carbonic acid gas takes its place. When lime, whether freshly burnt or slaked, is mixed with any moist, fibrous, vegetable matter, there is a strong action between the lime and the vegetable matter, and they form a kind of compost together, of which a part is usually soluble in water. By this sort of operation, lime renders matter which was before comparatively inert, nutritive; and as charcoal and oxygen abound in all vegetable matters, it becomes at the same time converted into carbonate of lime.

Mild lime, powdered lime-stone, marls or chalks, have no action of this kind upon vegetable matter; they prevent the too rapid decomposition of substances already dissolved, but they have no tendency to form soluble matters. It is obvious from these circumstances, that the operation of quick-lime, and marl or chalk, depends upon principles altogether different. Quick-lime in being applied to land, tends to bring any hard vegetable matter that it contanis into a state of more rapid decomposition and solution, so as to render it a proper food for plants. Chalk, and marl, or carbonate of lime, will only improve the texture of the soil, or its relation to absorption; it acts merely as one of its earthy ingredients. Chalk has been recommended as a substance calculated to correct the sourness of land. It would surely have been a wise practice to have previously ascertained the certainty of this existence of acid, and to have determined its nature, in order that it might be effectually removed. The fact really is, that no soil was ever yet found to contain any notable quantity of uncombined acid. The acetic and carbonic acids are the only two that are likely to be generated by any spontaneous decomposition of animal or vegetable bodies, and neither of these have any fixity when exposed to the air. Chalk having no power of acting on animal or vegetable substances, can be no otherwise seviceable to land than as it alters its texture. Quick-lime, when it becomes mild, operates in the same manner as chalk, but in the act of becoming mild, it prepares soluble out of unsoluble matter. Bouillon La Grange says, that gelatine oxygenized becomes insoluble, and vegetable extract becomes so from the same cause; now lime has the property of attracting oxygen, and, consequently, of restoring the property of solubility to those substances, which have been deprived of it, from a combination of oxygen.—Hence the use of lime on peat lands, and on all soils containing an excess of vegetable insoluble matter.—*Grisenthwaite.*

Effect of lime on wheat crops.—When lime is employed upon land where there is present any quantity of animal matter, it occasions the evolution of a quantity of ammonia, which may, perhaps, be imbibed by the leaves of plants, and afterwards undergo some change so as to form gluten. It is upon this circumstance, that the operation of lime in the preparation for wheat crops depends; and its efficacy in fertilizing peat, and in bringing into a state of cultivation all soils abounding in hard roots, or dry fibres, or inert vegetable matter.

General principles for applying lime.—The solution of the question whether quick lime ought to be applied to a soil, depends upon the quantity of inert vegetable matter that it contains. The solution of the question, whether marl, mild lime, or powdered limestone ought to be applied, depends upon the quantity of calcareous matter already in the soil. All soils are improved by mild lime, and ultimately by quick-lime, which do not effervesce with acids, and sands more than clays. When a soil, deficient in calcareous matter, contains more soluble vegetable manure, the application of quick-lime should always be avoided, as it either tends to decompose the soluble matters by uniting to their carbon and oxygen so as to become mild lime, or it combines with the soluble matters and forms compounds having less attraction for water than the pure vegetable substance. The case is the same with respect to most animal manures, but the operation of the lime is different in different cases; and depends upon the nature of the animal matter. Lime forms a kind of insoluble soap with oily matters, and then gradually decomposes them by separating from them oxygen and carbon. It combines likewise with the animal acids, and probably assists their decomposition by abstracting carbonaceous matter from them combined with oxygen; and consequently must render them less nutritive. It tends to diminish, likewise, the nutritive power of albumen from the same causes; and always destroys, to acertain extent, the efficacy of animal manures, either by combining with certain of their elements, or by giving to them new arrangements. Lime should never be applied with animal manures, unless they are too rich, or for the purpose of preventing noxious effluvia. It is injurious when mixed with any common dung, and tends to render the attractive matter insoluble. According to Chaptal, lime forms insoluble composts, with almost all animal or vegetable substances that are soft, and thus destroys their fermentative properties. Such compounds, however, exposed to the continued action of the air, alter in course of time, the lime becomes carbonate, the animal or vegetable matter decompose, by degrees, and furnish new products as vegetable nourishment. In this view, lime presents two great advantages for the nutrition of plants; the first, that of disposing of certain insoluble bodies to form soluble compounds, the second, that of prolonging the action and nutritive qualities of substances, beyond the term which they would retain them if they were not made to enter into combination with lime. Thus the nutritive qualities of blood, as it exists in the compound of lime and blood, known as sugar bakers' scum, is moderated, prolonged, and given out by degrees;—blood alone applied directly to the roots of plants will destroy them, with few or no exceptions.

Lime promotes fermentation.—In those cases in which fermentation is useful to produce nutriment from vegetable substances, lime is always efficacious. Some moist tanner's bark was mixed with one-fifth of its weight of quick-lime, and suffered to remain together in a close vessel for three months; the lime had become coloured and was effervescent; when water was poured upon the mixture, it gained a tint of fawn colour, and by evaporation furnished a fawn coloured powder, which must have consisted of lime united to vegetable matter, for it burnt when strongly heated, and left a residuum of mild lime.—*Loudon's Enc. Ag.*

GYPSUM.

Besides being used in the forms of lime and carbonate of lime, calcareous matter is applied for the purposes of agriculture in other combinations. One of these bodies is gypsum or sulphate of lime. This substance consists of sulphuric acid, the same body that exists combined with water in oil of vitriol, and lime, and when dry is composed of 55 parts of lime and 75 parts of sulphuric acid. Common gypsum or selenite, such as that found at Shotoverhill, near Oxford, contains, besides sulphuric acid and lime, a considerable quantity of water, and its composition may be thus expressed: sulphuric acid one proportion 75; lime one proportion 55; water two proportions 34.

The nature of Gypsum is easily demonstrated: if oil of vitriol be added to quick-lime, there is a violent heat produced; when the mixture is ignited, water is given off, and gypsum alone is the result, if the acid has been used in sufficient quantity; and gypsum mixed with quick-lime, if the quantity has been deficient. Gypsum free from water, is sometimes found in nature, when it is called anhydrous selenite. It is distinguished from common gypsum by giving off no water when heated. When gypsum free from water, or deprived of water by heat, is made into a paste with water, it rapidly sets by combining with that fluid. Plaster of Paris is powdered dry gypsum, and its property as a cement, and its use in making casts, depends on its solidifying a certain quantity of water, and making with it a coherent mass. Gypsum is soluble in about 500 times its weight in cold water and is more soluble in hot water, so that when water has been boiled in contact with gypsum, crystals of this substance are deposited as the water cools. Gypsum is easily distinguished by its properties of affording precipitates to solutions of oxalates and barytic salts. It has been much used in America, where it was first introduced by Franklin on his return from Paris, who had been much struck with its effects there. He sowed the words, *this has been sowed with gypsum*, on a field of lucern, near Washington; the effects astonished every passenger, and the use of the manure quickly became general, and signally efficacious. It has been advantageously used in Kent, but in most counties of England it has failed, though tried in various ways, and upon different crops.

Very discordant notions have been formed as to the mode of operation of gypsum. It has been supposed by some persons to act by its power of attracting moisture from the air; but this agency must be comparatively insignificant. When combined with water, it retains that fluid too powerfully to yield it to the roots of the plant, and its adhesive attraction for moisture is inconsiderable, the small quantity in which it is used likewise is a circumstance hostile to this idea. It has been erroneously said that gypsum assists the putrefaction of animal substances, and the decomposition of manure.

The ashes of saintfoin, clover and rye-grass afford considerable quantities of gypsum; and the substance is intimately combined as a necessary part of their woody fibre. If this be allowed, it is easy to explain the reason why it operates in such small quantities; for the whole of a clover crop, or saintfoin crop, on an acre, according to estimation, would afford by incineration only three or four bushels of gypsum. The reason why gypsum is not generally efficacious, is probably because most cultivated soils contain it in sufficient quantities for the use of the grasses. In the common course of cultivation, gypsum is furnished in the manure, for it is contained in stable dung, and in the dung of all cattle fed on grass, and it is not taken up in corn crops, or crops of peas and beans, and in very small quantities in turnip crops; but where lands are exclusively devoted to pasturage and hay, it will be continually consumed. Should these statements be confirmed by future inquiries, a practical inference of some value may be derived from them. It is possible that lands that have ceased to bear good crops of clover, or artificial grasses, may be restored by being manured with gypsum.

Dairy Husbandry.

The practice of the Dutch in Holland, and of the Germans in Pennsylvania, of cooling their milk immediately after it is drawn from the cow, is calculated to abridge the labor of the dairy, and to improve its products. During the hot weather of summer, milk becomes lobbered in 24 hours after it has been drawn, and before the whole of the cream has risen to the surface; *after which no more cream rises.* By reducing the temperature, nearly all the cream rises in 24 hours, and the lobbering of the milk is considerably retarded. In Pennsylvania, milk-houses of stone or brick, built over springs are common. In these the milk is kept in a temperature of 50 to 55 degrees, although the exterior heat may be 90. When springs are not convenient, milk cellars are constructed under ground, and water to reduce and keep down the temperature supplied by pumps. In Holland, where springs do not abound, every dairy is provided with a water tight pit, termed a *koelbak*, built of brick or stone; they are about six feet in length, three feet in breadth, and two in depth. These are filled with water by a pump, which is generally seen at one end, and the fresh drawn milk, in brass pitchers made for the purpose, is deposited in it for two hours, and frequently stirred. This cooling process is found of great advantage in causing the cream to separate rapidly and abundantly from the milk. The milk is then strained, placed in shallow pans, and remains in the milk cellar, which adjoins, and is sunk a few steps below the *koelbak*, where it remains for 24 hours, and is then skimmed.—*Cultivator.*

ON THE DAIRY HUSBANDRY OF HOLLAND.

The Highland Society of Scotland, considering the advantages that might be derived from an acquaintance with the modes of managing dairies in Holland, offered, in 1831, a premium for the best report upon that subject, founded on personal observation. The premium was subsequently awarded to John Mitchell, whose report was published in 1833. We abstract from this report, such facts as are likely most to interest our dairy farmers, and lead to their improvement. We will barely premise, that the products of the Dutch dairy, particularly the butter, are in higher demand than those of any other country. Vast quantities of butter are annually exported to Britain, the West Indies, &c. 116233 cwt. of butter, and 167,913 cwt. of cheese, were brought from Holland to England, in 1830. Were the same care taken in manufacturing our butter which is bestowed in Holland, we should find a brisk foreign demand for all our surplus stock. But at present our butter is inferior, will not bear transportation to a warm climate, and will not compete with that of Holland.

Pasture.—The pastures in Holland have been reclaimed from the ocean. They are flat, low and moist, the water in the small canals or dykes always rising nearly to their surface. They are of course permanent, or are seldom broken with the plough. They are top dressed every third year with cow-house manure, mixed with the scrapings of the small canals, and the first year after dressing, reserved, generally, for hay.

Supposing the whole growth 700, the Dutch farmers consider that there grows, for the consumption of the cow, from the beginning of spring till May, 135 parts; in June, 20; July, 135; August, 95; September, 55; October till winter, 80.

Cows are particularly selected for the dairy. Their price is about 9 or £10 ster.—40 to $45. They are generally fattened and turned off to the butcher at eight years old, and bulls at four or five. The cows are turned to pasture in March or April, and are at first covered with a very thick cloth of tow, covering the upper half of the body from the shoulders to the tail, to prevent diseases from cold. They are pastured about 30 weeks. Hay is their common food in winter, though rape cake and brewers' grains are sometimes added. The byres or cow-houses are generally lofty, airy, paved with large square bricks, and kept perfectly clean. The roof is about 10 feet high. There are no racks or mangers, but the food placed in gutters, always clean, near their heads. Gutters in their rear, serve to carry off the urine and dung, and these gutters are also kept clean.

Process of manufacture.—The cows are always milked by the men, and the butter and cheese made by the women, generally of the family. Ninety cows are managed by nine men, and two women. There is generally one man required to ten cows; while two women are considered enough for any dairy. The farmer reckons that he can make 100 guilders, about 40 dollars, per annum, by each cow.

Butter.—There are three distinct kinds of butter made in Holland; *Grass butter*, made when the cows are at grass; *Whey butter*, from the whey of sweet milk cheese; and *Hay butter*, made in winter.

Grass butter.—The cows being carefully milked to the last drop, the pitchers containing the milk, are put into the *Koelbak*, a description of which will be found in the preceding article. When the cream has been gathered and is soured, and if there is a sufficient quantity from the number of cows, they churn every 24 hours, the churn being half filled with the soured cream. A little *boiled* warm water is added in winter, to give the whole the proper degree of heat, and in very warm weather, the milk is first cooled in the *koelbak* or cooler. In small dairies, the milk is sometimes churned, when soured, without separating the cream. The butter, immediately after being taken out of the churn, is put into a shallow tub, called a *vloot*, and carefully washed with pure cold water. It is then worked with a slight sprinkling of fine salt, whether for immediate use or the barrel. When the cows have been three weeks at grass, the butter is delicious, is made in fanciful shapes of lambs, stuck with the flowers of the polyanthus, pyramids, &c. and sells as high as 44 stivers, 60 to 70 cents, the 17 oz. or Dutch pound. If intended for barrelling, the butter is worked up twice or thrice a day, with soft fine salt, for three days, in a flat tub, there being about two pounds of this salt allowed for fourteen pounds of butter; the butter is then hard packed by thin layers into casks, which casks are previously carefully seasoned and cleaned. They are always of oak, well smoothed inside. Before being used, they are allowed to stand three or four days, filled with sour whey, and thereafter carefully washed out and dried. Each cow, after being sometime at grass, yields about one Dutch pound ($17\frac{1}{2}$ oz.) butter per day.

We beg our dairy women to mark two points in the preceding process. 1. *No salt is used but what is incorporated with and dissolved in the butter, and which is necessary to give it flavor;* and 2, *the butter* intended for keeping *is worked from six to ten times,* to incorporate the salt, and *to separate from it every particle of liquid,* which, if left in it, would induce rancidity.

Hay butter undergoes a like process.

Whey butter.—The whey is allowed to stand three days or a week, after being separated from the curd, when the cream is skimmed off, or the whey itself put into the churn, and the butter is formed in about an hour. By this process, in winter one pound of butter is obtained from each cow in a week, and in summer $1\frac{1}{2}$ pounds. The relative prices are generally, grass butter $8\frac{1}{2}$ stivers, hay butter 7, and whey butter 6.

Cheese.—There are four kinds of staple chese made in Holland, —the *Edam* and *Gouda*, both made from unskimmed milk; and two kinds, called *Kanter Cheese*, made from milk once and twice skimmed.

Edam Cheese.—The process of manufacture of the Edam Cheese is as follows:

The milk being yearned as soon as taken from the cow, when coagulated, the hand, or a wooden bowl, is passed gently two or three times through the curds, which are then allowed to stand a few minutes; the bowl or finger is again passed through them, and they stand a few minutes. The whey is then taken off with the wooden bowl, and the curd is then put into a wooden form, (of the proper size and shape of the cheese to be made.) This form is cut out of the solid wood by a turner, and has one hole in the bottom. If the cheese is of the small size, (about 4 lbs.) it remains in this form about ten or twelve days; if the large sized, it remains about fourteen days. It is turned daily, the upper part during this time being kept sprinkled with about two ounces of purified salt of the large crystals. It is then removed into a second box or form of the same size, with four holes in the bottom, and put under a press of about 50 lbs. weight, where it remains from two to three hours, if of the small size, and from four to six if of the large size. It is then taken out, and put on a dry airy shelf in the cheese apartment, and daily turned over for about four weeks, when they are generally fit to be taken to market.

Alkmaar, in North Holland, is the great market for Edam cheese. It is not uncommon to see 800 farmers at the market, and 470,000 cheeses for sale on one day. The price there averages about 30s. per cwt. ($6.66).—*Cultivator.*

Gouda Cheese.—This kind of cheese is also made from the milk immediately on its being taken from the cow. After gradually taking off the principal part of the whey, a little warm water is put upon the curd, which is left standing for a quarter of an hour. By increasing the heat and quantity of water, the cheese is made harder and more durable. All the whey and water is then taken off, and the curd is gradually packed hard into a form cut out by the turner, flatter and broader than the form for the Edam cheese. A wooden cover is placed over it, and the press, with a weight of about 8 lbs. put upon it. It is here frequently turned, and altogether remains under the press about 24 hours. The cheese is then carried to a cool cellar, put into a tub containing pickle, the liquid covering the lower half of it. The water for the pickle is boiled, and about three or four handfuls of salt melted in about thirty imperial pints of water. The cheese is not put in until the water is quite cold. After remaining twenty-four hours, or at most two days, in the pickle tub, where it is turned every six hours, the cheese, after being rubbed over with salt, is placed upon a board slightly hollowed, having a small channel in the centre, to conduct the whey which runs off into a tub placed at the one end. This board is called the *Zouttank*, upon which several cheeses are placed at a time. About two or three ounces of the large crystallized salt is placed upon the upper side of the cheese, which is frequently turned, the side uppermost being always sprinkled with salt. It remains on the zouttank about eight or ten days, according to the warmness of the weather; the cheese is then washed with hot water, rubbed dry and laid upon planks, and turned daily, until perfectly dry and hard.

The cheese house is generally shut during the day, but must be open in the evening and early in the morning.

Gouda is the principal market for this kind of cheese, where it sells at about 35s. per cwt.

Each cow at grass in Holland is calculated to give about three or four pounds sweet milk cheese per day.

We omit the method of making the *Kanter Cheese*, which is similar to our skim-milk cheese—and of the cheese utensils.

The milk houses are generally between the dwelling and cowhouse, in a square apartment, in a corner of which is the cooler; it is airy, roomy, and paved with square bricks—the upper part serving for churning, making cheese, &c. and descending a few steps, into a sort of cellar, is the milk-room, having two to four windows, which are opened or shut according to circumstances.

The cheese houses are also generally cellars, kept clean and well ventilated.

The Dutch are remarkably particular as to the quantity and quality of their salt, of which there are three kinds manufactured; and it is this, our reporter thinks, which is the principal cause of the sweet and delicious flavor of their butter, which, although well flavored, hardly tastes of salt, or rather of that acrid quality which is perceptible in the butter of Great Britain.

Cleanliness governs in all the Dutch dairies. Every dwelling-house is a model and a pattern. They seem to vie with each other on this point. The cow house is pure and clean, not a particle of filth being to be seen in it; the cows, says Mr. M. are as clean as if they were in a dining room; the milk and cheese houses, and in short every part of the house, are free from dust and dirt of any kind. The whole apartments, even the byre (stalls) and hay house are generally under one roof; and the cleanly system, and the admirable arrangement, give that comfort and pleasure which are too often wanted in other countries.

Household Affairs.

To have good yeast in summer, is a desirable object with every housewife. She may have such by the following simple process:

Boil a single handful of hops (which every farmer can and ought to raise, to the extent of household wants) in two or three quarts of water—strain and thicken the liquor, when hot, with rye flour; then add two or three small yeast or turnpike cakes, to set the mass. If this is done at evening, it will be fit for use early next morning. Reserve a pint of this yeast, which thicken with Indian meal, make into small cakes, the size of crackers, and dry them in the shade for future use. In this way the yeast is always fresh and active.—Yeast cakes kept a long time are apt to become rancid, and lose their virtues. The fresher the cakes the better the yeast.

Junket, is a term applied to a dish which every farmer's wife can readily make, and which constitutes an excellent light food for all classes during the heat of summer. It is merely milk curdled by the addition of a little rennet half an hour before dinner, and seasoned to the taste. First prepare your rennet for use, by cleaning, salting, stretching and drying the skin. When dry, cut into pieces as big as a dollar, and put them into brown sugar. When wanted for use, put one or two of the pieces into half a gill of cold water half an hour before wanted. Season the milk with sugar, nutmeg, and wine, if desired, then add the water in which the rennet has been soaked, stir the whole well, and in fifteen minutes it will be fit for use. Milk from two to four quarts.

To boil green corn.—Take it fresh from the stock, husk and put it into a kettle or pot of boiling water, and cover it well with the inner husks. Green corn soon grows vapid after it is picked and husked; the husks in the kettle preserve its fine fresh flavor.

To make a Minute Pudding.—Stir flour into boiling milk, to the consistence of a thin hasty pudding, and in fifteen or twenty minutes it will be fit for the table. Serve with sauce to suit the taste.

To make Currant Jelly.—Take the juice of red currants and white sugar, equal quantities in weight. Stir it gently and smoothly for three hours, put it into glasses, and in three days it will concrete into a firm jelly.

Young Men's Department.

THE PLEASURES OF SCIENCE

[*Continued from page* 45.]

In the third place, science contributes to our enjoyment *by the grand and sublime objects she presents before us.* In consequence of the investigations which have been made to determine the distances and magnitudes of the heavenly bodies, objects of magnificence and grandeur are now presented to the view of the enlightened mind of which former ages had no conception. These objects are magnificent in respect of *magnitude*, of *motion*, of *the vast spaces which intervene between them*, and *of the noble purposes for which they are destined.* What a sublime idea, for example, is presented to the view by such an object as the planet *Jupiter*,—a globe 1,400 times larger than the world in which we dwell, and whose surface would contain a population a hundred times more numerous than all the inhabitants that have existed on our globe since the creation! And how is the sublimity of such an idea augmented, when we consider that this immense body is revolving round its axis at the rate of twenty-eight thousand miles in an hour, and is flying, at the same time, through the regions of space, twenty-nine thousand miles every hour, carrying along with it four moons, each of them larger than the earth, during its whole course round the centre of its motion! And if this planet, which appears only like a luminous *speck* on the nocturnal sky presents such an august idea, when its magnitude and motions are investigated, what an astonishing idea is presented to the mind when it contemplates the size and splendor of the sun,—a body which would contain within its bowels, nine hundred globes larger than Jupiter, and thirteen hundred thousand globes of the bulk of the earth, which darts its rays in a few moments to the remotest bounds of the planetary system, producing light and colour, and life and vegetation throughout surrounding worlds! And how must our astonishment be still increased, when we consider the *number* of such globes which exist throghout the universe; that within the range of our telescopes more than eighty millions of globes, similar to the sun in size and in splendor, are arranged at immeasurable distances from each other, diffusing their radiance through the immensity of space, and enlivening surrounding worlds with their benign influence, besides the innumerable multitudes which, our reason tells us must exist beyond all that is visible to the eyes of mortals!

But the *motions*, no less than the magnitudes, of such bodies, present ideas of sublimity. That a globe* as large as the earth should fly through the celestial regions with a velocity of seventy-six thousand miles an hour,—that another globe† should move at the rate of one thousand seven hundred and fifty miles in a minute, and a hundred and five thousand miles in an hour,—that even Saturn, with all his assemblages of rings and moons, should be carried along his course with a velocity of twenty-two thousand miles an hour,—that some of the comets, when near the sun, should fly with the amazing velocity of eight hundred thousand miles an hour,—that, in all probability, the sun himself and all his attending planets, besides their own proper motions, are carried around some distant centre at the rate of more than sixty thousand miles every hour; and that thousands and millions of systems are moving in the same rapid manner, are facts so astonishing, and so far exceeding every thing we behold around us on the surface of the earth, that the imagination is overpowered and confounded at the idea of the astonishing forces which are in operation throughout the universe, and of the power and energy by which they are produced! and every rational being feels a sublime pleasure in the contemplation of such objects, which is altogether unknown to the ignorant mind.

The vast and *immeasurable spaces* which intervene between the great bodies of the universe, likewise convey august and sublime conceptions. Between the earth and the sun there intervenes a space so vast, that a cannon ball, flying with the velocity of five hundred miles an hour, would not reach that luminary in twenty years; and a mail-coach moving at its utmost speed, would not arrive at its surface in less than twelve hundred years; and, were it to proceed from the sun towards the planet Herschel, it would not arrive at that body till after the lapse of *twenty-two thousand years.* And yet the sun, at that immense distance, exerts his attractive energy, retains that huge planet in its orbit, and dispenses light and colour, life and animation, over every part of its surface. But all such spaces, vast as at first sight they appear, dwindle as it were into a span, when compared with those immeasurable spaces which are interposed between us and the regions of the stars. Between the earth and the nearest fixed star, a space intervenes so vast and incomprehensible, that a ball flying with the velocity above mentioned, would not pass through it in four millions and five hundred thousand years; and as there are stars, visible through telescopes, at least a hundred times further distant from our globe, it would require such a body four hundred millions of years, or a period 67,000 times greater than that which has elapsed since the Mosaic creation, before it could arrive at those distant regions of immensity.

The *grand and noble designs* for which the great bodies to which I have adverted are intended, suggest likewise a variety of interesting and sublime reflections. These designs undoubtedly are, to display the ineffable glories of the Eternal Mind,—to demonstrate the immensity, omnipotence and wisdom of Him who formed the universe,—and to serve as so many worlds for the residence of incalculable numbers of intelligent beings of every order. And what an immense variety of interesting objects is presented to the mind when its views are directed to the numerous orders and gradations of intelligence that may people the universe,—the magnificent scenes that may be displayed in every world,—the moral economy, and the important transactions that may have taken place in their history under the arrangements of the Divine government!

Such are some of the scenes of grandeur which science unfolds to every enlightened mind. The contemplation of such objects has an evident tendency to enlarge the capacity of the soul, to raise the affections above mean and grovelling pursuits, to give man a more impressive idea of the *dignity* of his rational and immortal nature, and of the attributes of that Almighty being by whom he is upheld, and to make him *rejoice* in the possession of faculties capable of being exercised on scenes and objects so magnificent and sublime. —*Dick.*

* The planet Venus. † The planet Mercury

BENJAMIN FRANKLIN.

The life of Benjamin Franklin is one of deep interest to every young man who feels ambitious of elevating himself in the ranks of society—of acquiring wealth and reputation, and of fulfilling the high duties which every citizen owes to the commonwealth. We find Franklin at seventeen years of age, entering the streets of Philadelphia, three hundred miles from friends and home, a moneyless, friendless stranger, with but a dollar in his pocket, a penny roll under each arm, and making his breakfast from a third which he held in his hands. We find him a few years after the master of a printing-office, and subsequently filling the highest offices in the country, full of knowledge and full of honors, the pride of America, and commanding the plaudits of Europe, for his discoveries in science, his efforts in behalf of civil liberty, and his unaffected kindness to his fellow-men. To show the contrast in the condition of this good man, between his early and latter life, we will quote from his memoirs, his entrance into Philadelphia, at seventeen, and his appearance in the British House of Lords at riper years.

"I was dirty from my being so long in the boat; my pockets were stuffed out with shirts and stockings, and I knew no one, nor where to look for a lodging. Fatigued with walking, rowing, and the want of sleep, I was very hungry, and my whole stock of cash consisted in a single dollar, and about a shilling in copper coin, which I gave to the boatman for my passage. At first they refused it on account of my having rowed, but I insisted on their taking it. Man is sometimes more generous when he has little money, than when he has plenty; perhaps to prevent his being thought to have but little. I walked towards the top of the street, gazing about still in Market-street, where I met a boy with bread. I had often made a meal of dry bread, and inquiring where he bought it, I went immediately to the baker's he directed me to. I asked for biscuits, meaning such as we had in Boston: that sort, it seems, was not made in Philadelphia. I then asked for a three-penny loaf, and was told they had none. Not knowing the different prices, nor the names of the different sorts of bread, I told him to give me three penny worth of any sort. He gave me accordingly three great puffy rolls. I was surprised at the qantitity, but took it, and having no room in my pockets, walked off with a roll under each arm, and eating the other.—Thus I went up Market-street, as far as Fourth-street, passing by the door of Mr. Reed, my future wife's father; when she standing at the door, saw me and thought I made, as I certainly did, a most awkward, ridiculous appearance. Then I turned and went down Chesnut-street and part of Walnut-street, eating my roll all the way, and coming round found myself again at Market-street wharf, near the boat I came in, to which I went for a draught of the river water; and being filled with one of my rolls gave the other two to a woman and her child that came down the river in the boat with us, and were waiting to go farther. Thus refreshed, I walked again up the street, which by this time had many clean dressed people in it, who were walking the same way; I joined them and thereby was led into the great meeting-house of the Quakers near the market. I sat down among them, and after looking round awhile, and hearing nothing said, being very drowsy, through labor and the want of rest the preceding night, I fell fast asleep, and continued so till the meeting broke up, when some one was kind enough to rouse me.—This therefore was the first house I was in, or slept in, in Philadelphia."—*Franklin's Mem. vol.* 1, *pp.* 24, 25.

Before the rupture between Great Britain and these States, in 1775, Franklin resided in London, as a colonial agent. While there he attracted the notice of the elder Pitt, then Lord Chatham, who headed the opposition to Lord North's administration. Lord Chatham not only paid to Franklin the civilities due to a man of worth, but counselled him, and made him a confidant, on subjects connected with American affairs; and when about to present to Parliament a plan of pacification between the mother country and her colonies, invited him to be present at the presentation. The subjoined extract relates to what took place on that occasion.

"On Wednesday, Lord Stanhope, at Lord Chatham's request, called upon me, and carried me down to the house of lords, which was soon very full. Lord Chatham, in a most excellent speech, introduced, explained and supported his plan. When he sat down, Lord Dartmouth rose, and very properly said, it contained matter of such weight and magnitude as to require much consideration, and therefore he hoped the noble earl did not expect their lordships to decide upon it by an immediate vote, but would be willing it should lie on the table for consideration. Lord Chatham answered readily, that he expected nothing more. But Lord Sandwich rose, and in a petulant, vehement speech, opposed its being received at all, and gave his opinion, that it ought to be immediately rejected, with the contempt it deserved; that he could never believe it to be the production of any British peer; that it appeared to him rather *the work of some American;* and turning his face towards me, who was leaning on the bar, said, he fancied he had in his eye the person who drew it up, one of the bitterest and most mischievous enemies this country had ever known." "Lord Chatham, in his reply to Lord Sandwich, took notice of his illiberal insinuation, that the plan was not the person's who proposed it; declared that it was entirely his own, a declaration he thought himself the more obliged to make, as many of their lordships appeared to have so mean an opinion of it; for if it was so weak or so bad a thing, it was proper in him to take care that no other person should unjustly share in the censure it deserved. That it had heretofore been reckoned his vice not to take advice; but he made no scruple to declare, that if he were the first minister of this country [which he afterwards was] and had the care of settling this momentous business, he should not be ashamed of publicly calling to his assistance, a person so wholly acquainted with American affairs as the gentleman alluded to, and so injuriously reflected on; one, he was pleased to say, whom all Europe held in high estimation, for his knowledge and wisdom, and ranked with our Boyles and Newtons; who was an honour, not to the English nation only, but to human nature!"—*Vol.* 1. *Memoirs, pp.* 323, 324.

This deserved compliment to our countryman could hardly have come from a higher source.

How, the young reader will naturally inquire, did Benjamin Franklin rise to so high a condition from so humble an origin? By the same means, we answer, that any young man, following his example, may acquire knowledge and wealth—the means, if well applied, of rendering him respectable, useful and happy. Franklin enjoyed no greater advantages of education, or of friends, in his youth, than thousands do who will read these remarks. The whole secret is this: He RESOLVED to be a good and a great man, and relied, under the blessings of Providence, upon his OWN exertions to effect his end—and he nobly achieved his object. He early adopted definite rules for the government of his conduct, which had a controlling influence in his after life. These rules, among other things, inculcated study and reflection, and temperance, industry, frugality and justice. In the next number of the Cultivator, we shall speak of these rules, and his manner of enforcing them, more at large, that those who are ambitious of following his footsteps, though at a remote distance, may profit by them.—*Cultivator.*

THE CULTIVATOR—SEPT. 1834.

TO IMPROVE THE SOIL AND THE MIND.

DRAINING.

The operation of draining is performed to free land from an excess of water. Where such excess is allowed to remain, ploughing can only be imperfectly performed, and few of the cultivated crops can be grown with profit. Superfluous water is hurtful in the soil, and also in the subsoil, if it lies within the range of the roots of farm crops, by excluding air and heat, the vivifying influence of which, in the soil, is essential to healthy growth, and to the decomposition of vegetable food. If this water comes from springs, its temperature is too cold for cultivated plants; and if it settles from the surface, it stagnates, and during the heats of summer becomes deleterious alike to the health of plants and animals. Draining, therefore, is of primary importance upon most of our cultivated farms. And as the season has arrived when this operation is best performed, and when the laborers upon a farm have most leisure, we propose to make it the subject of a few remarks.

A superabundance of water may arise from various causes, singly or combined, and various methods of draining are practised for its removal.

Where there is a flat or slightly inclined surface, and a tenacious subsoil, of clay or hardpan, the rains that fall are arrested in their descent by the latter, and produce a cold, wet, uncongenial berth for healthy and vigorous vegetation. The best remedy in this case is under-draining—because it is believed the cheapest and most efficient mode, and causes no waste of land. When this tenacious subsoil is thin, and is underlaid by a porous stratum, the surplus water is often got rid of by boring or sinking pits through the tenacious layer. Pits or wells for this purpose are filled with large stones, and serve as outlets to the drains.

A tenacious subsoil is sometimes disposed in a concave or hollow form, the exterior raised and the centre depressed, so as to retain the water, and form ponds or marshes. These can only be drained by an outlet through their rims, sunk below the level of the basin, into which lateral drains, covered or open, may be made to empty, to the extent required.

A tenacious subsoil may overlay a porous one, which is filled with water; and if the strata incline from a horizontal position, as they generally do, the water from below will frequently burst through the subsoil and become prejudicial to tillage husbandry. The evil here is to be remedied by cutting underdrains, through the tenacious subsoil, or by pits through it, by which the water may at once rise and be carried off by drains. A substantial drain across the upper border of a field, will often be sufficient, in this way, to lay dry the grounds below.

When both the soil and subsoil are tenacious clay or hardpan, draining will effect but little benefit, except in preventing the approach of waters from other grounds. Resort must be here had to ridging, or underdrains repeated at intervals of 20 to 25 feet.

In many cases springs burst forth, in marshy grounds, and spread their waters over a wide extent, without being perceptible to the superficial observer. These should be intercepted at or near the source, so that their waters do not spread and saturate the soil, by sufficient drains, which may be covered, or blind drains, and should terminate in the main drain, or upon a lower surface.

The last cause of a superabundance of water which we shall notice, is that where, originating from springs, it descends from higher grounds, and saturates the slope, and perhaps the level at its base, so as to render the grounds in a measure unproductive. A porous soil often conceals the water from observation, as it filters through it without coming to the surface, but it nevertheless renders the soil cold and unproductive. These waters should be arrested and carried off by horizontal drains across the slope, as near the source of the spring as practicable; perhaps at intervals below, and also at the base of the slope. These drains should be so deep, where it is practicable, as to afford an ample channel for the water in the hard subsoil, as otherwise the water will continue to pass down upon the face of the subsoil, and under the drains. These should be covered drains also, as being more efficient in remedying the evil than open drains, and if well constructed, requiring no repair.

There are some general rules in regard to draining which are to be regarded in all cases.

All drains should be as straight as possible; as this shortens the distance, and renders the sides less liable to be worn, and the waters less apt to be obstructed. They should be made with but a moderate fall, as where the inclination is great, the bottoms are liable to be worn by the water. They should penetrate the subsoil or hardpan, a sufficient depth to contain all the water that comes from above. Open drains should be so large as to contain and carry off all the water that may at any time be required to pass through them. The sides should be sloping, according to the nature of the soil; the more porous and spongy this, the greater slope is required.—They should in no case, perhaps, be less than three feet broad at the surface. I never make them less than four. They should be comparatively narrow at the bottom, as, by concentrating the water, the current acquires new force, and carries off the earth and other obstructions which would otherwise accumulate. The sides of all drains should be preserved firm and unbroken, and should be carefully cut with the spade, in the direction desired, and as the digging progresses. The sides of under drains may be perpendicular, and the breadth of the drain need be no greater than is required for the convenience of the workmen; but such drains should be filled as fast as they are dug out; because, if left open for any length of time, the earth is not only apt to fall in, but the sides get into a broken irregular state, which cannot afterwards be well rectified. It also deserves attention, that in most under drains, a proper covering of straw or sod should be put upon the top of the materials, to keep the surface earth from mixing with them.

The pit method of draining, is often effectual, when properly executed. When it is sufficiently ascertained where the bed of water is deposited, which can easily be done by boring with a post auger, sink a pit into the place, of a size which will allow a man freely to work within its bounds. Dig this pit through the tenacious subsoil, or of such a depth as to reach the bed of the water meant to be carried off; and when this depth is obtained, which is easily discerned, fill up the pit with big stones, and if the water rises, carry it off by a stout drain to some adjoining ditch or mouth.

Under drains are constructed of various materials, as stone, brick, tiles, brush, wood, turf, &c. Where they can be had, stones are unquestionably the best material.

Stone drains are of three kinds. A common, but the least efficient mode, is to dig a trench from two to three feet deep, and fill it half full or less, with stones promiscuously thrown in, and then to fill it up with earth. The next method is, to lay at the bottom a regular drain with suitable stones, with an aperture of six or eight inches, upon which six or eight inches of stones are deposited in compact order, and then the trench is filled with earth. This sort of drain is extensively used in Scotland to drain large tracts of wet or boggy ground, and they are sometimes carried to the depth of 16 and 17, and commonly of 4 to 6 feet. An accurate survey is made of the grounds and drains, that in case of obstruction, the latter can be readily found. A third mode, and which we particularly recommend, on account of its permanency as well as cheapness, in all situations where it is practicable, is to use *broken stone* as the draining material. In constructing these a trench is first dug two feet deep; in the centre of the bottom a narrow sloping spit is then taken out, to be filled up with the broken stone, and carefully cleaned, after which the stone is deposited, and covered either with other stones, straw, brush, or sods, to prevent the loose earth getting into the draining materials. The dimensions of the draining section, a term which we apply to that part filled with the broken stones, may be proportioned to the quantity of water that is required to pass, and the abundance of the draining material. A spade, of the intended shape of the drainage section, must be provided to dig it, and also a scraper, to smooth the sides of the cut, and to take out the loose earth. This spade should be eight to ten inches long, should taper from the upper to the lower end, and possess a strong socket for the handle, and a stout iron pin projecting from it, on which the foot may be placed to drive it into the ground. A spade six inches broad at top, and three or four inches at bottom, is in most cases sufficiently large. The scraper resembles a large pod auger, with a goose neck and long handle, with which the workman cleans the cut, as he progresses, without changing materially his position. A cubic yard of broken stone, the price of breaking which is ordinarily $62\frac{1}{2}$ cents, will fill about seven yards of a drain of the above dimensions. Under-drains cannot well be constructed, in this way, in bog earth or in quick sands: Their advantages, in a more tenacious stratum, arises from their not being liable to be disturbed by the plough, or the dread of cattle; their affording no harbor for moles; their not being liable to be worn away by the attrition of the water which passes in them, or choked up by water and earth from the surface. These drains possess no large cavities; and the water rather filters than runs through them.

Straw drains are sometimes employed, where better materials cannot be had. They are formed somewhat like the preceding, except that the under cut should not be above three inches at top, and one inch, or one and a half inches broad at bottom,—and that a rope of straw, of adequate size, instead of broken stone, is employed to fill them. To give strength to a spade of the required dimensions, it should be made rounding on one side. The straw will fill only 5 or 6 inches of the cut, leaving an aperture below for the water of three or four inches. If there is a constant run of water, it will, as its force is concentrated in the narrow bottom, generally keep it free from all obstructions. The sod taken from the surface of the ditch, should be preserved, and laid in upon the straw rope. The expectation is, that before the straw has decayed, the earth upon it will have become so compact as not afterwards to settle and close the drain.—In some parts of England, sods are substituted for straw, in which case they are cut from 12 to 18 inches in length, and are set in with the grass side downwards, and pressed in as far as they will go. I last year employed straw in draining some acres of wet springy land, in the manner above described, much of which had before been too wet for the plough, and even for the better grasses. Upon the field I have this season planted corn and potatoes, and the crop is very promising. The draining cost about 9 cents the rod.

Brush drains are made in different ways. Faggots, tied in bundles, of a proper size, are sometimes laid in the bottom, to the thickness of one or two feet. At other times, the trench being dug with shoulders like that intended for straw, short sticks are laid across the lower aperture, and the brush then laid in. Our practice has been, to take dwarf pines, the buts from three to six inches, cut them into lengths of four or five feet, and commencing at the upper end of the drain, proceed to lay them in regularly and compactly, the buts downward, in a sloping form, until the drain is filled. The trench is then apparently full. The brush is then brought within the edges, smartly trod down, and the earth filled in. *Brush drains should be sunk so deep as to have the brush, when pressed upon by the earth, below the reach of the plough, at least six inches*, otherwise they are liable to be disturbed and choked by loose earth. *The brush should be used in a green state*, and with the leaves upon it if practicable, as in this condition it lasts much longer.

A mode of draining clay soils wet by rain or surface water, practised by Sir A. Fletcher, is thus described in the New Edinburgh Encyclopedia:

"The upper soil is of good quality but being situated in a mountainous part of the country, the frequent rains kept it so full of water, that it produced only a coarse grass, worth 3s per acre. The inferior soil of clay was of great depth. On grass lands he digs 22 inches, or 2 feet deep; the first spadeful is of the turf, taken so deep as where it separates from the clay; the turf is dug carefully out and preserved unbroken, with its grass side up, and laid on one side of the cut; then, with a very strong spade, 18 inches long, 6 inches wide at top, and 2 at the bottom, he digs a spadeful in the clay, which the men spread about the land, on the side of the drain opposite to which the turfs were laid, as far as possible from the drain, so that none may get in again. A scoop follows to clear out the fragments in the bottom, which are also spread in like manner. They are then ready for filling; and, in doing this, he takes three stone of a thin flat form, two of which are placed against the sides of the drain, meeting at the bottom; and the third caps the other two. Thus a hollow triangular space is left to convey the water, which is subject to no accidents that can fill it up, or impede the current. Stones always sink deeper in the ground; and in the common method, this frequently causes stoppages, by their being partly buried in the clay; but the triangle, when it subsides, does it regularly, and keeps its form and the passage of the water clear. One cart-load of stones in this way, will do a considerable length of drain. They are carefully laid down by the side of the cut, with a shovel or basket; and if there are any small refuse stones left on the ground, after the drain is set, they are thrown in above. The stones being thus fixed, the sods are then trimmed to the shape of the drain, and laid on them with the grass side downwards, and none of the clay used in filling up."

There are various other methods of draining, not so likely to be employed among us, at least for the present, which the protracted length of this article prevents our noticing at this time. We have practised many of the modes above suggested, and can confidently recommend the system of thorough draining as among the most profitable expenditures which can be made upon a farm. We have some other remarks upon this subject under the head of *Correspondence*.

With regard to the duration of hollow drains, or the length of time that the water will continue to flow in them, and preserve the soil in a proper state of dryness, it must necessarily depend, in a great degree, upon the nature of the materials with which they are filled, and the care that has been taken to prevent their being choked up by any soft soil. Independent of this last circumstance, a drain filled with stones, like the channel which supplies a natural spring, may endure forever. Wood perishes at certain periods according to its nature; but it does by no means follow, that the drain should lose its effect in consequence of the destruction of the wood. If the earth over it form itself into an arch, the water will still continue to flow. Accordingly, drains filled with bushes and straw have been known to run well after forty years.

ON THE COMPARATIVE ADVANTAGE OF FEEDING LIVE STOCK ON RAW OR ON PREPARED FOOD.

The Agricultural Society of Scotland, in 1833, offered a premium of thirty sovereigns for the best report, founded on actual experiment made for that purpose, on a number of oxen or heifers, not fewer than six, the animals to be of the same breed, age and sex, and the term of feeding not less than three months; and a premium of ten sovereigns for a like report on feeding ten or more swine.—Five reports were received, which appear in the Quarterly Journal of Agriculture for June, 1834. We record the result of these experiments, which purport to have been made with scrupulous accuracy, for the information of the numerous patrons of the Cultivator.

Robert Walker made his experiment with six two year old heifers, and four two year old stots, (steers;) each was divided into two lots and fed on like food, except that one-half received their food raw, and the other half in a steamed or cooked state. The food consisted of Swedish turnips, potatoes and crushed beans, with a little salt and straw. At the end of three months, it was found that the three heifers fed on steamed food had gained 48½ stone, or 679 lbs. and the three heifers fed upon raw food had gained 45½ stone; but the quantity consumed by the first lot exceeded that of the latter.

Cost of feeding on steamed food, ...	£14	1	3
" on raw food, ...	10	6	7½
The first cost more than the last, ...	£3	14	8½

Deducting the first cost, and the price of fattening, from the price paid by the butcher, there remained a profit on the three heifers fed with steamed food of nine shillings; while the profit on the three fattened on raw food, amounted to £3 10s. 6d. By a like estimate, the loss on the steam stot was 3s. 8¾d. and the profit on the one fed with raw food was 10s. 6d. The two other stots were put to good grass on the 25th May. On the 18th of October, they were found to have gained alike, each 12 stone.

Mr. Andrew Howden made a like experiment with 18 cattle, in six lots. Their increase, and expense of keeping, for three months, from 20th March to 20th June, were as follows:

	Lbs.	Expense.		
Three heifers on raw turnips, ...	392	£6	18	0
" " on steamed turnips, ...	532	8	18	0
" " on raw potatoes, ...	600	10	7	0
" " on steamed potatoes, ...	572	10	7	0
" stots on raw potatoes and corn, ...	722	9	4	0
" " on boiled potatoes and corn, ..	689	9	5	0

John Baswell gives the result of his experiments on feeding ten horned cattle and ten hogs, on raw and prepared food. The expense of keeping the five cattle on raw food was £32 2s. 1d. while that of the cattle on prepared food was £34 5s. 10. On being slaughtered, the two lots appeared to be very similar, but the particular weight is not mentioned.

The purport of these reports implies, that there is very little if any advantage in cooking food for neat cattle. But in regard to hogs, the experiments show a different result. The gain and expense of fattening Mr. Baswell's hogs are stated as follows:

	Cwt.	qr.	lbs.	Expense.		
Five hogs fed with cooked food, ...	4	2	7	£6	19	4½
" fed on raw food, ...	2	2	21	5	8	6

W. Dudgeon made his experiment with twelve pigs, six *he* pigs in one lot, and six *she* pigs in another, afterwards subdivided, to ascertain the respective merits of the sexes for feeding. The result was decidedly favorable to the cooked food, notwithstanding the expense was 20 per cent the greatest. The pigs were fed from the 2d July to the 12th October, at which latter date the *he* pigs had gained 38 stone 6 lbs. and the *she* pigs 17 stone 11 lbs. The result satisfied the reporter, that prepared food is best to be given to pigs, and, besides, that the pork is superior to that of hogs fed on raw food.

Robert Walker made his experiment with ten pigs, five fed on steamed potatoes, and five on raw potatoes, with a daily allowance of 2½ lbs. broken barley each lot. The result was as follows:

1833, March 4.—Live weight of 5 pigs on raw food,	108 lbs.
June 1.— " " "	223
Gain, ...	115 lbs.
March 4.—Live weight of 5 pigs on steamed food,	106
June 1. " " " "	279
Gain, ...	175
Difference in favor of steamed food......	58 lbs.

But what comes nearer to our practice, are the experiments of the Rev. H. Colman, one of our best practical farmers, in whose accuracy we may put implicit confidence. Our hog feed differs from that of Europe; and the main questions to be decided here, are, whether Indian corn is most profitably fed in a dry unground state, in the form of Indian meal, or cooked preparatory to its being fed. Soft or pig corn will be fed in the cob; and potatoes and pumpkins, of which every farm affords, or ought to afford, a considerable supply, should unquestionably be cooked; yet we generally finish off our pork, after the refuse of the farm is exhausted, on sound corn; it gives solidity and flavor to the pork; and the question, we repeat, is, in what form is this sound corn most profitably given? Mr. Colman's experiments were instituted in 1833, with a view not only to solve this question, but to ascertain the profit or loss incident to fattening pork with corn, and the age at which it is most profitable to put up swine to fatten. We regret that the limits of our monthly sheet will not permit us to give the whole of Mr. Colman's excellent communication, which we find in the Transactions of the Essex Agricultural Society for 1833. We however copy the account of his experiments, and his closing remarks.

"EXPERIMENT I.

"Two hogs one year old; one of them a barrow in very good condition; the other a barrow recently gelded, and in ordinary condition, were put up to be fed exclusively upon Indian hasty pudding, or Indian meal boiled with water. We began feeding them the 1st of March, 1831, and weighed them again on the 19th of the same month. In the 18 days they consumed six bushels of Indian meal. They were offered cold water to drink, but did not incline to take any. The result—

No. 1 weighed on 1st March, ...	233 lbs.
" " 19th "	269
Gain, ...	36
No. 2, (recently gelded,) weighed on 1st March...	190 lbs.
" " " 19th " ..	247
Gain, ...	57

The gain of the two was 93 lbs. in 18 days. The quantity of meal consumed by them was 10 qts. per day to the two. This allows 30 qts. to a bushel, deducting two for grinding. The price of corn at the time was 70 cents per bushel. The expense of the increased weight is 4.5 cents per lb.

March 21, 1831. Killed the hog mentioned first in the foregoing experiment. Live weight 273 lbs. Weight when dressed 215 lbs. Loss in offal, loose fat included, 59 lbs. or a little more than one-fifth.

EXPERIMENT II.

No. 2, mentioned above, weighed on 23d March,....		253 lbs.
" " " "	30th April, ...	312
In 38 days, gain,................		59 lbs.
No. 3, a shoat purchased from a drove, weighed on 28th	March,	100 lbs.
	on 30th April,	151
Gain in 33 days,................		51 lbs.

This is a fraction over 1 lb. 8 oz. per day each, nearly 1 lb. 9 oz. In this case their food was exclusively boiled potatoes mashed with Indian meal. Exact amount consumed not ascertained, but fed as freely as they would bear.

EXPERIMENT III.

The two last named hogs were for the next twenty days put upon Indian hasty pudding exclusively, with the following result:

No. 2 weighed on 30th April,...............	312 lbs.
" " 20th May, ...	382
Gain in 20 days,..............	70
No. 3 weighed on 30th April,...............	151 lbs.
" " 20th May, ...	185
Gain in 20 days,..............	34

The two in the above named 20 days, consumed four and one-half bushels of meal cooked as above. Meal 78 cents per bushel. Gain of the two, 104 lbs. in 20 days.

EXPERIMENT IV.

Sundry swine purchased from a drove, and fed with meal and potatoes washed and mashed.

	28th March, 1831.	19th May, 1831.	
No. 1 weighed	97 lbs.	165, gain in 52 days,	68 lbs.
2 "	134	182, "	48
3 "	100	186, "	86

The two following, raised on the farm, and fed as above—

	25th April, 1831.	19th May, 1831.	
No. 4 weighed	151 lbs.	206, gain in 24 days,	55 lbs.
5 "	140	165, "	25

EXPERIMENT V.

In this case it was not intended to force their thrift, but to keep the swine in an improving condition. They were shoats of the last autumn, and were of a good breed.

Tuesday, 3d April, 1833. Put up four shoats, and began feeding them with Indian hasty pudding.

3d April.	22d April.	25th June.
No. 1, 176 lbs.	202 lbs. gain 25,	264 lbs. gain 62
2, 119	153 " 34,	226 " 73
3, 150	170 " 20,	218 " 48
		[Total, 183 pounds.
4, 121	145 " 24,	Killed 30th May.

From 3d April to 22d April, the above swine consumed seven bushels and one peck of Indian meal. From 22d April to 25th June seven bushels of Indian meal cooked as above.

One of the above, No. 4, was killed on 30th May; being absent, the live weight was not ascertained.

On the 25th June, the three remaining hogs were weighed, and in the 63 days from 22d April to 25th June, they had gained in that time 183 pounds as above.

After 30th May, when one of them was killed, one peck of meal made into hasty pudding with a small allowance of the waste of the kitchen for a part of that time, lasted them three days, that is 22.25 or less than a quart, say ⅞ths of a quart per day to each.

☞ At first we employed half a bushel of Indian meal to make a kettle of hasty pudding; but we soon found that a peck of meal, by being boiled sufficiently, would make the same kettle nearly full of hasty pudding, and of sufficient consistency. The kettle was a common sized five pail kettle, set in brick work in the house; and it was remarkable that the peck of meal produced nearly the same quantity of pudding that we obtained from the half bushel, which showed the importance of inducing the meal to take up all the water it could be made to absorb.

The price of Indian corn was at that time 75 cents per bushel—30 quarts of meal to a bushel, deducting the toll. The amount of meal consumed in the whole time, from 3d April to 25th June, was 14¼ bushels—the cost $10.69—the total gain, making no allowance for the gain of No. 4 from 22d April to 30th May, which was not ascertained, was 287 lbs.

The gain of No. 1, 2 and 3, from 22d April to 25th June, was 183 lbs. in 63 days; and allowing one peck to serve the three hogs for three days, required 5¼ bushels, the cost of which was $3.94. The live weight could not be estimated at less than 4 cents per lb. when pork was at market 6 cents.

The value of the 183 lbs. therefore was equal to $7.32, or at 5 cents, to $9.15.

The gain of the swine for the first 19 days, from 3d to 22d April, was,

No. 1,	26 lbs. or	1.368 per day.
2,	34 "	1.789 "
3,	20 "	1.052 "
4,	24 "	1.263 "

The gain from 22d April to 25th June, 63 days, was,

No. 1,	62 lbs. or	0.984 per day.
2,	73 "	1.158 "
3,	48 "	0.761 "

The difference of daily gain in the two periods was attributable to the diminished quantity of meal. The question then arises, whether the first mode of feeding was as economical as the second?

In the first 19 days, 7 bushels 1 peck con'd gave 164 lbs. gain.
" next 63 " 5 " 1 " " 183 "

Had the first gain been in proportion to the second gain, in reference to the meal consumed, the seven and one-fourth bushels which gave 104 pounds, should have given 252 5.7 pounds. This great disparity can be explained only in the more economical preparation of the meal, by which a peck, taking up as much water as it would contain, gave a kettle nearly full of pudding, when half a bushel of meal, imperfectly prepared, gave little more. This seems to demonstrate the great advantage of cooked food, both as it respects its increase of bulk and the improvement of its nutritive properties.—Whether it would apply to those substances, whose bulk is not increased by cooking, equally as to Indian meal and the like, is a matter which experiments only can determine.

Such are some few trials in reference to the feeding and fattening of swine, which I have made, or information of which I have obtained from other sources, which may at least lead the inquisitive farmer to further experiments and inquiries, on a subject of great importance to his interest. The inferences to be made from them I shall leave to others. The results, as will be observed, are not uniform. The thrift of animals must depend on various other circumstances besides the kinds or the quantity of food given them. Much depends on the breed, as every farmer knows; much on the health of the animal; something on the season of the year. I failed in attempting to fatten several swine in one case, though they were carefully attended, and various kinds of feed were tried, and the failure was totally inexplicable until they were slaughtered, when the intestines were found corroded with worms, resembling those found in the human stomach, and this, I have no doubt, prevented their thrift. The same fact has occurred in another instance, and with the same result. I failed in attempting to fatten some other swine, who had been driven a considerable distance and exposed, probably not even half fed on the road, to severe cold and storms. Some of them were frost bitten in their limbs; and though attended and fed in the most careful manner, they made no progress for months. In an experiment recently made, of giving swine raw meal mixed with water, I have found a falling off in their gain of nearly one-half, compared with giving their food cooked, such as boiled potatoes and carrots, mixed with meal while hot; the result being, in a stye containing a number of swine, as 279 to 500. In respect to confinement or freedom, various opinions are entertained. "Elder Turner, of New-York, says, that hogs should never know what liberty is, but should be kept close all their lives, and as inactive as possible. That by this method double the quantity of pork can be produced with the same expense of feed."* F. Peabody, Esq. informed me that the Shakers at Canterbury, N. H. told him that they deemed it indispensable to the thriving of their swine that they should have access to water to wallow or wash themselves in; and that they by no means did so well without it. On this point I have had no trial farther than to satisfy myself, that fatting hogs are injured by being suffered to root in the earth.

With respect to the age at which it is advantageous to put up swine to fatten, I have only to remark, that it is with swine as with

* N. Y. Memoirs of Agri. Vol. 2, p. 50.

other animals, there are some breeds which come much sooner to maturity than others. A successful farmer in Saratoga county, N. Y. says that March pigs, killed about christmas, are the most profitable for pork. Four pigs of what is called the grass breed, were slaughtered at Greenfield, New-York, which weighed 348 lbs. 318 lbs. 310 lbs. and 306 lbs. at nine months and seventeen days old.

On this point, however, I take leave to present a letter with which I was honored by John Lowell, Esq. whose authority in the agricultural community is justly estimated.

"*Boston, April* 18, 1831.

"To Rev. Henry Colman,

"Dear Sir—I have been prevented by the state of my eyes from answering your inquiries as to my experience in raising old or young pigs. * * * * * I never wintered any pigs, as no person resides on my place from December 1st to May 1st. It was therefore matter of importance to me to ascertain on what description of pigs, or rather of what age, the most flesh could be put in my limited time with similar treatment. I may say that I have fully and clearly ascertained, from a trial of 20 years, that young pigs of from 25 to 30 pounds, will give nearly double, in some remarkable cases three times, as many pounds as shoats of 6 months weighing from 100 to 150. I have taken two pigs of 100 lbs. each, age six months, and never was able between May and November, to get them above 180, rarely above 170. I have taken three pigs of about 30 lbs. each, and on the same food which I gave to the two that would weigh from 170 to 180 each in the same period; nay I have taken pigs of 200, and never could get them to weigh more than 300 in seven months on my food. The way I ascertain the quantity of food is, that I never give any thing but the produce of my dairy, and the refuse of the garden, peaches, apples, and cabbage, which are uniform generally.

3 pigs of 90 wt. or 30 wt. each, will give ordinarily 510 lbs.
Less original wt. 90 often not more than 60.

Gain, 420 lbs.

2 pigs of 100 wt. each, will give ordinarily 330 lbs.
Less original wt. 200

Gain, 140 lbs.

"But the 3 pigs of 90 will not consume for the first three months half so much as the 2 of 100 each, and I have kept a 4th and sold it in August for quarter pork.

"There is nothing new or remarkable in these facts. It is the law of the whole animal creation. It is true of the calf and of man. The child of 7 lbs. quadruples its weight in 12 months; and the calf of 60 wt. if fine and well fed, will weigh 600 wt. at the end of the year, and (if a female,) will not double the last weight at any age.

* * * * * * * *

"Yours, very respectfully,

"J. LOWELL.

"P. S. It should be remarked that the weight at purchase is live weight, and at sale dead or nett weight, because in truth to the owner this is the true mode of considering the subject. No doubt my sort of food is peculiarly favorable to young animals, it consisting in very liberal allowance of milk. If the older pigs were at once put on Indian meal they would attain to 250 at a year old, but the cost of the meal 70 cents per bushel would amount to 9 dollars, and if the first cost 5 dollars 50 cents, be added, and the pig sold at 6 cts. there would be but two dollars gain on two pigs of 100 lbs. each; while three small pigs without meal, fed on milk, would give 24 dollars in the same time. I do not mean to give minute details, but general views.

"As an important qualification of the foregoing statement it should be added that shoats of six months bought out of droves, have usually been stinted in their growth, and animals, like trees, recover slowly after a check. I presume if shoats were taken from a careful and liberal owner, the difference would be less. But as a general law it may be safely affirmed, that weight for weight at the purchase, the younger the animal the greater the positive, and the far greater the nett gain. At least such is my own experience and belief."

The foregoing letter of this intelligent and practical farmer, is entitled to particular consideration. I have one or two other statements which deserve attention. It is stated in the Domestic Encyclopedia, article Soiling, that "Twenty-five shoats were fed for three months with green clover cut from less than one acre; they were then fed on Indian corn, and when killed weighed three thousand pounds." This is certainly an extraordinary statement, and I have no other authority for it than what is here given. But the Rev. Thomas Mason, of Northfield, Mass. showed me the 27th September last, three fine thrifty swine about nine months or more old, nine-tenths of whose feed, as he assured me, since the 13th of May last, had been obtained from one-eighth of an acre of clover, cut and given to them green.

The preceding facts and experiments encourage the belief that hogs may be raised and fattened by the farmer to advantage, where corn is worth about seventy cents per bushel, and his pork will bring him six cents per pound. Like almost every other business, especially of an agricultural nature, success must greatly depend on skill, care, selection and good management. The best swine that I have ever found have been in dairy countries, for there cannot be a doubt that milk and whey for every animal are among the most nutritious of aliments. Indian meal probably ranks next, though many farmers prefer a mixture of provender, such as corn, oats, rye or barley; but I believe in all cases, cooked food will have a decided advantage over that which is given in a raw state; an advantage more than equivalent to the labor and expense of its preparation. Potatoes are a valuable article of food, but the pork is not so good as that fattened upon corn. Carrots are more nutritious than potatoes. Corn given in a raw state or on the ear is a most wasteful management.

Swine ought to be kept on every farm in sufficient numbers to consume all the offal and waste of the dairy and kitchen. If beyond this, a breed can be obtained, which will arrive at early maturity, and which can be advantageously grass fed or kept at a small expense and in an improving condition through the summer; and being put up to fatten early in autumn and forced as much as possible so as to be sent to market early in the winter, the farmer will ordinarily find a fair profit in this branch of husbandry. A very great advantage is found in the keeping of swine from the valuable returns of manure both in quantity and quality, which are obtained from them, where care is taken to supply them with raw materials for the manufacture. Too much care cannot be bestowed in the selection of the breed and the general health of the animal when put up to feed; and it is strongly recommended to every careful farmer occasionally to weigh the animal and measure the feed, that he may ascertain seasonably on which side the balance of debt or credit is likely to fall. Nothing is more prejudicial to good husbandry than mere guesses and random conjectures; and though the result of our operations may not meet either our wishes or expectations, an intelligent and reflecting mind will be always anxious as far as practicable to know precisely how far they correspond with or disappoint them. Truth, exact simple truth, in every thing, is the proper pursuit and most valuable possession of the human mind; and more nearly than any thing else connected with man's true interest and happiness.

HENRY COLMAN.

Meadowbanks, Deerfield, 20th April, 1834.

TOPPING CORN.

Experience and science concur in disapprobating the common practice of topping corn. The experiments of Mr. Clark and Mr. Lorain, which we have published in the Cultivator, go to show thot it diminishes the crop; and the principles of science corroborate their report. The corn is nourished by the sap elaborated in the leaves *above* the ears, and when these elaboratic organs are taken away, the supply of food must cease in whole or in part. If fodder is the object, it is far better to cut the whole crop at the ground, when the corn is seared. This mode has two other recommendations: it clears the ground for fall grain, and the corn derives nourishment from the stock after it is cut. We invite our brother farmers, with a view of arriving at a correct result, to do as we intend, that is, to set apart three parcels of corn of similar dimensions, and quality, say three adjoining rows—to top one part, cut another at the ground, and to leave the third to ripen with the stalks; and, at the proper time, to husk, measure and weigh the three parcels separately. The results of a dozen such experiments will lead to pretty correct conclusions as to the best method. We not only invite them to make the experiment, but to communicate the results for publication in the Cultivator.

The work is foolishly executed by *many*, which might be accomplished by a few.

ESSEX AGRICULTUTAL SOCIETY.

We have received No. III. Vol. 2, of the Transactions of the Essex (Mass.) Agricultural Society, comprising its proceedings in 1833. We are indebted for this, as well as for the previous transactions of that society, to the Rev. H. Colman. The recent number is an 8vo. of 100 pages. It contains the annual address, delivered by Doct. Spafford; the annual reports—1. On farms, describing the quality and management of those offered for premium, with statements appended, of the owners, stating the labor employed, the method of culture and products: 2. On milch cows: 3. On the dairy: 4. On domestic manufactures: 5. On cider: 6. On potatoes: 7 and 8. On ploughing: 9. On the cultivation of the white mulberry tree, &c.: 10. On animals: 11. On turning in green crops for manure: and 12. On the cultivation of wheat and rye. And also a list of the premiums to be awarded in 1834, and a communication of the Rev. Mr. Colman on swine.

It will be seen that these pamphlets contain the best modes of practice, in the various departments of husbandry, in the county; and that this knowledge is annually disseminated by the society; so that each individual can profit by the skill, enterprise, and improvements of all; and if we consider the laudable emulation which the premiums and the pride of excelling are calculated to produce, we cannot fail of ascribing to the society a high degree of usefulness, both in increasing the labors of husbandry, and in rendering these labors more profitable to those who perform them. Among the enterprising members of this society, who have contributed largely to its prolongation and usefulness, we have recognized with pleasure two of our clerical acquaintances, both actively engaged in the labors of the field—the Rev. H. Colman, and the Rev. G. B. Perry. May they long enjoy the reward to which their useful services justly entitle them. As a specimen of the products, we abstract the following:

Joseph Kittredge improved 54 acres. The labor was performed by three men, with the addition of 50 days labor. He produced 238 bushels of corn, 207 bushels barley, 57½ do. oats, 18 do. wheat, 40 do. rye, 358 do. potatoes, 60 tons of hay, 60 barrels cider, 50 barrels winter apples, 574 lbs. butter, 1,826 lbs. pork, 5,000 lbs. beef—and kept the ordinary farm stock.

Thomas Chase cultivated 98 acres. He sold from these, besides family consumption, the following: Apples and cider, $18.50; beef, pork, pigs, calves and lambs, $243.94, about 120 lbs. wool, chiefly merino, 674 lbs. butter, 2,032 lbs. cheese, besides potatoes, grain, &c. These specimens will suffice for farm products.

Of the Dairy, we learn, that Richard Heath, from nine cows, made 2,249 lbs. cheese in four months; that Wm. Thruston made about 2,500 lbs. from 12 cows, in three months. His method of making cheese is described as follows:

"The rennet is taken from the calf, and allowed to become perfectly cool, when it is slightly rinsed in cold water and put down with strong rock salt. When taken out for use, one rennet is put into a stone pot, and one quart of water (after being boiled and cooled) put to it, and a cold brine, sufficiently strong to keep the rennet, is made with the same kind of salt. Of this liquor is used from a gill to half a pint to every thirty gallons of milk, according to the strength of the rennet, heat of the milk and state of the weather; always taking more rennet when the weather and milk are cooler, less when warmer. It is then allowed to stand from three-quarters to a full hour before breaking up the curd, believing it to be very important during the warmth of the weather to get the curd, in the press as early as possible. From the beginning of breaking up the curd, the operation is continued till it is sufficiently hard and fit to scald, when it is scalded from fifteen to twenty minutes with scalding whey, as the tenacity and state of the curd require. It is then allowed to remain till perfectly cool, when it is ground up in a curd mill; after which process it is put into the cheese hoop in layers, salting each layer by judgment, as the softness, hardness and tenacity of the curd require, using the dry and whitest Liverpool blown salt. It is then put into the press, and allowed to stand half an hour, when it is first turned; then it is allowed to stand from two to three hours, according to the state of the weather, two hours in very warm, three in more moderate weather, when it is again turned; and it is regularly turned every two or three hours through the day, till dark, when it is left in the press through the night. The following morning it is taken from the press and put in brine, where it remains twenty-four hours, being turned at sun down. At the expiration of the twenty-four hours, that is, on the second morning, from the milk, it is taken from the brine and swathed in a linen bandage, which is continued on from seven to nine days as is requisite, turning the cheese twice in twenty-four hours through the heat of the weather, rubbing them daily with pork or bacon fat, in which red peppers have been summered, and afterwards settled and strained off."

Considerable competition is manifested in the culture of the white mulberry. The Rev. Mr. Perry exhibited to the committee 5,500 transplanted trees, besides a very extensive nursery of two years growth. He also showed a mulberry hedge of 150 rods, of two and three years growth. Mr. Perry also exhibited to the committee about 450 sugar maple trees, transplanted from the forest, many of them near the walls of the enclosures, and others in the form of an orchard, thirty-three feet apart one way and sixteen and a half the other. This gentleman received the second premium of $15. Other nurseries and plantations, of 4,000, 25,000 and 30,000 mulberry trees were offered for premium, and also parcels of 8,000 and 20,000 cocoons. Mr. Eaton exhibited 8,000, weighing twenty-three pounds. The leaves for the worms were gathered and fed out by his two sons, eight and thirteen years old, assisted by their mother in cleaning. The average number of cocoons to the pound was 230. The worms were fed from thirty-two to forty days before they formed their cocoons. The committee discovered a decided advantage in the growth of those trees from which the tap root had been cut off when they were transplanted. The committee consider the culture of the mulberry and the manufacture of silk, as promising a more profitable reward than the usual course of field husbandry.

The county of Essex is of limited extent; and the soil, by a west New-Yorker, would be deemed very inferior. It abounds in rocks, stones and marshes. But it would seem, that where nature has done least, man does most; and that our rational enjoyments are graduated not so much by the bounties of nature, as by our personal exertions to procure those enjoyments. This county is exhibiting a noble example. She has established a permanent fund of ahout 6,000 dollars, which is profitably invested, the income of which enables the society to defray its contingent expenses, to print its transactions, and to award $500 dollars per annum in premiums. This investment, in all probability, benefits the county, annually, four times its amount, in the increased products of its agriculture, and in the consequent thrift of every other kind of business. It is not so much the concentration of great capitals in the hands of a *few* individuals, that constitutes a country's prosperity and happiness, but it is the general diffusion of knowledge and competence among *all classes*, with the moral and social habits which industry confers and establishes, that give health, strength, and prosperity to a people.

IMPROVED CHEESE SHELVES.

In large cheese dairies, the labor of daily turning the cheese, while undergoing the drying process, is considerable and fatigueing. The *Repertory of Patent Inventions*, describes a machine of simple construction, invented by Mr. Blurton, of Field Hall, near Uxoter, calculated greatly to abridge this labor. We copy this description for the benefit of the cheese dairy readers of the Cultivator.

"The machine consists of a dozen strong shelves, framed together, and having bars nailed from top to bottom of one side to prevent the cheese falling out while in the act of turning. The frame is suspended on two strong pivots, one of which is set into the wall of the room, and the other is supported by a strong post. Two catches keep the frame upright, and prevent it from being turned more than half round. By first filling the shelf immediately below the axis of the frame, and then placing the cheeses alternately on the two nearest shelves to that which has been already filled, the preponderance on the one side over the other can never be more than the weight of one cheese; the whole power, therefore, required to turn the machine cannot, in any circumstances, be greater than the weight of a cheese and the friction of the pivots. The cheeses, in the act of turning, drop on the shelves which, in the former position of the frame, were above them, and having been exposed to a current of air for twenty-four hours previous, have become perfectly dry.

"Mr. Blurton has had the machine in use for five or six years, and finds that by means of it fifty-five cheese are turned in the same time which is required for turning two by hand. Three other advantages attend its use; first, that a room thus furnished will hold thrice as many cheeses as when they are laid on the floor; second, that the shade afforded by the shelves, together with the current of air which passes between them, has the effect, in hot weather, of preventing excessive sweating, and consequently loss both in weight and quality, as well as diminishing the necessity of rubbing the cheeses; thirdly, the ripening of the cheese is hastened, so that on an average they are ready for market five weeks earlier than usual."

SMUT IN GRAIN.

This disease, particularly in the wheat crop, causes a great deterioration in the quality, and consequent value of the grain, and is the cause often of heavy loss to the farmer. It seems to have prevailed in the time of the Roman empire, and is mentioned by Pliny and Columella; yet down to the present day the origin of the evil is not satisfactorily known, though the surmises and speculations, and experiments have been without number. Jethro Tull ascribed it to moisture. Duhamel, after recapitulating the different opinions and experiments on the subject of smut, concludes with observing, that smut powder is highly infectious, and recommends leys of lime, salt-petre, alum, verdigris, salt, and wood ashes. Lord Somerville was of the opinion, that the disease was occasioned by an insect. In the course of his researches, by using highly magnifying lenses, and by concentating the light of the sun on the smut ball, by means of a concave mirror, he discovered that the specks on the ball were real insects, resembling wood-lice in shape. He then conceived, that when the smut powder comes in contact with sound grains, it adheres to them, and inoculates them, so as to render the plant incapable of producing any thing but smut. Linnæus, Walker, and other naturalists, were of the same opinion, that insects caused the smut. Sir H. Davy was of opinion, that smut is produced by a small fungus on the grain, as the products it affords by chemical analysis are similar to those afforded by the puff-ball, and thinks that without the agency of some organized structure, so complete a change could not be effected in the constitution of the grain. Wildenow thought that smut proceeded from a fungus, which multiplied so as to occupy the whole ear. Prevost ascribes it to a microscopic vegetable of some sort; and Jussieu says, the proximate cause of smut may be attributed to infection of the seed, by the dust of the smut ball, (Lycoperdon.) Bauer, of Kew, whose remarks on the grain worm we quoted in our 2d and 6th numbers, says the smut "is occasioned by a very minute parasitic fungus, of the genus *uredo*, being absorbed by the roots of the germinating wheat grains, and propelled by the rising sap, long before the wheat blossoms, into the young germen or ovum, where the seeds of the fungi vegetate, and rapidly multiply; thereby preventing not only the fecundation of the ovum, but even the development of the parts of fructification. In consequence no embryo is produced in an affected germen, which however continues to grow as long as the sound grains do, and, when the sound grains arrive at maturity, the affected ones are generally larger than, and are easily distinguished from, the sound ones, by their darker green colour, and from the ova retaining the same shape and form which they had at the time the infection took place.

The preventives of the disease are numerous, and most of them within the reach of our farmers. They are generally such as are calculated to destroy any noxious quality adhering to seed grain, be it the seeds of minute parasitic plants or of animalcula. Tull has related, that the use of salt brine as a pickle was discovered by the sowing of wheat steeped in salt water, and which escaped smut, when nearly all the wheat in England was affected. A solution of nitre, copperas and potash, in the proportion of eight pounds to 100 pints of water; arsenic; a decoction of tobacco, hellebore powder and aloes; a mixture of water, wood ashes, alum, vitriol and verdigris, boiled for an hour, have been all recommended with confidence. In Norfolk, England, the salt is dissolved in a small quantity of water, just sufficient for the purpose; lime is slaked with this solution, and the wheat is dried with it in its hottest state, having been previously moistened with pure water. In Yorkshire one ounce of white arsenic, finely powdered, is boiled in a gallon of water for two hours, and stale urine is added to increase the quantity to two gallons, then the wheat is steeped in the liquor and encrusted with quick-lime. In parts of England and Scotland, stale urine, free of any mixture, is generally used; and in a practice of forty years, Messrs. Culleys used this preparation, and never had any smut. Mr. Donaldson made sixteen experiments with seed impregnated with smut powder, and sowed some without any preparation, and the residue steeped in preparations of arsenic, vitriol, chamber ley and lime. That sown without preparation was one-half and five-sixths (being two parcels) smutty, while that steeped in chamber ley and limed had but one smutty ear in forty-six. Mr. Bauer expresses a strong conviction, from repeated experiments, that steeping the seed in properly prepared lime-water, for at least twelve hours, and then to dry it well in the air before sowing it, is the surest way to prevent smut.

It is the practice of many of our farmers, to steep the seed grain in lime-water, and though it does not wholly prevent smut in all cases, it certainly has a highly salutary effect in lessening the evil. Our practice has been, to steep the seed twelve hours in salt pickle, and then encrust with quick-lime; and when we have adopted this course no smut has been perceptible. Wherever experiments are make with steeps, it is well to sow a quart or two of seed without any preparation, the better to test the benefits of the steep. We hope our farmers will test the efficacy of steeps with their seed grain, and particularly those of lime and salt; and if they will make accurate notes, and communicate to us, after the next harvest, the result of their experiments, not only in regard to smut, but the grain worm, we may hope to make the Cultivator the medium of much useful information upon these important subjects.

We repeat the admonition, to use fresh burnt lime, where practicable. Lime long exposed to the atmosphere loses in a great measure its causticity; by absorbing carbonic acid, it is restored to the state of lime-stone or chalk, and its alkaline qualities ar completely neutralized.

COMPARATIVE VALUE OF ROOTS FOR FATTENING FARM STOCK.

The Agricultural Society of Scotland awarded to Andrew Howden, in 1832, a premium, for a report of experiments on the comparative advantages of feeding stock with mangel wurzel, turnips and potatoes. We abstract the result of the experiment for the Cultivator, from the Prize Essays of the Society.

Mr. Howden, with a view to the experiment, set apart the products of two acres of mangel wurzel, amounting to fifty tons, five acres of Swedish turnips, being 140 tons, and two acres of potatoes, weighing 29 tons 4 cwt. The experiment was made with 21 head of cattle, which received, in adddition to the roots, a few distiller's grains and a little straw. The following table shows the roots appropriated to each lot, and their monthly increase in girth.

	Lot No. 1, from one acre of potatoes, one acre of mangel wurzel, one acre of Swedish turnips.	Lot No. 2, from one acre potatoes 2, acres Swedish turnips.	Lot No. 3, from one acre mangel wurzel, 2 acres Swedish turnips.
1831, Nov. 30,	35 ft. 8 inches,	35 ft. 9 inches,	35 ft. 8 inches.
Dec. 30,	36 " 6 "	36 " 7 "	36 " 6 "
1832, Jan. 30,	38 " 2 "	38 " 4 "	38 " 2 "
March 1,	39 " 7 "	39 " 8 "	39 " 6 "
" 30,	40 " 8 "	40 " 10 "	40 " 6 "
April 30,	41 " 4 "	41 " 7 "	41 " 3 "

Twenty-eight tons of Swedish turnips and mangel wurzel withdrawn and fed to other stock.

On the 30th of Jan. Mr. Howden took a pair of cattle out of each lot, and fed No. 1 with potatoes and water, No. 2 he fed with Swedish turnips, and No. 3 with mangel wurzel. The following shows their relative increase in girth in three months.

	Lot No. 1. potatoes.	Lot No. 2. Swedish turnips.	Lot No. 3. mangel wurzel.
1832, Jan. 30,..	10 ft. 8 inches,	10 ft. 5 inches,	10 ft. 4 inches.
April 30,..	11 " 6 "	11 " 3 "	11 " 2 "

When the cattle were sold, the purchasers ageed that the lot fed on Swedish turnips were from 7 to 10s. a head better than the other lots. The average advance upon the original value of each was £6 12; and the cost of grain being deducted, there remained £120 ($532.80) in return for the eight acres produce consumed. This is no bad evidence of the profits of root culture, in the fattening of cattle; and we hope it will help to extend this culture among us.

MANURES.

Manures are the food of plants. They are to the vegetable what grain and hay are to the animal kingdom—the materials which give growth and profit. Every vegetable and animal substance is susceptible of being converted into the food of plants; and should be as carefully husbanded by the farmer, as the food destined to sustain and fatten his farm stock. From these considerations we have devoted a portion of the Cultivator to this branch of improvement; and we intend to extend our remarks, occasionally, to the various matters which are employed as manures, or which are available to our farmers. In doing this we shall avail ourselves of the experience of others, together with such hints as our own practice may suggest.

Salt.—Much has been said in favor and against the use of salt in imparting fertility to lands. In the Farmers' Series of the Library of Useful Knowledge, numerous experiments are cited, in many of which the application was of manifest advantage, not only in imparting fertility, but in destroying noxious insects and noxious weeds; in many other cases it produced no sensible effect, particularly in enriching the soil. The quantities that have been experimented with have varied from four to forty bushels the acre; and the kinds have also been different—some using refuse and others pure salt. The first is considered about half the strength of the latter. On the application of forty bushels of pure salt to the acre, vegetation ceased; one-half of this quantity destroys slugs and insects in the soil. From the great mass of testimony examined, the editors come to the conclusion,

"That nothing decisive has been ascertained regarding either the quantity or the season in which salt should be laid upon the land. It appears, however, that its effects are most visible and satisfactory when applied to hot dry soils, and in very warm summers; but on cold wet land, and in rainy seasons or under a humid climate, its powers seem to become neutralized, and of little value. We are of opinion that, on arable land, it will be found more advisable to lay it on before sowing, than either with the seeds, or afterwards as a top-dressing. If applied, for instance, to a clover lay, either a few weeks before seed time, or immediately after the first crop is off, it would effectually banish the slug; and it has been justly observed, that if all stubbles (not laid down with seeds) were to receive a slight dressing of salt before winter, it would not only tend to keep the land free from the slug, but probably otherwise benefit the soil."—p. 387.

The quantity of pure salt recommended on the acre, is from four to sixteen bushels. The best way of applying it is in the form of composts. It is mixed with earth, or with earth and lime, the mass turned occasionally and incorporated, till the salt has mostly dissolved, and then applied generally as a top-dressing. Hollingshead, who has published a volume of facts in favor of using salt, says a slight annual application will keep the land in a state of the greatest fertility. When a large quantity has been put on it has destroyed vegetation for a time; but afterwards, when the salt has been well dissolved and mixed with the soil, the land becomes very rich. This latter opinion is confirmed by Von Thaer, the principal of the great Prussian Agricultural School, and the first authority, who also says, that on rich land, when spread in small quantities, it produces, very sensibly, favorable effects, though of short duration; but if laid upon a poor soil, in an equal quantity, it has been found wholly ineffectual.

We have not introduced these remarks with a view of recommending the use of salt in our agriculture; for we deem the expense too great, and the benefits too precarious, for our present practice; but our object is rather to furnish useful hints, suggested by the experience of others, to those who may choose to experiment with it.

Nitre or Salt Petre.—Numerous experiments are detailed, in the work from which we quote, of the effects of nitre in husbandry. It is applied in quantities of 1 cwt. to 1½ cwt. per acre, as a top-dressing, on most soils, and has been found to be highly beneficial to wheat, oat and grass crops. Its benefits are greatest upon clays and stiff loams. It is said to prove destructive to wire-worms, slugs and other insects. We are furnished with no data to decide whether its benefits have been equal to the cost. The price of crude India salt petre, on the sea-board, is six to eight dollars per hundred weight.

Bones, Horns, &c.—Bones are in great demand, in Great Britain, as a manure; and great quantities are annually imported into that kingdom, from the continent, for this use. They are broken in mills constructed for the purpose, and often upon the farm, by the laborers. Bone dust ordinarily sells at about 2s. or 44 cents, and sometimes as high as 3s. 6d. per bushel; and at this price it is generally found to be a more profitable application than common dung. Bones are frequently applied, and by many preferred, when broken in half or three-quarter inch pieces, and sometimes when of larger size. Their durability is in proportion to their size; the smaller they are crushed or ground, the sooner their fertilizing properties are exhausted—and the less the quantity required to be applied. They have been applied in various proportions; though the ordinary dressing is from twenty to forty bushels per acre; a heavy dressing does not produce corresponding benefits, and in most cases, no additional benefit. Two bushels of crushed bones are deemed equal to a load or ton of manure. The uncrushed bones are sold at about 42s or from nine to ten dollars the ton. Their quality is not considered to be impaired by their having been boiled. Bones are applied as a top-dressing to grass, and harrowed in with the grain in tillage crops. The following results are selected from a great many, to illustrate the benefit and economy of bone manure.

On the estate of Garrowby in Yorkshire, the crops of turnips had dwindled to nothing; by the application of 12 to 20 bushels bone dust per acre, in drills, the crops have become excellent, and the following crops are very considerably improved.

At Clumber Park, 600 bushels, spread upon twenty-four acres of pasture, a dry, sandy and gravelly soil, doubled the product, in butter, of the cows pastured upon it, over those fed upon pasture not boned.

Mr. Watson, of Riellor, applied twenty-five bushels of bones to an acre of turnips, and twenty-five loads of manure to an adjoining acre. The dunged acre yielded twenty-two tons; that dressed with bones twenty-eight tons.

Mr. Graburn manured part of a field with crushed bones, at the rate of thirty bushels the acre, and another part with eight loads of dung, and repeated the dung the two following years upon this part. The turnips, wheat and grass, which constituted the three crops, were better upon the part once boned, than upon that thrice dunged.

Thirty-four acres of sandy soil, on the estate of Sir Charles Thockmorton, were half manured with bones and half with dung. The first gave the earliest and best turnips; the barley which followed yielded five bushels the acre more than the dunged part, and the clover was also heavier upon the boned part.

Capt. Ogilvie applied bone dust at the rate of 15 to 20 bushels the acre, to a light sandy loam, and after the experience of five years upon a series of trials, he found all the successive crops of turnips, barley and grass, decidedly superior to those which had been previously produced by other manure.

Twenty bushels of bone dust, at 2s. 6d. would be 50s; twenty loads manure at 10s. the price given in the statements, would amount to 200s. which shows a saving of three-fourths in manuring an acre with those substances, at the assumed prices, and in the assumed quantities.

The two following cases, taken from the Doncaster report, are worthy particular notice:

"1. On a field, part of which was boned forty years ago, the crops were, on that part, during fifteen or sixteen succeeding years, visibly better than the remainder, although the land was all of the same quality, and the part not boned was manured with barn-yard dung.

"2. In another case, about three acres of light sandy land were dressed, in 1814, with 150 bushels of bones per acre; since which time the land is said never to have forgotten it, but is nearly as good again as the other part, farmed precisely in the same way, with the exception of the one application of bones."

As to the size in which bones are most profitably applied, one of the Doncaster association remarks—"That if he meant to till for early profit, and if he wished to keep his land in good heart, he would use half inch bones; and, in breaking these, he should prefer some remaining considerably larger: that by using bones of a large size with dust in them, there must be sufficient of the small particles of the dust to set the turnip crop forward, and sufficient of the large particles of the bone left to maintain the land in good condition for the subsequent crop.

Bones are found on analysis to contain, in 100 parts, 40 of earthy and saline matter, 40 of cartilage and jelly, and 20 of fatty matter. The soft parts thus form, in the best bone about sixty, and upon an average about fifty per cent, which are almost entirely constituted of the same elements as plants, and all of them, sooner or later, liable to be dissolved and absorbed by the roots.

Bones should undergo a partial fermentation before they are applied, in order to produce the best immediate effect. This is done by mixing them with yard manure, or with manure and earth. They have also been mixed and applied with coal ashes with effect and economy.

The Doncaster Agricultural Association, after long experience in the use of bones, have published rules for its application, from which it appears,

That on dry sands, limestone, chalk, light loams, and peat, bones are a very highly valuable manure.

That they may be applied to grass with great good effect.

That on arable lands they may be laid on fallow for turnips, or used for any of the subsequent crops.

That the best method of using them, when broadcast, is previously to mix them in a compost with earth, dung, or other manures, and let them lie to ferment.

That if used alone they may be either drilled in with the seed or used broadcast.

That bones which have undergone the process of fermentation are decidedly superior (in their immediate effects) to those which have not done so.

That the quantity should be about twenty bushels of dust, or forty bushels of large, increasing the quantity if the land be impoverished.

That upon clays and heavy loams, it does not yet appear that bones will answer. *See No.* 55 *Farmers' Series.*

And where, it will be asked, are we to obtain bones to enrich our lands? Every farmer, we admit, cannot obtain them; but those who are located in the neighborhood of villages and cities may obtain a considerable supply. There are two bone-mills already established on Long Island, and it is understood the proprietors find a ready market for all they can crush. During the last year we purchased sixty horse-cart loads from one man. We had them crushed in a plaster mill; and when about to use them, mixed them with house ashes, and wet the whole plentifully with water. In 48 hours, fermentation having sufficiently progressed, they were applied to turnips, barley and corn; and though we cannot yet speak of their ultimate benefit, they so far confirm the highest opinion entertained of their utility.

We have had some years experience in the use of horn shavings and horn piths, which are procured from the comb manufactories. The first, of which we have used many hundred bushels, are equal, if not superior, to bone dust. The piths are cut into pieces, upon a block, and buried with the plough. Of these we used fifteen loads last spring, upon corn ground, and we think we have not seen a finer crop than is now growing there.

CORRESPONDENCE.

Erie County, July 28, 1834.

Being one of your subscribers, and having been much instructed by the perusal of the Cultivator, I take the liberty of addressing you on a subject of great importance to many of the farmers and land-holders in the western parts of our state. We find large tracts of land composed of *vegetable* matter *only*, and covered with a dense growth of alders, with here and there a soft maple. This vegetable matter is generally from four to six feet deep, and covering old logs, trees, roots, &c. in a good state of preservation.—These lands were once no doubt covered with water, and are at this time more or less overflowed in the spring and fall freshets, especially those lands in the vicinity of the Tonawanda creek, and known as the "*Tonawanda Swamp.*"

My great object in this communication is to respectfully solicit from you an answer to the following questions:

1. I would ask information in regard to the best manner of draining those lands, and the width and depth of the drains?

2. The most approved plan of clearing those lands, having in view the expense, and also the burning off the growth of alders, so that the soil, or vegetable matter may not be burned?

3. Whether manure, lime, or sand is necessary to be mixed with the vegetable deposite, in order to bring about decomposition; which is the most preferable, and the quantity of each per acre?

4. What crops can be cultivated to the best advantage on these lands, having in view the greatest profit?

I fear I am trespassing too much upon your patience by my numerous queries; but although they may seem trifling to you, they are of great importance to some of our western farmers and proprietors of many acres of these lands now lying idle, and which, if brought to a state of cultivation, might be very productive.

The reason why these *swamps* continue to remain in their *swamp character*, may with great truth be attributed to the ignorance of the farmers in regard, not only to the value of those lands, but to the *manner* and *mode* of clearing and cultivating them. Among these *illiterate swamp owners*, I freely acknowledge myself one, and my pride does not prevent me from confessing my ignorance, nor my delicacy from asking information of the experienced and scientific.

While I am on this *agricultural* subject, permit me to congratulate you on the success and encouragement attending the circulation of the Cultivator; and much more may I be permitted to congratulate my brother farmers that an opportunity is afforded them of reading the pages of your valuable paper, and of laying up in store a vast fund of information in no other work to be found.

I am truly yours, TONAWANDA.

REMARKS BY THE CONDUCTORS.

Our correspondent has imposed upon us a difficult task,—because we feel incompetent to answer his queries satisfactorily, without a local knowledge of the grounds to be improved, and of the quality of vegetable matter, whether, peat, moss or bog-soil, —of their extent, and the nature of the subsoil, &c. which we do not possess. If we succeed, therefore, in suggesting any useful hints, or in eliciting such from better informed sources, we shall be amply repaid for our labor. With this apology, we shall proceed to remark upon the several queries, in the order they are put to us.

1. The vegetable matter described, is manure, calculated, under a proper system of management, to afford an almost inexhaustible supply of food for cultivated crops. But in order to render it the food of vegetables, decomposition must be induced, first, by a complete drainage; and should this prove insufficient, second, by the admixture of such matters as will bring about the desired result. Heat and air are essential to the decomposition of these vegetable matters. While the vegetable matter continues saturated with water, these agents are in a measure excluded: For had they exerted their accustomed agency, this vast quantity of peaty matter would not have gone on accumulating to the extent it has perhaps for centuries. The first object, therefore, is to get rid of the surface, or the surplus water, by draining, Open drains can alone be depended on, till decomposition has somewhat progressed, and the ground become more firm and compact. If there is any fall, by which the water may be carried off, the lowest point should be selected for their outlet. If there is not sufficient fall, the drains must be of a capacity to receive and contain the surface water.—Many of the grounds in Holland are lower than the surface of the ocean, the waters of which are excluded from them by embankments. The waters which collect in these grounds cannot be drained off, but are received into canals or ditches which intersect the grounds at convenient distances. In these the water rises nearly to the surface, and yet they afford some of the finest pastures in the world. In Flanders, and in this country, large tracts of marsh have been reclaimed from the ocean by embankments, which are of great fertility and value. In the case under consideration, the principal drain should pass through the lowest ground, or centre of the piece intended to be improved, if no inequality of surface exists; and its size should be proportioned to the area of the surface to be drained, and the quantity of water which it may at any time be required to receive or convey. It will require to be from 6 to 20 feet broad on the surface, according to the extent of the swamp and the abundance of water, and from 2 to 8 feet at bottom, the sides sloping 45 deg. or more, to prevent their falling in and obstructing the water, or filling up the drain. It should be sunk down to the solid earth under the vegetable matter, if practicable, and it were better to penetrate this a foot or more. The earth taken from the drain should be thrown back, and not suffered to press upon the sides. Having completed the centre drain to the extent required, proceed to cut drains round the parts to be improved, terminating them in the main drain, to prevent the access of water from adjoining grounds, of such dimensions as shall answer the intended purpose, but never less than four feet broad at the surface. Experience has taught me, that to make shallow or narrow drains in grounds like these, is a waste of labor. The water coming from adjoining high grounds, may in most situations be collected by cutting a horizontal ditch above the level of the swamp, so as to intercept all the hill springs, and conducted into the main drain. If springs exist in the swamp, they must be intersected by drains, which may be covered, leading to the open drains. If found necessary, after the ground is cleared, lateral drains must be made at such intervals as will completely free the surface from too much moisture. Where the fall will permit it, the outlet is often dug 15 or 20 feet deep, when found necessary to draw off the surplus water. When grounds are compact, under drains may be substituted for open lateral ones, in a tenacious subsoil. For these stones are the best material; the most approved method of constructing which, we have noticed in another column of the Cultivator, under "*draining.*"

2. Having made the central and exterior drains, proceed to clear the surface of the ground of bushes and logs; and as there are represented to be no large trees, take up roots and all, which will be literally paring it, as the roots, in such situations, spread near the surface. The best instrument to effect this is a broad edged grubbing hoe; and if the ground is sufficiently firm, the work may be greatly facilitated by a yoke of oxen, which with a chain fastened around the bushes will pull up large masses at a haul, I should not think it would cost more than four or five dollars an acre to perform this operation; but if it costs double this, the money is well laid out. Where the growth is dense, there will be no difficulty in burning over the whole surface, which is desirable; the fire will contribute amazingly to ameliorate the soil, and with the ashes probably fit it for a first crop, which may be put in, with grass seed, with a harrow. There is no danger of injuring such a soil by burning, except in unusual dry weather. Its fault is an *excess* of vegetable matter.

3. If draining, paring, and burning do not induce fertility, and a wholesome vegetation, which however they probably will do, lime, or unfermented manure, or sand, may be employed to bring on a fermentation. The quantity of these required will depend upon the quality of the vegetable matter,—the finer this, and the freer it is from woody matter and moss, the less will be required. If feruginous matter abounds, (oxide of iron) which is indicated by a red colour, lime will answer the further purpose of destroying its baleful effects. Experiment can only determine the quantity of either that will be wanted, though we think neither of them will be required, where there is already a dense growth of alders and scattering soft maples. Next to lime, unfermented manure will best facilitate decomposition. The lime should only be harrowed upon the surface; the manure should be buried with the plough.

4. Grasses will constitute the best crop for some years, and perhaps permanently, with an occasional alternation of tillage crops; and indeed we have little doubt that many of these will spring up spontaneously and abundantly, when the surface has been burnt, particularly the white and red top, and other of the agrostic family, and also the poas. Of tilled crops, oats and potatoes, and where dung is employed, Indian corn, I have found to do best in reclaimed swamps. When properly drained, the vegetable mass soon begins to decompose and become compact, and the latter is aided much by the tread of cattle dispastured upon it. The grasses which come in spontaneously embrace some of the most nutritious kinds. I had two acres of this kind of land, which has been drained some years, in potatoes in 1833. This spring I had omitted to put in a crop till I found it was likely to be coated with grass, which I suffered to grow, and ten days ago cut from it more than an ordinary crop of good hay, although no seed had been sown.

Miscellaneous. What are called *carses* in Scotland, were originally very similar to the Tonawanda swamps, with a sub-soil of clay, They are now rated best lands; and the vegetable matter having been principally decomposed, or blended with the earths, the soil has become firm and tenacious, so as to admit of under-draining with great benefit. Vast areas of bog, moss and fen lands have been reclaimed, and are now being reclaimed, in Scotland and Ireland by draining and paring and burning, though at great expense, yet with great ultimate profit. In some instances in this country, where the large roots and stumps have been got rid of, the scraper has been successfully used to throw swamp lands into ridges, and in excavating the drains.

Albany, August 11, 1834.

Dear Sir—Agreeable to your request, I send you some account of the method of curing hops, are practised by the most successful persons I have known in that business, and also take the liberty of pointing out some of the common faults our western and eastern hop raisers fall into. There are so very few hops that are brought to our market of a prime quality, which makes it one of the most disagreeable tasks to select a supply, from the large quantities that are offered for sale; and it is truly lamentable to see the immense sacrifice of property from the want of care or skill in their management.

It may not be improper to premise, that hops, to be productive require a rich soil, an airy situation, as well as occasional manuring; even the best lands ought to have, every two or three years at farthest, from thirty to forty loads of well rotted barn yard manure to the acre: and although the wild hop is generally found on the banks near water, yet hops thrive well on almost any good land if properly attended to.

The time of picking hops varies—light soils or elevated and dry situations are earliest; even in a yard of a few acres, situated on a side hill, the highest ground is often ready for picking some days before the lower; and sometimes from the poverty of the land, the middle, or it may be, the lower part is ripe first. In commencing picking, too much care cannot be taken in gathering those first that are *ripe*, and not in picking those that are *largest*, as is often the case. The time of picking may be known by their change of colour, from deep green to a light yellow tinge. If they have seeds, the hop ought to be gathered as soon as the seed turns brown; but the certain indication of picking time, to those who are familiar with this article, is when the *lupulin*, or small globules of the bright yellow resin, are completely formed in the head of the hop, at the bottom of the leaves, and the leaves are readily rubbed from the stem. The lupulin (or flower of the hop as it is commonly called) is the only valuable part, and if gathered too early, before it becomes perfect turpentine, it soon dissipates and loses its fine aromatic flavor and all its medicinal qualities. Hence, gathering hops too soon is a total loss, and instead of imparting a palatable, pleasant flavor, and giving its fine tonic balsam to ale, they are unquestionably an injuiry, and ought not to be used; and if gathered too late, the lupulin drops out, and the hop is of no value; but the experienced cultivator takes the medium, commences when the hop is first ripe; has every thing prepared—his hands, kilns, baskets, baggings, &c. Five or six days ought to finish the whole process of picking and curing, if his yards ripen about the same time. The hop should be picked clean, without leaves or stems, and if possible without dew on them, nor *pressed to close* nor put in *too large quantities*, before going on the kiln, or they will *heat*. No rule can be given for the thickness they ought to be spread on the kiln, or even for the length of time necessary to dry them. A skilful operator is the only safety in this process. Care ought to be taken that the kiln draws well, as much depends upon its draft—the steam should not be allowed to fall back on the hops, and must pass off freely.

Preparatory to putting the hops on the kiln, it must have a fire put in, made perfectly dry, and fumigated by burning brimstone to take away all the bad smell, and when perfectly sweet, a layer of hops put on, say eight or ten inches deep, and this may be increased or lessened as the operator finds the draft. The time used in drying will also depend on the quantity of hops on the kiln, and on the draft, say from eight to sixteen hours; but they must not be removed from the kiln, until the core or stem of the hop is crisp and well dried, they must then be put upon a floor, and occasionally turned, until the leaf becomes tough, when they are ready for bagging.

The fuel used for drying, must be of the sweetest kind, and *perfectly charred*, and the best is beech, birch, hickory or maple. Pine may not be used under any circumstances, nor any brimstone, only as before directed. When the fire is once put to a kiln of hops, it must never be permitted to slacken or go out, until they are dried. The fire should never be so hot as to burn or leave the least taint of fire on them.

I would suggest to all our hop raisers a system to be *adopted and never deviated from*—that is to divide very carefully the hops into three equal parts or parcels, the first, second and last pickings.— If six days are consumed in picking, let the hops of the two first days, the third and fourth days, and the two last days, be kept separate, bagged and marked; each parcel will by this method be more valuable to the brewers, and enhance the price of those that should thus be brought to market if skilfully picked and cured. It would also be a good regulation, to have all our hop raisers put as near as may be, 220 pounds in each bag, and have all the bags of about one size, say five feet long, two feet wide, and eighteen inches thick—this would be more convenient for the brewer, but particularly so for shipping; and should we be so fortunate as to rescue our hops from their present degraded condition, they will soon be one of our principal articles of commerce. In a letter I received a few days since from a Havre merchant, he remarks, "the American hops are of all qualities, from the Vorgue refuse, to the delicious fragrant German; and if you could establish for yours the reputation of the latter, they would command the market."—

There is not perhaps amongst the whole range of resins, one so delicate, rich and powerful an aromatic as the hop, nor one more easily destroyed by improper treatment; nor is there another article of produce or manufacture so little understood and so unskilfully managed.

In connection with two of the largest brewers in the country, we purchased in the Boston market, last fall, a quantity of hops, and in the first shipment of about *two hundred bales*, there was not, after a careful examination, jointly, over *twenty-five bales* that ought to have been used, and all those were injured by being picked before they were ripe. This is not an individual instance; it is a prevailing evil, and of the total amount brought to Albany, speaking within bounds, more than one-half are destroyed or injured by early picking. This evil ought to be at once remedied; but let me caution your raisers not to run into the opposite extreme, and pick them as much too late.

For the last fifteen years, I do not recollect a season, but repeated instances have come to my knowledge, where the farmer has totally lost his crop by having it heated from neglect in not drying them well on the kiln.

How truly mortifying, when the farmer presents his hops, the fruits of a season's anxiety and labor, to be told they are scarcely fit for manure. I do know some men, whom I esteem as men of sense in other matters, year after year bringing their damaged goods for sale, in every other respect a splendid article, and having them heated, and this, after each year's repeated advice and caution. Of the amount of loss from this source, it would be difficult to form an estimate; it is, however, large. There are more hops injured from partial drying, in seasons when the crops are abundant, than in ordinary years, by not having kiln room enough, hence they are hurried off undried; this evil is easily corrected by having always rather too much than too little kiln room; the additional expense is trifling.

The next serious injury from want of skill in curing, is that of scorching or burning the hops on the kiln. There are large quantities, every year, of western hops destroyed or partially injured in this way. Our eastern hop raisers are far before those of our state in curing them on the kiln. Scarcely an instance of scorching on the kiln, of heating after being bagged, is known amongst them, and the fault with us must be want of care or skill.

The hops of this state, as a whole, are not cleanly picked, and are often injured by having them heated before going to the kiln. Many have their kilns so low, that the steam does not go off, consequently the hop is stewed in its steam, and by this means materially injured. A common practice of using coal, partially charred, smokes the hops, and their rich flavor is materially injured, and often totally destroyed. That we may not forget, let us recapitulate our grievances: About one-half our hops are injured by picking before ripe, (our eastern hop raisers do more injury in this respect than our western farmers;) another part are injured by partial drying, and bagging them in that state; another part are scorched or burned; some are heated before going on the kiln; some stewed on the kiln; some smoked; some gathered with the leaves and vines; some send us brimstoned hops, and a few good fellows bring us as fine hops as any part of the world can boast of, and they ought all of them, or nearly so, to be of this fine quality.

Let our farmers make exertions to cure their hops as well as our eastern friends, and their hops will find the readiest market and the best price, and will, intrinsically, be near double the value of the eastern, or until the eastern raisers let their hops ripen before they are gathered. It may be justice to our friends of the east to state, that the fault of picking their hops too soon, (and this is their only fault,) has been the mistaken advice of the hop inspector, who has branded the ripe hops as *seconds*, and those which were *refuse*, from being picked too early, he has branded *firsts*. I have often, some years since, remonstrated with the inspector on the injustice of his branding the refuse as firsts, and the firsts as seconds. He admitted, in his opinion, the course he was pursuing was wrong, but some pale ale brewers had advised him to brand the pale hops as first, to encourage the picking early. These ill-omened men have done incalculable mischief, and an evil that will take years to repair. There are, and it is to be regretted, but few brewers who are good judges of hops. I have not, however, conversed with an individual, even of my own brethren of the pale ale stamp, who has not admitted the propriety of all I have advised. I must again repeat, that hops too early picked, are the worst refuse we get; they are totally destitute of the only valuable part, the resin or lupulin. The hop is gathered before it is formed, having only a sort of sap: not only the smell, but also every appearance of lupulin is soon dissipated.

In submitting these brief remarks for the consideration of those interested, it is with a sincere hope that all will unite cordially in endeavoring to place the reputation of the hops of America as the best in the world.

I am, very respectfully yours, &c.

J. Buel, Esq. L. FIDLER.

Hamilton, Madison co. August 2, 1834.

Sir—I have been looking, for some time past, in the Cultivator, for a communication from Mr. Fidler, or some of our hop growers, relative to hops; not finding any, I have presumed to send you a few observations of my own.

It is said, and perhaps truly, that our western hops are not as good as the eastern; if so, I think it highly important that we learn the cause or causes, and remedy the defect, that the reputation of ours may compete with theirs, or even with the European.

I have been in the hop growing business about fourteen years, and have had some experience therein; but fearing I shall extend my remarks beyond the limits of the Cultivator, (if thought worthy a place therein,) I shall not speak of their cultivation, or of the different kinds, but of their curing, (the time of gathering being near.) It is necessary, however, that hops be picked clean from stems and leaves. Every hop grower should have a kiln of his own, and it is of the first importance that the cloth on which they are to be dried should be of suitable thickness. The cloth which I now use, placed about seven feet from the bottom of the cell or cavity, was all made of coarse linen yarn, wove in a slate of twenty-six, with one thread in a reed, which I think to be a good one.

The drying of hops requires experience as well as care and attention. Many go into the business for a year or two; not being very successful in growth or curing, and consequently in price, they relinquish it; others succeed them in the same path, with the like effect, which operates materially against the general reputation of our western hops. I would recommend to persons who commence in the hop business to persevere and pursue it, and in the first place obtain information relative to their proper management, and particularly the curing of them.

Obtain some person of experience, in drying, even at almost any price, attend closely with him, observe the light, loose manner in which they are spread upon the kiln cloth, and more particularly the temperature of the air within the kiln, and in a few days you can manage them yourself in good weather. In wet weather, it is almost impossible to dry them and have them retain their proper colour and flavor, if the same quantity as usual are put upon the kiln.

In drying wet hops, the heat of the fire at the commencement must be reduced at least one-third, to give time for the evaporation of the water they retain, otherwise you heat the water to such a degree that the hops are scalded, wilted, and often scorched before they are dry; stirring them in that situation is of little or no use. When dry they are worth little, but are often, I presume, carefully mixed with those that are good, thus damaging the whole, reducing their value and reputation. This is bad policy; we had better be equally careful to keep them separate from those which are good; press them by themselves, sell them to distillers for what they are worth, which is more to them than to the brewer, and thus retain, or rather obtain, a better reputation for ours.

But more relative to drying. Much depends upon the thickness of hops on the kiln when drying. It is too often the case that we employ more pickers than we can dry after to advantage, even in good weather, consequently we are obliged to place them too thick upon our kilns. The result is obvious; the hop naturally contains a quantity of moisture, the evaporation of which commences at the bottom and necessarily has to pass through the whole thickness, and unless great care is taken, with moderate heat, it becomes too hot and dense, and carries off a great proportion of the aromatic substance of the hop, and often changes its colour. Much, however, depends upon the cloth, as I have before observed, relative to the thickness on which hops may be spread; on a cloth sufficiently open, they will do well six inches in depth, and perhaps some more;

that thickness, however, is greater than I usually practice at the commencement of picking.

I am careful to commence my hop harvest with such a number of pickers as I am sure will not pick more than I can dry well, and do it the same day. My first batch I put on the kiln between eleven and twelve o'clock at noon, perhaps about five inches in thickness, which, if properly attended, will be ready to be taken off about eight o'clock in the evening. I then put on those picked on the previous afternoon, which I attend for an hour or two, and then leave until morning; the kiln, when left, possessing heat sufficient to cause the evaporation so far to take place, that the steam will not settle to their injury; a little fire next day will dry them sufficiently, and leave the kiln in a proper situation to receive the next batch at the same time.

I do humbly solicit our western hop growers to try the experiment of spreading their hops thinner on their kilns, and not ten or twelve inches thick, and consequently twelve hours in drying, with the use of sulphur to preserve their colour, without adding to their substance.

I made use of sulphur in drying one kiln, last year, for an experiment, and believe it to be perfectly useless and unnecessary. I believe we had better employ a few less hands, or extend our kilns, the expense of which would be barely nominal, compared with the profits we should receive, in two or three years, from a few acres of hops. I do not pretend, by these observations, to understand the curing of hops better than many others, and hope to see observations upon the same subject from those of greater ability in every sense of the word. I will, however, presume to observe, that I have never sacked but one bale of hops which an inspector marked as seconds, to my knowledge; my hops have been sold at home for two or three years past, and whether inspected or not I do not know. WM. LORD.

J. Buel, Esq.

To the Editors of the Cultivator—Permit me, through the columns of your valuable paper, to call the attention of farmers to the importance of under-draining where necessary, and by that means bring all their wet, and now comparatively waste lands, into profitable cultivation. Although wet lands may yield a considerable quantity of grass, yet it is generally inferior in quality; but by properly draining these, they can be made to bear all kinds of grain and grasses, yielding a profit to the farmer equal to the dryest soils. I saw a communication in one of the numbers of the Cultivator, estimating the cost at fifty cents per rod, the drain to be filled with broken stone. But is this the best method? it certainly is not the cheapest, and I think not the best. It is more subject to get filled up with the sand and other substances washing through it, and I think will not drain the land as dry as it will to leave an open passage for the water, by placing round stones, of three or four inches in diameter, where such are to be had, on the sides of the drain, and covering with flatter ones. This method, to the operative farmer, will not cost to exceed thirty-one cents per rod. The trench ought not to be less than two feet deep and fourteen inches wide, the sides pared down straight, leaving the middle a little higher than the outer edges, that the stones may incline outward against the bank rather than inward, as the water is continally washing out the centre. One of our neighbors recently opened one of his drains for examination, which was put down six years ago, in the manner above described, and found the passage as clear as the day it was put down, and I think must ever remain so, as the current of the water will always keep it open.—The benefit to be derived from under-drains must be obvious to every one. Where parts of a field are wet by this means, the whole may be brought into cultivation, and in many instances, making excellent watering places worth double the amount expended in their construction. Respectfully,

GEO. WILLET.

Skaneateles, Onondaga, co. N. Y. 8 *mo.* 1834.

Science of Agriculture.

SUPPLY OF FOOD BY MANURES AND CULTURE.

With regard to the food of plants derived from the atmosphere, the supply is pretty regular, at least in as far as the gases are concerned; for they are not found to vary materially in their proportions on any part of the surface of the globe; but the quantity of moisture contained in the atmosphere is continually varying, so that in the same season you have not always the same quantity, though in the course of the year the deficiency is perhaps made up. From the atmosphere, therefore, there is a regular supply of vegetable food kept up by nature for the support of vegetable life, independent of the aid of man: and if human aid were even wanted, it does not appear that it would be of much avail. But this is by no means the case in regard to soils, for if soils are less regular in their composition, they are at least more in the reach of human management. The supply of food may be increased by altering the mechanical or chemical constitution of soils; and by the addition of food in the form of manures. The mechanical constitution of soils may be altered by pulverization, consolidation, draining and watering; their chemical properties by aeration and torrification; both mechanical and chemical properties, by the addition of earths and other substances; and manures, either liquid or solid, are supplied by irrigation and distribution of dungs and other nourishing matters, with or without their interment.

Soils in a state of culture, though consisting originally of the due proportion of ingredients, may yet become exhausted of the principle of fertility, by means of too frequent cropping; whether by repetition or rotation of the same, or of different crops. In this case, it should be the object of the practical cultivator, to ascertain by what means fertility is to be restored to the exhausted soil, or communicated to a new one. In the breaking up of new soils, if the ground has been wet or marshy, as is frequently the case, it is often sufficient to prepare it by means of draining off the superfluous and stagnant water, and of paring and burning the turf upon the surface. If the soil has been exhausted by a too frequent repetition of the same crop, it often happens that a change of crop will answer the purpose of the cultivator; for although a soil may be exhausted by one sort of grain it does not necessarily follow that it is also exhausted for another. And accordingly the practice of the farmer is to sow his crops in rotation, having in the same field, perhaps, a crop of wheat, barley, beans and tares in succession; each species selecting in its turn some peculiar nutriment, or requiring, perhaps, a smaller supply than the crop that preceded it. But even upon the plan of rotation, the soil becomes at length exhausted, and the cultivator is obliged to have recourse to other means of restoring fertility. In this case, an interval of repose is considerably efficacious as may be seen from the increased fertility of fields that have not been ploughed up for many years, such as those used for pasture, or even from the walks and paths in gardens where they are again broken up. Hence also the practice of fallowing, and of trenching or deep ploughing, which, in some cases, has nearly the same effect.

The fertility of a soil is restored, in the case of draining, by means of its carrying off all such superfluous moisture as may be lodged in the soil, which is well known to be prejudicial to plants not naturally aquatics, as well as by rendering the soil more firm and compact. In the case of burning, the amelioration is effected by means of the decomposition of the vegetable substances contained in the turf, and subjected to the action of the fire, which disperses also a part of the superfluous moisture, but leaves a residue of ashes favorable to future vegetation. In the case of the rotation of crops, the fertility is not so much restored as more completely developed and brought into action; because the soil, though exhausted for one species of grain, is yet found to be sufficiently fertile for another, the food necessary to each being different, or required in less abundance. In the case of the repose of the soil, the restored fertility may be owing to the decay of vegetable substances that are not now carried off in the annual crop, but left to augment the proportion of vegetable mould; or to the accumulation of fertilizing particles conveyed to the soil by rains; or to the continued abstraction of oxygen from the atmosphere. In the case of fallows, it is owing undoubtedly to the action of the atmospheric air upon the soil, whether in rendering it more friable, or in hastening the putrefaction of noxious plants, or it is owing to the abstraction and accumulation of oxygen. In the case of trenching or deep ploughing, it is owing to the increased facility with which the roots can now penetrate to the proper depth, and thus their sphere of nourishment is increased. But it often happens that the soil can no longer be ameliorated by any of the foregoing means, or not at least with sufficient rapidity for the purposes of the cultivator; and in this case there must be a direct and actual application made to it of such substances as are fitted to restore its fertility. Hence the indispensable necessity of manures, which consist principally of animal and vegetable remains that are buried and finally decomposed in the soil, from which they are afterwards absorbed by the roots of the plant, in a state of solution.—*Enc. of Ag.*

Plants are nourished in some degree analagous to the animal economy. The food of plants, whether lodged in the soil, or wafted through the atmosphere, is taken up by introsusceptions, in the form of gases or other fluids: It is there known as their sap; this sap ascends to the leaves, where it is elaborated as the blood of animals is in the lungs; it then enters into the general circulation of the plant, and promotes its growth, [of the roots as well as of the branches, seeds and fruits.]—*Ibid.*

Household Affairs.

Corn Starch, we are advised by an exellent house-keeper, is no wise inferior to wheat starch, while it can be made with half the labor and expense. As this is the season for making it, we have obtained from our informant, for the Cultivator,

Directions for making it.—Take thirty good ears of green corn, fit for eating, grate the corn with a large grater, a lantern will do, into a pail of water; turn the whole through a fine metal cullender, or a coarse cloth strainer, to separate the hulls, &c.; then change the water two or three times, to render the starch, which settles at the bottom white and clean; and after the last water is removed, the starch may be cut in pieces, laid out a few days to dry, when it is fit for use, and may be kept any length of time. This quantity will suffice a year for a small family.

To boil meat.—Let the following rules govern. After the water begins to boil, it should be kept boiling till the meat is cooked.—Put the meat into cold water, sufficient only to cover, and to keep it covered during the cooking process. More water than this renders the meat less savory, and weakens the broth. The water should be heated gradually according to the thickness of the article boiled: the larger the piece of meat, the more moderate should be the fire. If the water boils before the meat is heated through, the latter will be hardened, and shrink up as if it were scorched. The slower it boils, the tenderer, plumper and whiter it will be.—Fresh killed meat requires longer boiling, than that which butchers call ripe, and is withal more tough and hard.

Young Men's Department.

BENJAMIN FRANKLIN.

We promised, in our last, to say something more of the rules which Franklin adopted for his guidance in life, and of the manner in which he enforced them. But it is proper first to speak of his early habits of reading and reflection, which were the ground-work of his greatness and fame. His attachment to books commenced almost in infancy. Among those which he first read, he enumerates De Foe's *Essay on Projects*, Dr. Mather's *Essay to do Good*, Plutarch's Lives, and a volume of Addison's Spectator. He subsequently directed his attention to philosophical works. As books were scarce, and his means restricted, his practice was to buy one or more volumes, read and sell them, and with the avails to purchase others; and in this way he contrived to gratify his thirst for knowledge, without infringing on the hours of ordinary labor as an apprentice. This taste for reading continued to exert its influence upon him during life, and led him, at an early day to project the establishment at Philadelphia, of the library which now bears his name, and which contains one of the most extensive and valuable collection of books to be found in our country. But as we would teach others by his example, we will give some quotations in his own words:

"I now had access to better books. An acquaintance with apprentices of booksellers, enabled me sometimes to borrow a small one, which I was careful to return soon and clean. Often I sat up in my chamber the greatest part the night, when the book was borrowed in the evening to be returned in the morning, lest it should be found missing. After some time, a merchant, an ingenious sensible man, Mr. Matthew Adams, who had a pretty collection of books, frequented our printing-office, took notice of me, and invited me to see his library, and very kindly proposed to lend me such books as I wished to read. I now took a strong inclination for poetry, and wrote some little pieces; my brother [to whom he was an apprentice] supposing it might turn to some account, encouraged me, and induced me to compose two occasional ballads. One was called the *Light-house Tragedy*, and contained an account of the shipwreck of Capt. Worthilake, with his two daughters: the other was a sailor's song, on the taking of the famous *Teach* (or Black-Beard) the pirate. They were wretched stuff, in street ballad style; and when they were printed, my brother sent me about town to sell them. The first sold prodigiously, the event being recent, and having made a great noise. This success flattered my vanity, but my father discouraged me, by criticising my performances, and telling me verse makers were generally beggars. Thus I escaped being a poet, and probably a very bad one: but as prose writing has been of great use to me in the course of my life, and was a principal means of my advancement, I shall tell you how in such a situation I acquired what little ability I may be supposed to have in that way.

"There was another bookish lad in town, John Collins by name, with whom I was intimately acquainted. We sometimes disputed, and very fond we were of argument, and very desirous of confuting one another, which disputatious turn, by the way, is apt to become a very bad habit, making people often very disagreeaale in company, by the contradiction that is necessary to bring it into practice; and thence, besides souring and spoiling the conversation, it is productive of disgusts and perhaps of enmities with those who may have occasion for friendship. I caught this by reading my father's books of disputes on religion. Persons of good sense, I have since observed, seldom fall into it, except lawyers, university men, and generally men of all sorts who have been bred in Edinburgh. A question was once some how or other started, between Collins and me, on the propriety of educating the female sex in learning, and their abilities for study. He was of opinion that it was improper, and that they were naturally unequal to it. I took the contrary side, perhaps for dispute sake. He was naturally more eloquent, having a greater plenty of words, and sometimes, as I thought, I was vanquished more by his fluency than by his reasons. As we parted without settling the point, and were not to see one another again for some time, I sat down to put my arguments in writing, which I copied fair and sent to him. He answered, and I replied. Three or four letters on a side had passed, when my father happened to find my papers and read them. Without entering into the subject in dispute, he took occasion to talk to me about my manner of writing, observed, that though I had the advantage of my antagonist in correct spelling and pointing, (which he attributed to the printing-house,) I fell far short in elegance of expression, in method and perspicuity, of which he convinced me by several instances. I saw the justice of his remarks, and thence grew more attentive to my writing, and determined to endeavor to improve my style." P. 13, 14, 15, vol. 1.

"When about 16 years of age, I happened to meet with another book, written by one Tyron, recommending a vegetable diet. I determined to go into it. My brother being yet unmarried, did not keep house, but boarded himself and his apprentices in another family. My refusing to eat flesh occasioned an inconvenience, and I was frequently chid for my singularity. I made myself acquainted with Tryon's manner of preparing some of his dishes, such as boiling potatoes or rice, making hasty pudding, and a few others, and then proposed to my brother, that if he would give me weekly half the money he paid for my board, I would board myself. He instantly agreed to it, and I presently found I could save half what he paid me.

"This was an additional fund for buying books. But I had another advantage in it. My brother and the rest going from the printing-office to their meals, I remained there alone; and despatching presently my light repast, which was often no more than a biscuit, or a slice of bread and a handful of raisins, a tart from the pastry cook's and a glass of water, had the rest of the time till their return for study, in which I made the greater progress, from that greater clearness of head and quick apprehension which generally attends temperance in eating and drinking.

"Now it was, that being on some occasion made ashamed of my ignorance in figures, which I had twice failed learning when I was at school, I took Crocker's book on arithmetic, and went through the whole by myself with the greatest ease. I also read Seller's and Sterney's book on navigation, which made me acquainted with the little geometry it contained; but I never proceeded far in that science. I read about this time, *Locke on the Human Understanding*, and the *Art of Thinking*, by Miss Du Port Royal.

"While I was intent on improving my language, I met with an English Grammar, having at the end of it two little sketches on the arts of rhetoric and logic, the latter finishing with a dispute in the Socratic method; and soon after I procured Xenophon's *Memorable things of Socrates*, wherein there are many examples of the same method. I was charmed by it, adopted it, dropt my abrupt contradiction and positive augmuentation, and put on the humble inquirer. I continued this method a few years, but gradually left it, retaining only the habit of expressing myself in terms of modest diffidence; never using when I advanced any thing that might possibly be disputed, the words *certainly—undoubtedly*, or any other that gave the air of positiveness to an opinion; but rather say, I *conceive* or *apprehend* a thing to be so or so; it *appears to me*, or I should not think it so, for such and such reasons; or, I *imagine it to be so*; or, *it is so, if I am not mistaken.* This habit I believe has been of great advantage to me, when I have had occasion to inculcate my opinions, and persuade men into measures that I have been from time to time engaged in promoting; and as the chief ends of conversation are to *inform* or to *be informed*, to *please* or *persuade*, I wish well meaning and sensible men would not lessen their power of doing good by a positive assuming manner that seldom fails to disgust, tends to create opposition, and to defeat most of those purposes for which speech was given to us.

"In fact if you wish to instruct others, a positive and dogmatical manner in advancing your sentiments may occasion opposition and prevent a candid attention. If you desire improvement from others, you should not at the same time express yourself fixed in your present opinions; modest and sensible men, who do not love disputation, will leave you undisturbed in the possession of your errors. In adopting such a manner, you can seldom expect to please your hearers, or obtain the concurrence you desire. Pope judiciously observes,

> "Men must be taught as if you taught them not,
> And things unknown as things forgot."

He also recommends it to us,

> "To speak, though sure, with seeming diffidence,"

and he might have joined with this line, that which he has coupled with another.

> "For want of modesty is want of sense."—P. 16, 17, 18.

When about 28 years old, after he was married and settled in business, Franklin began to study the languages, and soon acquired a tolerable knowledge of the French, Spanish, Italian, Latin, &c. An acquaintance who was learning Italian with him, used often to tempt him to play chess. Finding this took up too much of the time he had to spare for study, Franklin at length refused to play any more, unless on this condition, that the victor in every game should have the right to impose a task, either of parts of the grammar to be got by heart, or in translations, which tasks the vanquished was to perform, upon honor, before the next meeting. "As we played pretty equally," says Franklin, "we thus beat one another into that language."

We learn from this portion of the early history of Benj. Franklin.—

1. That useful knowledge can be acquired by one's unassisted, but persevering exertions. And,
2. That where the inclination to obtain knowledge exists, ample opportunities present, even to these who are in the daily habits of labor.

THE CULTIVATOR—OCT. 1834.

TO IMPROVE THE SOIL AND THE MIND.

WHEAT AND CLOVER.

The practice has obtained, in Monroe, Orleans, and some of the neighboring counties, the great wheat district of our state, and is rapidly gaining ground, of alternating wheat and clover, that is of sowing wheat and clover seeds every other year upon the same ground. This is said to afford not only an increase of crop, but to effect a great saving of labor. The clover is sown with the wheat in autumn, or upon it in the spring. It is mown or pastured the second year, and the lay is then turned over and wheat and clover again sown upon the first furrow. Thus the grounds receive but one ploughing in two years, and the green manure, afforded by the clover, is all preserved for the wheat crop, not being dissipated by cross ploughings. Thus, too, the clover promotes the pulverization of the soil, keeps it light and friable, and pervious to atmospheric influence, by its gradual decay in the soil. We are advised, upon respectable authority, that under this practice there is seldom a diminution of crop, and that in some cases the product has been nearly doubled in a few years.

The wheat country of the west is a deep secondary formation,—the earth taken from the depth of ten and twenty feet, often exhibiting a fertility, when exposed to atmospheric influence, equal to that of the surface soil. It is a deep deposite of vegetable, animal and earthy matter, abounding in the specific food of the wheat crop. Hence it often occurs, particularly in the oak openings, that tillage, by facilitating decomposition, increases fertility, even without the aid of manure. But the question worthy of consideration is, whether the practice of alternating wheat and clover, even upon these fertile formations, can be long continued, without impoverishing the soil? A yoke of oxen may be turned to a stack of hay, and they may continue to thrive; but at length the stack and the food will become exhausted, and without a further supply, the oxen will ultimately become poor and die. The vegetable and animal matter in our western soils is to the wheat what the stack is to the oxen, the food which causes growth, maturity and profit, and constant feeding must exhaust alike both. Although the clover lay affords vegetable food, it by no means makes up for the exhaustion of the wheat crop; and we suspect it benefits more by rendering the soil porous, and thus facilitating the decomposition of the vegetable matter which it contains, than by its own enriching qualities. We have little doubt but this alternation would soon fail on ordinary soils; and we believe it cannot be long persevered in at the west without serious detriment. The banks of the Hudson were once celebrated for their wheat crops; and within our recollection, west Vermont sent as fine wheat to the Troy and Lansingburgh markets, and it was their staple production too, as now comes from the west. *Now*, west Vermont consumes New-York flour, her soil no longer producing good wheat in any quantity. And Oneida, too, is no longer distinguished as a wheat growing country; the specific food of this grain being in a measure exhausted in her soil. We are aware that the preceding cases do not afford exact parallels for the west. They are drawn principally from transition formations, while that of the west is secondary, and is more permanent in its natural fertility. To assume again our comparison, while nature had supplied one with hay *cocks* merely, she has bountifully furnished the other with hay *stacks:* and the result we think will be, that though the latter will hold out longer, they are, nevertheless, imperceptibly diminishing, and must ultimately be exhausted, as the former have been, by injudicious cropping. Sterility is the worst desease that can afflict a farmer; and the adage teaches, that ' an ounce of prevention is worth a pound of cure." It is far better to keep lands in good heart, by a judicious alternation of crops, than to restore them to fertility when they have become exhausted. Upon this view of the subject, our advice to the western farmer would be that as soon as his circumstances are comfortable, he should cease to sow wheat upon the same grounds every other year, lest he should kill the goose that lays his golden eggs.

EXTRACT OF A LETTER TO THE EDITORS.

"I think in the Cultivator you ought to dwell continually on the importance of science to agriculture; I mean of all the applicable science the world has got: and the world is getting more every day, but with very little thanks to America. We want to see the application of geological and chemical science to the different processes in agriculture. If a knowledge and conviction of the essential importance of lime to the growth of wheat could be brought home to the farmers on the Mohawk river, it would be worth to them a million of dollars. In this section of the state (the west,) God has spread lime over our fields, and mingled it with the soil, —hence we are raising thirty and forty bushels of wheat per acre. On the Mohawk river, God has given to the farmers lime in abundance, *but has not spread it.* A knowledge of the process of burning and spreading lime over their fields would enhance the value of their farms fifty per cent."

REMARKS BY THE CONDUCTORS.

We commend the zeal which our correspondent evinces for the diffusion of agricultural science, and agree with him as to its value in practical husbandry. We are promulgating its principles in the Cultivator as far as we think the public taste will warrant us. But we ask gentlemen of scientific knowledge to aid us in applying geological and chemical science to the laborers of the field; and we particularly urge an esteemed correspondent to redeem his promise in this particular. We urge him to do it for the public benefit. All have a *public* duty to perform; and much is expected from him to whom much is given.

We are not certain that lime is the *only* requisite in the valley of the Mohawk, to restore the soil to its former fitness for the wheat crop; yet it may be, and the experiment deserves trial. The valley of the Mohawk, and west Vermont, were, within the recollection of the writer, the districts which furnished nearly all the wheat which was bought in Albany, Troy and Lansingburgh. The former now sends to market but a trifling amount, and the latter does not grow enough, nor half enough, for its own consumption. We have little doubt but these districts might again become wheat districts, by the aid of agricultural science, and the value of their products greatly enhanced. But the present generation will neither acqirue nor apply that science. This must, as in every other business, be learnt in youth, and be incorporated with practical instruction. We must look to the rising generation for these improvements, and we must qualify our sons, by timely education, to make these improvements. What, that is useful in this business of life, does the young farmer learn in school, if we even embrace schools of the higher order? The professional man learns in his school many of the fundamental maxims of science, and rules of practice, which are to govern him in his profession. Yet the agriculturist, whose business embraces a far greater scope of science than any one profession, and the profits of whose labors depend essentially upon the application of this science, learns nothing in his school which can forward him in the great business upon which not only his individual success depends, but which constitutes the main source of the public prosperity. The studies of common schools, with competent teachers, might be rendered highly useful to agriculture, by imbuing the minds of the young farmers with the elementary principles of the business which is to occupy him through life.

Seed Corn.—Thomas Foster, of Auburn, writes us, that he has for years selected his seed corn, at harvest time, from stalks producing two ears, preferring the upper ear, and that he has had one-eighth more product than from seed saved in the ordinary way.

"A Subscriber," who dates from Stamfordville, suggests a suspicion, that *Junket* may be unhealthy, because, when left standing, it formed itself into a hard curd. We can only say, that his suspicions are unfounded, as we have used it ten or a dozen years without the least perceptible injurious effect, even on the most delicate habits. Eggs form one of the hardest cements, and yet they constitute a harmless and nutritious food. The laws of chemistry do not apply to the human stomach. The expected effect of rennet upon milk is to produce curd.

Skinless Oats.—The communication of Mr. Thorp, in relation to this valuable species of grain, cannot fail to interest the farmer; and Mr. Thorp deserves their thanks for the care with which he has nursed, increased and brought it into notice. A bushel of these oats, we are told, will weigh forty-five pounds, while the average weight of the common oat is believed not to be over thirty-six or thirty-eight pounds. Mr. T. will exhibit a sample of the skinless oat at the Albany Cattle Fair, on the 8th and 9th October instant.

Ribbon Grass (*Phalaris Americana.*)—We again invite the reader's attention to this subject, and refer him to the interesting letters of Mr. Goodrich and Dr. Harris, under the head of correspondence. The experiments of the latter gentleman seem conclusively to show, that the highest expectations which we indulged in our former remarks, seem likely to be fully realized; and that we have in the ribbon grass a plant peculiarly calculated to render productive and profitable, a description of land hitherto mere waste. There is reason to believe that this grass will prove highly beneficial also upon the sloping banks of streams and rivulets, to prevent their abrasion by the water.

THE PROFITS OF THE DAIRY COMPARED WITH THAT OF FATTENING ANIMALS.

"It has been asserted on the authority of the Board of Agriculture, and upon incontrovertible data, which any farmer or cow feeder may ascertain for his own satisfaction, that the quantity of herbage that will add 112 pounds to the weight of an ox, will, when bestowed on a dairy cow, of ordinary good breed, and in fair condition to yield milk, enable her to yield about 2,700 imperial pints of milk. And as it is well known that even in Scotland, where milk often contains as much cream as that of cows fed on richer pasture, yet in general seventeen pints of milk will yield an imperial pound of butter; and the buttermilk will sell at 1d. the three pints; and as 120 pints of that milk yield from sixteen pounds avoirdupois, of full milk or Dunlop cheese, it is easy to ascertain whether the 112 pounds of beef, or these quantities of butter and buttermilk, or of cheese, will realize the greatest sum.

2,700 pints of milk will yield nearly 385 pounds, or twenty-seven stone imperial of full milk cheese; and if made into butter, they will give 157 pounds, besides the buttermilk, which would amount to half the quantity of milk churned. The average price of beef, for seven years past, has not exceeded 6s. per English stone; and the 112 pounds of course amounts to £2 8s. while twenty-seven stones of cheese, at 5s. per stone, the average price paid by the merchant to the farmer, during the last seven years, amounts to £6 17s. 6d.; and the average price of 157 pounds butter, at 8d. per pound for the same period, amounts to £5 5s. and the buttermilk to £1 17s. 6d. more, or £7 2s. 6d.; so that the average price of the cheese exceeds that of the beef, to the amount of £4 9s. 6d.; and the butter and buttermilk give £4 14s. 6d. more than the beef produced from the same quantity of food to the cattle."

The above extract is from the Quarterly Journal of Agriculture for March. Let us apply its leading facts to our market. We will assume that the average price of beef in our large towns is $5 per cwt. of butter sixteen cents per pound, and of full milk cheese seven cents.

The result would be this:

112 lbs. of beef, at 5 cents, ...	$5 60
380 lbs. of cheese, at 7 cents, ...	26 60
157 lbs. of butter, at 16 cents, ...	24 22

These facts, at all events, are worthy the consideration of cattle farmers.

THE GRAIN WORM AND WEEVIL.

The injury that has been done in a section of our state the present season to the wheat crop by the ravages of an insect, called by some the grain worm, and by others the weevil, ought to lead to the inquiry whether these destructive animals are identical, and if not, what is their true character. Their ravages for the present year have been confined to a small district of country as far as our knowledge extends, but as it is in the nature of these insects to spread, the probability is that in a few years we shall hear of the depretions they have committed through much more extended districts. It is only by acquiring a thorough knowledge of the animal, and its habits, that we will ultimately be able to stop its progress, and thus put an end to the evil. The first question is, are the grain worm and weevil identical? The grain worm is thus described by M. Bauer: "Its first state is an egg, or fungus, deposited in the grain of wheat, whether when growing or not does not appear. Its second state is after the grain has germinated and is growing, when the principle of the fungus is absorbed through the circulatory powers of the plant, and will produce a diseased grain the succeeding season." But it does not appear from him that the growing, or forming ear of wheat, if stung by an insect, will produce the worm soon enough to make its ravages by the time the grain is hardened. His words are, that "it requires several generations of these worms to introduce their eggs into the young germen: the large worms found in the substance of the young stem were undoubtedly some of the worms with which the seed corn or grain was inoculated, for they were on the point of laying their eggs in that stage, and these eggs being again propelled by the rising of the sap a stage further, there come to maturity, and then lay their eggs, and thus progressively reach the elementary substance of the ear, when they are finally deposited in the then forming grain: the whole progress (to reach the grain) probably requires three reproductions." It appears from this account of the grain worm, which to understand more fully we must refer the reader to the April and the August numbers of the Cultivator, that in no case has it been traced to the insect form, and we are left therefore to infer that it does not assume the shape of a fly or beetle, with the power to pierce a grain of wheat, deposite its egg, and thus produce a maggot or worm in the ear. It is upon the principle, therefore, that the egg or fungus of the grain worm, adhering to or inserted into the kernel of grain, may have its principle of vitality destroyed by coming into contact with lime, and for this reason he recommends that the grain that is to be sown should be immersed in lime water, or have lime sprinkled upon it, to make the worm innocuous. The remedy is easy, and if effectual, it is the fault of every farmer when he becomes acquainted with the antidote, if the grain worm above described by Mr. Bauer is identical with the one which is committing its ravages here, if the evil is not immediately arrested. The application of lime to seed wheat is, under any circumstances, advisable; for, apart from its powers to destroy the vitality of such animalculæ as might adhere to the grain to its injury, it produces a stimulating and quickening effect, which will cause a more active growth of the plant. But will lime water be sufficiently caustic to answer the purpose of Mr. Bauer? It is well known that water will take up only a certain and small portion of lime, and no matter how large the quantity used, the strength of the lime water is not increased. That the quantity of lime so dissolved is small, we must know, from the fact that it may be taken into the human stomach with very little farther dilution. The remedy of lime water diluted with an equal quantity of milk, for certain states of disordered stomach, is too well and has been too long known to require further remark, and if causticity is required in treating of the present subject, we would have it in a much greater degree by adopting the English method for the prevention of smut in wheat—that is, to soak the wheat intended to be sown in urine or brine for a day—at night remove the grain to the barn floor, take as much unslaked lime as would be required, slake it, and as soon as done sift it or throw as much upon it with a shovel, while the heat is passing off, as will adhere to the wet wheat, stirring the wheat well at the same time. This wheat so mixed is to remain one night and be sown the next day. The slaking lime cannot be so hot but when mixed with cold wheat that it will prevent it from germinating. We would therefore advise it to be thrown on as soon after slaking as possible, because no injury can arise from it. To what point the principle of heating wheat without destroying its vitality can be carried, we will soon see, as we now come to speak of the weevil.

The weevil in natural history is thus described: "It is a small insect which does great damage in magazines of corn, by eating into the several grains and destroying their whole substance. This creature is somewhat bigger than a large louse, and is of the scarab or beetle kind, having two pretty, jointed, tufted horns, and a trunk or piercer projecting from the fore part of its head: at the end of this trunk, which is very long in proportion to its body, there is a sort of forceps or sharp teeth with which it gnaws its way into the heart of the grain, either to seek its food or to deposite its eggs there. By keeping these creatures alive in glass tubes with a few grains of wheat, their manner of reproduction has been discovered. The female perforates a grain of wheat, and in it deposites a single egg, or at the utmost two eggs, and this she does to five or six grains every day, for several days together. These eggs, which are not larger than a grain of sand, in about a week produce an odd sort of white maggot, which wriggles its body very much about, but is very little able to move from place to place: this, in about a fortnight, turns to an aurelia, from which is produced the perfect weevil. This destructive creature is itself very subject to be destroyed, and when in the egg or aurelia state, it is eaten by mites." This insect is extremely common in England, and its ravages, not only there, but over a large portion of Europe and many of our southern states, have been almost incredible. It is said the larvæ inhabit the ploughed lands and feed on the roots of corn. The complete insect makes its appearance in the beginning of summer, but its appropriate place is in magazines of corn. Still they have been known in such quantities as to strip trees of their foliage, and to produce mischiefs approaching to the devastation occasioned by the locust tribe. The larvæ, according to well informed naturalists, is two, and sometimes three years in passing from its first state into that of the perfect insect. The eggs are laid in small detached heaps, beneath the surface of some clod: and the young, when first hatched, are scarcely more than the eighth of an inch in length, gradually advancing in their growth, and occasionally shifting their skins, till they arrive at the size of two inches or more. At this period they begin to prepare for their change in a chrysalis or pupa, selecting for the purpose some small clod of earth, in which they form an oval cavity, and, after a certain space, divest themselves of their last skin, and appear in the chrysalis form, in which they continue till the succeeding summer, when the beetle emerges from its retirement and commits its depredations on the leaves of trees and other things that it selects for its food, breeds, and deposites its eggs in a favorable situation; after which, its life is of short duration.

It is evident from the description of the grain worm given by Bauer, and of the weevil, as taken from the best authorities, that although they may be allied or belong to the same order, they are not of the same genus, as they are dissimilar in many points. How far the worm or insect which has committed its ravages here may belong to either or to other orders, farther observation must determine: still Bauer's description of the worm he has noticed comes much nearer than any other account we have yet seen of this destructive animal.

As a remedy to stop the injury of weevil in a magazine of corn, it is discovered that the most effectual is steaming, and there are some interesting particulars of the process and its effects related in some English reports upon agriculture. It not only stops the progress of the weevil, but so effectually destroys it in all its states, that the grain which has been submitted to this process is used for sowing, and is considered quite clean, as without a new application of the germ of weevil in the ensuing crop it will not again make its appearance. Steaming, they say, does not injure the germination of wheat. Repeated experiments to that effect have been made, and always with the same result. It follows, therefore, that the heat engendered in slaking lime cannot be made so great, under the circumstances in which it is applied to wheat, that is preparing with it to be sown, that its vital principle can in any event be impaired. Hot lime might prove as efficient a remedy for weevil as for the grain worm described by Mr. Bauer. A.

EXPENSE OF CURING HAY.

An accurate account of expense in different operations of farming, has heretofore been so little attended to, that in making out an estimate of costs of any one process of the many that are to be performed, the farmer has to be governed more by conjecture than by any rule of correct calculation. This deficiency is owing to his own neglect, and if he now suffers, as he must necessarily, from the evil, a little time and pains are all that are required to enable him hereafter to count the cost of any one process he may wish to have performed. It is as important to the farmer to know what ought to be the reasonable cost to have a piece of work done, as it is for the manufacturer to calculate the expense per pound or per yard of carding, spinning or weaving, and as we are well assured, that if the last is unacquainted with the expense of each of these processes, he is totally incompetent to carry on his business successfully. It is the same with the mechanic, and that one only, at this day, becomes wealthy, who is competent to make a correct account of profit and loss. Where a farmer does all his own work, it may not be so necessary to keep a debtor or creditor account, but when job work is to be done, as it must in a variety of cases, accuracy of cost is essential to the interest of all engaged. We do not hesitate to say, that a man who would keep a correct account of all the expenses and labor upon a farm, giving a separate page to each laborer, each lot, each horse, ox and cow, with the profits derived from each, and this system kept up for successive years, and extended throughout his whole arrangement, and published, would aid more directly the class of community to which he belonged, and it would give rise to more beneficial results, than the present opening of new canals, or originating other great improvements. We would then be furnished with a guide or table, from which we could calculate the expense of each operation and class of husbandry, and settle the many principles which are now left to reason, and, in many cases, to conjecture. It has been for many years, and is yet, a disputed point among the most intelligent farmers, whether the raising of grain or stock, where there are proportionate facilities for each, is most conducive to their interest, and we do not see that the controversy can be settled in any way, except by keeping the debtor and creditor account we have mentioned. It is useless to enlarge upon the subject. Doubt and uncertainty will always rest upon it, and we suffer from a continuance of the evil, until we adopt a better and more systematic manner of calculating all our expenses and profits. Our object at this time is, to give the expense of curing hay, and it is as accurate as circumstances would allow. It would be better could we estimate the cost per ton, but as a farmer has not the conveniences, and does not weigh the hay intended for his own consumption, it would be difficult to say, with certainty, what is the cost of curing by weight. It is a common observation, however, that twenty feet square and one foot high of well packed hay, give one ton of 2,240 pounds by weight; how far it is correct, we have never had the opportunity of ascertaining. We have estimated it by the load, and a two horse load, with the wagon, or one with an ox cart, are considered equal—each load we put down as twelve cwt. of well cured hay, such it would turn out from the mow.

For cutting, curing and housing	126 cart loads	hay,	......	$143 00
do. do do.	124 wagon	do.	......	136 00
do. do. do.	38 cart	do.	......	34 37
Total, ...	288 loads	costing,	......	$313 37

Or $1.08¾ per load.

We give three different statements as the work was done on three different farms, and the first two under the direction of the persons living upon them who were hired tenants, and who employed men to work with and under them—the work was charged at $1 per day wages and board, which was the actual price. How far the tenants who had no interest in the hay, or were not charged with any part of the payment of the expenses, might, if they had been concerned in either or both, by greater efficiency, been enabled to lessen the expense, we are unable to say: they were, however, as competent as the better kind of day laborers, and as the farms were some distance apart, and there was no communication between the tenants, still the expense for the labor done on each is nearly the same. A revolving horse hay rake was used in both instances, and there was no charge for the use of the team to house the hay. Still we have no doubt that had the owner personally superintended the work, the cost would have been less; because his direct interest in lessening all expenses would have created facilities which did not occur to those less interested. In the last statement given this was the case, for there we see thirty-eight loads cured for $34, or about ninety cents per load; whereas the other two cost about $1.12 per load. We have heretofore made estimates of the expense of curing hay, and have uniformly made them at about $1 per load. Last year, the expense was rather less than this; for although the weather was not quite so dry for harvesting, yet as the heat was not so intense, laborers were enabled, on the whole, to do more, and this year, a mower had to go over more ground to obtain the same quantity of hay. A.

CORRESPONDENCE.

SKINLESS OATS.

Albany, Sept. 11, 1834.

Sir,—In compliance with your request, I now give you some account of a new kind of oat, called the skinless oat; of which I received a small parcel (about a table spoonful) in the spring of 1832, said to have come from Siberia, in the north of Asia.

Owing to the very small quantity which I received, and being much pleased with their appearance, I, with great care sowed them in drills in the garden. Their growth is very similar to the common oat, and of the same appearance at maturity, except the head is more compact and larger. The second year I sowed in the same manner, the product of which was about three bushels; and this season I sowed them broadcast upon ordinary ground. They matured some few days earlier than the common oat, which were sown on the same day on the adjoining ground, each kind having the same attention, in all respects, as to quantity of ground, cultivation, &c. &c.

I have not yet threshed them. Their appearance on the ground was extremely fine; the usual quantity of straw, uncommon large and heavy heads, and the products, as to measure, certainly equal if not more than the common oat, and one third more in weight.

They are well adapted to our soil and climate, and require only the same cultivation as the ordinary kind. Half the quantity of seed, however, only, is required per acre.

When threshed, the grain is entirely free from every particle of husk, and has precisely the appearance of the common oat hulled.

A sample of them may be seen at Mr. Thorburn's Seed Store, North Market-street.

I intend to thresh them soon, when I will endeavor to give some further account of them.

For a more particular description of these oats, I have thought proper to annex an extract from the New-York Farmer, vol. 7, No. 1, page 26, which please publish.

Respectfully, your obedient servant,

To J. Buel, Esq. A. THORP.

Extract.—At a meeting of the Warwickshire Agricultural Society, a specimen of the skinless oat was produced by the Rev. Mr. Knott, which had been plucked that morning out of a piece of ground belonging to that gentlemen at Wormlington. It was produced from seed furnished to him from Mr. Tucker of Heanton Punchardon, near Barnstable, Devonshire.

According to the account furnished to us by that gentleman, it was grown in the season of 1830 for the first time. It was produced in Great Britain, by Thomas Derenzy, Esq. of Clebemore Hall, who obtained the seed through a friend of his at Rotterdam, whither it was imported from Shantez, a remote district in China, and was quite unknown to Europeans till within three years.

The advantages which this extraordinary and valuable grain possesses over all other kinds of oats, are numerous, viz: When threshed from the sheaf it is exactly like oat-meal, and it is fit for immediate use for culinary purposes, and every other sort which oat-meal is consumed for, the grain being quite free from every particle of rind or husk. The flavor is delicious, and it contains much more farinaceous matter. There is, of course, considerable saving of oats, and expense of kiln-drying, sifting, &c, &c. and one peck of it contains more nutritious food for a horse than three pecks of common oats.

The produce is astonishing, the average being twenty-six bbls. of fourteen stone to the Irish acre, the exact quantity grown by Mr Derenzy on one acre. It was not sown till the 4th May, 1830, and was reaped early in August the same year.

It is remarkably hardy, and well adapted to the climate.

WILD CARROTS.

Similarly pernicious with the Canada thistle, in being useless and a nuisance, in being rejected by cattle as fit herbage for pasture, in being difficult to be exterminated, and in rapidly spreading over and densely covering fields, door yards, road sides, &c. to the exclusion of grasses more sightly and useful; yet, either through inattention to their progress, or ignorance of their noxiousness, many farmers in this country, perhaps from negligence detrimental both to themselves and their neighbors, permit wild carrots to extend and overrun their grounds, without an effort to subdue them. Seeds may be conveyed from one place to another by winds, birds, &c. it is admitted, but it may be proper for your readers further to know another mode of conveyance: that it is but a few years since any wild carrots (in patches so as to be noticed) were know to be on this Island, and that now they are to be seen in different parts of it; that they have been found to spring up where none previously existed in the neighborhood, in fields recently sowed with red clover seed purchased in the city of New-York; that, as much of the wild carrot is ripe at the same time that the second crop of red clover is cut for seed, it is thought by many that the two are carelessly gathered together, sold and dispersed over the country. From the state of Pennsylvania and the state of New-Jersey, where, in places, the weed is much too prevalent, is brought for sale the greater part of the red clover seed sold in the city of New-York, whence much of it is shipped, the supplies generally for the neighboring country, and the whole annual supply of this county are obtained.

With leaving it to your readers in their own way to condemn and guard against such as would thus "sow tares among wheat," or propagate poison disguised in salutary medicine, it is recommended, as the most simple and natural process found to be successful, to those who find wild carrots growing on their premises, to have them annually, when the seeds ripen, pulled up by the roots, which can easily and speedily be done when the ground is wet and soft by rain. When in blossom they are more readily seen, and their stalks are sufficiently strong to bear pulling without breaking off at the root. Any person so disposed or determined to free his land of their incumbrance may succeed, with a few hours occasional labor in three or four summers, by strictly adhering to a resolve to extirpate them in blossom, or suffer none to mature their seeds. Ploughing, hoeing, mowing, pasturing, &c. in the usual cultivation and rotation of crops, do not destroy them.

The subscriber conforms to the repeated requests of the conductors of the Cultivator, not to sign fictitions names to communications. JOHN J. CROCHERON.

Richmond county, N. Y. Sept. 9*th* 1834.

ON LAYING DOWN PERMANENT PASTURES.

It would be gratifying if some farmer, or other person of experience and observation, would give some information, through the medium of this paper, relating to the seeding of lands designed for permanent pasturage and meadow. I think it cannot be denied that an error exists with the generality of our farmers regarding this part of husbandry, as it is but seldom that only two species of grass seed, viz: Herd's grass and clover, are applied to all the different and various soils of our country, whether it be sand or clay, loam or gravel; whether the soil be wet or dry, whether it be upland or lowland, rich or poor; whether it be designed for durable pasturage or mowing, or soon to be ploughed and tilled for grain, these, in nine cases out of ten, are the only species of grass which the farmer attempts to cultivate. In this state, and the New-England states, are many farms, and indeed many towns, the soils of which will not admit of the cultivation of grain. The raising of stock, the wool-growing and the dairy business, are here resorted to as being the most advantageous branch of husbandry—hence, it is of the utmost consequence that some more durable species of grass should be incorporated with the soils, than those above mentioned, which require to be renewed every two or three years, and which subject the farmer to a great disarrangement and loss, especially when the soil is not adapted to grain; it is therefore earnestly hoped that some information on this subject will be given.

A FARMER.

RIBBON GRASS.

Hartford, Conn. Sept. 12, 1834.

Sir—I recollect, with pleasure, the interview I had with you in July, and, on my return home, addressed a line to Dr. A. Harris, of Canterbury, Windham county, in this state, relative to the Phalaris Americana. The first information I had concerning it, was from him, which induced me to visit Plainfield, a town adjoining Canterbury, for the purpose of personal examination. Doctor Harris is a distinguished physician and a gentleman of great worth. He devotes much of his leisure to botany and to practical scientific agriculture. I have lately received from him a statement, which I have the pleasure to enclose, and from which you can, if in your opinion the subject demands it, prepare an article for publication.

I am, with sentiments of esteem and respect,
Your humble servant,

J. Buel, Esq. ELIZUR GOODRICH, Jr.

Plainfield, Windham county, Conn.

Dear Sir—I received a letter from you, a short time since, requesting information concerning the ribbon grass, (Phalaris Americana.) The grass you saw at Plainfield, on Mr. Woodward's farm, two years since, I was informed, originated from the ribbon grass. It was originally cultivated in the garden for ornament, where it spread, to the great annoyance of the vegetables. Mr. W. becoming dissatisfied with it, dug it up and threw it over the wall into the mowing lot, where it continued to grow luxuriantly. Being determined to get rid of it, he again took it up and threw it into the brook. It was so tenacious of life, that it seized upon the watery element and spread rapidly down the brook, so that in a few years it extended down the brook more than a mile; its progress towards dry land was more slow, but has eventually spread over a number of acres, converting a bog meadow into the best of mowing. Mr. Bowen, who lived on the farm, informed me that he mowed it twice in the season, and that it produced about three tons to the acre, annually, of excellent hay, which the cattle consumed with as much avidity as any that was cut on the farm.

The meadow was so miry in many places, that cattle could not pass, but the grass roots formed such an impenetrable surface, that they could cart over it in getting hay, without difficulty; and, in some places, they entirely united across the brook, forming a natural bridge that a person might pass over. The brook is sufficiently large to operate a cotton factory which has been erected about a mile below.

I have taken considerable pains to ascertain the history, character and importance of the ribbon grass, and come to the conclusion that it was originally an aquatic grass, and that the striped color was produced by being transplanted into a dry, gravelly soil. I have seen it in a number of places where it had been cultivated for ornament, spreading beyond its boundary and outrooting other grass; in these instances, if in the shade or on moist ground, it loses its striped colour. In one instance, the roots passed under the garden wall into the back yard, and entirely eradicated the other grass, and occupied a number of rods of ground, when it grew rank and lost its striped colour. I have not been able to ascertain the best mode of propagation; it produces little if any seed that will vegetate. The striped grass of the garden, I am confident, does not produce any; for we have cultivated it for near twenty years, and have never known a single spear that was produced from seed. The Phalaris that grows in wet land, blossoms abundantly, but produces very little seed, and that is liable to become fungus, resembling the spurred rye. The propagation by transplanting the roots into wet land, among the bogs, although attended with but little labor, must take considerable time to entirely eradicate the bog grass, as I have proved by experiment. I transplanted, a number of years since, into a bog meadow, some of the grass, and although it took root and grew rapidly, spreading among the other grass, and even sending up shoots in the centre of bogs, still the bog grass remains. I planted, as an experiment, about one-half of an acre of bog meadow with the Phalaris a year last spring, it having been previously ploughed for two or three years; it was planted four feet apart each way; it all lived, and is spreading well, and probably in a few years, will occupy the whole ground. I have ploughed up one acre more, and intend to plant it in the same way. I also sowed some of the seed last spring, procured from grass that grew on wet land, but am not certain that any of it has come up. Shall sow more next spring, and hope in a few years to be able to ascertain its importance, and the best mode of cultivation. Yours, with respect.

ANDREW HARRIS.

Hon. Elizur Goodrich, Jr.

Mr. Cultivator—From the character of your paper, so far as I can judge of it from the seven printed numbers, I think it highly deserving of being introduced into our common schools, as a class book for the elder boys, at least one or two days in a week. Most of the boys in our country schools are to be the farmers, and politicians too, of the coming generation; and all of them expect, at one time or another, to manage a farm or a garden. Early impressions have an abiding influence on the mind; and what impressions so useful as those which have a bearing upon their future usefulness —as those in a business in which they intend to get their living?—The matter in the Cultivator comes home to their employment, their understanding, their interests; it is calculated to make them think, and compare good with bad farming, to nurture good habits, and to excite in them a laudable ambition to become distinguished in their business of life. The paper will have a tendency to lay a substantial foundation, and to beget in our boys a desire and a resolution, to rear themselves, upon this foundation, a noble superstructure of usefulness. Judging from my own feeling, and from the benefits I have derived from the practice of other farmers, through agricultural publications, I think the public advantages of the arrangement I suggest would be infinitely great. The information which I have acquired in this way, even in ten years of manhood, has been of great advantage in my affairs; and I am conscious that the *book knowledge* which I now have, had I possessed it when I started in business, would have been of more value to me than $500 capital: so true is it, that knowledge is power and capital. Cold, calculating cupidity may inquire, how am I to be benefitted? I answer, in the general prosperity. The prosperity and happiness of every good man is intimately identified with the prosperity and happiness of those around him. Those are bad passions, depend upon it, which seek gratification in retarding the march of intellect and the improvements of social life—or depend for enjoyment in encroaching on the comfort of others.

Under a strong impression of public utility, I venture to suggest, for the consideration of a future legislature, the propriety of furnishing each common school with half a dozen copies of your paper, at the charge of the common school fund. This will amount to $1.50 for each district: and the cost may be either defrayed from surplus moneys, or deducted from the sum apportioned to each district.—There is not a district in the state which will not be benefitted tenfold by the information thus disseminated, or I am no judge of cause and effect. FELLENBURGH.

Saratoga, Sept. 20, 1834.

INDIAN CORN SOWN FOR FODDER.

The extreme drought, which has the present season oppressed the vegetable world, and rendered abortive many of the early hopes of the husbandman, would seem a fit occasion to introduce to the notice of farmers, a simple and effective remedy for a deficiency of the grass and hay crop at least. It is the *sowing of Indian corn* any time in the month of June, at the rate of two bushels to the acre.

The writer has adopted this expedient several times when pasturage and mowing promised to fail, and has found the product generally more abundant, as food for sheep and cattle, than the best meadow. Let it be supposed, that from the 1st to 15th or 20th June, one shall have reason to apprehend a scarcity of subsistence. Let him select his poorest pasture or meadow, after being closely fed, and applying manure or not, according to circumstances, plough, sow, harrow and roll the land. If the season be tolerably favorable, the probability is, in less than ninety days there will be *ten tons* of the most nutritious green food on an acre, which may be cut and fed to milch cows, working or fattening cattle, and even to horses and swine, to great advantage, more especially at a time like the present, when pasturage is nearly destroyed.

By allowing it to stand until just before early frost, the full profit is insured, and a mass of the best quality of winter food is realized at a very trifling expense. The manner of cutting and curing, is to use a strong short grain cradle, and to set it up in small stouts, (not bound in sheaves,) binding the stouts with two bands of the same material, and after it is suitably cured, house, as in case of the corn tops.

It is believed by the writer, that this plan of multiplying animal subsistence is of very great importance, and he hopes another year, some will make experiments of it.

A SARATOGA FARMER.

P. S. It will be recollected that a wheat or rye crop may follow the sowed corn, or, if deemed too late, oats, peas or barley may succeed the next spring. The ground is left light and clean.

A DAIRY FARM.

Schohorie, August 22d, 1834.

Sir—The annexed account of "Orange farm" is extracted from a "Complete view of Baltimore," with directory, &c. 1833, by Charles Varle. The mode of making butter by steam, is novel to me, and is the principal cause of my copying it. I give you the whole article, of which, make any use you please.

Your obedient servant,

A WELL WISHER TO THE CULTIVATOR.

J. Buel, Esq.

"Orange farm, the property of Robert Smith, Esq. containing 4 or 500 acres, situated about three miles from the Court-House, on the turnpike to Havre de Grace: It is conducted on the soiling system, viz. no cattle are allowed to graze on the fields, but occasionally; they are kept in stables; the black cattle, which constitute the base of this system, are here about 100. They furnish daily, in summer, near 200 gallons of milk, and are attended by white people, as being more clean and careful than the black. The cream, which is raised by *steam*, produces very sweet butter, which is sent to the Baltimore Centre Market, every day, and the machine in which it is conveyed, is well appropriated for an easy carriage. It sells in summer at 31 cents per pound, and 50 cents in winter. The sour, or rather butter-milk, because it does not partake of acidity as the other milk *which has fermented*, and whose buttery particles have been taken out is as sweet as fresh milk, and it is sold in market and places of deposite, for two cents a quart.

"The mode of feeding the cows is different from the common mode. Their food is hay and vegetable matter, cut in small pieces and steamed—they carry it to the stalls of the cows.

"The goodness of this system consists of losing no manure, and for not having the soil trampled by cattle. For that purpose, a gutter is placed in every stable, and is so situated, that nothing is lost of what is considered of a fertilizing quality, and is conveyed to a reservoir, from which it is pumped out in a pipe placed in a cart, which is sent to the field to be regularly spread, by means of a spiggot arranged for the purpose.

"This farm has been improved by the above means to such a degree, that hemp will grow luxuriantly on it, while before this system was adopted, the soil was as thin as any other in the vicinity of this city. The quantity of hogs fed on the offals, is a great addition to this good mode of farming.

"The nett income of this farm, is from four to five thousand dollars a year.

"The preceding account is to be relied on as correct, it having been copied from my journal of a tour of agriculture through the United States, made a few years ago."

Mr. Editor—Several methods of drying unripe corn for winter use are recommended and may be practised with advantage. Probably the worst of these is the common one of boiling, and afterwards cutting the grain from the cob. The corn is not only deprived of much of its sweetness and flavor by the boiling, but the best, though not the largest part of each kernel, the *corculum*, or as it is called by the farmers, *chit*, is left on the cob. A far better plan is that adopted by the Indians of Lake Michigan, who roast the corn in a sand bath, heated by a fire which they make on a bed of soft sand, into which the ears are plunged. After being roasted in this way, it is removed from the cob and kept in sacks for winter use.

A neater and still better method is, to put the ears of green corn into a *baker*, or oven of any kind, and roast them about as much as you would do for immediate use. The corn is then shelled, each grain being preserved entire, and spread to dry for a few days, either in the open air or a dry room; and may be kept for years. When thoroughly boiled, (for at least 12 hours,) it is as tender and soft as green corn, to which in flavor it is no way inferior, and constitutes a most admirable ingredient in soups, or if eaten by itself is one of the most delicious and wholesome dishes that can possibly be prepared.

A diet consisting exclusively of corn preserved in this way is regarded as a specific in the removal of a predisposition to cancer.

Yours, very respectfully,

EDWIN JAMES.

CURE FOR FOOT ROT IN SHEEP.

The above complaint has been very troublesome in some parts of the country; and for the information of those not acquainted with a remedy, I should like to see it published in the Cultivator. I had my information from a gentleman who had been much troubled with it. The disease is very infectious, and sheep affected with it should be immediately separated from the flock, and their feet scraped clean, and spirits of turpentine poured in. This course should be pursued once in eight or ten days till the cure is effected, which is accomplished, in most cases, by three applications.

DANIEL CURTIS.

Canaan Centre, September 10th, 1834.

Cattle Husbandry.

THE SHORT HORNS.

Known as Durham, Teeswater, Holderness, Improved Short Horns, &c.

(Concluded from page 78.)

CRITERION OF A GOOD YORKSHIRE COW.

"A milch cow, good for the pail as long as she is wanted, and then quickly got into marketable condition, should have a long and rather small head; a large headed cow will seldom fatten or yield much milk. The eye should be bright, yet with a peculiar placidness and quietness of expression; the chaps thin, and the horns small. The neck should not be so thin as that which common opinion may have given to the milch cow. It may be thin towards the head, but it must soon begin to thicken, and especially when it approaches the shoulder. The duelap should be small; the breast, if not so wide as in some that have an unusual disposition to fatten, yet very far from being narrow, and it should project before the legs; the chine, to a certain degree, fleshy, and even inclining to fullness; the girth behind the shoulder should be deeper than it is usually found in the Short Horn; the ribs should spread out wide, so as to give as globular a form as possible to the carcass, and each should project farther than the preceeding one to the very loins, giving, if after all the milch cow must be a little wider below than above, yet as much breadth as can possible be afforded to the more valuable parts. She should be well formed across the hips and on the rump, and with greater length there than the milker generally possesses; or if a little too short, not too heavy. If she stands a little long on the legs, it must not be too long. The thighs somewhat thin, with a slight tendency to crookedness, or being sickle-hammed behind; the tail thick at the upper part, but tapering below; and she should have a mellow hide, and little coarse hair. Common consent has given to her large milk veins; and although the subcutaneous milk vein has nothing to do with the udder, but conveys the blood from the fore part of the chest and sides to the inquinal vein, yet a large milk vein certainly indicates a strongly developed vascular system—one favorable to secretion generally, and to that of the milk among the rest.

"The last essential in a milch cow that we shall mention is the udder, rather inclining to be large in proportion to the size of the animal, but not too large. It must be sufficiently capacious to contain the proper quantity of milk, but not too bulky, lest it should thicken and become loaded with fat. The skin of the udder should be thin, and free from lumps in every part of it. The teats should be of moderate size; at equal distances from each other every way, and of equal size from the udder to nearly the end, when they should run to a kind of point. When they are too large near the udder, they permit the milk to flow down too freely from the bag, and lodge in them; and when they are too broad in the extremity, the orifice is often so large that the cow cannot retain her milk after the bag begins to be full and heavy. The udder should be of nearly equal size before and behind, or, if there is any difference, it should be broader and fuller before than behind.

"The quantity of milk given by some of these cows is very great. It is by no means uncommon for them, in the beginning of summer, to yield 30 quarts a day: there are rare instances of their having given 36 quarts: but the average measure may be estimated at 22 or 24 quarts. It is said that this milk does not yield a proportionate quantity of butter; and that, although these cows may be valuable where the sale of milk is the prime object, they will not answer for the dairy.

"That their milk does not contain the same proportionate quantity of butter as that from the Long Horns, the Scotch cattle, or the Devons, is probably true; but we have reason to believe that the difference has been much exaggerated, and is more than compensated by the additional quantity of milk."

It is said that the milk increases in richness as the cows grow older. It is conceded on all hands that the Short Horns consume more food than any other breed.

The best *milk* breed of cattle are probably those selected by the London milkmen. The number of these is estimated at 12,000.—The market price of a good dairy cow is £20, ($88.) They are, with very few exceptions, the Short Horn breed—the Holderness or Yorkshire cow described above, and almost invariably with a cross of the improved Durham blood. They are selected for their qualities for milk, as well as aptness to fatten; for they are rarely suffered to breed while in the dairyman's possession. When they cease to give a remunerating quantity of milk, they are fattened and sold to the butcher. This is the case when they cease to give four quarts a day. The cows are principally kept constantly housed—their food and water being supplied in the stable, and are turned out to fatten in yards. They are fed principally with brewer's grains, to which cut clover and roots are added, when these can be had at a reasonable price; oil cake is added to fatten. The grains are deposited in pits, lined with brick work set in cement, from ten to twenty feet deep, firmly trodden down, and covered nine inches with a layer of moist earth, to keep out the rain and frost in winter and heat in summer. They are thus preserved for all seasons of the year.—They are sometimes kept in these, two years without being touched. A very accurate experiment was made by the Duke of Bedford, on the fattening quality of linseed, boiled and unboiled, in which the simple unboiled linseed fattened the animals more expeditiously than any cooked preparation of that seed. The average product of the London dairyman's cows is a little over nine quarts a day.

Although we have fulfilled the task we proposed, of describing the Devon and Short Horned cattle of Great Britain, we think it may not be uninteresting, particularly to cattle breeders, to take a brief notice of the *Long Horns* and *Hornless*, or *Polled* breeds, which form a considerable portion of the farm stock there, and from which our native breeds have in a great measure proceeded.

While the *Short Horns* were principally confined to Durham and York; and the *Middle Horns*, including the Devon, Hereford, Sussex, Welch and Scotch breeds, spread over the south, the north and a part of the east; the *Long Horn* cattle attracted the attention of the midland and some of the western districts of Great Britain. The first improvements noticed in this breed were made by Linton and Webster, but the greatest improvement was made by the celebrated Bakewell, of Dishley, in Leicestershire, whose improved cattle were sometimes denominated the Dishley breed. The points which this great breeder aimed at, were, *beauty of form;* next *utility* of form, in distinction from *beauty* of form; 3. quality of flesh; and lastly, *fattening property*. Many years did not pass before his stock was unrivalled for the roundness of its form, the smallness of its bone, and its aptitude to acquire external fat; while they were small consumers of food in proportion to their size; but at the same time their quality as milkers became sensibly diminished. The *grazier* could not too highly value the Dishley long horn; but the *dairyman* and *little farmer*, cling to the old breed as most useful to their purpose. It was his grand maxim, that the bones of an animal intended for food could not be too small, and that the fat being the most valuable part of the carcass, it could consequently not be too abundant.

The *polled* or *hornless breeds* are in repute in particular districts. The Galloway, from which Colling obtained a cross with the large Teeswater, as the basis of his improved Short Horns, is raised in vast herds in some parts of Scotland, and driven in the fall to the northern counties of England, where they are fattened for the London market. They are a hardy and docile race, admirably adapted for the grazier, yielding the finest meat in the British market. The cows are not good milkers; but though the quantity is small, it is rich in quality. A cow that gives 12 to 16 quarts a day, is esteemed a great milker, and that quantity produces more than a pound and a half of butter. The average for the summer is not more than six or eight quarts.

The Galloway cattle are straight and broad in the back, and nearly level from the head to the rump. They are round in the ribs, and also between the shoulders and ribs, and the ribs and the loins.—They are broad in the loins without any large projecting hip bones. In roundness of barrel and fulness of ribs they will compare with any breed, and also in the proportion which the loins bear to the back bone, or protuberances of the ribs. When viewed from above, the whole body appears beautifully rounded like the longitudinal section of a roller. They are long in the quarters and ribs, and deep in the chest, but not broad in the breast, short in leg, and moderately fine in the shank bones. There is no breed so large and muscular above the knee, while there is more room for the deep, broad and capacious chest. He is clean, not fine and slender, but well proportioned in the neck and chaps. The neck of the bull is thick almost to a fault. The head heavy, the eyes not prominent, the ears large, rough and full of long hairs on the inside. Skin mellow, and of a medium thickness, clothed with long, soft and silky hair. The prevailing colour black, but some are brindled brown. A beautiful heifer of the Galloway breed was slaughtered at Smithfield, which weighed 1,920 pounds. Twenty or twenty-five thousand cattle are annually driven to England for feeding. The expense of driving them 400 miles is from £1 to £1 4s. a head. We have the following amusing account of the economy of a Scotch drovier. "A mountaineer will travel from fair to fair, for thirty miles round, with no other food than the oaten cake he carries with him, and what requires neither fire, table, knife, nor other instrument to use. He will lay out the whole, or perhaps treble to all he is worth, in the purchase of 30 or 100 head of cattle, with which, when collected, he sets out for England, a country with the roads, manners and inhabitants of which he is totally unacquainted. In this journey he scarce ever goes into a house, sleeps but little, and then generally in the open air, and lives chiefly upon his favorite oaten bread. If he fail of disposing of his cattle at the fair of Carlisle, he is probably ruined, and has to begin the world, as he terms it, over again. If he succeeds, he returns home only to commence a new wandering, and a new labor, and is ready in about a month perhaps to set out again for England."

The Norfolk cattle are generally of the polled breed. They have supplanted here the middle horns. A warmer climate and richer soil have rendered them superior to the Galloway in size but not in quality.

In Sussex, the polled breed has been manifestly improved, particularly for the dairy. In the height of the season, some of these cows will give as much as eight gallons of milk in a day, and six gallons is not an unusual quantity. Three of them produced 683 pounds of butter, from June to November. A Suffolk cow will make 150 pounds butter, and 75 whey cheese in a season. They are of small size, and consume comparatively little food.

The *Alderney* cattle are of French origin. The cows are diminutive in size, but are remarkable for the richness of their milk, and the great quantity of butter which it produces.

The *Nagore* cattle are a species lately introduced into England from interior India. They are dissimilar in appearance to any hitherto known breed. The figure of the bull in the work before us, has a large lump upon the back, over the fore shoulders, and an enormous duelap dropping from the neck and the chaps to the lower point of the brisket. They are considered the highest breed of Indian cattle. They are used in India by the higher order to draw their state carriages, and are much valued for their size, speed and endurance, and sell at very high prices. They will travel 15 or 16 hours in a day, at the rate of six miles an hour. A pair reached England in 1829. Two calves have been bred from them, and a milch cow is now (1833) in calf by the bull.

Science of Agriculture.

LIME

Is applied to a great variety of uses; it is employed in medicine as an anti-acid; mortar is composed of it, when combined with sand; and it serves as a manure, which is the only view in which we now have to regard it. When used for the purpose of agriculture, it is formed by exposing the substances we have mentioned to a certain degree of heat in the furnace, or kiln, of the lime-burner. When this has been continued for a sufficient length of time, their weight becomes considerably diminished, though they retain their former shape and bulk; and either limestone or chalk, when thus reduced, is in most places known by the name either of *lime-shells*, or *shell-lime*, or simply *shells*. In this state it is called *quick-lime:* the materials of which it is thus composed possess hardly any active property, but when burned, it then becomes caustic to the tongue, and effects the speedy decomposition of most vegetable and animal bodies. When applied in this form—either in the way of compost, or spread over the soil by itself—it is so far from affording nutriment to any thing that may be there growing, that, were its effects to be long continued, it would consume it. But if water be thrown upon it, a great degree of heat is in a short time generated; the burnt shells begin to crack and burst asunder, and the mass gradually crumbles down or falls, as it is more commonly said, into a fine powder, which becomes white, of whatever color it may have been before it was calcined. Or when it has been exposed for a short time to the influence of the atmosphere, it is also found to lose this caustic power, and it is thus reconverted into a substance of the same mild nature as that from which it was obtained—in all its properties exactly resembling chalk.

This operation is called *slacking*, or *slaking;* and lime, when deprived of its scorching quality, is termed *slaked-lime*, or, in the language of chemists, *effete*. Instead of watering it in heaps, the practice which generally prevails is to lay the shells upon a fallow, in small hillocks of about a bushel and a half each, either thrown up around the circumference of each heap, or covered up immediately with some fresh soil made very fine, which, when laid on moderately thick, should be clapped close down with the back of the spade, so as to exclude the admission of either air or rain. In this state it may remain for a few days, care being taken during that time to keep every part of the heaps tight and sound, when it will be found that the moisture of the earth will have completely slaked it. Although it may be thought that this covering of the lime is unnecessary, it yet has this use—that without it the rain would form crusts over the heaps, which would not only prevent the moisture from penetrating regularly thro' them, but would also hinder them from being pulverized without considerable difficulty. It will then be fit for use, and when spread over the field, it should be immediately ploughed in with a shallow furrow, and well stirred with the barrow in every direction. Upon an 18 feet ridge these heaps will be the same distance, or six yards asunder, from centre to centre, if about 200 bushels be laid on per acre; and so on when other quantities are applied. Instead of slaking the lime in this manner, it has however been recommended, "to lay it down in a long heap, or mound, on one side of the field on which it is to be applied. Two laborers are then employed to turn the mound, and a third waters it. When the whole has thus been gone over, it is allowed to lie for four or five days, after which it is again turned, and if any part of the lime should be found to be still unslaked, more water is added."

From this it will be perceived, that one chief cause which renders the burning of lime necessary, arises from the extreme difficulty of obtaining the powder without the process of grinding; but by being thus more finely divided, it can also be more evenly diffused over the soil, with which, therefore, it becomes more evenly mixed, and more prompt in its effects upon the land; and when laid upon it in its hot state, it not only occasions the destruction of weeds, but powerfully stimulates the action of manure.

One very strong reason for applying it instantly is, that, if spread immediately after being turned, and while yet in a powdry and caustic state, a smaller quantity may suffice to cover the whole surface of the ground, and to come into contact with more minute particles of the soil; whereas, if suffered to lie for any length of time exposed to the atmosphere, it imbibes so much moisture that it runs into clods, and can never again be so equally divided into small parts, wherefore a much larger quantity is required to produce the same immediate effect. It is in this state, also, that it acts the most powerfully upon all organic matter, which may be already lying undecomposed within the soil—insects, the fibres and roots of obnoxious plants, and the seeds of weeds, which it dissolves and transforms into mould. It is also more efficacious than effete lime in its influence upon what is called *sour land*, though simple chalk, if applied in large quantities, will correct the evil. Neither is it improbable that, during its process of slaking, the heat which it generates by absorption of moisture causes it to swell in a manner which the tenacity of the soil cannot resist: thus producing fermentation, it not only eventually makes the land mellow, but renders matter which was comparatively inert, nutritive, and is probably more beneficial to land containing much woody fibre, or animal fibrous matter, than any calcareous substance in its natural state.* If, therefore, quick-lime really possesses superior qualities as a manure, it seems only fair to infer that, the greater the strength and vigor of such properties, the more assuredly will they effect its purpose when in that state, than after it has been rendered effete.

Considerable judgment is however requisite in this mode of its application; for, although it promotes putrefaction, and converts the pulp, or saponaceous substance, of vegetable matter into the food of plants, yet, if too great a portion of lime be added, it may have a contrary effect; and it always destroys, to a certain extent, the efficacy of animal manures, either by combining with certain of their elements, or by giving to them some new arrangement. It is necessary to the reduction of carrion, or for qualifying the noxious effluvia of night-soil; but is so injurious, when mixed with any common dung, that it tends to render the extractive matter insoluble; thus, if a sufficient quantity of quick-lime be added to a heap of stable-dung in a state of fermentation, it will set it on fire, and the whole will be consumed. It should never, therefore, be mixed with farm-yard manure, unless a small quantity be found absolutely necessary for the prompt destruction of seed-weeds, or the decomposition of roots; but when laid upon the land during the same season, the dung should be ploughed down alone, and the lime afterwards harrowed in with the seed-furrow.

By neutralizing the acids combined with the mould, this manure qualifies the vegetable and other soluble substances also present in it, and occasions the whole to be converted, by the influence of the atmosphere and of water, into nutriment for plants; but in poor soils, having less vegetable matter to convert into mucilage, it acts so powerfully as not only to exhaust such land by its final effects, but to be prejudicial to the immediate crops.† We have, indeed, the opinion of a very experienced farmer, who is also well versed in chemistry, 'that, should much rain immediately succeed the ploughing, and any considerable portion of sand be either in the lime or in the soil, it is almost a moral certainty that such soil will be in a worse state than it was before the lime was put on, because, the moisture being retained by the lime and the soil, and the tenacity of the substratum not suffering the superabundance to pass quickly away, it causes the whole to run together, and form a compact and impervious bottom, which before, however, might have been pervious in a slow degree. That this must be the case is evident from this consideration,—that quick-lime, mixed with a certain portion of sand, and duly moistened, contracts and forms a substance which we call mortar, or cement; in proportion, therefore, as the quality of these

* In its *first effect*, burnt lime decomposes animal matter, and seems to accelerate its progress to a capacity of affording nutriment to vegetables; gradually, however, the lime is neutralized by carbonic acid, and converted into a substance analogous to chalk; but in this case it more perfectly mixes with the other ingredients of the soil, and is more pervadingly diffused, more finely divided, than mere chalk, artificially applied.—*Sir Humphrey Davy, Elem. of Agric. Chem. lect. vii.*

† 'All the experiments yet made render it probable that the food of plants, as it is taken up from the soil, is imbibed by the extremities of the roots only. Hence, as the extremities of the roots contain no visible opening, we may conclude that the food which they imbibe must be in a state of solution at first; and, in fact, the carbonaceous matter in all active manures is in such a state of combination as to be soluble in water whenever a beneficial effect is obtained.' —*Dr. Thomas Thomson's Chemistry, 2d edit. vol. v. p. 376.*

materials is more or less perfect, so does the substance become more or less compact, hard, solid, and impervious; such must be the condition of the soil; and it is but reasonable to suppose that a great part of the seed sown upon it must perish.'

It may indeed be alleged that the caustic action of quick-lime can never be exerted to any great extent, as it attracts fixed air too strongly not to become immediately slaked; but its effects are found to be powerful even in that short period, provided that it be promptly and intimately mixed with the soil, for though the land should contain an abundance of vegetable matter, yet if it has been injudiciously cropped, or insufficiently manured, the lime will only add to its infertility.

When quick-lime has been deprived of its causticity, it is called by chemists, *carbonate of lime*, and in that mild state it does not act upon animal or vegetable matter with the same violence as quick-lime, but instead of dissipating any portion of the substance which may be contained in the soil, it facilitates its reduction into that state by which it the most effectually assists vegetation. Neither has it the same tendency to combine, as it were, into a mortar with the sand of poor clays.

Lime, however, *whether quick or slaked*, when used by itself, without any addition of earth, is not possessed of any vegetative quality: thus, 'seed planted in a flower-pot filled with powdered carbonate of lime, regularly watered, vegetated feebly, made little progress, and died without coming to perfection; but when partly filled with garden-mould, and carbonate of lime one and a half inches thick over it, the plants put down their radicles straight through the lime, without ramifying or stretching sideways, till they arrived at the mould.' Even in a mixture where lime was only one-fifth, the plants were poor and sickly, and made no progress: and when quick, it, with the aid of water, suddenly destroys all vegetable substances. It may even be hurtful to vegetation when laid in too large a quantity upon very light and warm soils, for, by quickening evaporation, it dries the land too much, by which means plants are deprived of the moisture necessary to their sustenance; therefore it is that calcareous earths are frequently known by farmers as 'burning soils;' and, by its injudicious use or repetition, without the aid of animal or vegetable manure to supply the nourishment of which they have been deprived by crops, the growth of which has been thus forced, land, though of superior quality, may at length become exhausted, Thus experience teaches that lime, when applied to land, has different effects upon some soils than it has upon others: on many there is a rapid and permanent improvement, on others there is less benefit, and on some it is said rather to retard than to promote vegetation.

This is no doubt chiefly influenced by various unascertained properties in the soil, and partly also by difference in the qualities of the lime istelf, arising from its mixture with other earths.

Whether it possesses any further properties, through the stimulating effects of light and heat upon the vegetable fibre, has been conjectured, but has not been supported by any positive fact, and seems to be contradicted by the slow effect of effete lime in its operation upon the soil. It is, however, worthy of remark, that calcareous earth is found in the ashes of all vegetables; that it is present in a larger proportion in wheat, clover, and some other plants whose growth is especially promoted by the use of calcareous manures, and many are said not to ripen in ground in which it is entirely wanting. We may, therefore, conclude that it is of the highest importance in the process of vegetation, and that an accurate investigation of its mode of action, by enabling us to judge with more certainty of its powers, would greatly tend to the improvement of agriculture. It is indeed much to be regretted that the subject has not been more fully investigated, and that some more definite judgment has not been framed regarding the properties of lime, the effects of which in its application to the soil are exposed to the most contradictory results. Much money has thus been uselessly expended and labor thrown away, which, under better information, might have been saved; and without scientific analysis of the component parts both of soils and of lime, we remain much in the dark regarding their effects on vegetation; but, judging from the faint lights with which we have been furnished, we shall still endeavor, by comparing science with practice, to obtain such instruction as may guide us to an economical and useful application of this manure to field culture.—*British Husbandry.—To be continued.*

"Fortune is as a glass; when she shines she is broken."—*Pub. Syr.* With its splendor, she also possesses its fragility.

Household Affairs.

To Steam Potatoes.—Put them clean washed, with their skins on, into a steam saucepan, and let the water under them be about half boiling; let them continue to boil rather quickly till they are done *If the water once relaxes from its heat, the goodness of the potato is sure to be affected, and to become soddened be the quality ever so good.* A too precipitate boiling is equally disadvantageous; as the nigher part to the surface of the root begins to crack and open, while the centre part continues unheated and undecomposed.

To Make Potato Bread.—Boil the potatoes not quite so soft as common, then dry them a short time on the fire, peel them while hot, and pound them as fine as possible; next put a small quantity of pearl ash to new yeast; while it is working briskly, add as much rye meal or flour as can be worked in. Mix the whole well together, but do not add any water to it. After the dough is thus prepared, let it stand an hour and a half or two hours before it is put into the oven. Observe it will not require so long baking as regular flour bread.

To Make Tomato Catsup.—Boil tomatoes, full ripe, in their juice, to nearly the consistence of pulp, pass them through a hair sieve and add salt to the taste. Aromatize it sufficiently with cloves, pepper and nutmegs.

To Make Tomato Sauce.—Peel the ripe fruit—if dipped in scalding water the skin readily separates—boil or simmer them in their juice, without water, until the moisture is sufficiently evaporated, and season with salt. A little crumb of bread, or pulverized cracker may be added.

[The tomato may be raised in every garden. They make a pleasant sauce for meats, and habit soon renders them very desirable. They are said to promote health by removing biliary obstructions.]

To Make Rhubarb Pies.—Peal the leaf stalks of the rhubarb, and cut them in half inch pieces, lay them on the crust as you would gooseberries, currants or other fruit; and strew over a plenty of sugar, a little orange peal, and, if you like, some nutmeg, and then cover and bake.

[Several varieties of the rhubarb are used for pies and tarts. They are equal to the gooseberry for this purpose, and resemble this fruit very much in flavor. The rhubarb is a perennial herbaceous plant, with leaves larger than the burdock, is raised with little trouble, and may be used most of the summer. In rich ground a single root will afford materials for a dozen or more pies. The seed ripens in August, and is best sown as soon as it is gathered, though it keeps good till the following year. It may be readily transplanted in fall or spring. I have used a new and superior variety this year, the seed of which came to me in July 1833, enclosed in a horticultural publication from London. It was immediately sown, and last spring transplanted.]

Dutch Pudding.—Cut a round piece out of the bottom of a loaf, and put that and the piece that was cut out into a quart of cold new milk, in the evening, and let it stand all night. If the milk is all soaked up by morning, add some more. Put the piece in the bottom again, tie the loaf up in a cloth, and boil it an hour. Eat with sugar, or with melted butter, white wine and sugar sauce.

Apple Jelly.—Take of apple juice strained 4lbs. sugar 1 lb. Boil to a jelly.

Miscellaneous.

From the Montreal Daily Advertiser.

THE WHEAT-FLY.

Sir,—In a paragraph which appeared in your *Courier* of Friday last, copied from the *Sherbrooke Advocate*, the damage to the kernel of wheat in the ear of the growing crop, has been attributed to the insect called weevil. This surely is a mistake, the weevil is a very different sort of insect from that which has damaged the wheat in this neighborhood.

The Encyclopædia of Agriculture describes the wheat-fly, which has been one of the greaest enemies to the wheat crop in Scotland of late years, and I have every reason to suppose it is the same species of fly that has caused the injury to wheat this summer.

The following article is from the *Encyclopædia*:—In the modern nomenclature, the Rev. W. Kirby informs us that the wheat-fly, ormerly the *Tipula tritici* of Linnæus, is now the *Cecidomyia tritici*: and the Hessian fly the *C. destructor*. The wheat fly generally makes its appearance about the end of June; and according to the observations of Mr. Sherriff, they exist throughout a period of thirty-nine days. The hue of the fly is orange, the wings transparent, and changing colour according to the light in which they are viewed. It lays its eggs within the glumes of the florets, in clusters varying in number from two to ten, or even to fifteen, and the larvæ feed upon the grain. They are produced from the eggs in the course of eight or ten days; they are at first perfectly transparent, and assume a yellow colour a few days afterwards; they travel not from one floret to another, and forty seven have been numbered in one. Occasionally there are found in the same floret, larvæ and a grain which is generally shrivelled, as if deprived of nourishment, and although the pollen may furnish the larvæ with food in the first instance, they soon crowd round the lower part of the germen, and they, in all probability, subsist on the matter destined to form the grain. The larvæ are preyed on by the *ceraphron destructor*, or *ichneumon* fly, which deposites its eggs in the body of the larvæ of the wheat-fly; and this is the only check hitherto discovered for preventing the total destruction of the wheat crops attacked by the *cecidomyia*. Mr. Sherriff, speaking of the ichneumon, says, 'I could not determine if it actually deposites its eggs in the maggot's body; but there can be no doubt, however, of the ichneumon piercing the maggots with a sting; and from stinging the same maggot repeatedly, it is probable the fly delights to destroy the maggot, as well as deposite eggs in their bodies. The ear-wig, also, destroys the maggots as food.' Mr. Gorrie estimates the loss sustained by the farming interests in the Carse of Gowrie district alone, by the wheat-fly, at £20,000 in 1827; at £30,000 in 1828: and at £36,000 in 1829. The same writer, in May, 1830, thus depicts the prospects of the wheat crop in the Carse of Gowrie: 'The *cecidomyia* are still alive in formidable legions. That the flies will this season be in as great plenty as ever, is quite certain: that they will lay their eggs on no other plants than those of the wheat genus, is also true: the only chance of escape is in the time the pupæ appear in the fly state: should the sunny weather bring them forward within a fortnight or three weeks from this date, the greater part will have perished before the wheat is in the ear, or should the earing take place before the fly appears, the late or spring sown wheat will suffer—but these appear slender chances. We know the history and habits of the insect too well to believe that either mist, or rain, or dew, or drought will either forward or retard their operations, if the main body appear about the time the wheat comes to the ear.'"

From my own observations I am convinced it is the same species of insect described above, that we have got here. I am not aware that it has been known in Canada before last year, and it appears to have multiplied prodigiously. Now that the wheat has got ripe and hard, the maggots have disappeared; it is only when the grain is in the soft and milky state they prey upon it, or rather upon the matter destined to form the grain. Wheat on new lands does not appear to have suffered so much as that on lands long cultivated; this I know by experience. My wheat was on new land this year, and has not been much injured; this circumstance should induce further inquiry, which might, perhaps, lead to the discovery of some remedy for an evil which may otherwise be a very great one here, where wheat is the principal crop that farmers cultivate.

I have the honor to be, sir, your obedient servant,

Cote St. Paul, August 13, 1834. WM. EVANS.

[*From the Quarterly Journal of Agriculture, Mechanics, &c.*]

THE RELATIVE PLEASURES AND PROFITS OF AGRICULTURE.

BY H. W. DELAVAN.

SIR,—I have received your letter of the 15th of March, and regret that neither my experience or ability is adequate to do justice to the vaious topics you have intimated relating to the subject of agriculture.

Since you have paid me the compliment to consult my opinions, I will endeavor briefly to state them, in a manner which will substantially constitute a reply to your several inquiries.

The pursuit of husbandry has not yet attained to the rank to which it is entitled in the northern portion of the United States—a rank which is conceded to it in some other sections of our country, and among the most enlightened nations of Europe. This circumstance will serve to retard advances in the most useful avocation, which a higher estimate on the part of the enlightened classes of our citizens could not fail to create. Yet it cannot be doubted that this department of life will more and more be sought for, its intrinsic advantages, presenting, as it does, a healthful occupation to mind and body, and a stability which no other pursuit can equal. It migh seem invidious to institute comparisons among the several occupations incident to civilized life. Let it suffice that each has its appropriate usefulness, and that husbandry is not the least useful or least honorable among them. Many illustrious men have borne testimony to the diversified pleasure of rural life, and that it affords occupation to the most enlarged capacity.

In reply to the question, whether "capital may be properly invested in cultivated land," I confidently answer *it can; and I am of the opinion, that in no other way can a moderate fortune be so profitably employed.* In adopting this conclusion I am supposing the objects to be safety, productiveness, comfortable life, pleasant occupation, the education of children, and the transmission of property to descendants.

It may, on a superficial view appear paradoxical, that the cultivation of land can compete in profits with the adventures in commerce, or the operations of machinery. It is the greater uniformity in the products of land contrasted with the ever fluctuating character of commerce and manufactures, which establishes the point in question. If it be true, as is asserted, that in our own country, every twenty years witnesses the *insolvency* of the whole aggregate trading community, what does it not argue in favor of a pursuit in which a man need never fail?

The habits of expense, engendered by commerce, constitute a heavy annual levy upon the income of the prosperous merchant. Those habits are too likely to survive the prosperity which fostered them, than which a more deplorable condition cannot well be imagined.—But he who resides on a landed estate, and practises assiduity, and evinces the intelligence of the merchant, the manufacturer or professional man, may sustain himself during periods of depression without diminution of capital at any rate. His habits are frugal, which is equivalent to wealth; his daily occupation is a lesson of economy, a term seldom addressed and never palatable to American ears; a virtue as far removed from meanness as it is from prodigality, the more general practice of which could not fail to give greater stability to private and public prosperity.

The trading classes usually incur debts beyond the capital possessed by them, and frequently, credit alone is the expedient relied upon. The farmer of even small possession need incur no debts; this difference is vital, and gives to the land proprietor a guarantee of success and certainty which other classes cannot possess. My object in the preceding remarks, is to inculcate the idea, that to those who are in circumstances to elect their mode of life, agricultural pursuits are the most eligible. But in order to succeed in husbandry in the condition of things existing among us, the proprietor must vigilantly conduct his own affairs; he may hire men to labor, but he cannot so readily hire them *to think.* A man with us, who has a small respectable capacity, will become a small proprietor rather than a hireling. Agriculture is *not an amusement*, more than law or commerce are such; and what lawyer or merchant could dream of success while leading a life of idleness or pleasure.

Agriculture is not incompatible with mental cultivation; it is favorable to virtue, as the farmer knows nothing of the strifes and rivalries, which grow out of competition in other pursuits, and which lead men to look with an evil eye upon the prosperity or skill of a neighbor. The country resident escapes many of the time-destroying frivolities of the town, and, on the other hand, has fewer of the social advantages which conduce to refinement. These things may be offset to the freedom and healthfulness of rural existence, where man draws less of his satisfaction from others, and more from himself and the works of God, divested of the conventional rules which constitute an artificial existence.

There is one part of your letter which I deem it important to notice, the most pactical part, and relates to the articles of culture which an agriculturist should select as his own, among the many. * * * * * * * *

In determining the objects of culture to which a person attempting farming should select as primary, the circumstances of soil, position, and the price of land, should govern. In western New-York, wheat is the great staple, for the reason that much of the soil of that region is well adapted to its production. The Hudson river counties, on the contrary, seem, by the variety of soil, to be favorable to the dairy, wool-growing, and stock generally, as also to the growth of all the grains produced in a northern latitude.

What is denominated *convertible husbandry*, or rotation of crops is the improved feature in modern husbandry, as it conduces to the constant improvement of land; and while it diminishes labor it increases products. Neither grazing nor cropping, exclusively, can be deemed judicious, as both, when combined, are admirably calculated to aid each other, the former supplying manures to give a profitable effect to the operations of the plough; and besides, the regular employment given to laborers at all seasons, by uniting the different parts into one system, is an advantage which every economist will appreciate.

In conclusion, I would decidedly discourage amateur farming, as it usually is brief in its history, and disastrous in its results. But to such as seek rational employment where a comparative independence may be enjoyed, I would recommend agriculture.

If I may be allowed to speak of my individual undertakings, I would say that an investment of a large sum in the course of a few years, in lands, improvements, and animals, commenced in inexperience, and misdirected by ignorance, my anticipations of profit have not been disappointed. The nature and magnitude of the trust have tied my attention to its accomplishment, and I have the satisfaction of finding my income yearly increasing, and my expenditures diminishing. I am sir, yours, &c.

Ballston, May 1, 1834. HENRY W. DELAVAN.

On Pickling Seed Grain.—This process is indispensably necessary on every soil; otherwise smut, to a greater or less extent, will, in nine cases out of ten, assuredly follow. Though almost all practical farmers are agreed as to the necessity of pickling, yet they are not so unanimous as to the *modus operandi* of the process, and the article which is best calculated to answer the intended purpose. Stale urine may be considered the safest and surest pickle; and where it can be obtained in sufficient quantity is commonly resorted to. It is either used as a steep, or sprinkled upon the grain. Some again are advocates for a pickle made of salt and water, sufficiently strong to buoy up an egg, in which the grain is to be thoroughly steeped. But whatever difference there may be as to the kind of pickle that ought to be used, and the mode of using it, all agree in the utility of mixing the wetted seed with *hot lime* FRESH SLAKED; and this, in one point of view, is absolutely necessary, so that the seed may be equally distributed. There is some danger from the first of these modes; for if the seed steeped in urine is not immediately sown, it will infallibly lose its vegetative power.—*New Edin. Encyc.*

Young Men's Department.

IMPORTANCE OF SCIENTIFIC KNOWLEDGE TO THE YOUNG FARMER.

The diseases of cattle.—This is an important subject. There is no individual of many years experience in farming, who has not suffered severe losses from the death of horses, cows or sheep. Diseases amongst sheep are perhaps the most common and most extensive, and to whom is the cure of them entrusted? Generally to a laboring man, who has not the remotest knowledge of the several organs which compose the animal frame, or of their functions, and whose education has not fitted him to reason correctly even upon the few facts which he knows. What should we think of entrusting our friends or relations in sickness to a man who had studied no more of anatomy or medicine than a shepherd? And the mischief is not confined to their ignorance of the true remedy. Ignorant men are the most irreclaimable theorists. They attribute disorders to the most fanciful cause, and then, from their assumed and absurd premises, they argue away to a conclusion as hard as a geometrician. I have heard many striking instances of this from a friend of mine, who is himself both a physician and a philosopher. One poor patient laid the blame of his sufferings upon a cause which few would have thought of. "Sir," said he, "*it is the wind meeting the digester;*" and no doubt his remedy would have been to put some covering round the digester to keep the wind away. Another poor fellow was troubled with a "*rising of the lights;*" and being asked whether he had taken any thing for it, "yes," he said, "*he had swallowed some shot to keep them down.*" And I beg to assure the incredulous, that this is an extremely common disease and remedy in this neighborhood; and these are the very men who prescribe for our sheep! Formerly it was common to ascribe diseases to the direct operation of the devil, and of course the cure was co-relevant to the assigned cause. "Touching the heart and liver, if a devil or an evil spirit trouble any, we must make a smoke thereof before a man or a woman, and the party shall be no more vexed, and the devil shall smell it and flee away, and never come again any more." And the story goes on to say, that in Tobet's case the evil spirit fled, when he had smelt it, into the utmost parts of Egypt. But I do not suppose that this kind of fumigation would answer now a days. But *revanons a nos moutons*, or rather let us proceed with the horses, with which, indeed, the case is not much better. If you send for a farrier, the message not unfrequently is, that he cannot come to see the horse to-night, but that he has sent him a drink, and will come and see him in the morning. Now, try this system by the same test:—How would you like it yourself? You are suddenly attacked with a violent complaint, and you send for the physician. He never saw you perhaps in his life, and knows nothing whatever about what is the matter with you; but he sends his compliments and desires you to take a dose of Daffy's elixir; and if your complaint be what is very common with horses, viz. inflammation of some of the viscera, this dose will probably finish you, as out of all doubt it has finished many an unfortunate quadruped. Not that the absence of the farrier signifies much; he probably does not know a bit the less of the disease on that account. The study of horse medicine and surgery has no doubt made much greater progress than that of cows and sheep, and some of its professors are men of sense and education; but how few are they compared to those of an opposite character. It was said with much spirit and truth, by an old physician, that in all cases of illness there were three things to consider—the patient, the disease and the doctor; and that if any two of them pulled well together, they would be able to beat the third. In the case I have been supposing, it is the disease and the doctor against the patient.

"Cows, again, stuff themselves with cabbage, or other succulent food, which by and by ferments, and gives out a great deal of carbonic acid gas; the stomach becomes distended, and if relief be not speedily afforded the animal dies. Many a valuable creature has perished in this way, whose life might have been saved if the owner had been chemist enough to know what would stop the fermentation, or had been provided with mechanical instruments for drawing off the gas. And these attacks are sudden—remedies to be useful must be near. There is no time to fetch the doctor, even supposing him to be worth fetching. The owner himself must know what to do, and how to do it. It is not proposed to make every farmer an accomplished surgeon; that would be impossible; but it is not impossible, and it would not be useless, to teach him at school, [or for him to teach himself afterwards,] something of the structure, and diseases of the animals on whose health his fortune depends; something of the symptoms by which those diseases are indicated, and something of the operation of the most important medicines. Being so constantly slaughtered for domestic purposes, there never would be wanting opportunities for studying their organization. In Holland, above 500,000 cattle are known to have died of disease within twenty years. At £10 a piece, this would come to £250,000 ($1,110,000) a year. The tenth part of one year's loss upon this article of cows alone, would be enough to put into operation throughout the whole kingdom, schools, which would create ten times as much wealth annually as we ever lost by the death of cows. If the money laid out in diffusing knowledge produced a return of only one hundred fold, it would be certainly an eligible investment; but a hundred fold would be little, compared with its eventual products.

"*Mechanics.—The art of producing a given result with the smallest expense of power.*—It is very important to make power go as far as possible, because it is the dead weight upon a farm. Horses eat and drink, but produce neither meat nor wool. Perhaps the best way to show the value of this kind of knowledge, is to point out the losses attendant on its absence. Every body must have seen ploughs so illy constructed as to require three hoases to draw them through a soil which might have been worked well enough with two in a plough of the improved pattern. Instead of a sharp edge, contrived to cut the ground, and a well-formed mould-board to turn it over, you may sometimes see a blunt edge dragged slowly through the soil, to the intolerable fatigue of the cattle, as well as the rapid destruction of the plough and harness; but little work is done, and that little in a slovenly and expensive manner. Carts and wagons too are susceptible of great improvement; their more common faults are their weight—the friction of the axle, the dishing of the wheels, and the want of springs; the consequence is, that a horse is jaded and knocked up by what would, under more skilful management, have been an easy day's journey. An acquaintance with mechanics would also induce a man to pay more attention to the state of the roads. But besides carts and ploughs, we are every day producing fresh machinery. We thrash, dress, plant and sow by its aid, and though of no very intricate construction, these machines are somewhat more so than the old farming implements. The farmer is not expected to neglect his labor to study their principles, and he is not up to his work unless he can tell whether his tools are well or ill made, and can see the cause of any defect in their workings. If, by a little there and here, a man can save the labor of one horse on a farm, it is a great thing. The multitude of machines which are rising like meteors around us, should, in this branch of science at all events, unteach us the foolish vanity of supposing our present practice to be the best possible. In the West Indies they are no doubt as well convinced of the excellence of their agriculture as we are, and they have not generally introduced either the plough or the wheel-barrow! My authority for this is the writer of a lively sketch of their manners and customs, entitled, "Marley, or a Planter's life in the West Indies." He says, "After a week or five days of this kind of labor, very distressing to the people, few acres indeed were gone over, although there were rather more than 100 negroes employed, one day with another, digging only the holes in the ground. *Had the ground been previously tilled, with the plough*, an amazingly greater quantity of those holes would have been made in one day than it was possible for the people to effect in three or four in the manner in which they worked." "To carry the manure to the required spot was the task of the negresses, and the weak negroes, who, with some little help at the manure heaps, had to fill their baskets and then carry them on their heads, at a pretty smart pace, and empty them in the holes. This employment of bearing the manure none of the carriers relished, but the stimulus of the whip, and the daily encouragement of a glass of rum, effected wonders. *Had the people been furnished with wheel-barrows*, they would have performed their tasks with ease."

"It need not be inferred from this, that I suppose our practice to be as faulty as theirs. It is adduced for no other purpose than to arouse people from the lethargic dream in which we are all too apt to indulge, that the established practice is the *ne plus ultra* of perfection."—*Mr. Hawkins in the Quarterly Journal of Ag.*

LIFE OF FRANKLIN.

We now give, as we promised, some account of the rules which Franklin adopted to regulate his conduct in life; and in doing this, we shall quote his own words.

"It was about this time I conceived the bold and arduous project of arriving at *moral perfection;* I wished to live without committing any fault at any time, and to conquer all that either natural inclination, custom, or company, might lead me into. As I knew, or thought I knew, what was right and wrong, I did not see why I might not *always* do the one and avoid the other. But I soon found I had undertaken a task of more difficulty than I had imagined; while my attention was taken up, and care employed in guarding against one fault, I was often surprised by another; habit took the advantage of inattention; inclination was sometimes too strong for reason. I concluded at length that the mere speculative conviction, that it was our interest to be completely virtuous, was not sufficient to prevent our slipping; and that the contrary habits must be broken, and good ones acquired and established, before we can have any dependance on a steady uniform rectitude of conduct. For this purpose I therefore tried the following method:

In the various enumerations of the *moral virtues* I had met with in my reading, I found the catalogue more or less numerous, as different writers included more or fewer ideas under the same name. *Temperance*, for example, was by some confined to eating and drinking; while by others it was extended to mean the moderating every other pleasure, appetite, inclination, or passion, bodily or mental, even to our avarice and ambition. I proposed to myself, for the sake of clearness, to use rather more names, with fewer ideas annexed to each, than a few names with more ideas; and I included under thirteen names of virtues, all that at that time occurred to me as necessary or desirable; and annexed to each a short precept, which fully expressed the extent I gave to its meaning.

These names of *virtues*, with their precepts, were:

1. TEMPERANCE.—Eat not to dullness; drink not to elevation.
2. SILENCE.—Speak not but what may benefit others or yourself; avoid trifling conversation.
3. ORDER.—Let all your things have their places; let each part of your business have its time.
4. RESOLUTION.—Resolve to perform what you ought; perform without fail what you resolve.
5. FRUGALITY.—Make no expense but to do good to others or yourself; i. e. waste nothing.
6. INDUSTRY.—Lose no time; be always employed in something useful; cut off all unnecessary actions.
7. SINCERITY.—Use no hurtful deceit; think innocently and justly; and, if you speak, speak accordingly.
8. JUSTICE.—Wrong none by doing injuries, or omitting the benefits that are your duty.
9. MODERATION.—Avoid extremes; forbear resenting injuries so much as you think they deserve.
10. CLEANLINESS.—Tolerate no uncleanliness in body, clothes, or habitation.
11. TRANQUILLITY.—Be not disturbed at trifles, nor at accidents common or unavoidable.
12. CHASTITY.—Rarely use venery, but for health or offspring; never to dullness or weakness, or the injury of your own or another's peace or reputation.
13. HUMILITY.—Imitate *Jesus* and *Socrates*.

My intention being to acquire the *habitude* of all these virtues, I judged it would be well not to distract my attention by attempting the whole at once, but to fix it on *one* of them at a time; and when I should be master of that, then to proceed to another; and so on till I should have gone through the thirteen; and as the previous acquisition of some, might facilitate the acquisition of certain others, I arranged them with that view as they stand above. *Temperance* first, as it tends to procure that coolness and clearness of head, which is so necessary where constant vigilance was to be kept up, and a guard maintained against the unremitting attraction of ancient habits and the force of perpetual temptations. This being acquired and established, *Silence* would be more easy; and my desire being to gain knowledge at the same time that I improved in virtue; and considering that in conversation it was obtained rather by the use of the ear than of the tongue, and therefore wishing to break a habit I was getting into of *prattling, punning* and *jesting*, (which only made me acceptable to trifling company) I gave *Silence* the second place. This and the next, *Order*, I expected would allow me more time for attending to my project and my studies. *Resolution* once become habitual, would keep me firm in my endeavors to obtain all the subsequent virtues. *Frugality* and *Industry* relieving me from my remaining debt, and producing affluence and independence, would make more easy the practice of *Sincerity* and *Justice*, &c. &c.—Conceiving then, that agreeably to the advice of Pythagoras in his Golden Verses, daily examination would be necessary, I contrived the following method for conducting that examination.

I made a little book, in which I allotted a page for each of the virtues. I ruled each page with red ink, so as to have seven columns, one for each day of the week, marking each column with a letter for the day. I crossed these columns with thirteen red lines, marking the beginning of each line with the first letter of one of the virtues; on which line, and in its proper column, I might mark by a little black spot, every fault I found upon examination to have been committed respecting that virtue, upon that day.

FORM OF THE PAGES.

INTEMPERANCE.
Eat not to dullness: drink not to elevation.

	Sun.	M.	T.	W.	Th.	F.	S.
Tem.							
Sil.	*	*		*		*	
Ord.	*	*	*		*	*	*
Res.		*				*	
Fru.		*				*	
Ind.			*				
Sinc.							
Jus.							
Mod.							
Clea.							
Tran.							
Chas.							
Hum.							

I determined to give a week's strict attention to each of the virtues successively. Thus in the first week, my great guard was to avoid every the least offence against *Temperance;* leaving the other virtues to their ordinary chance, only marking every evening the faults of the day. Thus, if in the first week I could keep my first line marked T. clear of spots, I supposed the habit of that virtue so much strengthened, and its opposite weakened, that I might venture extending my attention to include the next; and for the following week keep both lines clear of spots. Proceeding thus to the last, I could get through a course complete in thirteen weeks, and four courses in a year. And like him who having a garden to weed, does not attempt to eradicate all the bad herbs at once, (which would exceed his reach and his strength,) but works on one of the beds at a time, and having accomplished the first, proceeds to a second; so I should have (I hoped) the encouraging pleasures, of seeing on my pages the progress made in virtue, by clearing successively my lines of their spots; till in the end, by a number of courses, I should be happy in viewing a clean book, after a thirteen weeks' daily examination.

This my little book had for its motto, these lines from Addison's Cato:

> "Here will I hold; if there's a power above us,
> (And that there is, all nature cries aloud
> Through all her works;) he must delight in virtue;
> And that which he delights in must be happy."

Another from Cicero:

"O vitæ philosophia dux! O virlutum indagatrix expultrixque vitiorum! Unus Dies bene, it ex præceptis tuis actus, paccanti immortalilati est anteponendus."

Another from the Proverbs of Solomon, speaking of wisdom or virtue:

"Length of days is in her right hand, and in her left hand riches and honor. Her ways are ways of pleasantness, and all her paths are peace."

And conceiving God to be the fountain of wisdom, I thought it right and necessary to solicit his assistance for obtaining it; to this end I formed the following little prayer, which was prefixed to my tables of examination, for daily use:

"O powerful goodness! bountiful father! merciful guide! Increase in me that wisdom which discovers my truest interest; Strengthen my resolution to perform what wisdom dictates: Accept my kind offices to thy other children, as the only return in my power for thy continual favors to me."

I used, also, sometimes, a little prayer, which I took from Thomson's poems, viz:

> "Father of light and life, thou God supreme!
> O teach me what is good; teach me thyself!
> Save me from folly, vanity and vice,
> From every low pursuit; and fill my soul
> With knowledge, conscious peace, and virtue pure;
> Sacred, substantial, never-fading bliss!"

THE CULTIVATOR—NOV. 1834.

TO IMPROVE THE SOIL AND THE MIND.

ELEMENTS OF PRACTICAL AGRICULTURE.

We have received a highly valuable volume under this title, from the pen of David Low, Esq. Professor of Agriculture in the University of Edinburgh—comprising *The Cultivation of Plants—the Husbandry of the Domestic Animals, and the Economy of the Farm.* This volume is peculiarly adapted to every class of men engaged in agriculture, or who are about to engage in its labors, and particularly to the instruction of young men who are emulous to excel in this healthful and independent employment. It is so well suited to the wants of our country, that we avail ourselves of the earliest opportunity of extracting from its pages, and intend to continue to extract from them as our limits will permit, such portions as seem best adapted to improve our practice.

"In describing a system of agriculture," our author observes, "it is important, that while it is one which admits of being carried into easy effect, it shall be as perfect as, under this necessary condition, it can be rendered. A rude system of practice will not serve the purpose of useful example. Although the agriculturalist may not be able to reach in all things, the model proposed to him, it is yet important that this model be good in itself, so that his own practice may become as perfect as the circumstances in which he is placed will allow." "The attention of the reader is mainly directed to the essential parts of practice; and while the connexion of agriculture with other branches of knowledge is carefully pointed out, this is in most cases done rather to show the relation between them, than to pursue the subject in detail."

"The application of science to agriculture affords the materials of interesting and useful study. Chemistry ascertains the nature and constituents of soils, the mode of action of manures, and the substances fitted for the nutrition of plants; Botany and Vegetable Physiology treat of the structure, the properties, and the use of plants; animal physiology and Medical Science relate to the form of animals, their properties and diseases; and Mechanics are applied to the construction of machines and rural works."

Clover may always be sown upon small grains with profit. We sowed clover upon four acres of rye and two of barley last spring, and notwithstanding the dry weather, it took well. After pasturing the rye stubble some ten or fourteen days, the autumn feed was sold for $12.50. The barley ground has afforded an abundance of fine feed. Say the six acres required a bushel of seed, at $6, and that the fall feed was worth $18, there will be a profit of $12, or $2 per acre. But the clover lay will furnish at least 30 tons of vegetable food to the next season's crop, if turned under the first of May, which will be no inconsiderable increase to the profits. These littles will make up a handsome aggregate upon a farm in a few years; and there is no economy of this kind which should be considered beneath a farmer's notice. "A penny saved is as good as two-pence earned," as Poor Richard says.

There is one strong reason for using long or unfermented manure for hoed crops, which chemistry furnishes: When the manure begins to rot, it affords to plants moisture as well as food. Unfermented manure consists principally of carbon, oxygen and hydrogen, in a solid form; and these simple substances, too, are to become the constituents of the new plant. But ere they can be incorporated with the new plant, they must be separated from each other, and be reduced to a liquid or gaseous state. As soon as this decomposition begins, two new compounds are formed by chemical process; a part of the oxygen unites with the carbon, and this always in certain proportions, and forms carbonic acid, the principal food of plants. The remainder of the oxygen unites with the hydrogen, and forms water, which serves as a medium to convey this food to the mouths of plants. Thus the whole of the dead plant is transmuted into the living one. Hence soils in which manures are undergoing decomposition, suffer least from drought; hence moisture always abounds under a decomposing mass of straw; and hence I have raised upon a dry sandy soil, and during the last very dry and hot summer, a fine crop of melons, on a layer of 18 inches of straw, deposited dry in a trench, and covered with six inches of earth. The straw became completely decomposed. We would apply these remarks to hoed crops, because long manure is apt to be prejudicial to all the small grain crops, by causing too rank a growth of straw; but it is peculiarly adapted to Indian corn, potatoes, ruta baga, and all the crops raised for the stock or root. We would also admonish against using long manure, especially in a dry state, in hills or in drills, for if the season is dry, decomposition does not take place. But spread, and ploughed under, it will take place in due time on the sandy, gravelly and loamy soils adapted to corn, ruta baga, &c.

To test the quality of Gypsum—for there is a material difference in this mineral—there are two modes recommended, both within the reach of the common farmer. One consists in putting a quantity of it pulverized into a kettle over the fire, and when heated it gives out a sulphurous smell. If the ebullition, or bubbling, which takes place, is considerable, the plaster is good; but if not, it is considered indifferent: and if it remains motionless, like sand, it is thought to be hardly worth any thing.—(*Parkinson.*) The other test of its goodness is obtained by putting the powder alone into an iron pot over the fire, and when it bubbles, like boiling water, it will admit of a straw being trust to the bottom without resistance.

Transplanting.—I have often smiled with incredulity, at Cobbett's suggestion, that plants of cabbages, strawberries, &c. may as well be put out at meridian of a hot sunny day, as during a rain; but I begin to concur with him in opinion, provided the plants are first grouted, and well watered at evening following. Yesterday and the day before, (August 6th and 7th,) the thermometer ranging at 85 to 92 degrees, the sun constantly shining, and during an extremely severe drought, my gardener was employed in planting out strawberries and cellery, the plants being first divested of their larger leaves, grouted and afterwards watered. They have received no covering, and yet they have hardly wilted, and now appear nearly as fresh as those which have been left in the nursery beds. I do not think I shall lose a plant in two thousand.* My reasoning is this, that the plants, when taken up, being almost wholly devoid of moisture, and the ground extremely warm, the water with which they were supplied, imparted a remarkable vigor to them, and induced them to throw out new fibrous roots in a few hours after they were put into the ground. *To grout plants*, take any small vessel, or dig a hole eight or ten inches in diameter in the ground, put into it water and stir in earth till the mixture is of the consistence of porridge; into this dip and fully saturate and coat the roots of the plants. Plant with a *dibble*, a piece of a hoe or spade handle, 15 inches long, sharpened at one end; make a hole with this of sufficient depth for the plant, insert the roots, then enter the dibble a second time, an inch or two from the first hole, directing its point to the bottom of that hole, and when low enough, press the top of the dibble briskly up to the plant, thus bringing the earth in contact with all the roots, and afterwards closing the first hole. I have seen 500 plants put out in 30 minutes, in this way, by an expert man, the plants being dropped for him.

Canaan Centre, Oct. 27th, 1834.

J. Buel, Esq.—Sir—I send you the result of a trial I made on the different methods of curing corn. Soon after the first frost that injured corn leaves, I cut off two rows through a small piece by the ground, and set them up around standing hills, in the usual way.—On four adjoining rows, two on each side, I topped four hills and left four without topping. On gathering it, I was very particular to keep each parcel by itself, and weigh them accurately, and found the result as follows: On the hills not topped, which were equal to two entire rows, I had two hundred and sixty-seven and one-fourth pounds. On the same number of hills topped, I had two hundred and forty pounds, and on the two rows cut off by the ground, I had two hundred and sixty-one pounds.

In trying the above experiment, I have satisfied myself that I, as well as most other farmers, have been wrong in supposing that topping corn would facilitate the ripening, as what I topped was evidently not as sound, and had more soft ears than either of the other parcels.

DANIEL S. CURTIS.

TOASTS DRANK AT CATTLE FAIRS IN MASSACHUSETTS.

Our anniversary celebration—Its foundation is the earth, its support industry, temperance and enterprise.

Two modern scourges—The Asiatic cholera and the ultra party spirit—both spasmodic and fatal. The first produces physical, the other moral and political death.

The present generation—With our cup of blessings running over, we are dissatisfied and are destroying our best institutions, in the vain hope of the golden egg.

The high party press—A sort of safety valve, through which high pressure politicians corrupt the political atmosphere by letting off their gas, till at length they burst their own boilers and blow themselves sky-high.

Fat cattle and fat offices—The one fills the farmer's pockets, the other empties them.

The working class of our citizens—Our *support* in peace, and *defence* in war. The bone and muscle of a Republic is the product of its soil.

The yeomenry of Massachusetts—In their selection of an overseer and other agents for the *State Farm*, should they exercise the discretion they evince in the concerns of *their own*, the *best* will be employed.

CUTTING GRAIN BEFORE RIPE.

For seed, we believe it is recommended to let wheat become fully ripe. For flour, Mr. M'Culloch says:—"I had a part of my wheat field cut about ten days sooner than the residue—it was kept separate, and when recently brought to the mill with the wheat cut from the same field at the usual time, the early cut wheat weighed two pounds to the bushel heavier than the other. The flour made from it (there were ten bushels) is remarkably fine, equal to any I ever had in my family, and superior to any I have had this year from any other wheat. I think it proper to make these facts known although I would not say that a single experiment like this ought to establish a general rule."

* Sept. 12. On carefully looking over the plants, I find that nine have died.

Elements of Practical Agriculture,

By David Low, Professor of Agriculture, &c.

1. SOILS.

1. *The Classes of Soils, and their properties, as determined by external characters.*

The Soil is the upper portion of the ground in which plants are produced. It forms a stratum of from a few inches to a foot or more in depth. It is usually somewhat dark in colour, arising from the mixing with it of the decomposed stems, leaves, and other parts of plants which had grown upon it, and in part often by the presence of animal substances. It is this mixture of organic bodies, in a decomposed or decomposing state, with the mineral matter of the upper stratum, which distinguishes this stratum from the subjacent mass of earth or rock, to which the term subsoil is applied. The decomposable organic portion of the soil may be termed *mould;* and it is the presence of mould, accordingly, which distinguishes the soil from the subsoil.

Soils are very various in their fertility and texture. With relation to their power of producing useful plants, they may be termed rich or poor: with relation to their texture, they may be termed stiff, and free or light. The stiff soils are those which are tenacious and cohesive in their parts; the light or free soils are those which are of a looser texture, and whose parts are easily separated. But the cohesive soils pass into the loose, by imperceptible gradations, and hence, though all soils may be termed rich or poor, stiff or light, they are so in every degree of fertility and texture.

All soils which possess this tenacious or cohesive property in a considerable degree, are termed *clays*, or clayey soils; while all the looser soils are termed *light* or *free.* And all soils are more or less clayey, or more or less light, as they possess more or less of this tenacious or cohesive property or of this looser texture.

The fertility of soils is, *cœteris paribus*, indicated by the greater or smaller proportion of mould which enters into their composition. When soils are thus naturally fertile, or are rendered permanently so by art, they are frequently termed *loams*. Thus there are clayey loams and light loams; and peat itself may, by the application of labor and art, be converted into loam.

The parts of plants which grow upon the surface, and are mixed with the mineral matter of the soil may decompose and become mould. Uuder certain circumstances, however, the plants which have grown upon the surface do not decompose, but undergo a peculiar change, which fits them to resist decomposition. They are converted into what is termed peat, and the soils formed of this substance are termed *peaty.* The peaty soils are the lighter class, and are distinguished from all others by peculiar characters.

Soils, then, may be distinguished from each other:—

1st. According to their texture, in which case they may be divided into two classes—1, the stiff, denominated clays; 2, the light or free, comprehending the peaty.

2. According to their fertility or power of producing useful plants, in which case they are termed rich or poor.

Soils, too, from particular causes, may be habitually wet or habitually dry. Soils, therefore, may be further distinguished by their general relation to moisture. When water, from any cause, is habitually abundant, the soils may be termed wet; when not habitually abundant, they may be termed dry.

Subsoils, it has been said, are distinguished from soils properly so termed by the absence of mould. Plants, in growing, may extend their roots into the subsoil, and decomposing there, mix with it.—But this is in small quantity, and for the most part the subsoil is readily distinguishable by the eye, from the upper stratum or soil, by the absence of organic matter, in a decomposed or decomposing state.

Subsoils may either consist of loose earthy matter, like the soil, or they may consist of rock. Subsoils, therefore, may be divided into two classes, the rocky and the earthy.

When the soil rests directly upon and extends to the rock, without any intervening bed of looser earthy matter, the soil will frequently be found to be similar in the composition of its mineral parts to the rock upon which it rests, it having been formed by the gradual disintegration of that rock. This is chiefly found to be the case with the soils of mountains; for, in plains, the soil is generally formed, not by the disintegration and decomposition of the rock upon which it rests, but by the intermixing together of the disintegrated parts of different rocks and mineral strata.

The rocky subsoils consist of granite, sandstone, limestone, chalk, and other mountain rocks of a country. They are sometimes easily penetrated by the water that falls upon the soil, and are then termed free or porous; and sometimes they resist the percolation of water, when they are termed close or retentive.

The earthy subsoil, may, in like manner, be divided into the close or retentive, and the free or porous. The retentive are those which, from containing clay, are tenacious and cohesive in their parts, and little pervious to fluids: the porous are those which, having less of clay in their composition, are more readily permeable.

Whether the subsoil be retentive or porous, the soil which rests upon it should be of good depth. If the soil be shallow on a retentive subsoil, it is affected too greatly by the alternations of dryness and moisture. And if, again, a shallow soil rest upon a porous subsoil, the moisture of the soil is too easily acted upon and exhausted by heat.

A subsoil, in so far as mere texture is concerned, should be neither too retentive nor too porous. But although this intermediate condition is, in most cases, the best, yet in a very cold and moist country, a free or porous subsoil is, for the most part, to be preferred to one which is close and retentive. The soil besides being affected by the texture of the subsoil, is sometimes also affected by the nature of the mineral substances of which the subsoil is formed.

If the subsoil be rocky, it is desirable that it be calcareous rather than silicious,—chalk or limestone, for example, rather than quartz. Sometimes the subsoil contains matter which is directly injurious to the growth of plants. This matter is generally found to be the oxides of metals in combination with acids. Subsoils of this kind are usually distinguished by deepness of color.

Soils, then, it is seen, are affected in their properties not only by their own texture and composition, but by the texture and composition of the subsoil; and they are divided into the stiff or clayey, and the light or free.

The clayey soils have, as their distinguishing character, the adhesiveness of their parts; and this property alone will enable even the inexperienced to discriminate them. A stiff clay when dried either by natural or artificial heat, becomes so hard as to resist a considerable mechanical pressure. On account of the tenacity of such soils, they are tilled with more difficulty than the freer soils. They require, to fertilize them, a larger proportion of manures; but they retain the effects of these manures for a longer time. They are better suited to the cultivation of plants, with fibrous than with tuberous or bulbous roots. Soils of this class, as of every other, possess many degrees of natural fertility. The poor clays form, for the most part, a very unprofitable soil, because, while their powers of production are inconsiderable, the expenses of tilling them are large. The clay soils of this character are generally of little depth, and rest upon a retentive subsoil. The natural herbage they produce is coarse and little nutritious, and they are not well suited to the production of the cultivated grasses and other herbage plants. They are little fitted for the growth of turnips or other plants with bulbous and tuberous roots. Such soils have every where local names which sufficiently denote their qualities. They are termed, by a not improper figure *cold* soils; and sometimes they are classed under the general name *moor*, which term is often used to denote soils, whatever be their nature, of a low degree of fertility.

Very different in their value and nature, are the richer clays.—These bear weighty crops of all the cultivated kinds of corn:* they do not excel the better soils of other classes so greatly in the production of oats, and still less in that of barley, in which lighter soils loams may surpass them; but they are unequalled for the production of wheat, and in many places derive their descriptive appellation from that circumstance, being termed *wheat* soils. They are well suited for the growth of the bean,† a plant with a weighty stem, and requiring a stiff soil to support it. They will yield large returns of the cultivated grasses, and leguminous herbage plants,‡ though they are not so quickly covered with the natural herbage plants of the soil, when laid down to perennial pasturage, as the lighter soils.

Clays, like other soils, approach to their most perfect condition as they advance to that state which has been termed loam. The effect of judicious tillage, and of the application of manures, is to improve the texture of such soils, as well as to enrich them. Thus, clays in the neighborhood of cities become dark in their colour, and less cohesive in their texture, from the mixture of animal and vegetable matter, and thence acquire the properties of the most valued soils of their class.

Natural changes, however, yet more than art, have furnished the rich soils of clay. The best, for the most part, of the soils of clay, are those which are formed from the depositions of rivers or the sea. The finest natural soils of this and other countries are those which are thus formed. The deposition of rivers, indeed, are not always of a clayey nature. In mountainous districts, they generally form soils of the lighter kinds. Where the sea, however, is the agent or where both the rivers and the tides combine their action, the depositions generally partake of the nature of clay. Such alluvial soils have every where local terms to mark their character and fertility. On the great rivers and estuaries in England, and in what are termed *carses* in Scotland, fine and extensive districts of this kind exist.

The next class of soils is the light or free. These are readily distinguished from the last by their smaller degree of tenacity. They are less suited for the production of wheat and beans than the clays, but they are better suited for the production of plants cultivated for their bulbs and tubers, as the turnip and the potato.

This class of soils may be divided into two kinds, or sub-classes, differing from each other in certain characters, but agreeing in the common property of being less tenacious in their parts than the clays.

The first of these sub-classes of the lighter soils has been termed the sandy.

The sandy soils are of all the degrees from barrenness to fertility. When wholly without cohesion in their parts, they are altogether barren, and are only rendered productive by the admixture of other substances. The cultivated sands part readily with their moisture on the application of heat. They do not become hard like the clays, and, making no considerable resistance to external pressure, they are tilled with little labor.

The poorer sands are almost always marked by the scantiness of their natural herbage. This character they possess in common with the poorer gravels. Other soils, even the poorest, may be thickly covered with the plants peculiar to them; but the poorer sands and gravels put forth their natural herbs with a sparingness which denotes the absence of vegetable nourishment.

But sand, without losing its distinctive characters as a soil, may possess a greater cohesiveness in its particles, and be fertile by nature, or rendered so by art, and then the soils denominated sandy become of deserved estimation. Rich sands are early in maturing the cultivated plants, and thence they are familiarly termed *kindly* soils. They are fit for the production of every kind of herbage and grain. They yield to the richer clays in the power of producing wheat, but they surpass them in the production of rye and barley. They are well suited to the growth of the cultivated grasses; and, when left in perennial pasture, they are quickly covered with the natural plants of the soil. But their distinguishing character is their peculiar adaptation to the raising of the plants cultivated for the bulbs and tubers of their roots.*

The next division of the lighter soils, and allied in the character to the sandy, is the gravelly.

Sands will frequently be found to be the production of flat countries, gravels of the mountainous and rocky. The characteristic of the gravelly soils is the quantity of loose stones which they contain. These stones will be found to consist of those varieties of rock which the mountains of the country afford; and the nature of these rocks will frequently indicate the character of the soil; thus soils, of which the stony matter is very silicious, are generally found to be barren, while those of which it is calcareous, are found to be fertile.

Sands, upon examination, will be found to consist of small particles of stony matter, and thus sands may be said to differ only from gravels in the more minute division of their parts. Yet, in this minuteness of division, there is generally sufficient to distinguish the two kinds of soils. The stony matter of the sand forms its principal component part, while the larger stones in the gravel, which give to it its name and its character, seem only to be mixed with the other necessary parts of the soil. The stone of the one has undergone a

* This term applies in Europe, to wheat, barley and the other small grains, and not to Indian corn, as in the United States.

† The bean here alluded to is the horse bean, little cultivated here, and not the kidney bean which we grow.

‡ As peas, beans, &c.

* And to the culture of Indian corn.

considerable mechanical division, while much of that of the other has only been loosened, in sensible masses, from its native bed. Any light soil, mixed with a sufficient portion of stones, is gravel: and gravel, therefore, is nothing else than the different kinds of light soils, mixed with a greater or less proportion of stones.

Gravels, like sands, have all the gradations of quality, from fertility to barrenness. The loose soils of this nature, in which the undecomposed material is great, and the intervening soil silicious, are held to be the worst of their kind. These are in some places, termed *hungry* gravels, not only to denote their poverty, but their tendency to devour, as it were, manure, without any corresponding nourishment to themselves. As the texture and quality of the intervening earth improve, so does the quality of the entire soil; and gravels, like sands and clays, advancing through all the intermediate degrees, may become, at last, of great fertility. The rich gravels will produce all the cultivated kinds of grain. Their looser texture renders them less suited than clays to the growth of wheat and beans, but they are admirably adapted to the growth of barley and oats. They are quick in their powers of producing vegetation; and, from this quality, they are, in some places, termed *sharp* or quick soils. They readily admit of alternations of herbage and tillage, and improve in a state of perennial pasturage. They are generally trusty soils with regard to the quality of the grain which they yield; and in this respect, they differ from many of the sands, in which the quality of the grain produced docs not always accord with its early promise. It is well, then, even in the best sands, to see a tendency to gravel, which denotes a sharpness, as it is termed, in the soil. Gravels, like sands, are suited to the culture of the different kinds of plants raised for the bulbs and tubers of their roots; and they are in so peculiar a degree suited to the growth of turnips, that, in some parts, they receive the distinguishing appellation of *turnip* soils.

The last division of the lighter soils consists of those which are termed peaty.

The matter of the soils of this class is dark in its colour, spongy in its texture, and full of the stems and other parts of plants, either entire or in a state of partial decay. It is generally tough and elastic; and, when dried, loses greatly of its weight, and becomes inflammable. These, the most observable characteristics of the soils termed peaty, will distinguish them, in their natural state, from every other; and even when they shall have been greatly improved by culture, enough of their original characters will remain to make them known.

Peat, it has been said, consists of vegetable matter which has undergone a peculiar change. Under a degree of temperature not sufficiently great to decompose the plants that have sprung upon the surface, these plants accumulate; and, aided by a certain degree of humidity, are converted into peat, which is either found in strata upon the surface of plains, or accumulated in great beds upon the tops and acclivities of mountains, or in vallies, hollows and ravines. Successive layers of plants being added to the mass, it continues to increase, under circumstances favorable to its production. Water is a necessary agent in its formation, and we may believe too, a peculiar temperature, since it is only in the cold and temperate, and not in the warmer regions of the earth, that it is found to be produced. The plants which form it have not entirely decayed, but still retain their fibrous texture: and from the action of certain natural agents, have acquired properties altogether distinct from those which, in their former condition, they were possessed of. They have now formed a spongy, elastic, inflammable body, and so different from the common matter of vegetables, as to be highly antiseptic.

The plants whose progress towards decompositon has been thus arrested, are very various. Over the greater part of the surface of the primary and transition districts of colder countries, the peat is chiefly formed of mosses, and other cryptogamic plants, mixed with the heaths and other plants which had grown along with it. Sometimes the peat has been formed in swamps and lakes, and at other times the humidity of the climate has been sufficient to form it in one continued bed, covering the whole surface of the country.

Of the heaths which enter into the composition of peat, that hardy species the common ling, *Calluna vulgaris*, is the native inhabitant of the alpine countries of northern Europe, and grows in vigor, and overspreads the surface, where hardly any other of the larger plants could live. But although this and other species of heath are very generally converted into peat, this not necessarily or universally so. By the growth and decay of the roots and stems, a soil is indeed formed; but then this may take place in the same manner as in other soils, and without the actual conversion of the upper stratum into peat. This, however, in the case of the cold and moist countries of the north of Europe, is comparatively rare, for, generally the plants, from the slowness of decomposition of their ligneous roots and stems are wholly or partially converted into peat. In the cases in which, these plants are not converted into peat, a dry and turfy soil is formed, very different in aspect from that formed by the gramineous and other easily decomposed plants, but still produced in the same manner, though, like the peaty soils, elastic and inflammable, on account of the greater quantity of ligneous matter in its composition. The soil itself is generally thin and little favorable to vegetation. It usually rests upon a subsoil of silicious sand, and sometimes of chalk, and then it is comprehended under the class of soils termed light.

The soil formed of peat would, from its vegetable composition, seem to contain within it the necessary elements of fertility, and yet this is not found to be so. The excess of vegetable matter which it contains is injurious rather than useful. In the state of nature, it is often found to be as barren as the sand of the desert, and scarcely to deserve the name of soil until the labor of art has been extended to its improvement, and even then it is not entirely divested of its original characters.

The effect of thorough draining off the water of peat, continued for a long time, is to carry away the antisceptic matter which it contains. When the water of peat ceases to be turbid and comes off clear, then we have the assurance that the peat is freed of the principles injurious to vegetation. This is the greatest improvement of which peat is susceptible, and when we have brought it to this condition, the main difficulty of improving it has ceased.*

Peat may then be brought to the state of what has been termed loam. In this ameliorated condition it becomes a soil of the lighter kind, well suited to the culture of the larger rooted plants. It is dark in its colour like the richest vegetable loam, and to the experienced eye, may pass as such. But still, unless greatly corrected in its texture by the application of the earths, it is found to be porous and loose, too quickly saturated with moisture, and too easily freed from it. In this improved condition, it will yield bulky crops of oats and barley, although the quantity of the grain will not always correspond with the weight of the stem, nor the quality of the grain with its quantity.

Soils, then, we have seen, may be distinguished according to their texture and constitution, when they may be divided into two classes —the stiff or strong, denominated clays—the light or free, subdivided into the Sandy, Gravelly and Peaty; and all these again, may be distinguished,

1st. According to their powers of production, when they are termed Rich or Poor; and,

2d. According to their habitual relation with respect to moisture, when they are termed Wet or Dry.

This simple nomenclature of soils, is sufficiently intelligible to the practical farmer. The farmer chiefly regards soils with relation to their fertility, and the means of cultivating them, and he naturally classifies them according to these views. A main distinction between soils, in practice, is founded upon their comparative productiveness, and this is the distinction which is most important with regard to mere value. We constantly refer to soils with reference to their good or bad qualities, without adverting to the particular circumstances which renders them of good or bad quality. We speak familiary, for example of land worth 40s. 50s. and 60s. the acre, without considering whether it be a fertile clay, a fertile sand, or a highly improved peat. We speak of it with reference to its fertility and value alone. But those other distinctions, which are derived from its constitution and texture, are essential when we regard the manner of cultivating such a soil; for the same method of tillage, and the same succession of crops, as will be afterwards seen, do not apply to all rich or to all poor soils, but are determined by the character of the soil, as derived from its other properties.

Though soils are thus distinguished by external characters, they pass into each other by such gradations, that it is often difficult to say to what class they belong. These intermediate soils, too, are the most numerous class in all countries. The soils termed peaty, indeed form a peculiar class, always marked by distinctive charac-

* These characteristics of peat do not *generally* apply to the matters found in our swamps and marshes. We have no heaths, and the vegetable matter is more broken down by the heats of our summers than it is in the north of Europe. Draining, in most cases, converts our swamps into productive soils.

ters; but even these, when mixed with other substances, pass into the earthy soils, by imperceptible gradations. We may say, therefore that the great part of soil consists of an intermediate class, and that it is often difficult to bring them under any division, derived from their texture alone. Such soils, however, can always be distinguished by their powers of production. They are good, bad, or intermediate between good and bad; and their relative value is determined by the produce, which, under similar circumstances, they will yield.

Cattle Husbandry.

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ON THE POINTS BY WHICH LIVE-STOCK ARE JUDGED.

BY JAMES DICKSON.

Were an ox of fine symmetry and high condition placed before a person not a judge of live-stock, his opinion of its excellencies would be derived from a very limited view, and consequently from only a few of its qualities. He might observe and admire the beautiful outline of its figure, for that might strike the most casual observer. He might be pleased with the tint of its colours, the plumpness of its body, and the smoothness and glossiness of its skin. He might be even delighted with the gentle and complacent expression of its countenance. All these properties he might judge of by the eye alone. On touching the animal with the hand, he could feel the softness of its body, occasioned by the fatness of the flesh. But no man, not a judge, could rightly criticise the properties of an ox farther. He could not possibly discover, without tuition, those properties which had chiefly conduced to produce the high condition in which he saw the ox. He would hardly believe that a judge can ascertain, merely by the eye, from its general aspect, whether the ox were in good or bad health;—from the colour of its skin, whether it were of a pure or cross breed;—from the expression of its countenance, whether it were a quiet feeder;—and from the nature of its flesh, whether it had arrived at maturity or no. The discoveries made by the hand of a judge might even stagger his belief. He could scarcely conceive that that hand can feel a hidden property,—the touch,—which of all tests is the most surely indicative of fine quality of flesh, and of disposition to fatten. It can feel whether that flesh is of the most valuable kind; and it can foretell the probable abundance of fat in the interior of the carcass. In short, a judge alone can discriminate between the relative values of the different points, or appreciate the aggregate values of all the points of an ox. The parts of the ox by which it is judged are called "*points*."

We have thus seen that a person even totally ignorant of cattle may judge of some of the most apparent properties or points of a *fat* ox; but were a *lean* ox placed before him, he would be quite at a loss what opinion to pass on its present, and far more of its future, condition. The outline of its figure would to him appear rugged and angular, and consequently coarse. To him the body would feel a number of hard bones, covered with tough skin and coarse hair. A judge, on the other hand, can at once discover the good or the bad points of a lean as well as of a fat ox; because the properties of the former are the same in kind, though not in degree, as those of the latter; and in accordance with the qualities of these points, he can anticipate the future condition of the lean ox, save and excepting the effects of accidents and disease.

But, it may be asked, if a judge of cattle is a character so easily attained as is here represented, how is it that the opinion of a judge is always held in deference, and is always referred to in cases of difference of opinion? This question admits of a very satisfactory answer. Errors in the judging of cattle arise not so frequently from not knowing the points to be judged of, as from judges allowing one or more of their favorite points the power of too great an influence over the future increasing condition of the ox; and as long as there are so many points to be considered, and as most of them may be partially altered by local circumstances, a difference of opinion may exist among judges of lean stock.

Now, what are those *points* of an ox, a thorough knowledge of which is so essential to constitute a perfect judge? Could they be described and illustrated with such precision, as that they may be applied at once to every ox, in whatever condition it may be, a great advancement would be made towards establishing fixed rules for the right judging of all the domestic animals. Fortunately for the suppression of human dogmatism on this subject, Nature herself has furnished rules for ascertaining points for judgment, which can only be discovered by long and constant practice. Nevertheless, I shall endeavor to describe them plainly, and after perusing the description, I hope my readers will perceive that they are established laws of nature; and are therefore unerring and applicable to every species of cattle. Like other phenomena of nature, a knowledge of them can be acquired by observation. This knowledge is the most difficult which a farmer has to acquire, inasmuch as the management of live-stock is a much more difficult branch of husbandry than the cultivation of corn. And although the importance of this knowledge is acknowledged by every experienced farmer and a desire for its acquirement is strongly felt by every young one, it is remarkable that very little is said in professed works on agriculture on those rules which guide us in judging of fat or lean live-stock.

The first *point* to be ascertained in examining an ox is the *purity* of its breed, whatever that breed may be. The ascertainment of the purity of the breed will give the degree of the disposition to fatten in the individuals of that breed. The purity of the breed may be ascertained from several marks. The colour or colours of the skin of a pure breed of cattle, whatever those colours are, are always definite. The colour of the bald skin on the nose, and around the eyes, in a pure breed is always definite, and without spots. This last is an essential *point*. When horns exist they should be smooth, small, tapering, and sharp-pointed, long or short, according to the breed, and of a white colour throughout in some breeds, and tipped with black in others. The shape of the horn is a less essential point than the colour.

Applying these marks on the different breeds in Scotland as illustrations of the points which we have been considering, we have the definite colours of white and red in the Short Horns. The colour is either entirely white or entirely red, or the one or the other predominates in their mixture. The skin on the nose and around the eyes is uniformly of a rich cream colour. The Ayrshire breed in its purity is also distinguished by the red and white colour of the skin, but always mixed, and the mixture consists of spots of greater or smaller size, not blended together. The colour of the skin on the nose and around the eyes is not definite, but generally black, or cream coloured. In other points, those two celebrated breeds differ from one another more than in the characters which I have just described. In the West Highland, Angus, and Galloway breeds, the colour of the skin is mostly black in the animals of the purest blood, although red, dun, and brindled colours, are occasionally to be seen among them. The black colour of the skin of the nose and around the eyes is indicative of the pure blood of black-coloured cattle, but a cream-coloured nose may frequently be observed among the other colours of skin. It would perhaps be hazardous to assert, in the case of the West Highlanders, that the characters above given are the only true indications of the pure breed, for their origin cannot now be certainly determined; but the characters given will certainly apply to the purity of the blood in the Short-Horns and Ayrshire breeds.

The second *point* to be ascertained in an ox is the form of its carcass. It is found, the nearer the section of the carcass of a fat ox, taken longitudinally vertical, transversely vertical, and horizontally, approaches to the figure of parallelogram, the greater quantity of flesh will it carry within the same measurement. That the carcass may fill up the parallelogram as well as its rounded form is capable of filling up a right-angled figure, it should possess the following configuration. The back should be straight from the top of the shoulder to the tail. The tail should fall perpendicularly from the line of the back. The buttocks and twist should be well filled out. The brisket should project to a line dropped from the middle of the neck. The belly should be straight longitudinally, and round latterally, and filled at the flanks. The ribs should be round, and should project horizontally, and at right angles to the back. The hooks should be wide and flat; and the rump, from the tail to the hooks, should also be flat and well filled. The quarter, from the itch-bone to the hook, should be long. The loin-bones should be long, broad, and flat, and well filled; but the space between the hooks and the short-ribs should be rather short, and well arched over with a thickness of beef between the hooks. A long hollow from the hooks to the short ribs indicates a weak constitution, and an indifferent thriver. From the loin, the shoulder-blade should be nearly of one breadth; and from thence it should taper a little to the front of the shoulder. The neck-vein should be well filled forward, to complete the line from the neck to the brisket. The covering on the shoulder-blade should be as full out as the buttocks. The middle ribs should be well filled, to complete the line from the shoulders to the buttocks along the projection of the outside of the ribs.

These constitute all the *points* which are essential to a *fat* ox, and which it is the business of the judge to know, and by which he must anticipate whether the lean one, when fed, would realize. The remaining points are more applicable in judging of a lean than a fat ox.

The first of the *points* in judging of a *lean* ox, is the nature of the *bone.* A round thick bone indicates both a slow feeder, and an inferior description of flesh. A flat bone, when seen on a side view, and narrow, when viewed either from behind or before the animal, indicates the opposite properties of a round bone. The whole bones in the carcass should bear a small proportion in bulk and weight to the flesh, the bone being only required as a support to the flesh. The texture of the bone should be small grained and hard. The bones of the head should be fine and clean, and only covered with skin and muscle, and not with lumps of fat and flesh, which always give a heavy-headed dull appearance to an ox. The forearm and hock should also be clean and full of muscle, to endure travelling. Large joints indicate bad feeders. The neck of an ox should be, contrary to that of the sheep, small from the back of the head to the middle of the neck. The reason of the difference, in this respect, betwixt the ox and the sheep, is, that the state of the neck of the ox has no effect on the strength of the spine.

A full, clear and prominent eye is another *point* to be considered; because it is a nice indication of good breeding. It is always attendant on fine bone. The expression of the eye is an excellent index of many properties in the ox. A dull heavy eye certainly indicates a slow feeder. A rolling eye, showing much white, is expressive of a restless capricious disposition, which is incompatible with quiet feeding. A calm, complacent expression of the eye and face is strongly indicative of a sweet and patient disposition, and, of course, kindly feeding. The eye is frequently a faithful index of the state of the health. A cheerful clear eye accompanies good health; a constantly dull one proves the probable existence of some internal lingering disease. The dulness of the eye, arising from the effect of internal disease, is, however, quite different in character from a natural or constitutional phlegmatic dulness.

The state of the skin is the next *point* to be ascertained. The skin affords what is technically and emphatically called the *touch*,—a criterion second to none in judging of the feeding properties of an ox. The touch may be good or bad, fine, or harsh, or, as it is often termed, hard or mellow. A thick firm skin, which is generally covered with a thick set, hard, short hair, always touches hard, and indicates a bad feeder. A thin, meagre, papery skin, covered with thin silky hair, being the opposite of the one just described, does not, however, afford a good touch. Such a skin is indicative of weakness of constitution, though of good feeding properties. A perfect touch will be found with a thick, loose skin, floating as it were, on a layer of soft fat, yielding to the least pressure, and springing back towards the fingers like a piece of soft, thick, chamois leather, and covered with thick, glossy, soft hair. Such a collection of hair looks rich and beautiful, and seems warm and comfortable to the animal. It is not unlike a bed of fine soft moss, and hence such a skin is frequently styled "mossy." The sensation derived from feeling a fine touch is pleasurable, and even delightful, to an amateur of breeding. You cannot help liking the animal that possesses a fine touch. Along with it is generally associated a fine symmetrical form. A knowledge of touch can only be acquired by long practice; but after having acquired it, it is of itself a sufficient means of judging of the feeding quality of the ox; because, when present, the properties of symmetrical form, fine bone, sweet disposition, and purity of blood, are the general accompaniments.

These are the essential *points* of judging *lean* cattle; but there are other and important considerations which must claim the attention of the judge, in forming a thorough judgment of the ox.

The *proportion* which the extremities bear to the body, and to one another, is one of these considerations. The head of the ox should be small, and set on the neck as if it appeared to be easily carried by the animal. This consideration is of great importance in showing cattle to advantage in the market. The face should be long from the eyes to the point of the nose. No face can be *handsome* without this feature. The skull should be broad across the eyes, and only contract a little above them, but should taper considerably below them to the nose. The muzzle should be fine and small, and the nostrils capacious. The crown of the head should be flat and strong, and the horns should protrude horizontally from both sides of it, though the direction of the growth from the middle to the tip varies in the different breeds. The ears should be large, stand a little erect, and so thin as to reflect the bright sun-light through them. The neck should be light, tapering from the front of the shoulder and neck-vein, with a gradual rise from top of the shoulder to the head. The length of the neck should be in proportion to the other part of the animal; but this is a non-essential point, though I would prefer an apparently short neck to a long one, because it is generally well covered with the neck-vein. A droop of the neck, from the top of the shoulder to the head, indicates a weakness of constitution, arising frequently from breeding too near akin. The legs below the knee should be rather short than long, and clean made. They should be placed where they apparently bear the weight of the body most easily, and they should stand wide asunder. The tail should be rather thick than otherwise, a thickness indicates a strong spine and a good weigher. It should be provided with a large tuft of long hair.

The *position* of the *flesh* on the carcass is another great consideration in judging of the ox, the flesh on the different parts of the ox being of various qualities. That part called the spare-rib in Edinburgh, and the fore and middle ribs in London, the loins, and the rump or hookbone, are of the finest quality, and are generally used for roasts and steaks. Consequently the ox which carries the largest quantity of beef on these *points* is the most valuable. Flesh of fine quality is actually of a finer texture in the fibre than coarse flesh. It also contains fat in the tissue between the fibres. This arrangement of the fat and lean gives a richness and delicacy to the flesh. The other parts, though not all of the same quality, are used for salting and making soups, and do not fetch so high a price as the part just described.

A full twist lining the division between the hams, called the "closing," with a thick layer of fat, a thick flank, and a full neck-vein. are generally indicative of tallow in the interior of the carcass; but it frequently happens, that all these symptoms of laying on internal fat fail. The disposition to lay on internal fat altogether depends on the nature of the individual constitution; for, it is often observed, that those individuals which exhibit great fattening *points* on the exterior, do not fill with internal fat so well as others which want these points. On the contrary, thin made oxen, with flat ribs, and large bellies, very frequently produce large quantities of internal fat.

The first part which shows the fat in a feeding ox, is the point or top of the rump, which in high-bred animals, is a prominent point; sometimes it protrudes too much, as the mass of *fat* laid on these is out of proportion to the *lean*, and therefore useless to the consumer. This is the part which frequently misleads young or inexperienced judges in the true fatness of the ox, because fat may be felt on this part, when it is very deficient on most of the other points.

The parts on the other hand, which are generally the last in being covered with flesh, are the point of the shoulder-joint, and the top of the shoulder. If these parts are, therefore, felt to be well covered the other and better parts of the animal may be considered ripe. Ripeness of condition, however, can only be rightly ascertained by handling, for there is a great difference between the *apparent* and *real* fatness of an ox. The flesh of an apparently fat ox to the eye, may, on being handled by a judge, feel loose and flabby; but a truly fat ox always feels "hard fat." With such the butcher is seldom deceived, while loose handlers give no assurance of killing well.

It is proper in judging of the weight of a fat ox, to view his gait while walking towards you, which will, if the ox has been well fed, be accompanied with a heavy rolling tread on the ground. In this way a judge can at once come very near to its weight.

The application of all these rules and considerations to the judging of *lean* stock constitutes the chief difficulty to the judge. An ox, in high condition, in so far as its condition alone is under consideration, can be judged of, as we have seen, by any one; and sometimes the fatness may be so great as obviously to deform the symmetry to any observer. The superiority of a judge to others, in these cases, consists in estimating the weight, observing the purity of the blood, and valuing the points of the animal. But in judging of a lean ox, its future condition and symmetry must be foreseen. The rules which I have attempted to describe, will, if studied practically, enable an inquiring observer to foresee these points; and in judging between a number of valuable points, it should be remembered, that purity of breeding will always insure aptitude to fatten, which, in its turn, will insure the largest remuneration for the food consumed.

Sheep, both fat and lean, may be judged of by nearly the same rules. The purity of breeding will be seen in the large full prominent eyes, the clean thin bone of the head and legs, and the large thin pricked up ears, set on each side of the top of the head, and in the short, thick, smooth, clear hair of the face and legs. The section of the form of the fat sheep is even more mathematically like a parallelogram than that of the fat ox. The touch of the skin is also the same in kind, and is as sure an indication of the disposition to fatten as in the ox. In regard that wool varies so greatly in the many breeds of sheep, I can only make this general remark on the fleece best suited to every breed, namely, the whole body should be well covered with wool, with the exception of the face and legs, which are always covered with hair. A large covering of wool, not only protects them against the inclemencies of the weather, and the coldness and dampness of the ground, but it supplies a large fleece to be disposed of to the wool buyer. One deviation from the rules of judging cattle, must be made while judging sheep, to which I have already alluded, namely, while the neck of the ox should be thin, that of the sheep should be thick; because a thin necked sheep is found to possess a weak spine, and is generally a bad feeder. A thin neck has thus the same effects on sheep that a small tail has on cattle. As in cattle, a drooping neck in sheep indicates a weakness of constitution, arising from breeding in and in.

Some of the rules for cattle and sheep are applicable to swine. Swine should have broad straight backs, round ribs, thin hair, thin skin, small tails, short and fine muscles, pricked ears, small and fine bones, and round and well turned shoulders and hams.

In conclusion, it is obvious that these rules for judging live-stock are not founded upon arbitrary assumptions. Had no *natural* means of judging existed, man could no doubt have contrived rules to suit his own convenience; and in such a case, he would probably have chosen such as he could have most easily applied; but unless they could be applied to the *growing*, as well as to the *mature* condition of animals, they would be of little value. But we have seen that natural means of judging *do* exist, and although they cannot be easily understood without much observation and practice, yet, by practice they can be acquired, and easily applied to the existing circumstances of the animal, whatever these may be. Any person, it is true, cannot at once perceive that their necessary tendency is to lead to a correct judgment. Long and careful personal observation is requisite to convince the mind of their value in that respect. Tuition, without practical observation, cannot of itself do it. It has been the study of nature, in short, which has enabled man to establish these rules for his guidance; and as all the operations of nature are regulated by general laws, these rules must be of universal application. It is clearly established by observation, as an uniform principle of judgment, that when an ox, in a growing, state, presents a certain degree of purity of breeding, a certain form of body, and a certain kind of handling of its skin, a certain result is undeviatingly exhibited in the mature state from these given premonitory symptoms. Should this result conduce to the acquisition of wealth, we are anxious to possess the growing animal which exhibits such favorable points; and, on the other hand, we are as anxious to avoid the possession of that animal which exhibits unfavorable points, unless at a very depreciated value. Now, it has been ascertained by experience, that pure breeding, perfect form, and fine touch, make the best mature animal. Hence *these points* will insure both the growing and mature animal a ready market and good price; and hence also, that breed which constantly presents these points, deserves, by its intrinsic worth, to be generally cultivated.

Means of Inducing Fertility.

APPLICATION OF LIME.

Those purposes appear to be—first, to render whatever substances may be lodged in the soil, or matter which forms part of it, and which may be injurious to vegetation, either harmless or useful; and thus to prepare the soil for the reception and nourishment of seeds and plants: and secondly, to facilitate the decomposition of putrescible matter, so as to furnish food to vegetables during their growth. It has been proved by careful experiment, that the application of lime is the only known alterative which, upon poor, weak, and weeping clays, has power to heal the soil. With the assistance of water, it suddenly decomposes all animal and vegetable bodies, and when thus spread upon neglected ground covered with heath and moss, the old turf is decomposed, and a saponaceous matter is formed which sinks into the soil, and covers it with sweet herbage. We also know that it imparts a certain degree of vigor to some peculiar plants—as, for instance, sainfoin, the roots of which penetrate far into the interstices of chalk, and grow luxuriantly, though only covered by a slight coat of inferior soil.

It is however an error,—though entertained by many farmers,—to suppose that lime in any state comprises fertilizing properties within itself; and that, without operating upon the soil, or upon the substances which it contains, it is an enriching manure. It does not possess any fertilizing principle in its own composition; it is merely a calcareous earth combined with fixed air, and holding a medium between sand and clay, which, in some measure, remedies the deficiencies of both. But though, when alone, unfavorable to the growth of plants, yet experience shows that it is an ingredient in soils which, whether naturally forming a component part of their substance, so judiciously mixed with them by the husbandman, adds greatly to their fertility, for it has the power of attracting much both from the earth and from the air, which occasions the decomposition of plants, and thus converting them into nutriment, it gives power as to vegetation which, without its operation, would otherwise lie dormant. It also appears to act with great force upon that substance which, being already converted by the decomposition of plants into a species of earth, we call *mould*.

The other causes with which we are acquainted regarding the operation of lime as a manure would lead to a chemical discussion, which could only prove uninteresting to the generality of our readers; we shall therefore confine ourselves to the following observations.

There can be no doubt that it is a most powerful stimulant when applied to deep loams and heavy clays, which contain mould of a nature so sour as to appear to unfit them for the purposes of vegetation; or to land which has been previously either more or less manured with animal or vegetable substances, without any addition of lime or other calcareous matter, in which case it often produces effects far more fertlizing than the application of dung, for its active powers render every particle of the putrescent manure useful; but if the latter be not afterwards repeated at no great distance of time, the soil will, in the course of a few years, become considerably exhausted. In all arable land, however impoverished it may be, either by nature or bad management, there yet always exists some portion of mould, and, on this, a first dressing of lime occasions a sensible improvement of the soil, which soon becomes apparent in the increased product of the crops. A second dressing will also be attended with some apparently good effect; but unless that, and every succeeding repetition, be accompanied with ample additions of farm-yard manure, or other putrescent matter, to supply the loss thus occasioned by the exhaustion of the vegetative power, every future crop will be diminished. The land is then necessarily thrown out of cultivation, and left for a series of years to recover itself under pasture, which, in the course of time, may be effected according to its former condition; but in the interim it is rendered nearly fruitless. It is thus that many thousands of acres in every part of the kingdom have been run to a state of almost total infertility; and it is even said, that the too great use of lime, though apparently judiciously employed by some of the first farmers in the Lothians, has been lately found very detrimental to their crops.

Marsh lands, however, which have been drained, will generally support a repeated and abuudant application of lime, because they usually contain a large proportion of matter upon which the stimulating powers of lime are peculiarly adapted to act; and it will be found much better suited to the purpose than dung. On all rich, deep, dry, and loamy soils it may also be applied with effect; for although they contain within themselves the component parts of the best soils, yet they are frequently found to be sluggish and inert; and dung, whether through imperfect fermentation or owing to the want of calcareous matter, often remains dormant in the land until roused by moderate quantities of quick-lime, which, if applied at distant periods, will effectually operate to bring it into activity. It should, however, be turned into the ground some weeks before the dung, in order that it may become thoroughly slaked by mixture with the soil, or otherwise it would have the effect of abstracting some of its nutriment. Such soils, after the application of lime, produce much heavier crops with a much smaller proportion of dung than if no lime had been used, because the operation of the latter acting upon the dung renders every portion of it useful.

Clay land, shows an evident disposition to combine with lime, and it bears the repetition of this species of amelioration better than lighter soils. When applied to heavy tillage land, either for the purpose of reducing its cohesive properties, or of supplying an additional quantity of calcareous matter, small dressings of lime will have but little effect; and if sand or calcareous earths are to be employed, it is recommended, by a practical farmer of known experience, as more economical to apply them separately than as a compost. It powerfully assists all adhesive soils; and when laid hot from the kiln upon deep clay, it has been known to occasion a very large increase in the following crops. It has also been often observed, in fallowing clayey soils, "that, in wet weather, when a dose of lime has been just given, the land continues more friable, and is less apt to bind up on the recurrence of drought, than where it has been neglected. The grain growing on the well-limed ground preserves its healthy appearance in wet seasons, while that growing on land that has not been limed is yellow and sickly."

Upon *sandy soils*, which seldom abound much in vegetable matter, lime has a mechanical operation, which, by combining with the finer particles of the soil, gives consistence to the staple of the land, and attracting the moisture from the atmosphere, it imparts it so gradually as to be less liable to be hurt by drought in those parching seasons by which crops are injured. It is therefore said to be cooling to hot land; but if it be not also mixed with some portion of clay, with which it may combine, it then is apt to unite itself with the sand, with which it composes a kind of mortar, the effect of which has been already described, and which cannot be dissolved without much difficulty, and the plough often brings hard lumps to the surface of the soil which cannot be easily broken. Thus when such land has been frequently limed, nothing can restore it but the abundant and reiterated application of putrescent manure; the demonstration of which is perceptible throughout many parts of England, where, from possessing a chalky soil without strength to maintain a sufficiency of live stock to furnish dung, the land has in many places been worn out through the inconsiderate use of lime.

On the *exhaustion of land by the application of lime* there is, however, much difference of opinion. It is indeed evident that the continuation of cropping, without an addition of nutritive manure, will ultimately exhaust the best soils; but though their natural fertility be thus aided, it yet cannot depend entirely on that support. This must be apparent if we reflect that land, without any addition of animal or vegetable substance, will still produce crops; for pure sand, clay, and chalk, though each in themselves separately barren, yet, when mixed together, exert chemical influences upon each other, which, by the attraction of the air, the dews, and the rain, the force of the sun, and the generative powers of growing vegetables, effect the production of corn and fruit. It is therefore clear that the land alone is capable of vegetation; but every day's experience proves, that the amount of its products, its fertility, in short, depends in a great degree upon the decomposition of the substances which have been previously converted into vegetable mould, or which are added to it by manure. Any thing whatever may be called manure which, when applied to the soil, either rectifies its mechanical defects, corrects any bad quality, and either stimulates it to yield, or stores it with nutriment. Thus, if lime be laid upon pure sand, although the latter would be rendered more tenacious, and would thereby become more favorable to the germination of vegetables, yet seeds could find no nourishment from either the lime or the sand, and putrescent manure would still be necessary to produce a crop. But if the soil consists of clay and sand, containing animal or vegetable matter in a torpid state of decay, then lime would be preferable to dung. The state of the soil should therefore be minutely inquired into before lime is employed, and it should be only used to give effect to the inert substances with which it may be combined.

By the analysis of soils, we find that all productive earth contains a certain portion of lime; and although we learn from experience that its stimulative powers upon the roots of plants are very great, yet we are but imperfectly acquainted with the extent or the exact manner in which its influence is brought into action, and "we are in a great measure ignorant of the actual changes that are produced upon the earth after this manure has been applied." It would, however, seem that, where it exhausts, it is only by hastening the putrefaction of the animal and vegetable matter in the soil, and by that means applying a larger portion of those substances in a given time than could be otherwise afforded to the growth of plants. It is thus known to produce more luxuriant crops, and it will also consequently enable the farmer to continue his land in tillage, during a certain time, with more effect than if no calcareous manure had been laid on; but, although it may not tend to the deterioration of the original staple of the soil, it can hardly be doubted that it must be thus more promptly deprived of its fertility than if the exhaustion of that vegetable mould with which it had been supplied by nutritive manure were occasioned by a more gradual process of decomposition.

That this is the only way in which effete lime can exhaust land, seems probable from the large quantities of neutralized calcareous earth which are often applied without any bad effects in the form of chalk, shells, limestone-gravel, and the whole tribe of marls. A larger quantity of these is oftener laid on in one year than would be used of lime in half a century, were the land in tillage to be managed according to the custom of some countries; yet it is not generally impoverished, and, in many cases, it is permanently improved.—This, however, is probably occasioned by its combination with other substances, which either counteract its exhausting powers or supply the waste of nutritive matter.

The employment of lime seems to be of the greatest service in the *breaking up of fresh and coarse land*, on which it acts more powerfully than on soil which has been long in cultivation, and indeed the most striking improvements have been effected by its means on moorlands and mountain; but it should be given for the first time abundantly. Such is the usual effect of lime upon arable; upon *grass-land* it is laid in smaller quantities; and in this top-dressing, perhaps the preferable mode is to apply it in a compost with earth; except when the soil consists of clay. When thus spread upon the surface, its action upon the sward is productive of the most palpable improvement, and continues perceptible during a long period. No other manure will create so rapid a change; for it is such an excellennt corrector of acidity, that it tends to produce the sweetest herbage where only the most unpalatable pasture was formerly to be found. This, indeed, is so apparent, that if a handful of lime be thrown upon a tuft of rank, sour grass, which has in former years been invariably refused by cattle, they will afterwards eat it close down. Now, animal dung, when dropped upon coarse benty sward, produces little or no improvement until limed; it then, however, not only augments the crops, but the finer grasses continue in possession of the soil, and the land is then doubly benefitted; for the dung dropped by the stock on which it is pastured, is both increased in quantity, and improved in quality.* Farmers should never consider lime as the food or nourishment of plants, but as an alterative of the soil; never to be used but when nature requires it, either to dissolve noxious combinations, or to form new ones; to bind loose soils, or to diminish excessive cohesion; and to reduce the inactive vegetable fibre into a fertile mould. For such purposes there is not, perhaps, a more valuable article in the whole catalogue of agricultural remedies; but some farmers, who do not reflect upon the subject, when they perceive that lime has once excited the dormant powers of the soil into action, and that good crops succeed for a few years, are apt to draw from thence very false conclusions, and continue liming and tilling without the assistance of putrescent manure, until their land at length is rendered incapable of the production of corn. It has indeed been pertinently observed by a good judge of such matters, "that there is an analogy between the treatment suitable to the animal and vegetable creation. When medicines have removed the cause of their application, they are discontinued, and the patient, rendered weaker by the application, requires some invigorating aliment; in like manner, some time after an effectual liming, the soluble carbon of the rotten dung, or some such restorative, should be applied to the soil to replenish it with what it may have been robbed of by the action of the lime."

In fine, lime should always precede putrescent manures when breaking up old leys for cultivation, for, if the land contains acids, or noxious matter that is poisonous to plants, they will be decomposed and rendered fit for vegetation; and hence the superiority of lime to dung on new lands. But calcareous and putrescent manures

* In Derbyshire the farmers have found that, by spreading lime in considerable quantities upon the surface of their heathy moors, after a few times the heath disappears, and the whole surface becomes covered with a fine pile of grass, consisting of white clover and the other valuable sorts of pasture-grasses. —Anderson's Essays, 4th edit. vol. i. p. 527. Survey of Derby, vol. ii. p. 437; and of Westmoreland p. 235.

operate very differently: "the former, being more stimulant and corrective, help the farmer to an abundant crop at the expense of the soil alone; while the latter furnish the land at once with fertilizing fluids, and will insure a good crop on a place perfectly barren before, and after the application of lime."

Much uncertainty prevails among farmers *regarding the state of lime;* some contending that it should only be applied when hot and powdered, and that when it has been slaked, its effect is comparatively trifling; others maintain the contrary. But these disputants consist chiefly of men whose experience has either been confined to one kind of soil, or who have only used it under particular circumstances, and as they only condemn the system of others because their own has turned out successful, or the reverse, it is not improbable that, in the view they take of the subject, each may be in the right. It will therefore probably be found, that in all cases where the land is constitutionally disposed to receive benefit from a calcareous dressing, that is to say, when it has not been previously limed, on when it has been long laid down and refreshed by grass, or enriched by the application of dung, it is of little importance whether the operation take place when the lime is quick or effete. Upon waste lands, however, its causticity has an evident and necessary effect; for the undecayed vegetables, which abound in all soils in a state of nature, should be speedily decomposed, and it should therefore be spread hot from the kiln. In point of economy, too, there can be no doubt but that it is most thriftily used when laid upon the land in the latter state: for the labor is less; and a smaller quantity will serve the immediate purpose. It is, however, obvious that the choice of circumstances and season is not always in the farmer's power; and that necessity often obliges him to lay it on when completely effete. It has been said, indeed, upon high authority, that caustic lime exhausts the land; but repeated trials have shown that its ultimate effects are equally beneficial in the one state or the other, though there is a more immediate advantage in the employment of quick-lime by the destruction of weeds. A common method is to leave it spread during some months upon clover or sainfoin, not intended to be broken up until the following year,—a plan which is advisable with regard to marl, which partakes of some of the qualities of lime, and is the better if allowed to remain during a season exposed to the atmosphere; but the stimulating properties of quick-lime will be thereby lost; as it will be converted into mere chalk.—Opinion are also much divided respecting its effects when laid upon pasture land which is intended to be kept in grass. There is indeed no question that, in either state, if applied in moderate quantities to a dry soil, or to land that has been completely drained, such a top-dressing will have the most beneficial effect upon the herbage; but it must be admitted, that when laid on quick, it requires more circumspection in its application, and should not be employed in the same quantity as when effete.—*British Husbandry.*

MISCELLANEOUS MANURES.

Peat-moss, which is universally considered as an inert mass of half-corrupted vegetable matter, has been long applied to land in different ways, and, when burned, has been already treated of in the Chapter on Ashes. When reduced to that state, it is of course rendered light by combustion, and consequently so portable as to be easily conveyed to any part of the kingdom; but it is only in the immediate neighborhood of bogs that it can be used in its natural state, for, even when dried by exposure to the air, its bulk is too great to admit of its being carried to any great distance, unless at such expense as would render its application as manure unprofitable.

It has been extensively used in its natural state in both Scotland and Ireland, in various parts of which there are large bogs, as well as in some parts of this country; it is, however, very sluggish in becoming reduced, and requires two or three years, with repeated turnings and exposure to the atmosphere, to bring it to anything like the condition of vegetable mould; but being of a cold nature, it is found, by a heavy dressing, to cause considerable improvement in hot, gravelly and sandy soils. When brought to the decayed condition of *bog-mould,* or rich earth, it has also been found highly useful in opening stiff clay land, and has been largely used for that purpose in Ireland; but on mellow friable soils, it is stated to possess too little substance to be of much utility, and it is said it inclines grass-land to the production of moss. It is likewise impregnated with noxious roots and seeds of aquatic grasses, which, when laid on in its raw state, fill the land with those nuisances; and some farmers who have thus applied it, have occasioned such injury to their grass-land, that it has not recovered for several years; though a small quantity of quick-lime sprinkled sparingly over the surface, after the peat is spread, has been known to correct its bad effects.

During many years it has been the practice of farmers residing in the vicinity of fens, to bed their cattle upon dried peat, as they find that the dung and urine occasion it to ferment and become decomposed. This is so common in Ireland, that every peasant who has a few acres of ground, bottoms his dung-stead with stuff drawn from the bogs, that he may thus preserve the *seep* or *gooding,* as he terms it, of his stable manure. They also mix the peat with dung in various proportions—sometimes one-third of the latter, at other times one-half; and in the latter case have in most instances found that the mixture has produced an equal crop with a similar quantity of stable dung. In countries where peat-moss cannot be readily obtained, a proportion of moory soil may be substituted; but it is not advisable that either of these should form the principal part of the compost heap, for neither of them contains fertilizing properties of sufficient power to act in any other way than as alteratives, until effectually decomposed by being judiciously blended with stimulating substances. The difficulty of effecting this decomposition led to frequent disappointment in the application of the manure, and consequently to much difference of opinion regarding its value, until the late Lord Meadowbank happily overcame the objections to its use, by a scientific investigation of its properties, and directions for its preparation in composts with dung, of which the following is a summary:

COMPOSTS.

The peat of which the compost is to be partly formed, should be thrown out of the pit some weeks, or even months, previously, in order to deprive it of its redundant moisture. By this means it is rendered the lighter and less compact when made up with fresh dung for fermentation; and accordingly, less dung is required for the purpose than if the preparation be made with peat recently dug from the pit. It should be taken to a dry spot, convenient to the field which is to be manured, and placed in a row of the length intended for the midden. When ready to be made up into compost, half the quantity of dung must be carted out, and laid in a parallel row at such a distance as will allow the workmen to throw the rows together by the spade: the compost may thus be laid in the centre, and will form the area of the future heap, which is to be thus formed.

Let the workmen make a layer or bottom of peat about six inches deep, and extending further than the base of the proposed midden, which is to be thrown up in alternate layers,—first, ten inches of dung over the peat, then peat six inches, dung four inches—thus diminishing each layer of dung until the heap rises to a height not exceeding between three and four feet, when the whole should be covered—top, ends and sides—with the remains of the peat; the whole to be put loosely together, and made quite smooth.

In mild weather, seven cart-loads of common farm-yard dung, tolerably fresh made, is sufficient for twenty-one cart-loads of peat-moss; but in cold weather, a larger proportion of dung is desirable. The dung to be used should either have been recently made, or kept fresh by the compression of cattle or carts passing over it; and as some sorts of dung, even when fresh, are much more advanced in decomposition than others, it is necessary to attend to this, for a much less proportion of dung that is less advanced will serve the purpose.

After the compost is made up, it gets into a general heat, sooner or later, according to the weather and the condition of the dung; in summer, in ten days or sooner; in winter, not perhaps for so many weeks, if the cold is severe. It always, however, has been found to come on at last; and in summer, it sometimes rises so high as to be mischievous by becoming fire-fanged. Sticks should therefore be kept thrust into different parts, as by drawing them out occasionally the progress of the fermentation may be ascertained; and if so rapid as to approach to blood heat, it should either be watered or turned over, and a little moss be added. The heat subsides after a time, and with variety proportioned to the season and the perfection of the compost; but, when cooled, it may be allowed to remain untouched till within about three weeks of being wanted; it should be then turned over, upside down, and outside in, and all the lumps broken; after which, it comes into a second heat, but soon cools, and may be taken out for use. In this state the whole appears a black mass, like garden mould, and, it is said, may be used, weight for weight, like farm-yard manure, with which it will fully stand a comparison throughout a course of cropping.* Sixteen single-horse cart-loads per acre, are indeed, said to have produced comparatively as good a crop as twelve of farm-yard dung.†

By this plan, one ton of dung will ferment three tons of peat; and wherever moss is only two or three miles distant from the farm, this mode of raising manure can be confidently recommended as a great acquisition. His Lordship also tried various experiments on the mixture of animal matter—such as refuse fish, whale blubber, and the scourings of the shambles—with peat, without the addition of any other substance, and found that, in the course of about nine months, a compost formed of one ton of animal substance and 10 or 12 tons of peat, produced a compost of superior power to that composed with dung. He, however, states, that peat prepared with lime alone is not capable of being decomposed when collected in a heap, and has consequently not been found to answer as a good manure; which opinion he supports upon chemical principles, which we need not now discuss, as experience proves that he is mistaken; for not only does peat, when compounded wth a small quantity of lime, obviously undergo tha putrid fermentation, but it is well known to many farmers that such composts form excellent dressings, particularly for grass-lands. In corroboration of which, there is an experiment recorded by the Manchester Agricultural Society, stating that "A compost of 119 tons of peat moss and lime having been laid upon five acres of a poor sandy soil, and harrowed in with oats, an equal quantity of the same compost was laid upon five acres of thin, poor clayey soil, and harrowed in with the seed, which was likewise oats. The crop upon the sandy field was uncommonly heavy; that on the clay land, though inferior, was, however, very abundant, considering the state of the soil previously to the application of the compost."

To this may be added, that lime will operate in composts when used upon land which has been previously exhausted by the application of lime and marl, although it may have failed to act when used by itself; but it is only upon the varieties of deep argillaceous soils that it can be used with advantage. It is, indeed, generally supposed that the power of the compost will be increased if animal or vegetable matter be added; but the mixture of quick-lime and dung can never be advisable, for the lime will render some of the most valuable parts of the dung insoluble.

EXPERIMENTS.

The following experiments upon composts of peat combined with various substances, communicated to Sir John Sinclair by Mr. Arbuthnot, of Peterhead, will tend to show the power of fermentation in occasioning its decomposition, and its consequent probable effect upon the land:

1. Peat-moss was mixed, in the month of November, with rotten sea-ware, in the proportion of 300 cart-loads of the former to 50 of the latter. In January, the midden, having attained the heat of 90 degrees of Fahrenheit, was turned; in March, the operation was repeated; and in the latter end of April, the compost was spread upon 18 acres of land, and immediately ploughed in. On the 15th of May, the field was sown with barley, which produced one-third more than any similar crop from the same land when manured with dung.

2. Another field was manured in the same proportion of composition, with equal parts of cow-dung and sea-ware; the ground was planted with potatoes, and the produce was large and of excellent quality. Turnips, mangel wurzel, and cabbages, were tried with the same manure, and the crops were all luxuriant.

3. The foundation of a midden was laid on the first of May, with 800 cart-loads of peat-moss and 150 of cow-dung. The cattle had been littered with green rushes; which, although they had lain in the dung-pits for more than nine months, showed no signs of decomposition. About the middle of June, 50 hhds. of salt water were therefore thrown upon it, and the fermentation then began very quickly. The heap was first turned in the beginning of July, and some newly slaked lime added to it. By the latter end of August, it was all grown over with chickweed, when it was again turned, and showed the appearance of a total decomposition of all the mass, into mould of a uniform, smooth, soapy-like consistence, of a strong smell.

4. Consisted of three hundred cart-loads of peat-moss and fifty of town-dung. The decomposition was completed as soon as in the former experiment; but the appearance was not equal throughout.

5. Was composed of 200 cart-loads of rough peat-sods, with a leafy sward, mixed together in July with 30 cart-loads of horse-dung, and the fermentation came on more rapidly than in either of the foregoing experiments; probably, however, owing partly to the heat of the weather, as well as the nature of the dung.

6. In this experiment, 300 cart-loads of peat-moss were put up in three layers of equal quantity. The foundation was laid one foot deep with moss, and then 150 gallons of the urine of cattle was thrown upon it. The fermentation came on almost instantaneously, attended with a hissing noise. The other two layers were then put on, when the same effect was produced; eight days afterwards, it was turned, and to all appearance was completely fermented.

APPLICATION.

The practice most usually followed in preparing the compost is to trench and throw the moss up into ridges, at the most convenient time after the autumn sowing, that it may be dried and pulverized by the winter's frost; and towards the latter end of February to turn it over and lay it flat, when it will be found considerably lighter than when it was first dug up. It is then mixed with the dung, and the process of composition already stated is carried through until it is ready to be laid upon the land. When made up in January, such composts are generally in good order for the spring crops; but this may not happen in a long frost. In summer, they are ready in eight or ten weeks; but if there should exist any necessity for hastening the process, that can be effected by a slight addition of ashes, rubbish from old building, or of lime slaked with foul water, and applied to the dung when the compost is being made up.

Doubts have arisen respecting the proper season of laying on this manure—some insisting that it should be applied to spring crops—others, that it should be ploughed in for wheat in the autumn; but we believe that its effects upon the land will, in the long run, be found in either case equal.—*Farmers' Series, &c.*

* Essay by Lord Meadowbank, pp. 148 to 151. To every 28 cart-loads of compost, when made up, it is also recommended to add one cart-load of ashes: or, if these cannot be had, half the quantity of finely powdered slaked lime may be used; but these additions are not essential to the general success of the compost, though they will tend to quicken the process.

† Gen. Rep. of Scotland, vol. ii. n. p. 550. In Holland's Survey of Cheshire, it is also mentioned, that three tons of compost made from moss and dung, having been spread on part of a meadow, and three tons of rotten dung upon an equal portion of the same field, it was found that, although the grass on that part which was covered with dung only, came up as soon, and upon the whole grew rather higher than that on the other part, yet the latter was of a darker green, and yielded nearly an eighth more when it came to be cut. —p. 282.

[*From the Genesee Farmer.*]

CULTIVATION OF MADDER.

Mr. Tucker—There are consumed in the counties of Oneida and Otsego, by three manufacturing establishments, about two hundred and thirty-four thousand pounds of madder every three years. This article is dug from the ground once in three years. Suppose each acre produced from 1,500 to 2,000 pounds, but say the former, on a common soil, it would require 156 acres of land to produce madder for these establishments; and perhaps the remaining manufactories, cloth dressers and families, use half as much more, making the whole 351,000 pounds, which, at fifteen cents per pound, the average price of best Dutch madder for the last twelve years, is over $50,000. What a large sum to send to foreign countries, for an article which can be cultivated here as well as potatoes! I am well aware that less than 156 acres will produce the above amount; as, according to the quality of the land and cultivation, it will produce from 1,500 to 2,000 pounds of dry madder. I think it will produce 2,000 pounds on land that will yield, in a good year, fifty bushels of corn to the acre. The whole cost of cultivation on rich deep loam, say sandy loam, digging, washing, drying, grinding, rent of land, seed, and interest of money, at 2,000 pounds to the acre, will not exceed seven cents per pound. There are, without doubt, on most farms in these counties, a few acres of land at least, suitable to the cultivation of this article. I consider that the demand will be for years unlimited; as there is not, as yet, in the circle of my acquaintance, more than twenty-five acres under cultivation, nine of which are under my management. The price of American madder, for the three past years, has averaged about twenty-three cents, wholesale. The time for digging, as also for selling the top roots, or seed, is from the 15th of September to the 15th of October; the price at this time is $3 per bushel, by the quantity. These top roots are buried in the fall like potatoes, and planted the following spring in drills, six feet apart between the drills, (giving room for a crop of potatoes the first year,) and twelve or eighteen inches apart in the drills. It is better to purchase the seed in the fall, as it will bear transportation much better when the buds are not much started,—and the price is considerably lower. The bottom roots are also dug at this time and washed, (or rinsed if dug from a light soil,) dried, &c. I have, of three year old roots, unengaged, 150 bushels, or enough to plant from 23 to 25 acres.

Mr. James Eaton, of Winfield, Herkimer co. is a successful cultivator and an honorable dealer in the article. There are others also, so that applicants can be supplied to a considerable amount. For more particular information, as to the cultivation of madder, see "Phinney's Calendar, or Western Almanac, for 1834,"—also a communication in the Cultivator for August, in which is stated my success in the cultivation of this root for two or three years past.

As it is not the intention of the subscriber to offer any remarks to the public but what he believes are founded in truth, he respectfully invites editors of newspapers devoted to agriculture and manufactures, to copy some portion of the above into their respective papers—also other editors who may consider the subject important to the public.

A small package of ground madder will be sent, on application to the care of the president or committee of any agricultural society in the state, previous to their annual fair, for the inspection of members interested. RUSSEL BRONSON.

Bridgewater, Oneida co. Sept. 1, 1834.

[*From the American Farmer.*]

QUERIES ON PLASTER OF PARIS.

PROPOUNDED BY MR. JEFFREYS.

The following are the queries, to which Col. Taylor has annexed answers, on plaster of Paris: (See his letter.)

What quantity to the acre have you generally used?

On what soils does the plaster succeed best?

In what way is it best applied to the soil—with, or without ploughing—with, or without other manure?

Have you repeated the application of it? At what intervals, and with what *effect?*

To what kind of grain, succulent, and leguminous crops can it be beneficially applied? And in what way is it best applied to them?

To what kind of grasses can it be beneficially applied? and in what way is it best applied to them?

What has been the increased product per acre, of grain and grass crops, by means of the plaster alone?

What is the result of the experiment which you have made of setting aside 200 acres, half to be cultivated in corn yearly and alternately, half to lie uncultivated and ungrazed, and the whole to receive an annual dressing of one bushel of plaster to the acre.*

COL. TAYLOR'S REPLY.

Port Royal, March 4, 1818.

DEAR SIR,—To your questions of the 4th inst. I reply—

1. I sow from three pecks to one bushel of plaster upon an acre.

2. It succeeds upon all soils to which I have applied it; those requiring to be drained excepted.

3. Sown on clover in the spring, it benefits it considerably. Used in any other mode, I plough it in. But I have even discontinued the first practice, from observing, that when plaster is sown and ploughed in with wheat in the fall, a top dressing to the subsequent clover is of little or no use; and from thinking that the effect of the plaster sooner ceases as a top dressing, than when ploughed in. The best ways I think of using it, are in the spring, upon the long manure of the preceding winter, to be ploughed in with it—upon well covered fields to be sown immediately before they are fallowed—in rolling it very wet with seed corn, bushel to bushel, and in mixing it with seed wheat so moist as to let the wheat divide in sowing, in such a quantity as that the land shall not receive less than three pecks to an acre. The latter is chiefly for the sake of the succeeding clover. The wheat is benefitted in a very small degree, but it prevents embezzlement of the seed.

4. I have had a small mill exclusively for grinding plaster during twenty years. In that period I have used several hundred tons, and tried a great variety of experiments, using it every year to considerable extent. I think it a valuable ally of, but by no means a substitute for manure. That there should be intervals of two, three, or four years, between applying it broadcast to the same land. That its effect is graduated by the quantity of vegetable matter upon which it is sown. That upon close grazed land, it does but little good at first, and repeated, would become pernicious; and that it must be united either with the long manure of the winter, or the ungrazed vegetable cover produced in summer.

5. Corn mixed with plaster is sometimes highly benefitted, and almost unexceptionably in a degree, depending chiefly on its alliance with vegetable matter, and occasionally upon the seasons. Its effect upon wheat is before stated. But all crops are ultimately improved by its gradual improvement of the land, including those upon which its effect is not immediately visible. The small crops, vegetable, succulent, or culmiferous, are often benefitted by a mixture with plaster, when planted measure for measure.

6. I have satisfied myself that plaster ought to be used to benefit all kinds of grasses, in the modes explained, and that it ought not to be sown as a top dressing. By improving the land, it benefits all kinds of grasses.

7. It is impossible to say how far the plaster, valued exclusively of its vegetable ally, may have increased the crops of grain. Used as a top dressing to clover (red) on land never before plastered, I have often had that grass increased four fold to a line, dividing it from similar land clover. Spaces left unplastered across large fields, when sown in wheat, have remained visible during the whole season of rest, by the inferiority in luxuriance of a great variety of natural grasses and weeds. The 200 acres you mentioned have never received any manure, and the corn stalks have been taken off. But they have been completely secured against grazing. They now produce threefold more corn than when the experiment commenced. The rest of my farm, having had the manure, will produce fivefold more corn than it could do twenty years ago. The casualties attending wheat, render that a precarious criterion of improvement.

I am respectfully, sir, your most obd't serv't,

JOHN TAYLOR.

* For fear this experiment may not be understood by the question, I will give it more fully in Col. Taylor's own words: "I have set aside 200 acres, (divided into two fields,) half to be cultivated in corn yearly, half to lie uncultivated and ungrazed, and the whole to receive an annual dressing of one bushel of plaster to the acre. The repetition of the culture being too quick for a perennial plant, I use the bird foot clover, as we commonly call it, to raise clothing for the land, having found that the plaster operated as powerfully on that as on red clover. One field produces a crop of corn, and the other being enclosed, receives a crop of ungrazed vegetable matter. The succeeding year the ungrazed field is taxed with the crop of corn, and the corn field fed with the ungrazed vegetable In one, the plaster is sown upon the bird-foot clover in March or April, and in the other ploughed in at its fallow. The object of the experiment is to ascertain whether an annual bushel of plaster to an acre, combined with a biennial relinquishment to the soil of its natural vegetable product, will enable it to be severely cropped (cropt) every other year without impoverishment, or with an addition to its fertility. The first effect would suffice to check an evil, every where demonstrating the wretched state of our agriculture: the second would be a cheap and expeditious mode of improving the soil, even where the state of agriculture is good."

G. W. JEFFREYS.

Household Affairs.

[*From the Ohio Farmer.*]

THE FRUIT-DRIER.

MR. MEDARY:—Having found a fruit-drier a convenience in family economy, I am induced to give a short description of it, and its uses, pro bono publico. Take two boards eighteen inches wide and four feet long, set them on end by the side of the house—on the top nail a cover, extending a little over the front, and leaving an inch open at the back to allow the air to pass freely—make ten or twelve drawers three feet long, three inches deep. The sides of common stuff, the bottoms of half inch stuff, split into narrow slits, and with brads fastened five-eighths of an inch from each other, so as to let the air pass freely; on these slats lay the fruit; the drawers may be taken out on sunny days, and in case of rain, and at night, they can be replaced. In this way the fruit is never moulded, and much labor is saved. The fruit requires no moving, and the drawers can be replaced with very little labor, and the drying goes on in rainy weather and at night. A HOUSE KEEPER.

White maple bark makes a good light brown slate colour. This should be boiled in water, set with alum. The colour is reckoned better when boiled in brass instead of iron.

The purple paper which comes on loaf sugar, boiled in cider or vinegar, with a small bit of alum, makes a fine purple slate colour. Done in iron.

Dairy Secret.—Have ready two pans in boiling water, and on the milk's coming to the dairy, take the hot pans out of the water, put the milk into one of them, and cover it with the other. This will occasion great augmentation in the thickness and quality of the cream.

Corn Husks for Beds.—As soon as the husks of Indian corn are fully ripe, they should be gathered when they are dry in a clear air. The outer hard husks are to be rejected, and the softer inner ones to be fully dried in the shade. Cut off the hard end formerly attached to the cob, and draw the husk through a hatchel, or suitably divide it with a coarse comb. The article is then fit to use, and may be put into an entire sack as straw is, or be formed into a mattrass, as prepared hair is. Any upholsterer can do the work. This material is sweet, pleasant and durable.

Cockroaches.—Take a deep plate or dish, and nearly fill the bottom part with molasses and water; set it near their haunts, with some chips from the shelf to the edge of the dish for the insects to travel upon. In this way they may be caught, and apparently drowned, but will often revive when thrown out of the plate. To render their extermination sure, they should be stamped on, or thrown into a fire.

Young Men's Department.

ON THE PLEASURES AND ENJOYMENTS CONNECTED WITH THE PURSUITS OF SCIENCE.

What a sublime idea, for example, is presented to the view by such an object as the planet *Jupiter*,—a globe fourteen hundred times larger than the world in which we dwell, and whose surface would contain a population a hundred times more numerous than all the inhabitants that have existed on our globe since the creation! And how is the sublimity of such an idea augmented when we consider, that this immense body is revolving round its axis at the rate of twenty-eight thousand miles in an hour, and is flying, at the same time, through the regions of space, twenty-nine thousand miles every hour, carrying along with it four moons, each of them larger than the earth, during its whole course round the centre of its motion! And if this planet, which appears only like a luminous *speck* on the nocturnal sky, presents such an august idea, when its magnitude and motion are investigated, what an astonishing idea is presented to the mind when it contemplates the size and splendor of the sun,—a body which would contain within its bowels nine hundred globes larger than Jupiter, and thirteen hundred thousand globes of the bulk of the earth,—which darts its rays in a few moments to the remotest bounds of the planetary system, producing light and colour, and life and vegetation throughout surrounding worlds? And how must our astonishment be still increased, when we consider the *number* of such globes which exist throughout the universe; that within the range of our telescopes more than eighty millions of globes, similar to the sun in size and in splendor, are arranged at immeasureable distances from each other, diffusing their radiance through the immensity of space, and enlivening surrounding worlds with their benign influence, besides the innumerable multitudes which, our reason tells us, must exist beyond all that is visible to the eyes of mortals!

But the *motions*, no less than the magnitudes, of such bodies present ideas of sublimity. That a globe* as large as the earth should fly through the celestial regions with a velocity of seventy-six thousand miles an hour,—that another globe† should move at the rate of one thousand seven hundred and fifty miles in a minute, and a hundred and five thousand miles an hour,—that even Saturn, with all his assemblage of rings and moons, should be carried along his course with a velocity of twenty-two thousand miles an hour,—that some of the comets, when near the sun, should fly with the amazing velocity of eight hundred thousand miles an hour,—that, in all probability, the sun himself, and all his attending planets, besides their own proper motions, are carried around some distant centre at the rate of more than sixty thousand miles every hour; and that thousands and millions of systems are moving in the same rapid manner, are facts so astonishing, and so far exceeding every thing we behold around us on the surface of the earth, that the imagination is overpowered and confounded at the idea of the astonishing forces which are in operation throughout the universe, and of the power and energy by which they are produced; and every rational being feels a sublime pleasure in the contemplation of such objects which is altogether unknown to the ignorant mind.

The vast and *immeasurable spaces* which intervene between the great bodies of the universe likewise convey august and sublime conceptions. Between the earth and the sun there intervenes a space so vast, that a cannon-ball, flying with the velocity of five hundred miles an hour, would not reach that luminary in twenty years; and a mail-coach, moving at its utmost speed, would not arrive at its surface in less than twelve hundred years; and, were it to proceed from the sun towards the planet Herschel, it would not arrive at that body till after the lapse of *twenty-two thousand years*. And yet the sun, at that immense distance, exerts his attractive energy, retains that huge planet in its orbit, and dispenses light and colour, life and animation, over every part of its surface. But all such spaces, vast as at first sight they appear, dwindle as it were into a span, when compared with those immeasurable spaces which are interposed between us and the regions of the stars. Between the earth and the nearest fixed star a space intervenes so vast and uncomprehensible, that a ball flying with the velocity above mentioned, would not pass through it in four million and five hundred thousand years; and as there are stars, visible through telescopes, at least a hundred times farther distant from our globe, it would require such a body four hundred millions of years, or a period 67,000 times greater than that which has elapsed since the Mosaic creation, before it could arrive at those distant regions of immensity.

The *grand and noble designs* for which the great bodies to which I have adverted are intended, suggest likewise a variety of interesting and sublime reflections. These designs undoubtedly are, to display the ineffable glories of the Eternal Mind,—to demonstrate the immensity, omnipotence, and wisdom of Him who formed the universe,—and to serve as so many worlds for the residence of incalculable numbers of intelligent beings of every order. And what an immense variety of interesting objects is presented to the mind when its views are directed to the numerous orders and gradations of intelligence that may people the universe,—the magnificent scenes that may be displayed in every world,—their moral economy, and the important transactions that may have taken place in their history under the arrangements of the Divine government!

Such are some of the scenes of grandeur which science unfolds to every enlightened mind. The contemplation of such objects has an evident tendency to enlarge the capacity of the soul, to raise the affections above mean and grovelling pursuits, to give man a more impressive idea of the *dignity* of his rational and immortal nature, and of the attributes of that Almighty Being by whom he is upheld, and to make him *rejoice* in the possession of faculties capable of being exercised on scenes and objects so magnificent and sublime.—*Dick on Knowledge.*

* The planet Venus. † The planet Mercury.

MR. HAWKINS' REMARKS ON THE ADVANTAGES OF SCIENCE IN HUSBANDRY.—*Continued from last No.*

ACCOUNTS.

In a business embracing so many particulars as farming, it is essential to be able to distinguish the profit and loss upon each. Nothing is more easy or more common than for a man who keeps no accounts, to continue for a series of years, to lose money upon some particular department without knowing it, or, which is almost as bad, to employ his time and capital in less profitable speculations, when he might have applied them to such as were more so. A farmer grows many sorts of crops, and keeps several species of animals,—breeding some and buying others, and uses many kinds of manure. Assuming that he has a general profit of ten per cent at the year's end, how is he to tell whether all the branches of his business have contributed rateably to this result—how, I say, is he to tell this without accounts? The cost of one acre of corn, for example, is by no means self-evident; it is "compounded of many simples, extracted from many objects,"—rent, tithe, taxes, seed and tillage—horses' keep and man's keep—rates for the poor—the church and the highways, and so with every other crop. Suppose now, that in the case of oats, all the items of expenditure accurately set down, shall amount to £5, 15s. annually, and that the crop shall sell for £5. 10s. Upon forty acres, here would be a loss of £10 a year;

but without setting down the several items which compose the cost, and adding them together, how is a man to tell within 5s what his acre of oats cost him? He may know that his acre cost him *about* £5 or £6, but in this *about* is the very *essence* of the mischief. About £5 or £6 may mean either £5 or £6; now if the selling price were £5, 10s. the former supposition would give a profit, and the latter a loss, of £20 a year; and thus any man may, and multitudes do, continue to the end of their lives carrying on branches of business by which they lose money unconsciously. The observations apply to manures brought on a farm. Price, carriage, labor, &c. all reckoned, bone dust may be 5s. an acre dearer or cheaper than stable dung; but without counting up the cost of each item that forms the price, a man may be ignorant of this difference, and he may lose 5s. on an acre. It is by a few shillings gained here and saved there, that a farmer makes his profit. It is no exaggerated estimate to suppose, that these petty items may often make a difference of ten per cent at the year's end, and that so, one man may make a living on the same farm, where another would fail. A knowledge of these details, therefore, is useful, and is to be acquired by a system of accounts. Nearly allied to, if not identical with, accounts, is a facility at all the common operations of arithmetic, and the storing in the mind of certain arithmetical results, which may serve as the basis of future calculations. The multiplication table is a familiar example of the vast importance of this prepared and portable knowledge. The commonest operations of arithmetic could scarcely be carried on without the intuitive readiness with which the product of any two of the numbers under twelve have been made to occur to the mind; but the principle is capable of an application much wider than it has received. The proportions existing between the numerical parts into which the year, the acre, the pound sterling, and the ton weight are divided, might be impressed on the mind, and, as it were, *burnt in* by continued repetition; as, for example, the weight of an acre of turnips, is a fact which it is desirable to know, and which is ascertained in five minutes, if we bear in mind, that, for every pound on the square yard, there are 2 tons, 3 cwt. 24 lbs. on the acre; and we should, in a similar manner, be able to tell without effort, what breadth of turnips would keep a sheep or a cow for a year. The number of inches in a square or cubic yard, and of yards in an acre; the number of pounds in a ton, and the proportion existing between the days in the year, and the common subdivisions of our measures of weight, capacity, superfices and value, suggest themselves as instances. A number of these facts and relations being well impressed on the recollection of boys at school, they would come in after-life to the calculations necessary to establish knowledge, instead of guesses respecting the affairs of their farms, so well prepared as to make that occur intuitively and without labor, which men, not so prepared, could only come at with much labor, or perhaps not at all. There is scarcely anything easier than the use of logarithms, but we are certainly not all qualified to have invented them.

ADVICE TO A YOUNG TRADESMAN.

BY DR. FRANKLIN.

Remember that *time* is money. He that can earn ten shillings a day by his labor, and goes abroad, or sits idle half of that day, though he spends but sixpence during his diversion or idleness, ought not to reckon *that* the only expense; he has really spent, or rather thrown away, five shillings besides.

Remember that *credit* is money. If a man lets his money lie in my hands after it is due, he gives me the interest, or so much as I can make of it during that time. This amounts to a considerable sum where a man has good and large credit, and makes good use of it.

Remember that money is of a prolific generating nature. Money can beget money, and its offspring can beget more, and so on. Five shillings turned is six; turned again it is seven and threepence: and so on till it becomes a hundred pounds. The more there is of it, the more it produces every turning, so that the profits rise quicker and quicker. He that kills a breeding sow, destroys all her offspring to the thousandth generation. He that murders a crown, destroys all that it might have produced, even scores of pounds.

Remember that six pounds a year is but a groat a day. For this little sum (which may be daily wasted either in time or expense, unperceived) a man of credit may, on his own security, have the constant possession and use of a hundred pounds. So much in stock, briskly turned by an industrious man, produces great advantage.

Remember this saying; "The good paymaster is lord of another man's purse." He that is known to pay punctually and exactly to the time he promises, may at any time, and on any occasion, raise all the money his friends can spare. This is sometimes of great use. After industry and frugality, nothing contributes more to the raising of a young man in the world, than punctuality and justice in all his dealings: therefore never keep borrowed money an hour beyond the time you promised, lest a disappointment shut up your friend's purse forever.

The most trifling actions that affect a man's credit are to be regarded. The sound of your hammer at five in the morning, or nine at night, heard by a creditor, makes him easy six months longer; but if he sees you at a billiard table, or hears your voice at a tavern, when you should be at work, he sends for his money the next day; demands it before he can receive it in a lump.

It shows, besides, that you are mindful of what you owe: it makes you appear a careful as well as an honest man, and that still increases your credit.

Beware of thinking all your own that you possess, and of living accordingly. It is a mistake that many people who have credit fall into. To prevent this, keep an exact account, for some time, both of your expenses and your income. If you take the pains at first to mention particulars, it will have this good effect; you will discover how wonderfully small trifling expenses mount up to large sums, and will discern what might have been, and may for the future be saved, without occasioning any great inconvenience.

In short, the way to wealth, if you desire it, is as plain as the way to market. It depends chiefly on two words, *industry* and *frugality*; that is, waste neither *time* nor *money*, but make the best use of both. Without industry and frugality nothing will do, and with them everything. He that gets all he can honestly, and saves all he gets, (necessary expenses excepted) will certainly become *rich*—if He, who governs the world, to whom all should look for a blessing on their honest endeavors, doth not in his wise providence otherwise determine.

THE CULTIVATOR—DEC. 1834.

TO IMPROVE THE SOIL AND THE MIND.

THE MANAGEMENT OF CALVES,

Is a matter of interest with the dairy farmer. The object is to fatten or rear calves in a healthful condition with the least possible expense to the dairy. We find in an article upon this subject, in the Edinburgh Quarterly Journal of Agriculture, written by Mr. Aiton, some remarks which are new to us, and which, we believe, will be useful to the dairy patrons of the Cultivator. In fattening calves for the butcher, the dairymen of Strathaven, whose practice Mr. A. describes, consider it most profitable to feed them from four to six weeks, at which age they are made to bring from £3 to £4. ($13 to $17.) Beyond this age they make but a bad return for their feed, and under it they are justly considered unfit for the market. The following is given as the Strathaven mode of feeding, and furnishes, also, the reasons for the practice.

"The calves are fed on milk only, with seldom any admixture; and they are not permitted to suck their dams, but are taught to drink their milk from a dish. As arguments are advanced for even the worst of practices, those who allow their calves to suck, say, that by so doing, a much greater portion of saliva is secreted, and carried with the milk into the stomach of the calf, where it promotes digestion, and accelerates the growth and fattening of the young animal. But although saliva is necessary to digestion, it can be drawn forth by placing an artificial teat in the mouth of the calf while feeding, and preventing the animal from drinking its milk too hastily, or giving it too cold. In the dairy districts of Scotland, the dairy-maid puts one of her fingers into the calves' mouth when they are feeding, and this, or any thing similar, serves the same purpose as the natural teat, in promoting the necessary secretion of the saliva. A piece of clean leather, about three inches long, and fixed to the bottom of the dish, will, when the milk is given slowly, so that the saliva may be drawn from the glands of the calf, and conveyed to the stomach with the milk, answer every purpose that sucking can serve, and still more saliva may be conveyed to the stomach of the calves. When they are not feeding, a lump of chalk is often laid within their reach, by licking which they are induced to swallow much saliva that would otherwise drop from their mouth and be lost. Calves frequently chew or suck any thing that is within their reach, not for food, but to help them swallow saliva, and on that account something like a teat should be placed near them, that by sucking it they may promote the secretion of saliva, and convey it to their stomach.

"But though sucking the dam may be favorable to the calf, yet it seriously injures the cow. The calf cannot, when young, consume all the milk of a good cow, and she becomes so fond of her calf that she will not yield her milk to the dairy-maid; and unless the cow's udder is completely emptied of milk every time she is milked, the lactic secretion is gradually diminished, and the cow will ultimately run dry on that account; but when the milk is drawn from the cows and given by hand to the calves, every thing can be regularly corrected to the advantage of the cow, the calf, and the owner of both. And when calves are reared for stock, various substitutes for milk can be gradually introduced, and the milk slowly withdrawn, without injuring the stomach of the calf by a too sudden change of food. And when calves are to be fed, the milk of two cows can be given them by hand-feeding, while cows will suckle none but their own calves.

"The whole secret of fattening calves for veal is to give them, after they are three or four weeks old, an abundance of milk, keep plenty of dry litter in their stalls, let them have the benefit of good air, moderate warmth, and be nearly in the dark, as they hurt themselves with sportiveness when exposed to too much light. In Holland, the best feeders keep their calves in pens or coops, in which they can stand or lie at pleasure, but cannot turn themselves round. I am not sure that such rigid confinement is beneficial. It is necessary, however, to keep fat calves in places where they have but little light. They require to be fed twice every twenty-four hours.

"If a calf becomes *costive*, a small portion of bacon or mutton broth will give them ease; and if they begin to *purge*, a small quantity of rennet, used in coagulating milk, will cure that disease. The Scotch calves are never bled, nor infusions of linseed, oil-cake, or any other food given them, but pure milk from the cow."

SCOTCH CATTLE FAIRS.

These have been established in many parts of Scotland, and are often held two, three and four times a year, at stated periods. At these fairs, immense numbers of cattle, sheep and horses are bought and sold, and indeed they constitute, almost exclusively, the places of sale and barter for live stock. The advantages of these fairs are many and important. They are the place of resort of all who wish to buy and to sell; and they afford to the farmers the best opportunity of becoming acquainted with the improvements in live stock, of appreciating the advantages of the superior kinds, and of acquiring a knowledge in the arts of breeding and fattening. We quote from an account of these fairs, the number of cattle and sheep which are brought to some of them, in order to show to the readers of the Cultivator the immense amount of business transacted at them; for it must be understood, that actual sales take place of most of the cattle mentioned.

Alnwick fair is held twice a year, in May and July. At the first, 3,000 cattle are generally brought, and at the latter 700 or 800, mostly short horns. One-half of these are fat animals, the remainder of various descriptions. The fat animals are bought by butchers for the large towns, and the others by feeders, drovers and dairymen.

At Whitsunbank fair, from 1,000 to 1,200 cattle are sold, mostly short horns; and from 12,000 to 20,000 sheep, principally Leicesters. Fat wethers sometimes reach 45s. a piece, equal to $10.

At St. Ninian's fair, from 700 to 800 cattle, principally short-horns, are sold, and from 12,000 to 20,000 sheep. The best Leicester rams sell as high as £10 to £15 each, and ewes from 30s. to 55s. The reader will bear in mind that a pound sterling is equal to $4.44.

At Woln fair, the sales are equal to the preceding.

At Dunse fairs, nearly 4,000 cattle are sold annually, and 7 to 8,000 sheep, &c.

There are sixteen other places enumerated in the Quarterly Journal, at which similar fairs are held in Scotland, and at which the sales are probably equal to those we have quoted. What we have detailed will serve to convey an idea of the immense business transacted, and of the great benefits resulting from these fairs. We had hoped, and still hope, to see regular cattle fairs established in some of our towns, as affording the most efficient means of improving our cattle husbandry. The exertions of a few spirited individuals, sustained by perseverance, cannot fail in establishing and giving confidence in such fairs among us.

ECONOMY OF FUEL.

We have examined, with interest, a small work, detailing "*Experiments to determine the comparative quantity of heat evolved in the combustion of the principal varieties of wood and coal, used in the United States, for fuel; and also to determine the comparative quantity of heat lost by the ordinary apparatus made use of for their combustion*— By Marcus Bull.

The experiments seem to have been made with great care and accuracy, and the results afford matter of interest to every householder.

Mr. Bull has computed the cost of fuel consumed in Philadelphia, in a given year, to be $80,043, which being divided among the population, gives $7.04 as the average cost of fuel to each inhabitant, supposing the consumption to be equal. Adopting this estimate as a fair average for the population within ten miles of tide water, in the Atlantic states, from Maine to Georgia, it gives an aggregate of twenty-one millions of dollars as the annual cost of fuel for this portion of population, which is assumed to amount to three millions of souls. Estimating the cost of fuel to the remaining eight millions and a half of our population at half the above price, or $3.50 to each individual, he gives us an aggregate of about fifty-one millions of dollars as the total annual expense of fuel, for every purpose in the United States.

The economy of fuel is to be studied—1, in the kind to be selected for use; 2, in its quality and preparation for use; and 3, in the choice of the apparatus in which it is to be used.

In regard to wood.—The quantity of heat evolved by a cubic foot of the several kinds, when in a perfectly dry state, is very nearly in the ratio of their specific gravity, or relative weight; as for example, the specific gravity of shell-bark hickory being 1.000, a cord weighs 4,469 lbs.; by the same scale, the specific gravity of white pine is .476, and the cord weighs only 1,868 lbs. The quantity of heat evolved by a pound of white pine is as great as that evolved by a pound of hickory. The difference in value arises from the great disparity in weight—the hickory weighing as 22, and the pine as 9—and their relative value being hickory 100, white pine 42—or the first being considerably more than twice as valuable as the latter. The table which we shall append will exhibit the relative value of the different kinds of fuel in common use.

Charcoal forms a considerable item of fuel; and the facts which Mr. Bull has given us upon this subject will be found to be new and interesting. The value of charcoal, like that of wood, is principally to be determined by its weight—a pound from one kind of wood affording about as much heat as a pound from another kind. The quantity, or rather weight, of charcoal, afforded by the different kinds of wood, is nearly in proportion to the relative weight of the wood. Thus hickory produces 26.22, the specific gravity of the dry coal being .625; while the white pine produces 24.35, and the specific gravity of the dry coal being only .298. Thus, whether burnt in the form of wood or of charcoal, a cord of hickory affords more than twice the heat that is found in a cord of white pine. The value of charcoal, however, depends much upon the manner in which it is prepared. The more completely the atmospheric air is excluded from the wood, while under the process of being charred, and the more heat that is given to it, the *heavier*, the *harder*, and the *better* will be the product. The best charcoal will be found of a slate colour on its surface, dense, sonorous and brittle; while inferior qualities approach to a jet black, and are soft and powdry, upon the exterior. To obtain the best quality, Mr. Bull recommends that the wood be piled in a single tier, that charcoal dust be interposed between the wood, that the pile be covered with clay, and then a layer of sand, to close the cracks which the fire may cause in the clay, and that the fire be communicated at the exterior base, and in the centre and from the top. An intelligent collier, who partially adopted Mr. Bull's recommendation, gained by it 10 per cent in quantity by measure; and Mr. B. found the coal nearly 20 per cent heavier than usual. If these facts are correct, and we have no reason to doubt them, it would be an excellent police regulation in our towns, to have charcoal sold by the weight, instead of by measure, and would ultimately be beneficial to the seller as well as to the buyer.

The loss in weight which wood undergoes in drying, and the moisture which it absorbs, by exposure, after it has become dry, are matters of considerable interest to the farmer and the consumer. Hickory wood cut green, and made absolutely dry, experienced a diminution in its weight of 37½ per cent, white oak lost 41 per cent, and soft maple 48 per cent, or very near one-half. Both wood and charcoal, after being made perfectly dry, absorbed in twelve months, under cover, from 8 to 12 per cent of moisture.

If we assume, says Mr. B. the mean quantity of moisture in the woods, when green, at 42 per cent, the great disadvantage of attempting to burn wood in this state, [or to transport it a distance,] must be obvious, as in every 100 lbs. of this compound of wood and water, 42 pounds of aqueous matter must be expelled from the wood, [or transported;] and as the capacity of water for absorbing heat is as 4 to 1, when compared with air, and probably greater during its conversion into vapor, which must be effected before it can escape, the loss of heat must consequently be great.

GENERAL TABLE.

Common names of woods and coals.	Specific gravity of dry wood.	Avoirdupois lbs. of dry wood in a cord.	Product of charcoal from 100 parts of dry wood by w't.	Specific gravities of dry coal.	Pounds of dry coal in one bushel.	Pounds of charcoal from one cord dry wood.	Bushels of charcoal from one cord dry wood.	Time 10° of heat were maintained in the room by the combustion of 1 lb. of each article. H.	M.	Value of specified quantities of each article, compared with shell bark hickory as the standard. Cords.
White Ash, ...	.772	3,450	25.74	.547	28.78	888	31	6	40	77
White Beach, ...	.724	3,236	19.62	.518	27.26	635	23	6		65
Black Birch, ...	.697	3,115	19.40	.428	22.52	604	27	6		63
Chesnut, ...	.522	2,333	25.29	.379	19.94	590	30	6	40	52
White Elm, ...	.580	2,592	24.85	.357	18.79	644	34	6	40	58
Shell-Bark Hickory, ...	1000	4,469	26.22	.625	32.89	1,172	36	6	40	100
Pig Nut Hickory, ...	.949	4,241	25.22	.637	33.52	1,070	32	6	40	95
Red Heart Hickory, ...	.829	3,705	22.90	.509	26.78	848	32	6	30	81
Horn Beam, (Iron Wood,)	.720	3,218	19.	.455	23.94	611	25	6		65
Hard Maple, ...	.644	2,878	21.43	.431	22.68	617	27	6	10	60
Soft Maple, ...	.597	2,668	20.64	.370	19.47	551	28	6		54
White Oak, ...	.855	3,821	21.62	.401	21.10	826	39	6	20	81
Shell-Bark White Oak, ...	.775	3,464	21.50	.437	22.99	745	32	6	20	74
Pin Oak, ...	.747	3,339	22.22	.436	22.94	742	32	6	20	71
Red Oak, ...	.728	3,254	22.43	.400	21.05	630	30	6	20	69
Rock Chesnut Oak, ...	.678	3,030	20.86	.436	22.94	632	28	6		61
Pitch Pine, ...	.426	1,904	26.76	.298	15.68	510	33	6	40	43
White Pine, ...	.418	1,868	24.35	.293	15.42	455	30	6	40	42
Lombardy Poplar, ...	.397	1,774	25.	.245	12.89	444	34	6	40	40

The above is merely an abstract of Mr. Bull's table, comprising merely the woods in most common use among us. The last column exhibits the relative value of a cord, according to the heat which each affords. Thus, if hickory is worth one dollar, pig nut hickory is worth 95 cents, hard maple 60 cents, white oak 81 cents, white pine 42 cents, pitch pine 43 cents, &c.

We will now exhibit, in tabular form, the relative value of coals, by the same standard, merely remarking, that a ton of anthracite coal is considered about equal to a cord of shag bark hickory.

COALS.	Specific gravity of dry coal.	Pounds of dry coal in one bushel.	Time 10 deg. of heat were maintained in the room by the combustion of 1 lb. of each article. H.	M.	Value of specified quantities of each article, compared with shell bark hickory as the standard.
			H.	M.	Tons.
Lehigh, ...	1.494	78.61	13	10	99
Lackawana, ...	1.400	73.67	13	10	99
Rhode-Island, ...	1.438	75.67	9	30	71
Schuylkill, ...	1.453	76.46	13	40	103
Susquehanna, ...	1.373	72.25	13	10	99
Worcester, ...	2.104	110.71	7	50	59
					100 bushels
Liverpool, ...	1.240	65.25	10	30	230
Richmond, ...	1.246	65.56	9	20	205
Hickory charcoal, ...	.625	32.89	15		166
Maple do	.431	22.68	15		114
Oak do	.401	21.10	15		106
Pine do	.285	15.	15		75
Coke, ...	.557	29.31	12	50	126

ECONOMY OF BURNING.

Mr. Bulls experiments were made in a sheet iron stove, with 42 feet of two inch pipe, having about 20 elbows. A thermometer placed at the mouth of this pipe indicated the same temperature as another hung against the wall of the room, which showed that all the heat given off by the combustion of the fuel, was retained in the room. On the supposition that 100 lbs. of fuel, consumed in this stove, would maintain a temperature of 60 degrees for 12 hours, he found, that to maintain the like temperature for the same time, by other apparatus, the fuel must be increased as follows:

In the experiment stove it required .... lbs.	100
In the sheet iron cylinder stove, the interior surface coated with clay lute, with nine elbow joints, and 13½ feet of two inch pipe, ...	105
In a like stove and pipe, with 3 elbow joints, ...	122
In a like stove, and similar pipe and joints, but the pipe placed more vertical than the preceding, ...	128
In a like stove, with 5 feet of pipe and one elbow, ...	149
In a like stove, without clay lute, one elbow, and five feet of four inch pipe, ...	222
In an open Franklin, with one elbow, and five feet of six inch pipe, ...	270
In an open ordinary parlor grate, ...	555
In an open chimney fire-place, ...	1,000

It would seem from these experiments, that nine-tenths of the heat given off by fuel burnt in an ordinary fire-place, are carried off in the draft, without benefitting the room; that nearly one-half is wasted when the fuel is consumed in an open parlor grate; and that lining a stove with fire brick, or clay lute, produces a great economy in fuel.

These experiments afford important suggestions to the housekeeper. Assuming as data, that four cords of dry shell-bark hickory, burnt in a sheet iron cylinder stove, with five feet of pipe and one elbow, will warm an ordinary room during the winter months, it will require to keep up the like temperature, in a similar stove, the following quantities of other materials:

Hickory, as stated	4	cords,
White oak, ...	4 3-4	"
Hard maple, ...	6 2-3	"
Soft maple, ...	7 1-5	"
Pitch pine, ...	9 1-7	"
White pine, ...	9 1-5	"
Anthracite coal, ...	4 tons.	

I. H. J. inquires of us, in the *Maine Farmer*, if the culture of wheat has not declined in the old counties of this state, and the cause of this declension. It has declined materially; and there are several reasons for it. One cause is, that we cannot compete in its culture with the great west, on account of the latter growing double the crop, and with less labor and expense in its production, than we do. The west is emphatically a wheat soil, a secondary formation, abounding in lime and animal matters, the specific food of that grain. Ours is but partially a wheat soil, being principally transition formation, and containing less, naturally, of the specific food of wheat. Another reason is, that our lands have been injudiciously cropped and impoverished. They have been made to carry wheat too often. A better system of management is obtaining among us, and the quality of our wheat is rather improving with good farmers, though the inducement for raising it is lessened by the facilities of the west for competing with us in this great staple. The valleys of the Hudson and Mohawk, formerly great wheat districts, do not at present, we think, grow wheat enough for the subsistence of their population, throwing out of the calculation the cities of New-York and Albany.

I. H. J. who appears to be a practical farmer, may render us a favor, and possibly the community a service, by one or two experiments, no matter upon how small a scale. We have intimated that lime and animal matters are essential to the successful growth of wheat—that they constitute its specific food. These, it is believed, do not naturally abound in primitive formations, particularly in old fields. We wish to have the correctness of our opinions tested, and our request is, that they may be artificially applied, separate and jointly, on different parcels of ground, to be sown with wheat, and that the result may be accurately noted and published. Crushed bones would supply both materials; or, if the lime is applied separately, slaughter-house manure, the urine of animals, soap-boilers' waste, comb-makers' shavings, fish, &c. would either of them supply the other material. It is proper to caution against applying any of these materials in excess—as a small quantity will suffice, and the result will be more satisfactory if the fertilizing materials are applied to the crop which precedes the wheat.

SPADE HUSBANDRY.

We have no expectation of ever seeing spade husbandry adopted in our country, on any thing like an extensive scale. The price of manual labor forbids it. Yet we cannot refrain from noticing an interesting article upon this subject in the September No. of the Edinburgh Quarterly Journal of Agriculture. A premium of £100 was given to Mr. Archibald Scott, "for the best plan of furnishing employment for the surplus laborers of England." Mr. Scott's *plan* consists in trenching with a spade the ground intended for its grain crops, and thus substituting manual labor for cattle power in cultivating his fields. The plan is not merely theoretical, but has been reduced to extensive practice, and found to be highly profitable. Mr. Scott pays his laborers 1s. 6d. per day, equal to about 33 cents, they boarding themselves. At this price of labor, the trenching costs him £4.10 (about $20) per Scotch acre. The soil is 18 inches, the top of which is thrown to the bottom, and the whole well pulverized. The first experiment was made in 1831, upon 13 acres of summer fallow. The profit per acre upon the trenched ground, was £3.18s. 9d. while that upon adjoining land, ploughed as usual, was only 9s. 6d. It is to be observed that the ploughings were repeated six times, which must uunecessarily have swelled the expense. In 1832, Mr. Scott trenched 44 acres with like success. His account of expense and profit stands thus:

By average of 44 bushels per acre, at 7s.......		£15 8 0
To rent of land per acre,............	£2 10 0	
Expense of trenching,..............	4 0 0	
Seed, ...	1 1 0	
Cutting, threshing and marketing,....	1 10 0	
Profit,..........................	9 7 0	
	£15 8 0	£15 8 0

Thus leaving a nett profit per acre, of about $28. In 1833, Mr. Scott trenched about 100 acres; and such was the apparent advantage of his method, that his example was being extensively followed in East-Lothian. The Scotch contains about a quarter more than the English acre, or about 200 rods; and to trench this, it requires, it seems, 60 days' labor.

The effect of trenching is to clean the ground, and to induce increased fertility, by turning the exhausted surface under, and effecting a complete pulverization. In gardens and other old cultivated grounds, trenching is sometimes resorted to even with us, and its advantages are found to repay the labor. The data furnished by Mr. Scott's experiments are worth preserving.

Gypsum.—Raspail has decided, as the result of a series of experiments, that "it is not the leaves of the leguminous plants that absorb the gypsum which is dusted over them, but the roots, when the dew or rain has washed it into the soil; and hence the advantage which has been found of applying this powder a little before the dew comes on." It was the practice of John Taylor, conspicuously known as the author of Arrator, and one of the best practical farmers in Virginia, to sow his plaster, for tillage crops, before the last ploughing, that it might be buried in the soil, where the roots of plants required it. In applying it to grass lands, he recommended, if our memory serves us, that it be applied early, that the spring rains might convey it to the roots. We have in the pamphlet of Judge Peters, upon the application of gypsum, another corroboration of the correctness of M. Raspail's conclusions: In many instances there narrated, where the gypsum was sown at the commencement of a drought, or late in the season, it produced no apparent benefit that year. It would be useful if farmers would satisfy themselves upon this head, by sowing a part of a field early and a part late, a part before the last ploughing, and a part upon the growing crop. So far as our opinions have been formed from practice, they are in favor of sowing on grass in April, and for tilled crops before the last ploughing.

HUMUS, HUMIN AND HUMIC ACID.

These are terms of recent introduction into the vocabulary of agricultural writers. There has been much controversy as to the nature and properties of this substance, or these substances, for it is not agreed yet whether they are identical or distinct. According to some, *humin* is composed of carbon, or *charcoal*, and hydrogen; and *humic acid* of carbon and oxygen.* For all practical purposes, it is sufficient to know, that these novel terms mean animal and vegetable matters, upon which fermentation has exhausted its powers, and dispelled their gaseous portions, and that it is the identical substance which imparts fertility to our soils. "It is," says Mr. Tower, in the Quarterly Journal, "in point of fact, neither more nor less than the substance which constitutes the black reduced mass of an old fermented dung-hill." Its origin and its properties are summarily expressed by Van Thaer, the principal of the great Prussian agricultural school, in the following concise quotation.

"Besides the four essential elements of its composition, (carbon, oxygen, hydrogen and nitrogen,) it also contains other substances in smaller quantities, viz. phosphoric and sulphuric acids, combined with some base, and also earths and salts. Humus is the product of some living matter, and the source of it. It affords food to organization. Without it, nothing material can have life. The greater the number of living creatures, the more humus is formed; and the more the humus, the greater the supply of nourishment and life, Every organic being in life adds to itself the raw materials of nature, and forms humus, which increases as men, animals, and plants increase in any portion of the earth. It is diminished by the process of vegetation, and wasted by being carried into the ocean by the waters, or it is carried into the atmosphere by the agency of the oxygen of the air, which converts it into gaseous matter."—See Thaer *Grundsatze, du Rationellen Landwerthschaft*, 4 vols. 4to.

Marl.—We have received for analysis, a specimen of marl found in Granville. It proves to be of little value for agricultural purposes. It has too much clay, and too little of carbonate of lime in its composition. The rulo in England is, that unless marl contains more than thirty per cent of carbonate of lime, it is of no value to the farmer. "Of all the modes of trial," says Parke, "the one best suited to the farmer, is to observe how much carbonic acid gas the marl gives out, and this he will learn by dissolving a little of it in diluted muriatic acid, and observing what portion of its weight is lost by the escape of the air. Thus, if an ounce loses only from forty to forty-four grains in weight, he may conclude that the ounce contained only 100 grains of carbonate of lime"—and consequently is not applicable in those cases where the soil requires lime. The marl should be completely dried and pulverized previous to trial, and both it and the acid should be accurately weighed before and after the test, in order to know the amount of gas which escapes, and which amounts from 40 to 44 in every 100 parts of carbonate of lime. It is to be borne in mind, however, that clay improves the mechanical texture

* Raspail asserts, that these are "simple alterations, either spontaneous or artificial, of the woody textures,"—[*New System of Organic Chemistry,*] preparatory to their entering into new organizations.

of sands as well as limes, and tends to increase their productiveness. In this point of view, therefore, the Granville marl, if transportation is not too expensive, may be applied to sandy porous soils with permanent advantage. On light sands, clay is of as much value as lime. Neither lime nor clay furnish food to plants, yet the presence of both is necessary to adapt a soil to healthy, vigorous vegetation.

CORRESPONDENCE.

FROM MY MEMORANDUM BOOK.

I send you, Messrs. Editors, a memorandum of the produce of thirty-six and a half acres of land, the past season, in grain and grass, not on account of any thing worthy of notice in the result, but that others may profit by my *errors* as well as by my wisdom. The soil is a sandy loam, and no part received but one ploughing for a crop.

17	acres produced	53	tons of	hay,
4	" "	74	bushels	rye,
1	acre "	2	"	wheat,
1½	acres "	574	"	ruta baga,
4	" "	776	"	potatoes,
5	" "	360	"	sound* corn,
4	" "	87	"	barley.
36½	acres.			

REMARKS ON THE CULTURE.

Hay.—The crop was impaired by the frost of last winter having killed much of the clover, particularly on about three acres laid down last year. Two acres were in a reclaimed swamp, which were cropped with potatoes in 1833. The wet spring not permitting the ground to be ploughed in due time, and the grass, which sprung up spontaneously, promising something of a crop, it was suffered to remain. The product was but *so so*. Three and a half acres were a ley of four or five years, which ought to have been broken up before; as grass, with me, generally diminishes after the third year. The residue bore a heavy crop, and averaged, by estimation, three tons an acre.

Rye.—As it is my maxim to sow this grain either very early or very late, I was obliged to sow late, in consequence of the ground having been encumbered with a potatoe crop. The product was a fair crop, though I think that if three or four pecks more of seed had been sown on the acre, there would have been a corresponding increase in the product. The grain was good, but thin, the late sown not tillering like that which is sown early.

Barley.—One-half of the barley ground was over-manured, and the grain was prostrated before it got into blossom. The product of this part was of course trifling. It should have had no manure, as it followed a crop of ruta baga well dunged. Besides, it does not answer to have barley ground too rich, or to apply to this crop long manure.

Wheat.—This was sown in February, on ground ploughed in the fall. It promised tolerably well, until it was attacked by the wheat insect, which virtually destroyed the crop. Scarcely a head contained more than three or four kernels, and in some cells, while the grain was standing, I found five and six insects.

Ruta Baga.—This was the poorest crop I ever raised of the kind, and the failure is not attributable to any error of mine, but to the dry summer. It was sown upon an old grass ley, previously plastered, and dunged, ploughed and harrowed just previous to drilling in the seed. The soil was very dry when worked, and there was not sufficient rain afterwards to bring on a decomposition of either the manure or the sod. Comparatively but few of the seeds grew, and the rows were not half filled with plants. In a favorable season the product would have been more than double.

Potatoes.—Two acres were on a grass ley, well dunged with long manure, and gave a good crop for the season, of more than 300 bushels the acre. This crop received two ordinary dressings, but after harvest I caused all the weeds to be pulled up, and carried to my cow-yard, which, I am confident, added very greatly to the potato crop. One acre was planted on ground habitually wet, and which had been underdrained late the preceding fall. The ground was but imperfectly ploughed, the crop was badly tended, and the product was hardly worth gathering, even in this season of scarcity. The fourth acre was principally on ground where barley had been seriously injured by the frost of the 15th May; it was planted late, with refuse seed. The ground was very dry, and from late planting, bad seed, and a very dry season, the product did not exceed 100 bushels. My practice is not to earth potatoes after the tubers have began to form, as earthing them is apt to cause a new set of stolens to start near the surface, which rob the elder ones of their food, and produce potatoes only of a diminutive size. Yet weeds ought to be carefully extirpated, as they not only impoverish the soil, but shade the ground, to the great prejudice of the crop. The labor of extirpating weeds is amply repaid in the increased product. I think I am warranted in saying, that a clover ley, and long manure, the latter well spread and ploughed under, are admirably adapted both to the corn and potato crop.

Corn.—This and the unproductive acre of potatoes, were grown in a field abouuding in springs, and heretofore habitually wet, but which was underdrained the preceding autumn. A part of the ground had been in pasture, and a part under tillage, and the whole was well manured. The hills were planted three by two and a half feet apart, and there remained after the first dressing, four spears in almost every hill. The corn was dressed with the harrow and cultivator, and twice hoed, though but very slightly hilled. Four-fifths gave an uncommon fair crop. Sixty-three selected ears gave a half bushel of shelled grain, averaging more than half a pint each. The other fifth was killed by kindness, or rather from want of personal attention. Having two loads of horn shavings and crushed bones, I directed them to be spread on *two* acres: but my men, being unacquainted with these materials, and not appreciating their strength as a manure, thought to do me a kindness, and applied the whole to *one* acre. The consequence was, the stalks were too luxuriant and tender, and the wind prostrated them flat to the ground ere the grain was half grown, and but very little of the corn was fit for the crib.

At present prices, the products I have enumerated are worth about $1,300, and average about $36 to the acre.

The errors in my practice, against which I would guard the reader, are:—

1. In sparing grass lands from the plough after the cultivated grasses have most run out, and after the product has materially diminished.
2. In sowing *late* rye too thin.
3. Applying manure to a barley crop, the soil of which was already rich enough—particularly long manure.
4. In planting potatoes too late, and with bad seed.
5. In the excessive and wasteful application of bone and horn manure. And finally,
6. In not superintending personally ALL the operations of the farm. We may hire men to *work;* but it is difficult, as my friend Delavan observes, to hire men to *think correctly.*

By way of postscript I will remark, that I had made, in 1833, in the six acre field in which I grew my corn, about 200 rods of brush and straw underdrains, which cost me about $20, and that I think I am fully remunerated for this outlay in the *increased* product of the field in the past season. B. J.

* My *soft* corn and small potatoes, and some pumpkins, have fattened about 2,500 pounds of pork, *finished,* during the last ten day, with *hasty pudding.*

New-Paltz, Nov. 3, 1834.

SIR,—I have a very valuable apple tree which had the bark eaten off a few inches above the ground, by mice, in the winter, and I took the following method to save the tree. I took four small twigs from another tree, and engrafted them below the wound, in the manner of side grafting, and loosening the bark above, bent the twigs and slipt them under the bark until they came parallel with the body, then covered them well by banking the dirt above the wound and grafts. I left the earth around one season, then cleared it away, and found two had taken. These have commenced to form new bodies, and the tree, from all appearances, is as thrifty as ever, and the twigs have grown in two years to the bigness of your thumb.

I am, dear sir, your humble servant,

J. BUEL, Esq. ABRAHAM STEEN.

P. S. I have also obtained a few twigs or slips of the real Italian Mulberry; the seed was imported three years ago; these I have inoculated in the common white mulberry stock, and they grow very thrifty indeed. They have very large leaves and are very tender. Some of the largest I have measured, and find them from six to eight inches wide, and from seven to ten inches long. I shall have some fit for sale in a few years. A. S.

SOUTH DOWN SHEEP.

I was very much gratified, a few days since, on viewing six ewes and a buck of the much esteemed breed of South Down, lately imported, in the ship Hannibal, from the famous flock of Mr. John Ellman, England, by Francis Rotch, Esq. of Butternuts, Otsego co. They were in fine condition, and did not appear to have suffered in the least from the voyage, which is a strong argument in their favor as to hardihood.

The buck is rather larger than they generally are, but of fine form and symmetry—great length, round and deep in body—fine in the head and legs—full and capacious chest—remarkably broad in the loin and heavy in the quarters—and well covered with a close fine fleece of wool.

The ewes are equally beautiful, and show higher breeding than the buck, and of course not so large. Take them together, I saw more to admire, more good points, more style and fashion about them than any others I ever witnessed.

This breed of sheep are justly becoming great favorites in this country. They will, I think, cross well with the Merino or our native sheep, giving them stronger constitutions and a greater aptitude to fatten.

From the transactions of the Pennsylvania Agricultural Society, I have transcribed the following account of this breed of sheep.

"The South Down sheep are much smaller than the Dishly—they are more hardy—their wool is short, equal in quality to that of half-bred Merino—their fleeces are not so heavy—they carry more fat within, and much more flesh without, than either the Dishly, Tunisian, Irish or Teeswater sheep. By their activity and vigor, both of muscle and constitution, they are fitted to encounter every difficulty, as well as to endure the extremes of heat and cold. They occupy, in England, one of the most exposed and least fertile portions of the Island. Their mutton is of the finest kind, and commands the highest price, although, from the properties of the sheep, it can be produced at the least cost.

"I am of opinion," says this writer, "that the South Down sheep are as valuable a stock, if not more so, than any other that have been kept in this country."

"The fleece is close, heavy, and sufficiently fine for general purposes, and a small part fine enough for any purpose to which wool is likely to be applied for many years to come."

From the New-York Farmer and Horticultural Repository, the following description of these sheep is taken.

"*The South Down sheep* are without horns; they have dark or black-grey faces and legs, fine bones, long small necks; are low before, high on the shoulders, and light in the fore quarter: the sides are good and the loin tolerably broad, back bone too high, the thigh full, and twist good. The fleece is very short and fine, weighing from two and a half to three pounds. The average weight of two year old wethers is about eighteen pounds per quarter, the mutton fine in the grain and of an excellent flavor. These sheep have been brought to a high state of improvement by Ellman, of Glynde, and other intelligent breeders. They prevail in Sussex, on very dry chalky downs, producing short fine herbage."

Albany, Nov. 1834. AMATUER.

Elements of Practical Agriculture,

By David Low, Professor of Agriculture, &c.

I. SOILS.

II. *The Properties of Soils, as determined by Chemical Analysis.*

Having examined the external characters of soils, we might inquire into their properties, as determined by chemical analysis. This, however, is a branch of the extensive subject of agricultural chemistry, into which it would not be consistent with the practical and elementary nature of this work to enter at length. It is merely proposed, therefore, to direct the attention of the student to this part of the science of agriculture, and to make known to him a few results which have been arrived at.

The soil has been said to be a compound of mineral substances, mixed with a portion of vegetable and animal matter.

The vegetable and animal matter of the soil, to which the term mould has been applied, exists either in a state of mixture, or of chemical union with the minerals of the soil.

The mineral matter of the soil forms greatly the larger part of it, and necessarily consists of the same substances which constitute the mountain rocks and mineral masses which are found on the earth, and which form its crust or covering. The hardest rocks break down by degrees, and are decomposed by the influence of air and moisture. Sometimes the decomposed matter remains upon the rocky basis from which it had been derived, and there forms a soil; but more frequently the action of water has mingled together the different mineral masses and strata which are found over all the earth.

The great body of the soil, then, is a mixture of the various mineral substances which are upon the earth, and is resolvable into the same constituent parts. Now, all the rocks and other mineral masses which exist on the surface of the earth, are found to consist of a few bodies, the principal of which are four earths—silica, alumina, lime and magnesia,—and the oxide of iron, soda, and potassa. In like manner, the great mass of the mineral part of the soil is resolvable into silica, alumina, lime, magnesia, the oxide of iron, soda and potassa.

The manner in which this compound body may be conceived to exist is the following: Let it be supposed that the different minerals on the surface of the earth are more or less decomposed, broken, ground down, as it were, and mingled together.

Some are in the form of stones, and are therefore merely species of the different rocks of a country. These form loose stones and gravel, which we see accordingly to be every where mingled with the soil, and to form often a great proportion of it.

A more minute comminution reduces these mineral substances to sand. This is the form in which the largest part of all soils exists, and when it is in a very considerable proportion to the whole, the soil is termed sandy.

When the parts are more comminuted still, and reduced by chemical or mechanical means to powder, the soil appears to be in the state most favorable to vegetation. All our finest soils contain a large comparative proportion of their parts reduced to this state of division; and where none of this finely divided substance, or a small quantity of it only exists, the soil is barren.

Of the substances which form the constituent parts of minerals, the most widely diffused is silica. This earth forms the principal constituent part of all the fossils and mountain rocks of which the crust of the earth is composed. Those in which it exists in large quantity are usually very hard. The sand of the sea-shore is mostly silicious, and silicious sand forms vast deserts in every part of the world.

In quartz, and in felspar, this earth exists nearly pure, and it forms 98 parts in 100 of common flint. It is from its abundance in quartz, a mountain rock of universal diffusion, and in felspar, which is likewise one of the most abundant minerals in nature, that silica is important as forming a principal constituent part of all the loose mineral matter of the surface of the earth, and consequently of all soils.

Quartz is a rock of constant occurrence, and its disintegrated parts have been every where washed into the plains to form an element of the soil. Quartz has been found to consist of silica, alumina, and a small quantity of oxide of iron. Quartz is also an integrant part of sandstone, and other rocks of general diffusion. It enters largely into the composition of granite and other primary rocks. It forms, in short, a part of the rocks in all the series of formations which geologists enumerate; and thus silica is the most universally diffused mineral substance on the surface of the earth, and forms a part, accordingly, of every soil that is known to us.

Alumina, next to silica, is the most generally diffused of the earths. United with silica, it forms a great proportion of all the rocks and mineral masses on the earth. It is accordingly every where found; and forms a part of every soil not wholly barren. Kneaded with water it becomes a ductile paste, and is the substance which chiefly gives their plastic and ductile characters to the soils termed clays.

Silica and alumina, then, forming the largest part of the rocks and minerals which exist upon the surface of the earth, enter the most largely into the composition of soils; and in these they are found to exist, either as grains of sand, or as gravel, or in the form of an impalpable powder.

Lime, the next of the earths, is one which is of wide extension, and performs an important function in the vegetable economy.

In nature this mineral is usually found in combination with acids. Combined with carbonic acid, it constitutes the numerous varieties of marble, limestone and chalk. In this and other combinations, it exists in rocks, in soils, in the waters of the ocean, in plants, and in animals. It forms great rocks and mineral strata; and numerous fossils in combination with silica and alumina.

It is chiefly from the carbonate that the lime used in agriculture is derived. By exposing the carbonate to strong heat, the carbonic acid is driven off, and that which remains is the caustic earth, to which we give the name of quicklime. This substance has a strong affinity for water, which it will absorb from the atmosphere. When the water is applied in quantity, it is absorbed by the lime, with a great evolution of heat; and this is the process of slaking so well known. The lime thus combined with water attracts carbonic acid, and again becomes carbonate of lime; although, in this state of carbonate, it presents external characters entirely different from those which it possessed in its original state of marble, limestone and chalk. But it is in external characters only, and in the lesser degree of cohesion of its parts, that it differs, for otherwise the substances are the same.

By the minute division of its parts by heat, we are enabled to apply lime to the soil in the shape of a finely divided powder, and thus in the best form for improving the texture of the soil. It is from this cause doubtless, as well as those important purposes which it serves as a manure, that this earth is of such importance to the husbandman. Could we apply the earths silica and alumina to the soil in their pure state, or could we reduce them by mechanical or chemical means to powder, we should be able to apply them in a form calculated to improve the texture of the soil.

Lime exists in all soils formed by the decomposition of rocks; but in soils formed wholly by the aggregation of vegetables, as peat, it does not necessarily exist. It improves the quality of all soils, whether they are formed of silica, alumina or vegetable matter.

Silica, and alumina, and lime, forming the principal part of soils, and, where any one of them prevails, giving its character to the soil, it is frequently convenient to distinguish soils, as being Silicious, Aluminous or Calcareous. Where silica prevails, as in the case of many sands, we may call the soil silicious; where clay prevails, we may call the soil aluminous; and where lime exists in quantity, as in the case of chalk, we may call the soil calcareous. Thus, in addition to the less artificial division of the farmer, derived from the texture and external characters of the soil, we may use those derived from its composition.

Magnesia, in various states of combination, exists in nature in considerable quantity. It is generally found in combination with acids, as the carbonic. In mountain rocks and fossils, it exists along with silica, alumina, lime, iron, and other substances. The minerals of which it forms a part, generally feel soft and unctuous. It is the principal constituent of various mountain rocks, as serpentine and chlorite-slate; and thus being an element in many rocks and fossils, it must form a considerable part of soils. Magnesia, however, is less generally diffused than lime, and may perhaps perform a less important function in the economy of vegetation. When it exists in such quantity as to give a character to the soil, we may term the soil Magnesian.

The next substance that exists largely diffused in the mineral kingdom, is oxide of iron.

Iron, as it is the most useful of the metals, so it is generally diffused on the earth. It is derived, for the purposes of the arts, from a series of minerals termed ores of iron. It is found extensively in mountain rocks, and many fossils; and it exists, accordingly, in more or less quantity, in almost every soil. Its precise effects, however, on the productive powers of soils, have not been well determined, some soils, where it exists, being extremely barren, while in some very fertile soils it exists in large quantity. Soils which contain much of iron may be termed Ferruginous.

The alkalies, soda and potassa, are also found in soils, being extensive products of the mineral kingdom. They are found in nature combined with various acids. Muriate of soda, or common salt, one of these combinations, is a widely diffused mineral in soils, a certain quantity of which is probably necessary to the existence of plants, while in excess it is known to be injurious.

Soils, then, consist chiefly of silica, alumina, lime, magnesia, oxide of iron, potassa and soda, together with a portion of organic matter.

From various experiments, it is known, that plants consume, in growing, the decomposing animal and vegetable matter which the soil contains. It is rendered probable also by experiments, that a portion of the earthy matter of the soil—the silica, the alumina, the lime, as well as various saline substances contained in it—is absorbed by the plant, though in minute quantity, as compared to the animal and vegetable matter absorbed.

Further, the medium of supply of the matter of nutrition contained in the soil, may be regarded as water holding in solution the vegetable, animal and other matters which pass into the roots of plants. The soil, then, may be chiefly regarded,

1st. As the instrument for fixing the roots of plants in the ground; and,

2d. As a medium for conveying to them the water holding dissolved the different substances which pass into the plant.

The air may be considered as a vehicle for conveying water to the soil. It is continually charged with aqueous vapor; which partly descends to the earth in rains, and is partly deposited in dews, in the cool of the night. In many countries, it never rains at certain seasons, and the whole moisture is supplied by the dew. In this case, in an especial degree, and in all cases in a certain degree, the power of the earth to absorb moisture from the air, may be regarded as connected with the means of the soil to nourish plants.

All our fertile soils, accordingly, have a power of thus supplying themselves with moisture, and of retaining it for the proper time; while infertile soils either have less of this absorbent power, or retain the fluid absorbed for a shorter time.

Of the different matters which enter into the composition of soils, animal and vegetable substances possess the greatest power of absorbing moisture; and the addition of animal and vegetable substances always increases the fertility of soils.

Of the pure earths, the least absorbent is silica, and it is that also which parts the most readily with its moisture. A soil consisting of too great a proportion of silicious sand is always infertile. It imbibes the aqueous vapor of the atmosphere with slowness, and parts with it quickly. A soil of silicious sand will scarcely be penetrated by the dew of night, and will part with it on the first action of the morning rays of the sun.

While pure silica will imbibe scarce a fourth part of its weight of water, lime will absorb nearly its own weight, and alumina two and a half times its weight. But while the silica will absorb a smaller quantity than alumina or carbonate of lime, it will allow it to evaporate two times more quickly than carbonate of lime equally divided, and five times more quickly than alumina in the same state.* The addition of carbonate of lime or alumina to a soil containing too much silica, never fails to increase its powers of absorption and its fertility.

The order in which the principal substances that enter into the composition of soils, possess an absorbent power, is the following:

1. Animal and vegetable substances.
2. Alumina.
3. Carbonate of lime.
4. Silica.†

It appears, too, that the more perfectly the parts of the soil are comminuted, decomposed and reduced, the greater is the power of absorption which they possess; and that the larger the proportion of the soil is which exists in this minutely divided state, the greater, *cæteris paribus*, is its fertility.

But, although certain earths in their separate state have thus a greater power of absorption than others, it does not follow, that a soil consisting chiefly of that one earth would possess a greater power of absorption than a soil composed of a mixture of earths, even though these earths should in themselves be less absorbent. Thus, a soil consisting chiefly of aluminous earth, though alumina be itself the most absorbent of all earths, taking water up in the greatest quantity when poured upon it, as well as retaining it the longest, would not really be so absorbent as if it were more mixed with other earths. Hence, the stiffer clays are not the soils which absorb water readily from the atmosphere; for, when the weather is dry, such soils become indurated upon the surface, which presents an obstacle to absorption; and thus we find, that in hot weather the vegetation of very stiff clays is almost as soon injured by drought as that of light soils, and much more quickly than that of good loams.

A mixture of silicious sand, then, with a very aluminous soil, although the sand be the less absorbent substance of the two, seems to increase the general power of absorption from the atmosphere; so also does a mixture of lime, and in an eminent degree, of animal and vegetable matter.

It is not, therefore, the prevalence of any one earth that constitutes a soil well fitted to absorb humidity. A mixture of certain

* Chimie appliquée à l'Agriculture par M. le Compte Chaptal. † Chaptal.

proportions of alumina and silica, of carbonate of lime and vegetable and animal matter, appears to be the best suited for absorbing the humidity of the atmosphere, of preserving it, and transmitting it the most regularly to the plant.

Neither does it appear that the prevalence of any one earth in a soil is favorable to vegetation. Too great a proportion of alumina forms a soil too stiff and tenacious. Such a soil will, from this cause, be found to be unproductive. A soil consisting of carbonate of lime only, as we see in the case of chalk, is a bad soil. A soil consisting of alumina and carbonate of lime only, as we see in the case of clay-marl, is unproductive as a soil, until mixed with other substances.

A soil consisting chiefly of silica, is often so barren as to be incapable of sustaining vegetation at all.

Some, founding on the experiments of Sir Humphrey Davy, have been led to the opinion, that the fertility of soils is directly indicated by their power of absorbing water from the atmosphere, and that their relative fertility may be estimated by this circumstance alone. Sir Humphrey Davy compared together the absorbent power of various soils with respect to the moisture of the atmosphere, and found it to be the greatest in the most fertile. Thus; 1000 parts of a celebrated soil from Ormiston in East Lothian, when dried at 212°, gained in an hour, when exposed to air saturated with moisture at the temperature of 62°, 18 grains.

1000 parts of a very fertile soil from the banks of the river Parret in Somersetshire, under the same circumstances, gained sixteen grains.

1000 parts of a soil from Mersea in Essex, worth 45s. an acre, gained 13 grains.

1000 parts of a fine sand from Essex, worth 28s. an acre, gained 11 grains.

1000 parts of a coarse sand, worth 15s. an acre, gained only 8 grains.

1000 parts of the soil of Bagshot-heath gained only 3 grains.

It is an error, however, to hold that the relative fertility of soils may be determined by their power under the circumstances mentioned, to absorb moisture from the atmosphere. The power of soils to retain moisture when absorbed, and thus to supply it in due quantity to the plant, is also to be taken into the account. Peat-earth is a very absorbent soil, but it is not a soil of great fertility. It parts with the moisture absorbed with too great facility. Besides, to infer that the fertility of soils depend upon their powers either to absorb or to retain moisture, were to reason as if these were the only conditions of fertility in soils, which does not appear to be the case; and other experiments accordingly do not bear out the conclusion that the fertility of soils depends upon these properties. But this may be inferred, that all productive soils have a considerable power of absorbing moisture and retaining it when so absorbed, and that the property does not depend on the prevalence of any one substance, but on a mixture of several substances.

It has been found, also, we have seen, that the fertility of soils, however produced, is not dependant on the prevalence of any one mineral in the soil, but on a mixture or combination of several. But what the precise proportion of these is which is the most favorable to fertility, has not yet been determined.

Without detailing any of the numerous experiments of chemical analysis that have been made, with the design of ascertaining this and other points relating to the properties of soils, the following conclusions may be given as apparently deducible from the investigations that have taken place:

1. Soils in which the largest quantity of silica and alumina exists in the state of impalpable division, are, *cœteris paribus*, the most fertile.

2. Soils in which the quantity of silicious sand is large are comparatively infertile: while soils in which the sand is fine and only partially silicious, are comparatively fertile.

3. Oxide of iron exists in all soils, but does not influence their fertility in proportion to its larger or smaller quantity.

4. An excess of the acid combinations of the oxide of iron, and certain other saline bodies, is hurtful to vegetation.

5. Carbonate of lime exists in the best soils, and generally, though not always, in larger quantity in the better than in the inferior soils.

6. Certain earths possess the power of combining chemically with animal and vegetable matter, and of retaining it for a longer or shorter time. Thus, alumina and lime form certain compounds of greater or less insolubility with animal and vegetable matters, while silica will not enter into the same combinations; and hence it is that aluminous and calcareous soils retain for a longer time the manures applied to them than silicious soils.

7. When water is in excess in the soil, and when vegetable matter is present, acid is formed which is injurious to the productive powers of the soil. In the first stages the acid appears to be the acetic; in the latter stages, when the matter of the vegetable is being converted into peat, the acid appears to be the gallic, and the tannin principle is formed.

8. Soils, besides absorbing moisture from the air, appear to absorb carbon and other matters nutrimental to plants.

These are the principal results to which the chemistry of agriculture has conducted us with respect to soils. This branch of science, however, may be said to be as yet imperfect, and a large field of useful investigation still remains for the philosophical inquirer. Although it may be said that much has not been done with relation to the really useful, which observation and practice had not before shown, yet we have at least escaped from the errors of former opinions, and so far the path of further inquiry is more open to us.

Amongst other results to which this species of investigation has conducted us, we have seen—that the practice known to agriculturists of mixing together different kinds of earths, admit of explanation on principles founded on our knowledge of the composition of soils; that the beneficial action of manures depends upon a proper constitution and texture of the mineral portion of the soil, and that hence to derive the full benefit of manures, the province of the cultivator is to improve the texture and constitution of the soil: that the comminution of the component parts of the soil is beneficial, as rendering the whole more pervious to the air, and the vapor, and other matters, with which the atmosphere is charged: and further, we have been enabled to render our common nomenclature of soils more precise, by distinguishing them by the terms Silicious, Aluminous, Calcareous, Magnesian and Ferruginous, as silica, alumia, lime, magnesia and oxide of iron, prevail in their composition.

We might now proceed to consider the relation existing between the soils of a country, and its geological condition. This is a subject interesting to the scientific agriculturist. But however curious the investigation might prove, it is not necessary for that practical illustration of the subject of soils, which consists with the design of this work. Besides, to characterize the quality of soils, as affected by the geological nature of the country or district, is to view the subject in a somewhat more extended manner than is consistent with the common purposes of the farmer. Although it is found that a relation may be generally traced between the nature of the rocks of a country or district, and its fertility—as, in the British Islands, between the new red sandstone and the finest districts of the country; between the coal formation, under certain circumstances, and a ferruginous and somewhat ungrateful soil; between the magnesian limestone and a tract of comparative infertility; between the lias formation and one of comparative productiveness, and so on—yet many degrees of quality may exist in the soils of the same series of rocks, and in the same country; and even all the contrast between great fertility and great barrenness may be found within the limits of a single field. We must, therefore, narrow our views when we examine the soils which we have occasion to cultivate, and regard, not their properties with relation to an entire district, but their minuter shades of fertility and character.

We have thus considered their properties as determined by their external characters, and in part by their chemical composition. We may now consider their characters as determined by their vegetable productions.

Miscellaneous.

EXPERIMENTS IN RAISING POTATOES.

BY JOHN ROBERTSON, OF CARLOW, IRELAND.

Experiment 1.—Mr. Robertson marked off, on an average portion of his potato ground, four drills, twenty yards each in length; in two of these he planted potato seed of the red-nosed kidney species, and in the remaining two of the apple kind. These he earthed up in the usual way: in these earthed drills the product was six pounds (about 10 per cent) less than in four corresponding ones unearthed. In all those drills, (which were 30 inches apart,) the sets were placed from ten to twelve inches asunder. The treatment of the unearthed drills may be thus stated: They were dug at bottom twelve inches deep, and left half full of the crumbling clods; on these the potatoe were laid, and then covered about three inches with dung, over which an inch of fine earth was drawn. When the shoots were sufficiently high, the clods were broken fine and closed about the stems, and the ground in the intervals dug deep and fine as possible, and left perfectly flat; this was the only tillage which the unearthed potatoes received. The produce was about 150 barrels* to the acre.

Experiment 2.—In order to determine at what distance in drills 30 inches apart, it is advantageous to plant the sets, Mr. Robertson proceeded as follows:

In a piece of ground of sixty square yards, (not yards square,) he planted eight drills of a new seedling cup potato at 30 inches distance; these drills, nearly 9 feet in length, he planted, at the distance above stated as follows:

Drill 1	the sets 9	inches apart, and	1 shoot left.
.... 2	6		2
.... 3	12		1
.... 4	12		2
.... 5	16		1
.... 6	16		2
.... 7	18		1
.... 8	18		2

The produce was—

	Bbls.	st.	lbs.
Drill 1	0	6	2
.... 2	0	4	7
.... 3	0	3	1
.... 4	0	4	3
.... 5	0	3	6
.... 6	0	4	7
.... 7	0	3	3
.... 8	0	6	1
Gross produce,	1	15	2

Which is about 228 barrels, or 28 tons 10 cwt. to the Irish acre, accurately weighed. This enormous produce was from an alluvial soil light and deep.

Experiment 3.—To ascertain the result of giving unlimited room to the potato, and the depth to which the roots would run if unrestrained.

On a piece of ground trenched upwards of 3 feet, Mr. Robertson planted eight whole potatoes, each 3 feet apart in the row, with unlimited room to grow at each side. The produce was six stones, and the fibres were traced downwards 3 feet, the space they occupied being equal to that of two drills in Experiment 2.

Experiment 1 proves the inutility of earthing.

Experiment 2 gives an interesting demonstration of the advantage of free access of air, the outside drills giving such superior produce; and the advantage (25 per cent) of the double stemmed ones over the single, at the same distance, proves (combined with the other circumstances) the truth of Mr. Knight's theory, that, in proportion to the abundance of its foliage, and the free access of air and light, will be the productiveness of the potato.

From the similarity of produce in the corresponding drills of Nos. 2, 4 and 6, and in Nos. 3, 5 and 7, it would appear of little importance at what distance the sets are placed in the drills, provided they have sufficient room to spread at each side; and the extent of this must be regulated by experience.

It is of the highest importance, however, that the ground should be deeply worked and highly pulverized: for the potato fibre is extremely delicate, and cannot penetrate through a hard unyielding soil, though it will run freely through that which is loose, and occupy the pulverized intervals between the drills.

Mr. Robertson deems it highly absurd, in shallow soils, to heap on the top of the potatoes, where it affords no nutriment, the earth which, if left within the range of fibre, would feed it. However, it is to be remembered, that *some species* of potatoes strike upwards, *cups* for instance, (though it appears that Mr. Robertson used these in this experiment;) and in such case earthing is most probably useful. *Apple* potatoes have a downward tendency, and therefore may not require moulding. The species under culture, and the nature of the soil, should also materially influence the farmer as to the disposition of the manure under or over the set. It is obvious that (on a dry and porous soil in particular) in the culture of *cup* potatoes, the vegetating tendencies of which are to the surface, it is injudicious to place the manure under the sets.—*Q. J. Ag.*

* The Kilkenny barrel contains 20 stones of 14 lb.; the total was therefore about 700 bushels.

NOTES ON THE MANAGEMENT OF CATTLE.

As soon as the ploughman has unyoked his oxen, let him rub them, and press their backs strongly with his hands, pulling their hide, and not suffering it to adhere close to their flesh, for such adhesion constitutes a very injurious disease. Let him rub their necks thoroughly. The oxen are not to be tied to their cribs until they cease to perspire and pant: Nor is it proper to give them much food, even when it shall be due time to feed them; but their allowance should be dispensed in small quantities at a time, which having finished, they may be led forth to water, and enticed to drink *by whistling;* immediately afterwards, they must be satisfied with a large allowance of fodder.—*Columella.*

The temper and disposition of cattle are most approved which approach the mild and gentle, rather than the violent and fierce, still without a sluggish heaviness; dismayed at loud and blustering words, yet with such a confidence in their own strength, as not to be startled at common objects of sight or hearing, or afraid to ford rivers or pass bridges: which are great feeders, but slow in mastication: for these digest better than such as devour their food greedily and with haste, preserving their condition and bodily strength. But it would be an equal fault in one who uses laboring oxen, to make them fat as to keep them lean; for their condition of body ought to be moderate and fit for business, robust and full in the muscles, but not loaded with fat, whence they would be jaded and wearied by their own weight.—*Columella.*

The stronger and richer the land is, the more must cattle be kept up to a good pitch; for if on such land cattle are in the winter suffered to run to poverty, or are brought into it poor, they will be liable to the yellows, or the blain, and most sorts of distempers; for it is the same as if you should offer strong meats to weak stomachs.—*Lisle.*

Clover intended to be kept the second year for feed, ought not to be grazed the first year by sheep, which bite so close as to wound the crown of the roots. [The same of other artificial grasses.] The leaves and stalks of artificial grasses being full of juices, cattle fed upon them, even in the driest summers, scarcely need water. Sheep fed on clover will dung quite moist; whereas their excrement, when fed on natural grass, will generally be hard and dry. (A double advantage in the artificial grasses; during seasons of great drought, neither the grass nor the cattle will feel the common want of water.) [Cattle fed in winter upon ruta baga, do not require, and should not receive, any water.]—*Lisle.*

A young beast may eat well HALF FAT; but an old cow half fat is not eatable, for the whole body of such a cow ought to be filled with new juices. A young cow will be fat on the back, but very rarely well tallowed within; whereas an old cow seldom handles so well, but generally carries most of her fat within. A two year old ewe will fatten and tallow well. The springing or standing out of the navel, the best sign of internal fat; also, in lean cattle, such protuberance is a sign that they will fatten internally.—*Lisle.*

TRANSPLANTING.

Transplanting is the changing of the localities of entire plants.—It is effected by disengaging the roots from the soil, and placing them in new situations favorable to the growth and development of the plant.

To accomplish this successfully, it is desirable that the roots be preserved fresh and entire.

The proper seasons for transplanting ornamental and other trees and shrubs, are the spring and fall. Generally in October and November of the latter period, and March and April of the former. It is commonly best in colder latitudes to remove the more delicate shrubs and trees in spring, but where the climate is not so severe, the autumn is preferable. In the latter case, the winter is not so likely to prove injurious to them.

Those which are natives of countries equally cold and rigorous with the one to which they are removed, may be transplanted either in the spring or autumn, indiscriminately. Such as are natives of warmer climates, and have become acclimated, by culture, to higher latitudes, may be transplanted in spring. They ought to have every advantage that the warm seasons can afford, previous to their exposure to the rigors of winter.

Plants transferred to a less favorable climate, should be removed at a period most favorable for them to support the change without injury. Delicate trees, when transplanted in spring, form new roots, that take firm hold of the earth during summer. Their roots become established in their position, so that there is far less prospect of injury from the severities of winter. It is a matter of little consequence, however, at which of these seasons the hardy kinds are removed.

Plants, when taken from the earth to be transferred, should be removed with much care. Should any injury be sustained by loss or a mutilation of a part of the roots, the whole body of the plant, together with the root, may be immersed in fresh water during a period of twenty or thirty hours, previous to setting it in the earth again.

The top is to be lessened in proportion to the loss the roots may have sustained. Otherwise the plant will perish from a loss of its wonted nourishment. The ordinary quantity of root being diminished, the exhaustion from *evaporation* will be greater than the *absorption* of the remaining portion of root, so that the plant will die by transpiration.

October and November, after the first frosts have arrested the progress of vegetation in woody *perennials*, is recommended as a proper season for *transplanting* them. Some are of the opinion, that the peach, plum, cherry, and most evergreens, succeed best when transplanted in spring.

Any trees, even the most delicate, may be successfully transplanted in autumn, if a little protection be afforded them by covering the root during the first and most trying winter. Where complete success is hoped, it is best to shift their locality in the fall, if possible.

The protection of most trees, shrubs and woody plants, may consist in spreading a few inches of litter from the stable around the trunk and over the roots.

Moss from the meadow and evergreen boughs are highly recommended for the protection of delicate plants. They are not liable to undergo decomposition during the winter, and thereby injure and destroy what they were designed to protect.

Delicate plants are sometimes supposed to be destroyed by too much protection after being transplanted, when, in fact, they perish for want of it, being killed by the alternate freezing and thawing of the earth at its surface. This difficulty might have been easily obviated by covering them with evergreen boughs or meadow moss.

When trees or shrubs are transplanted in *autumn*, the earth becomes consolidated at their roots, so that the radical fibres soon take firm footing in the earth, and the plant is prepared to vegetate with the earliest advances of spring.

The excavation of the earth for the reception of the roots of trees and shrubs should bear some proportion to their size. They may generally be made from four to six feet in diameter, and of about eighteen or twenty inches in depth. Large trees will require a larger opening than this, and small ones not so large.

The yellow or subsoil where they are to be located may be thrown out, and replaced at bottom with a fine mould, intermixed with a portion of good manure.

Trees transplanted should stand two or three inches deeper in the earth than they stood previous to their removal. In no cases should the extra depth exceed this.

The radical fibres are to be spread horizontally in their natural position, and the soil intimately blended with them and compactly pressed about the trunk and over the roots.

No manure should be permitted to come in immediate contact with the roots, though it should be plentifully placed about them on all sides. Should it touch them, they will be likely to sustain injury and rot.

The ground, before being trodden very hard about the roots, is to be plentifully moistened by pouring water about the plant.

In transplanting evergreens, it is generally recommended, previous to treading the earth about their roots, to pour several gallons of water about the trunk, and, after filling in with earth, to finish by treading it as hard as possible for the space of half an hour or more. This would be a good rule to follow in regard to all trees of whatever kind.

June has been considered by many as the best month for transplanting *annuals* that are cultivated as Florists' Flowers, and September most suitable for transplanting *biennials*.

In transplanting plants of every description, it is desirable that as much earth as possible be removed with the roots. If this be done, there will be less danger of their suffering by the change of situation.

Though moist, cloudy weather is generally best for transplanting, it should not be done when the ground is very wet. The earth should be only moderately moist, otherwise it will be clammy and heavy.

The operation of transplanting is most successfully performed in cloudy days, and a little before evening previous to a shower. The reasons for this are obvious. If it be done when the earth is dry and in the middle of the day, plants require watering and shading for a considerable time afterwards.

If the root be small, or injured, or destitute of earth when taken up, it will require that the earth which is placed about it be made finer, and pressed more firmly, and that the plant be more plentifully watered. It will also require to be longer shaded.

Plants, transferred to pots and boxes, after having the soil pressed firmly about them on all sides, should also be plentifully watered and for some time shaded. Care is to be taken that the shell be placed over the aperture at the bottom of the vessel, otherwise the plant will perish through a superabundance of moisture Saturation of the earth, without an outlet at the bottom, will rot the root and destroy the plant.—*Florist's Manual.*

BLUE COLOURING MATTER FROM STRAW OR BUCKWHEAT.

We intended to have mentioned this subject earlier in the season, in order that some of our readers who had buckwheat upon their premises might try the experiment and ascertain more satisfactorily the facts of the case. But we will bring it forward now; perhaps it may be recollected in its proper season. The method which has been recommended for preparing the colouring matter from this plant is the following:—Cut the stems before the grain is fully ripe, and spread them upon the ground exposed to the sun and leave them thus exposed until the seeds drop off with ease. When the grain is separated from the stems, they are thrown into heaps, moistened with water, and left to ferment to such a degree, that decomposition takes place, and a blue colour is developed. It is then formed into balls or flat cakes which are dried in the sun or by a stove, after which, if the balls be boiled in water, they impart an intensely blue colour which is not affected by vinegar or oil of vitriol. It may be converted into red by adding an alkali, as potash or soda; with nutgalls it strikes a blacker colour, and a very fine green is afforded by evaporation. It is said that stuffs dyed blue by this preparation retain their colours well, and appear very handsome.

We have never prepared any colouring matter from this plant, nor can we vouch for the truth of the above statement, but certainly we think it worth a trial.—*Farmer and Gardener.*

RIPE BREAD.

Bread made of wheat flour when taken out of the oven or skillet, is unprepared for the stomach. It should go through a change, or ripen before it is eaten. Young persons, or persons in the enjoyment of vigorous health, may eat bread immediately after being baked without any sensible injury from it, but weakly and aged persons cannot, and none can eat such without doing harm to the digestive organs. Bread after being baked goes through a change similar to the change in newly brewed beer, or newly churned buttermilk, neither being healthy until after the change. During the change in bread, it sends off a large portion of *carbon*, or unhealthy gas, and imbibes a large portion of healthy, or *oxygen* gas. Bread has, according to the computation of the physicians in London, one-fifth more nutriment in it when ripe, than it has when just out of the oven. It not only has more nutriment but imparts a much greater degree of cheerfulness. He that eats old bread will have more animal spirits than he would were he to eat unripe bread.

Bread, as before observed, discharges carbon and imbibes oxygen One thing in connection with this thought should be particularly noticed by all housewives. It is, to let the bread ripen where it can inhale the oxygen in a pure state. Bread will always taste of air that surrounds it while ripening—hence it should ripen where the air is pure. It should never ripen in a cellar, nor in a close cupboard, nor in a bed room—the noxious vapors of a cellar or a cupboard never should enter into and form a part of the bread we eat. The writer of this article has often eaten bread of this kind, and has felt strongly disposed to lecture the mistress of the house on the subject of keeping bread in a pure atmosphere. Every man and woman ought to know that much of health and comfort depends upon the method of preparing their food. Bread should be *light, well-baked, and properly ripened,* before it should be eaten,—*N. Eng. Farmer.*

HINTS TO HOUSEKEEPERS.

A writer of your paper of the 7th ult. over the signature of Sylvanus, has offered excellent advice for curing bacon, and insists that the hogs, for this purpose, must be corn fed. How long must they be so fed is the question.

Experience has shown that it requires but a very short time to entirely change the flavor and texture of all kinds of flesh. In 1770 I resided in New-Jersey where it was the custom to take great numbers of wild pigeons in spring-nets, by the assistance of decoy pigeons prepared for the purpose. The flesh of these birds, when first taken, is always very dark, and most generally tough. I have seen more than 300 of them confined and fed in a large corn-house, and in one week their flesh has not only become tender, but as white as a well fed chicken.

In 1784, I promised to present to a brother just married a prime beef towards his winter stores. I had a fine steer and a spayed heifer in a large wheat field abounding with wild garlic; my brother named a day to send for his beef, and three days previous we killed the heifer, which, although extremely fat, was to my great disappointment, so thoroughly tainted with garlic, even to the marrow in the bones, that my house servants refused to eat it—a bad prospect for my brother, whose wagon came the fourth day; and in despair I killed his beef, which was beautiful to the eye. I did not at the time pay much attention to a remark of his feeder, who observed that the steer had not eat any thing since the heifer was killed; my trouble was the certainty of my brother's disappointment, but to my great joy, I soon received his letter of thanks, saying, that a more juicy, tender, and fine-flavored beef could not be.

The foregoing facts are known to every experienced farmer, and they have convinced me, that hogs fed upon corn for two weeks is much better than two months, for the plain reason that the flesh is equally good, and the expense is less.

Hogs, as generally managed, are not only the most troublesome, but the most costly flesh we consume, and I have, for many years, been in pursuit of a plan to lighten the cost of their flesh, which is so absolutely necessary for the establishment of every Marylander. I flatter myself that I now see my way clear, for after two years trial, I am well satisfied that the use of cymblins, pumpkins, ruta baga and clover will enable me to send more corn to market, and with two weeks feeding upon that precious grain, my bacon will not yield to that of any person. No branch of rural economy requires more attention than feeding our various kinds of stock. Our northern friends laugh and say, that in Maryland the hogs eat all our corn, and our negroes eat all our hogs. This is too true to deny, and if my mite can, in your opinion, be of any use to the public, it is at your service.—*American Farmer.*

IMPORTANCE OF ABLUTION AND BATHING.

When the saline and animal elements left by the perspirations are not duly removed by washing or bathing, they at last obstruct the pores and irritate the skin—and it is apparently for this reason, that in the eastern and warmer countries, where perspiration is very copious, ablution and bathing have assumed the rank and importance of religious observances. Those who are in the habit of using the fl sh-brush daily are at first surprised at the quantity of white dry scurf which it brings off; and those who take a warm bath for half an hour, at long intervals, cannot fail to have noticed the great amount of impurities which is removed, and the grateful feeling of comfort which its use imparts. The warm, tepid, cold or shower bath, as a means of preserving health, ought to be in as common use as a change of apparel, for it is equally a measure of necessary cleanliness. Many, no doubt, neglect this, and enjoy health notwithstanding, but many, very many, suffer from its omissions; and even the former would be benefitted by employing it. The perception of this truth is gradually extending, and baths are now to be found in fifty places for one in which they could be obtained twenty years ago. Even yet, however, we are far behind our continental neighbors in this respect. They justly consider the bath as a necessary of life, while we still regard it as luxury.

When we consider the importance of the exhalation performed by the skin, the extent to which ablution and bathing of every description are neglected in charitable institutions, in seminaries for the young, and even by many persons who consider themselves the patterns of cleanliness, is almost incredible. Mr. Stuart, in speaking of the North Americans, states in his remarks, that "the practice of travellers washing at the doors, or in the porticoes or stoops, or at the wells of taverns, and hotels once a day, is most prejudicial to health; the ablution of the body, which ought never to be neglected, *at least twice a day*, in a hot climate, being altogether inconsistent with it. In fact," he adds, "I have found it more difficult, in travelling in the United States, to procure a liberal supply of water at all times of the day and night in my bed chamber than to obtain any other necessary. *A supply for washing the face and hands once a day seems all that is thought requisite.*" But bad as this is, I fear that numbers of sensible people may be found much nearer home, who limit their ablutions to the *visible* parts of their persons and would even express surprise if told that more than this is necessary to health. Certain it is, that many never wash their bodies at all, unless they happen to be at sea-bathing quarters in summer, or oppressed with heat, when they will resort to bathing as a means of comfort, but without thinking at all of its efficacy as a means of cleanliness in preserving health. In many public charities and schools, in like manner, bathing or ablution is never thought of as a proper or practicable thing, except for the sick; and yet, it is obviously of great importance to every one, especially to the young.

For general use, the tepid or warm bath seems to me much more suitable than the cold bath: especially in winter, and for those who are not robust and full of animal heat. Where the constitution is not sufficiently vigorous to secure reaction after the cold bath, as indicated by a warm glow over the surface, its use inevitably does harm. A vast number of persons are in this condition; while on the contrary, there are few indeed who do not derive evident advantage from the regular use of the tepid bath, and still fewer who are hurt by it.

While the health is good, and the bodily powers are sufficiently vigorous, the cold bath during summer, and the shower bath in winter, may serve every purpose required from them. But it should never be forgotten, that they are too powerful in their agency to be used with safety by *every one*, especially in cold weather.

In proportion as cold bathing is influential in the restoration of health when judiciously used, it is hurtful when resorted to without discrimination; and invalids, therefore, ought never to have recourse to it without the sanction of their professional advisers.

Even where cold bathing is likely to be of service when judiciously employed, much mischief often results from prolonging the immersion too long, or resorting to it when the vital powers are too languid to admit of the necessity of reaction; before breakfast, for example, or after fatigue. For this reason many persons derive much benefit from bathing in the forenoon, who, when they bathe in the morning before taking any sustenance, do not recover their natural heat and elasticity of feeling.

For those who are not robust, daily sponging of the body with cold water and vinegar, or salt water, is the best substitute for the cold bath, and may be resorted to with safety and advantage in most states of the system; especially when care is taken to excite in the surface, by subsequent friction with the flesh brush or hair glove, the healthy glow of reaction. It then becomes an excellent preservative from the effects of changeable weather. When, however, a continued sensation of coldness or chill is perceptible over the body, sponging ought not to be persisted in; dry friction, aided by the tepid bath, is then greatly preferable, and often proves highly serviceable in keeping up the due action of the skin.—*Combe's Principles of Philosophy.*

DEMAND CREATES A SUPPLY.

The improvement of agriculture, like that of every art, manufacture, or commodity, necessarily depend on demand and production; a powerful or effectual demand will ensure produce, and excellent produce will, to a certain extent, create demand. A general nicety of taste in coach or saddle horses will call forth a superior description of those animals, and superior animals will tempt purchasers; if the inhabitants of any district who live chiefly on barley or oats, indicate a preference for wheat, and a willingness to pay for that grain, wheat will be produced, and so on. Again, as the object of every individual who engages in art or trade is to acquire gain, the advancement of an art will depend mainly on the profits it affords; an art or occupation which affords less than the average profits on capital, will only be followed by such as from habit or other reasons, cannot apply themselves to any thing better, but extra profits will command both capital and skill. From these considerations it is obvious that the improvement of agriculture depends on the profits of capital employed in it, on the taste of those who purchase its products, and on the knowledge of those who are engaged in agriculture as a profession.

CHENAM.

Our merchants are indebted to Capt. Thomas Bennett, of the New-York and Liverpool packet line, for the introduction of this article into use here. Chenam (the East India name) is made by mixing slaked and pulverized lime with whale oil to the consistency of mortar. It is so tenacious that it adheres immediately wherever applied, and is entirely impervious to water, and becomes perfectly hard in it.

It is laid on ships' bottoms with trowels, sometimes under the sheathing and sometimes between the copper and sheathing; and, in some instances, in both places. The copper is put on while the Chenam is soft, and adheres to it so completely that no water passes between them; and it is said that copper in vessels which have a coat of Chenam wears nearly double the usual time.

Whale oil is used here in making it, because it fully answers the purpose, and is two-thirds cheaper than vegetable oil—but vegetable oil makes much the best Chenam, becoming after a short time as hard as a stone. It is suggested that the celebrated mortar of the ancients was made of lime and vegetable oil.

I understand that some experiments will be made here on roofs and outsides of houses, with Chenam, as it is believed it will effectually resist the fogs and frosts of our climate, which the common rough casting does not.—*New-Bedford Gaz. and Cour.*

VETCHES, &c. PLOUGHED IN.

Under this article may be included all sorts of green manure.—Amongst the most active parts employed as manure, I have found the wild species of the genus Sinapis, [Mustard,] ploughed in fresh in the bottom of turnip drills, at the rate of twenty tons per acre. The produce brought by auction £12, while the rest of the field, manured with twenty tons of farm-yard dung, brought only from £9 to £10 per acre. Other weeds, such as nettles, thistles, ragwort, &c. produce crops superior to farm-yard dung. Potato stems, fresh ploughed in on clover ley for wheat, I have found to produce crops exceeding by two bolls per acre in quantity, with more proportionate weight of straw, than other parts of the same field manured with farm-yard dung, but otherwise under the same circumstances. The stems from three acres of good potatoes, will manure an acre for wheat to much better purpose than 15 tons of farm-yard dung, the usual quantity allowed in that part of the rotation, clover after wheat being the crop which generally precedes fallow. Under the head of "green manure," I may mention an experiment I this year made with pea-straw converted into dung without the aid of cattle. Having something of that sort on hand about the middle of last May, and being in want of some loads of manure to finish a potato field, I had the peas threshed at the mill, and the straw and chaff carried to the side of the potato field, and made up like a large hot-bed, giving each layer of straw an ample watering. Fermentation soon commenced, and by the fifth day the mass was so far decomposed as to be easily filled into the carts. The effluvium in filling was almost intolerable. It was in this state laid in the bottom of the drills; the sets of potatoes were planted above, and the earth ploughed over the whole. Notwithstanding the dry nature of the ground, and the dry state of the weather in the summer months, the part of the field manured with the decomposed pea-straw yielded a better return than where farm-yard dung was applied.—*Loudon.*

WHEAT INSECT.

The following description of this insect, by Prof. Low, agrees with our observation of it about Albany.—*Con. Cult.*

"Certain flies also attack the wheat, at a later stage of its growth. The *Cecidomyia Tritici* is a fly with an orange colored body and white wings. About the month of June the female ascends the ears of wheat, and deposites her eggs in these by means of a fine trunk, and in a few days she perishes. The progeny being hatched in the ear, feed upon the grain. They are very small, from ten to fourteen being sometimes found in one grain, and are distinguished by being of a bright orange color. They do not extend beyond the grain in which they are born; but several grains being thus consumed on one ear, the damage done is often considerable. The larvæ, after a period, fall down to the earth, in which they burrow, and remain there till the following summer, when they ascend from the earth in the form of a beautiful fly which has been mentioned."

CUT AND UNCUT POTATOES FOR PLANTING.

Mr. Fessenden.—The following details of an experiment to ascertain the relative advantage of planting cut or uncut potatoes is at your service for publication if you think it of sufficient importance.

I planted this year alternate rows of cut and uncut potatoes. I put four pieces into each hill of the cut potatoes, and two potatoes into each hill of the whole potatoes. The hills were three feet apart, each way, and of course the number of hills in an acre was 4,840. The produce of the rows planted with cut potatoes, was at the rate of three hundred and thirty-five bushels the acre, or twenty-three thousand five hundred and twenty pounds. The produce of the rows planted with whole potatoes, was at the rate of four hundred and fifty-eight bushels, or thirty-two thousand and sixty pounds. The difference in the crop in favor of whole potatoes was at the rate of one hundred and twenty-two bushels the acre, but as there were twenty-two bushels more of seed to the acre used in planting the whole potatoes, the nett gain was only one hundred bushels. However, as one bushel of potatoes at the season of planting is usually worth two bushels at harvest time, it will be more accurate to calculate the gain at seventy-eight bushels. The kind of potatoes planted was the "*white blue nose*" which is decidedly the best potato for the table I have ever cultivated, though a moderate bearer, unless it receive generous treatment.—*New-England Farmer.*

Shell-Marl is very different in its nature from clayey or stone-marls, and, from its effects upon the soil, is classed among animal manures. The Rev. Mr. Dickson states, "that it does not dissolve with water as other marls do. It sucks it up, and swells with it like a sponge. It is a much stronger attractor of acids than they."—Dr. Horne says, that it takes six times more of acids to saturate it, than any of the other marls he had met with. But the greatest difference between the shell-marl and other marls, consists in this; the shell-marl contains oils. It is uncertain if the other marls contain any oils; but this kind, it is said contains them in great plenty.

This marl, it would seem, from the qualities which it possesses, promotes vegetation in all the different ways. It increases the food of plants; it communicates to the soil the power of attracting this food from the air; it enlarges the pasture of plants; and it prepares the vegetable food for entering their roots.

The clayey and stone marls are distinguished by their colours; viz. white, black, blue and red. The white, being of a soft crumbly nature, is considered to be the best for pasture land; and the blue [commonly called blue clay] which is more compact and firm, for corn land. In the districts where marl is much used, these distinctions of management are attended to, though either of the kinds may be employed with advantage, if the following rules are adhered to.

If marl is of the blue kind, or of any kind that is compact and firm, lay it upon the land early in the season, so as the weather may mellow it down before the last plough; and, if on pasture land, let it also be early laid on, and spread very thin, breaking any lumps afterwards which are not completely separated by the first spreading. If marl is of the white, or any of the loose or crumbling sorts, it need not be laid on so early; because those varieties break and dissolve almost as soon as exposed to the weather.—*New Edin. Enc.*

"We regulate our mode of living more by the example of others, than by the dictates of reason and sound sense."—*Lat.* And we too generally take the example from our superiors in station and fortune; a consideration which should impress their minds with a just sense of the effects which their manners, their habits, their general conduct may produce in society.

Young Men's Department.

ON THE PLEASURES AND ENJOYMENTS CONNECTED WITH THE PURSUITS OF SCIENCE.

Science administers to our enjoyment by *the variety of novel and interesting objects it exhibits.* Almost every department of natural science presents to the untutored mind an assemblage of objects, new and strange, which tend to rouse its faculties, and to excite to important inquiries and interesting reflections. The science of *mechanics* presents us with many curious combinations of mechanical powers, which, from the simplest principles, produce the most powerful and astonishing effects. "What can be more strange," says a profound and energetic writer,* "than that an ounce weight should balance hundreds of pounds by the intervention of a few bars of thin iron?" And when we consider that all the mechanical powers may be reduced to the *lever*, the *wheel and axle*, the *pully* the *inclined plane*, the *wedge*, and the *screw*, how astonishing are the forces exerted, and the effects produced, by their various combinations in wheel-carriages, mills, cranes, thrashing-machines, and pile-engines!† *Hydrostatics* teaches us the wonderful fact, that a few pounds of water, without the aid of any machinery, will, by mere pressure, produce an almost irresistible force; or, in other words, that any quantity of fluid, however small, may be made to counterpoise any quantity, however large: and hence a very strong hogshead has been burst to pieces, and the water scattered about with incredible force, by means of water conveyed through a very small perpendicular tube of great length. On the same principle, and by the same means, the foundations of a large building might be shattered and the whole structure overthrown. *Magnetism* discloses to us such singular facts as the following:—that a small piece of steel, when rubbed by the loadstone, and nicely poised, will place itself in a direction nearly north and south, so as to point nearly towards the poles of the world—that the north and south poles of two loadstones will attract, and two north or two south poles repel each other; and that the power of a magnet will pass through a thick board, and turn round a compass needle with great velocity, though placed at a considerable distance.

The science of *optics* likewise discloses a variety of astonishing truths, and is no less replete with wonders. How wonderful the fact, that *light* proceeds from the sun, and other luminous bodies, with a velocity of 195,000 miles in a moment of time; that myriads of myriads of rays are flying off from visible objects towards every point of the compass, crossing each other in all directions, and yet accurately depicting the same images of external objects in thousands of eyes at the same moment,—that the thousands of millions of rays of light which proceed from any particular object must be compressed into a space not more than one-eighth of an inch in diameter, before they can enter the pupil of the eye and produce vision,—that the images of all the objects which compose an extensive landscape are depicted on the bottom of the eye, in all their colours and relative proportions, within a space less than half an inch in diameter,—that the eye can perceive objects distinctly at the distance of six inches, and likewise at the distance of ten, fifty, or a hundred miles, serving the purposes both of a microscope and a telescope, and can be *instantaneously* adjusted to serve either as the one or as the other,—and that the variegated colouring which appears in the scenery of nature is not in the objects themselves, but in the light which falls upon them, without which all the scenes of creation would wear a uniform aspect, and one object would be undistinguishable from another!

The *instrument* which the science of optics has been the means of constructing are also admirable in their effects, and productive of rational entertainment. How wonderful that, by means of an optic lens, an image is depicted in a dark chamber, on a white table, in which we may perceive the objects of an extensive landscape delineated in all their colours, motions, and proportions, and so accurately represented, that we even distinguish the countenances of individuals at the distance of a mile,—that we can see objects distinctly when a thick board, or piece of metal, is interposed between them and our eye—that the images of objects can be made to hang in the air either upright or inverted, and that representations either of the living or of the dead can be made to start up instantly before the view of a spectator in a darkened room,—that, by admitting into a chamber a few rays of white light from the sun, through a prism, all the colours of light may be seen beautifully painted on a piece of paper,—that a single object may be multiplied to an indefinite number, and that a few coloured bits of glass may be made, by reflection, to exhibit an infinite diversity of beautiful and variegated forms! How admirable the effects of the telescope, by which we may see objects as distinctly at the distance of two or three miles as if they were placed within a few yards of us; by which we can penetrate into the celestial regions, and behold the distant wonders of the planetary system, and the millions of stars dispersed through infinite space, as distinctly as if we were actually transported by a supernatural power several hundreds of millions of miles into the regions of the firmament! And how curious the circumstance, that we can, by this instrument, contemplate such objects in all directions and positions,—that we can view them either as *erect*, or as turned *upside down*,—that we can perceive the spires, houses, and windows of a distant city, when our backs are turned directly opposite to it, and our faces in a contrary direction—the rings of Saturn and the moons of Jupiter, when we are looking *downwards* with our backs turned to these objects—that we can make an object on our right hand or our left appear as if directly before us, and can cause a terrestial landscape to appear above us, as if it were suspended in the sky. By the help of the *microscope* we can exhibit to a number of spectators at the same moment, a small animal, scarcely distinguishable by the naked eye, magnified to the size of ten or fifteen inches in length, and distinguish not only its limbs, joints, mouth and eyes, but even the motions of its bowels, and other internal movements; and in every department of nature can contemplate an assemblage of beauties, delicate contextures, and exquisite contrivances, which excite the highest admiration, and which would otherwise have appeared incredible and incomprehensible to the human mind.

The sciences of *electricity* and *galvanism* likewise display facts both curious and astonishing. How wonderful the operations of the electric fluid, which can suddenly contract the muscles of animals, and give a violent shock to a hundred or a thousand persons at the same moment—which moves with such amazing rapidity, that, in a few seconds of time, it might be made to fly to the utmost regions of the globe—which melts iron wire, sets fire to gunpowder and other inflammable substances, destroys the polarity of the magnetic needle, and promotes the vegetation of plants and the perspiration of animals—which can be drawn in vivid sparks from different parts of the human body, and made to descend from the clouds in streams of fire! And how powerful and astonishing the effects of the *galvanic* agency—which makes charcoal burn with a brilliant white flame, decomposes water into its elementary parts, and causes platina, the hardest and heaviest of the metals, to melt as readily as wax in the flame of a candle—which produces the most violent convulsions on the muscular system, causes a hare to move its feet, and a fowl to clap its wings, with force and energy, *after life is extinct*—throws the countenance, even of a dead man, into appalling grimaces and contortions, and excites the most rapid movements in his hands and limbs, to the horror and astonishment of all beholders.

The science of *chemistry*, throughout all its department, is no less replete with wonders. How astonishing are many of the facts which it discloses, of which the following are merely specimens:—That all the productions of nature in the animal and vegetable kingdoms, are composed of a very few simple substances, many of which are invisible gases—that water is chiefly composed of an *inflammable* principle—that the *acids*, such as aquafortis, and oil of vitriol, are formed of different kinds of *air*—that an invisible fluid, one of the ingredients of the air we breathe, will cause a rod of iron to burn with brilliancy, and phosphorus to produce a splendor which dazzles the eyes of every beholder—that the *diamond*, notwithstanding its value and brilliancy, is composed of the same materials as *coal*—that

* Lord Brougham.

† To illustrate the importance of mechanics in aid of human power, we quote the following experiment from *Babbage on the Economy of Machinery*.

"A block of squared stone was taken for the subject of experiment:

	lbs.
1. Weight of stone, ...	1080
2. In order to drag this stone along the floor of the quarry, roughly chiselled, it required a force equal to	758
3. The same stone dragged over a floor of planks, required, ...	652
4. The same stone placed on a platform of wood, and dragged over a floor of planks, required........	606
5. After soaping the two surfaces of wood which slid over each other, it required	182
6. The same stone was now placed upon rollers of three inches diameter, when it required to put it in motion along the floor of quarry	34
7. To drag it by these rollers over a wooden floor........	28
8. When the stone was mounted on a wooden platform, and the same rollers placed between that and a plank floor, it required	22

"From this experiment, it results that the force necessary to move a stone along the roughly chiselled floor of its quarry is nearly two-thirds of its weight; to move it along a wooden floor, three-fifths; by wood upon wood, five-ninths; if the wooden surfaces are soaped, one-sixth; if rollers are used on the floor of the quarry, it requires one thirty second part of the weight; if they roll over wood, one-fortieth; and if they roll between wood, one-fiftieth of its weight. At each increase of knowledge, as well as on the contrivance of every new tool, human labor becomes abridged. The man who contrived rollers, invented a tool by which his power was quintupled. The workman who first suggested the employment of soap, or grease, was immediately enabled to move, without exerting a greater effort, more than three times the weight he could before."

oxymuriatic acid, or the bleaching gas, discharges all vegetable colours, and, in the course of a few minutes, will change a piece of printed calico into a pure *white;* and likewise burns all the metals, dissolves gold and platina, and suffocates all animals that breathe it, after one or two inspirations—that there are metals much lighter than water, which smim in that fluid and burn spontaneously with a bright red light, and when thrown into the mineral acids, inflame and burn on the surface, and in oxygen and oxymuriatic acid gas produce a white flame, and throw out numerous bright sparks and scintillations,—that a certain kind of air, called the nitrous oxide, when inhaled into the lungs, produces an extraordinary elevation of the animal spirits, and irresistible propensity to laughter, a rapid flow of vivid ideas, and a thousand delightful emotions, without any subsequent feeling of debility or exhaustion—and that it is not altogether improbable, according to the deductions of some modern chemists, that "*oxygen* and *hydrogen*, with the assistance of the *solar light*, are the only elementary substances employed in the constitution of the whole universe;" so that Nature, in all her operations, works the most infinitely diversified effects, by the slightest modifications in the means she employs.

Such are only a few *specimens* of the curious and interesting subjects which the physical sciences present to the reflecting mind—And is it conceivable that a rational being can make such objects as those I have now specified the subject of his frequent study and contemplation, and not feel pleasures and enjoyments far superior to those of the mass of mankind, who are either immersed in sensuality, or enveloped with the mists of ignorance? The man who has such subjects to study and investigate, and such objects to contemplate, can never be destitute of enjoyment. If happiness depends on the activity of the mind, and the range of objects presented before it,—wherever he is placed, whether at home or abroad, in the city or in the country, he can never be at a loss for means of mental gratification, and of increasing his stock of intellectual wealth.—He needs not envy the rich and the noble, on account of the elegance of their mansions and the splendor of the equipage; for the magnificence and glories of the universe, and all the beauties of terrestrial nature, lie before him, and are at all times ready to minister to his enjoyment. In investigating the admirable arrangements which appear in the economy of creation, in tracing throughout that economy the perfections of his Creator, and in looking forward to a nobler state of existence where his views of the divine empire shall be expanded, he can enjoy a satisfaction and delight which the wealth of this world cannot bestow, and which its frowns and calamities cannot destroy.—*Dick on Knowledge.*

THE CULTIVATOR—JAN. 1835.

TO IMPROVE THE SOIL AND THE MIND.

TO THE PATRONS OF THE CULTIVATOR.

Gentlemen—We address you as farmers, as following a pursuit in common with us. The year 1834 has closed, and 1835 begun. It may be useful to look back and see what we have done in 1834, that if possible we may gain from the experince of the past, and be stimulated to greater exertions, guided by a more intelligent spirit for the future. At best, our lives are those of constant exertion; but when our labors are rewarded, and our hopes cheered, by fruitful returns, and all the comforts that necessarily follow, we look back with pleasure upon the past year that has ensured us the reward of our toil. This gratification is not lessened by a feeling of independence that springs from well conducted efforts, nor by the estimation in which we see ourselves held by an intelligent community. Under such circumstances we proceed with renewed energy to our work, and whether by the evening firseside or under an August sun, we feel the same buoyancy of spirits—the same ardent desire to press forward its execution. Seed time and harvest, summer and winter, follow each other in quick succession, and so do our lives; but when *our* summer is gone and winter is come, we will have at least the consolation to think, that our lives of industry and sobriety have not shortened our days or lessened our enjoyments, but that old age will find us with no premature infirmaties, but with a reputation well established, and a competence to support our declining years.

To gain from the experience of the year that has gone by, we must take a retrospect of its pursuits. And first as to ourselves. The Cultivator was commenced in March, 1834, and we have issued eleven numbers. The paper has been extensively circulated, and our patronage is as large as we had any reason to expect, and is still extending. Our contemporaries have spoken well of the work, and our farming community have given it a liberal subscription. They have not, however, given it the contributions of their pens, the result of their diversified expefience; and if the paper is not as useful as it ought to be in the extent and variety of its intelligence, they are in a measure to blame, because by withholding that which would add to its interest, they check its usefulness and show an indifference to its complete success. As to ourselves, we do not boast of our labors—far from it—we could wish for greater talents, aided by a deeper research and more unceasing application to make it more practically useful to a reading public, and so far as the experience of the past can be useful, so far we promise to make it a more acceptable vehicle of agricultural intelligence for the future.

And now, farmers, have you done justice to your profession, to your families, and to your country for the last year? To your profession, have you cultivated your grounds with all the assiduity and zeal of which you are susceptible? Have you called to your aid all the agricultural reading within your reach, and taken advice from those of your neighbors who are competent to give it? Are your farms generally in better condition than they were one year ago? Are your fields better laid out and enclosed—your waste grounds less—more of it grubbed up and improved—your ditches opened—useless stones removed, and the general surface of the ground better adapted for the raising of crops? Has your land been made richer, to enable it to yield more, and have you collected a large amount of materials to increase your annual stock of manure? Are your houses more comfortable, besides of a neater appearance from the labors of the year? Have you added to the conveniences and safety of your barns, to make them better adapted to the purposes for which they were built? Has your stock of cattle and horses improved not only in number but more in quality and appearance, and consequently in value? Have you selected, and do you raise the best kinds of sheep—we mean those kinds that are the most profitable to the owner? or do you still follow the old practice of having a few strolling animals that enjoy the delightful privilege of providing for themselves both in summer and winter, and when you want are always obliged to look for several hours to find them, and that attained, have the felicity to count at least one less in their number? Have you the most profitable breed of hogs, and do you carry just so many through the winter as best conduces to your interest? In short, have you so farmed it in all things that you have no cause of regret, because you have given to all a proper degree of attention and care? If so, we congratulate you; but if not so—if you have not done one, a part, or all these things, the year has been in a measure lost to you, and you have not done justice to your farm or your profession.—Take another year of probation, turn it to better account, and let your diligence give evidence of a thorough reformation. But if you will not, if experience cannot teach, and the prospect of harassing debts hereafter cannot incite you to a noble industry, you will soon become an evil in a neighborhood—your example will be injurious to others, and your slothfulness and unthriftiness will assuredly lay your farm under a cumbersome mortgage. This once imposed, the next step is a disposal of it by a creditor at auction.

We turn from such with disgust, and ask next, have you for the last year, done your duty to your family? That is, have you made the labors of the farm as cheerful to all your dependants as circumstances would allow? Have you been so far kind and indulgent as was consistent with the proper management of a well regulated household? Have you attended to the education of your children and apprentices, and, as far as one short year would allow, given them all the opportunities to acquire information that may be useful to them hereafter in their several pursuits, and that with intelligence they may support the free institutions of our country? If you have done this, you have done your duty; but let us at the same time remark, that education is on the advance: what was necessary for our generation is not enough for them. The march of intellect is onward, and our present attainments are comparatively small, and will be still more undervalued, in the advance of the generation to come.

Have you done your duty to your country? Have you given the necessary aid that the good of society demands at your hands—to the bridges, roads, public improvements in your respective neighborhoods, to schools, seminaries of learning, public morals and religious institutions? These are all great and important duties, and in a well regulated community ought not to be slighted or forgotten. Society cannot flourish without them—they are the stamina that give stability and health to our country and its government, and that man is unfit for associated life—he is wanting in principle and reckless of consequences, who will not lend his aid to the attainment of these great and important objects.

Should our sheet continue its labors through the changes of the year, and at the end of it we appear again before you, we hope to meet you under still more auspicious circumstances. Our first wish is for the prosperity of our country; the next for its agriculture—and we hope to find you not only more zealous in the pursuit of it, but more willing with you pens to lessen the labors of your hands. Depend upon it, when mind is brought to operate upon the stubborn soil, it removes obstacles, creates facilities and gives an expansion to our ideas, a directness to our efforts and a success to crown them, that hard knocks alone cannot overcome. With these remarks, we wish you all a happy New-Year. A.

AGRICULTURAL REPORT FOR 1834.

Although the quantity of *wheat* raised in this state, is annually increasing, from our becoming rather better acquainted with the plant, and a denser population, and consequently new grounds coming under the use of the plough, still the crop, considered as a whole, and allowing a pro rata calculation for the causes of its increase, is not as great this year as it was in 1833. The winter of 1833-34 was what is called an open one. A good deal of wheat was frozen out in the course of it, from the want of snow, which is essential to a good winter crop. The spring of 1834 was favorable to its growth, but in the early part of the summer, the weather was extremely hot and dry. The thermometer for some weeks in July, ranged nearly at 90°, and no rain to moisten the earth and cool the atmosphere. This weather was not injurious to wheat in particular localities, but in other parts of the state, the wheat suffered from blight, rust and in a few of the midland counties from the depredations of the grain-worm, supposed to be *Vibrio Tritici*. This grub made its appearance in June, was most troublesome in a few counties north of Albany, where it committed great ravages, and from whence it will probably spread to contiguous counties the succeeding season. The earliest indication of its appearance hereafter ought to be carefully noted, and its method of propagation and propensities closely observed, in the hope that it will lead to the adoption of a plan for its extinction. Generally speaking, the crop was of less weight too than the last year, and would hardly average 60 lbs. to the bushel, which is less than the weight ordinarily of our wheat. The price, too, has been at least 15 per cent less than the last year. We presume this was imputable to rather a lessened demand for many of our productions.

Wool.—The quantity grown in this state is annually and rapidly increasing, and the quality improving. Farmers generally are becoming better judges of both the animal and its fleece, and raise more of the valuable kinds. The native sheep have been much improved upon by intermixture with the foreign varieties, and we bid fair by a careful attention to this branch of agriculture, considering our facilities for its prosecution, to rival the English in the quality and weight of carcass, whilst we compete with Saxony and Spain in the fineness of the fleece. Perseverance will in a short time effect this, for the American wool is now preferred by our own manufacturers to a rather finer quality of foreign, because it works up better. The home market being supplied, the prospect is, we will soon see the time when it will be sought after from abroad. The price was about the same as last year, if any thing rather better; the supply on hand, now in the country is not large, and will probably be very nearly consumed by the manufacturers this winter, and the coming spring. The importation the last season has been small, and the prospect of the price for the crop of 1835, as flattering as the one just disposed of. The last public sales previous to the suspension of navigation by winter, (and which are a criterion not only of the quantity in market but the prospect of what the price is likely to be for months to come,) was quite as good as former sales, and if any thing rather in advance. The price of the article in Europe remains much the same as it has been some months previous, although there were reports to the contrary. The manufacturers of woollens in Europe have constant employment and a brisk demand for their products.

Indian Corn.—In this article for the last year there has been a great falling off in the quantity. The prospect for a crop was never more flattering than it was in the month of June last, when the coolness of the preceding spring had abated and the warm weather set in, but early in July the drought commenced, which continued nearly three months. The corn suffered very much from it. The crop taken as a whole, was not over a half yield, but the quality is good, and none was lost for want of ripening. Although this crop is small, the price is not advanced beyond the previous year. Corn is more extensively cultivated than formerly, and in ordinary seasons more is raised off of an equal quantity of land. It delights in a warm rich soil—clayey lands are not congenial to its growth without they are well manured, and we have a wet but warm season. Under such circumstances they will produce heavy crops, but it requires a late fall, (that is, late frost,) to ripen it. In suitable situations it is a profitable crop, next only to wheat, for it yields not only heavy crops of grain, but large quantities of the best of provender for a winter supply for stock, at the same time that it materially adds to our supply of manure. It is more extensively cultivated in the southern and middle than in the western portions of our state.

Oats are our next best crop. As they are extensively cultivated the supply in a measure supersedes the demand for corn. They do well on lighter land. The spring and summer were both favorable to their grcwth, and they probably suffered less from the drought than any other kind of grain. This crop, taken as a whole, was rather more than an average, and their growth seems to be congenial to all situations and soils. Upon the highest hills and lowest valleys—upon the lightest sands or heaviest clays, they make the best of circumstances, and thrive in all places—but from their greedy nature they exhaust the soil, and for that reason ought not to be extensively cultivated. The price about the same as last year. Stock will eat this straw next in avidity to that of corn.

The increasing demand for *barley*, for some years, has rendered its culture of the first importance in many of our agricultural districts, particularly in towns near and contiguous to the Mohawk, and even farther west; and it gives us pleasure to say, that the crop has been good—better than medium, and the quality fair—though prices, probably from the abundance of the crop, have not sustained their usual grade.

Hops have yielded too a fair crop, though we are sorry to say the quality has, as usual, been bad. The growers have suffered greatly in their prices in consequence of either the premature gathering of the crop, or of its having been injudiciously cured. But few good samples, we are told by buyers, have been offered in market; but these have brought a good price.

Potatoes were a light crop—not more than one-third of an average yield. It was entirely imputable to the dry weather, and they are now an article both high in price and in great demand. The kinds of potatoes generally cultivated are bad in quality and not over large in product. In both they are susceptible of great improvement, and it is against the farmer's interest that they do not receive it.

Pork has not been as cheaply fattened nor as much sought after as last year. The want of apples this year has been a serious loss to this interest, and the consequence was that to fit our hogs for market drew too much on our grain crib, which has made the fattening of the animal extremely unprofitable. The price, too, from there being much old pork left in market of last year, was a falling off.

Apples and fruit there were none.

Upon the whole, the year has not been as extensively prosperous to the farmer as the preceding one. The dry weather beginning in July has not ended even now, and winter has commenced with the fountains almost dried up and the streams of water low. But farmers will never despond, throwing themselves upon the bounties of Providence and their own industry. The spring of 1835, will see them recommence their labors with redoubled activity and zeal, as they act upon the motto that if they cannot "command success, they will at least try to deserve it. A.

EXCRETORY POWERS OF PLANTS.

Science is continually making new discoveries of the laws which regulate the animal and vegetable kingdoms, and furnishing new and useful suggestions to aid the operations of skill and industry. It is hardly two centuries since the circulation of the blood was fully confirmed by Harvey. The discoveries in vegetable have been more tardy than those in animal physiology. The laws which govern the vegetable kingdom are yet but imperfectly understood by the learned, and are much less known to the unlearned. But chemistry is successfully at work in disclosing useful facts in vegetable economy, before unknown. Among these, it has been declared, and satisfactorily demonstrated, that plants possess excretory organs, by which they throw off such matters as do not afford them nutrition, or which are not essential to their wants. It seems to be admitted, that plants take up, indiscriminately, the vegetable food which presents, in a prepared form, to their spongeoles, or mouths; that they have no power of selecting their food in this stage of nutrition; but that when the sap has been elaborated in the leaves, they have the power of retaining only such portions as food as are congenial to their wants, and necessary to their perfect development, and of throwing off the residue into the soil. As plants differ essentially in their properties and products, it would seem to follow, that different proportions of the elementary matters which constitute the food, and make up the substance of vegetables, and in various combinations, must be required by different species, or in other words, that they do not all subsist upon and exhaust the like food. This is proved by the experience of every farmer, who finds it profitable to alternate or change his crops, and prejudicial to crop a field two or more years in succession with the same grain.

The conclusions which some philosophers have drawn from these facts, viz. that the excrementitious matter thrown off by plants is a sort of poison to the like species—and that *hence* the necessity of alternating crops—is at least of very doubtful authority; and to our minds seems to be contradicted by theory as well as practice. And if the inferences are to be admitted as a general rule, this general rule certainly admits of numerous and broad exceptions.

Soils are impoverished, not by what is *grown upon them*, but by what is *carried off* from them. If the crop is all retained upon, and returned to the soil, fertility will rather be increased than diminished; and the same crop may be made to follow without deterioration. The reason is simply this, that the very matters which constituted the dead crop, remain to be transmuted into the living one. But when the product is carried off from the ground, the soil is robbed of part of its specific food for the like crop. We have several familiar illustrations in proof of our position, some of which we beg leave to mention.

We have seen poor waste lands enclosed, from which cattle were excluded, and upon which the stinted herbage had been suffered to remain and rot—aud although the same plants grew upon them annually, the herbage and the soil annually improved.

We have seen about buildings, waste patches, where nettles, burdocks and other foul weeds were permitted to luxuriate unmolested, and to fall and decay upon the ground; and every succeeding growth seemed to increase in vigor.

We have seen lands that were never cultivated, particularly wet grounds, covered with the same annual plants for successive years, without perceiving any sensible diminution of growth.

The vast prairies of the west, and indeed all our wild lands, have produced annually the same herbage, probably for centuries; and yet we do not learn that this herbage is less luxuriant now than it was half a century ago.

These facts, and many more that might be cited, go to disprove the hypothesis of De Candolle, Macaire, Rennie and others, that the excrementitious matter of plants is poison to their own species. The undiminished, or rather increased fertility, in the cases we have referred to, arises from the circumstance, that nothing is carried off from the ground: that what grows upon the soil is returned to it again, and becomes proper food for its own species.

The preceding cases have reference only to uncropped grounds. Let us now test the hypothesis by known results in farm culture.

There are many perennial cultivated plants, the circle of whose roots does not materially enlarge, which are cropped, and thrive in the same locations for years, the vigor of whose growth may be increased by the liberal application of manure. We give asparagus as a familiar illustration. The roots of the plant are interwoven, and virtually fill the bed the first year of their growth; and yet the plants continue to increase in vigor for some years, under good culture. This they could not do upon the assumed doctrine we are combatting.

Wheat, of all the cultivated crops, should afford proof of the poisonous nature of its excretory matter, if such matter is truly deleterious. Upon ordinary soils, this grain will not bear repetition in successive years, without great diminution in product; nor would it upon *any* soils if Macaire and Rennie were right in their conclusions. Yet upon some soils, highly charged with its specific food, it *does bear repetition* for many years. In reference to this question, we made particular inquiry last summer, in a circle of intelligent gentlemen at Auburn, "how many years in succession any of their grounds had been known to carry wheat?" An instance was given, in reply, where wheat had been grown on a field twenty-one out of twenty-two years; and a second was immediately noted, where it had been grown *twenty-two years in succession.* Turning to our informant, we asked, "what was the product of the last crop?" "Forty bushels per acre," he replied. "Was the ground manured?" "No." These cases, we believe, are not singular, though they may indicate bad husbandry. In several districts in the west, and in some in the Canadas, wheat has been grown many years in succession, and constitutes almost the exclusive crop; and on what are termed the oak openings, we are told, there has often been an increase of crop, for successive years, and this without the aid of manure.

Let it not be supposed, from our remarks, that we are opposed to an alternation of crops; on the contrary, we consider it the basis of good husbandry. The theorist, as well as the practical farmer, admits its great utility. But the necessity of this alternation, we contend, does not arise from *a poison* deposited in the soil by a previous crop, but from the exhaustion of *food* by that crop—the *specific* food of the species. Whichever party may be right as to the cause of infertility, both are agreed as to the preventive means, which is the main point. Because some lands *can* bear successive crops of the same grain, it is no proof that it is wise to *require* them to do it—or that other lands can be made to do the like. The reasons in favor of the alternation of crops are not weakened by the arguments upon either side, but rather acquire new force from both.

Morus Multicaulis.—It appears from the deliberations of the French Royal Society of Agriculture, which we find noted in the Farmers' Register, that the Chinese mulberry is not a distinct species; that its seed will not produce its like, and as a valuable variety, cannot be preserved except by multiplying it by cuttings, grafts or layers; and that it is exclusively by these means the Chinese cultivators have reared this tree from time immemorial. Seeds sown near Venice have produced varieties, but none like the true morus multicaulis.

SHEEP HUSBANDRY.

The rapid increase of woollen manufactories among us for the last fifteen years, and the corresponding increase of our flocks, render it obvious, that sheep husbandry has already become an important branch of our farming, and a source of individual and public wealth. And when we consider, that neither our woollens nor our wool are equal to the home consumption—that both are already becoming articles of export—and that wool is now profitably grown upon our most valuable farms,—we have good reasons to believe, that the time is not distant, when wool will become one of the prime staples of the north, as cotton has, within a few years, of the south. Impressed with this belief, the conductors feel desirous of rendering the Cultivator a useful vehicle of information upon this important branch of our industry; and while they earnestly solicit communications upon this subject from practical husbandmen, they promise to contribute such information as their observation or reading may suggest as valuable. With this view, they have collected some facts, from high authorities, for this number, which will be found under the head of *Sheep Husbandry.*

There is little doubt but that the mountainous and hilly districts of our state, at present of comparative little value, will ultimately become our most profitable sheep grounds. They will afford a more healthy range for these animals than flat rich lands, and sheep will be maintained with far less expense upon them than upon the latter. Sheep delight in pure free air and dry pasture, and are constitutionally fitted for rocky and stony situations; and indeed it is contended by some, and with much reason, in our opinion, that stony grounds are important to their health;—that on stony dry soils, they are not subject to the foot-rot and other distempers which are known often sorely to afflict them when kept on moist soft pastures. Many of the farmers in England pave the yards in which sheep are folded. If these animals can be profitably maintained upon farms worth from fifty to one hundred dollars per acre, they can be maintained with greater profit upon hilly lands costing from two to twenty dollars per acre; for certainly the difference in the herbage of the two descriptions of land will bear no proportion to the difference in price. Of all products of the farm, wool will best bear the expense of long transportation to market. When on a late visit to a friend in Massachusetts, we were told by an intelligent resident, that fifteen years ago most of the farmers of the town were deeply in debt, and their farms going to ruin; but that sheep husbandry, to which all but two or three had since turned their attention, had given an entire new aspect to their affairs; and that he would then engage to pay every debt owing by the inhabitants of the town, for the surplus produce of that season. It seems to be well established, that the soil, as well as the owner, of a sheep farm, become enriched by the flock.

As particularly applicable to the season, we recommend to all who stand in need of our advice, that they keep their sheep dry, give them pure air, and plenty of food, and carry them to spring grass, by all means, in good flesh. Ten well kept sheep are more profitable than thirteen badly kept. To protect them from storms in winter, you should have a covered shelter for them to resort to at night. To ensure them pure air, this shelter should not be habitually, if at any time, wholly closed at the sides. To keep them dry, they should have a liberal supply of straw litter, and this often repeated. This will also become a matter of economy in regard to manure, as the straw will absorb and prevent the loss of the urine, which is a moiety of the manure. To keep them in good health and good plight, feed them well, stint them not in salt; and feed turnips, potatoes or coarse grain occasionally, particularly to such as have to give suck. If you have not the roots, by all means provide them another year; for rely upon it, there is no more profitable winter, or rather spring food, for sheep, than Swedish turnips—they are wholesome, nourishing, and tend greatly to enrich and increase the milk of the ewes. Green food is besides highly valuable for all farm stock in the spring of the year.

UNHEALTHINESS OF VEGETABLE CELLARS.

We insert to-day, a communication upon this subject, from a medical correspondent; and, without wishing to trespass on the province of the profession, we beg leave to make some additional suggestions.

Pure air is all-essential not only to animal, but vegetable health. All farm stock are most healthy, and thrive best, when kept in a cleanly condition, and permitted to enjoy a free circulation of air. Vegetable putrefaction, and animal respiration, vitiate, and render air unhealthy, and often become the imperceptible cause of sickness and death. Many of the diseases which man is incident to, owe their origin, or are materially aggravated, by neglect of personal cleanliness, by living in close apartments, or by breathing impure air, vitiated by the putrefaction of vegetable matters, by animal respiration, or by combustion: For however comfortable it may seem, in cold winter weather, to sit or sleep in a hot, close stove room, both are deleterious to a hale constitution—the purity of the air becomes impaired in proportion to the closeness and warmth of the room, and the numbers of its inmates. Hence there is found most sickness, and the greatest mortality, in small, hot and crowded tenements; and hence epidemics prove most fatal in situations where the importance of pure air and cleanliness are disregarded. With regard to depositing vegetables in the cellars of dwellings, it is a general practice, and however detrimental it may prove to health, there is little prospect of seeing the practice materially abated. Experience has pronounced it convenient, and safe in regard to the effects of frost. But much may be done, and with little trouble, to lessen the evils which may result from it. In the first place, every cellar should have a good drain to carry off all water. Stagnant water, especially when mingled with the vegetable matters which are ever found in cellars, is extremely deleterious to health. In the second place, cellars should be ventilated as long, and as much, as the temperature of the weather will permit. All vegetables are best preserved in a temperature a little above the freezing point. For this purpose, cellars should be furnished with a hatchway and windows, with gratings or slats, for the free admission of air, and these should not be closed till imperiously demanded by the severity of the season. In the third place, every decaying vegetable matter should be promptly removed as soon as discovered, and all vegetables should be removed to an out-building, and the cellar thoroughly cleansed, as early in the spring as the weather will permit, and the windows and door unclosed for the escape of the impure, and the admission of fresh air. If cellars are floored, the bottoms ought to be brick, stone or water cement. Much filth accumulates under a wooden floor, and the decay of the wood adds to the deleterious properties of the surrounding air. And in the last place, nothing has a greater tendency to purify the atmosphere of cellars, than whitewashing their walls, ceilings and timbers with lime, as soon as they have become sufficiently dried by ventilation and the advance of spring, to permit the operation to be well performed. With good housewives, this is the last operation of the annual house-cleaning process in May. It proves not only beneficial to health, but evinces a tidiness of management grateful to the senses, and highly commendatory of those who practise it.

MAKING CLOVER HAY—IN COCKS.

Nothing is so hard to combat as the prejudice of farmers, who think they *can learn nothing* in their business. We have often recommended curing clover hay *in cocks*, as a means of doubling the value of this kind of hay, besides lessening the expense of curing it. Many good farmers, and intelligent men, have ridiculed the process, because it run counter to their practice, and was what they could not reconcile to their idea of good management. But they would never make the trial; if they had done so, they would have seen that they were wrong, and we right. We beg leave here to say, that in many districts of Great Britain, spreading hay from the swath, or tedding it, is going wholly out of practice, as causing unnecessary labor, and as diminishing the value of the hay. But there they are not blessed with our ordinary sunshine and heat in the haying season. The hay curing process, with them, is a business of some days, on account of their comparatively cool climate and humid atmosphere. But with us, when the grass is matured, and *thin*, and the weather good, it is often the business of *a day*. But this cannot be the case with us with early-mown hay, particularly where clover abounds. The grass is then full of juices, and the succulent stocks of the clover require time, as well as sunshine, to part with their moisture. Spread and exposed to a hot sun, the leaves, blossoms, and exterior of the stems soon dry, but in drying, the exterior of the stems become indurated, and refuse, like wood painted when green, to part with the interior moisture. The consequence is, the grass must either be housed in this half-cured condition, and spoil in the mow, or, if the curing process is completed, so as to prevent damage, the leaves and blossoms, which constitute the best parts of the hay, are over dried, crumble and are lost. Cured in cock, every part of the grass, whether the leaves or thick stocks, dries alike, and is alike preserved, and the evaporation of moisture goes on, I believe, even in wet weather: for a partial, though in no wise a prejudicial fermentation takes place, and the rarified air which it generates, being specifically lighter than the atmosphere, is constantly passing off.

We have been induced to these remarks, at this untimely season, in consequence of finding in *The Farmer and Gardener*, an agricultural paper published at Baltimore, a communication from John Smith, fully confirming the utility of our recommendation and long practice. It would seem that Mr. Smith was led to make the experiment rather from necessity than from choice. But we will let him tell his own story.

"It will perhaps be recollected," he says, "by all attentive agricultural readers of that paper [the American Farmer] that it was recommended to farmers to put their hay, in its green state, or as soon as cut, into small cocks, and cure it by sweating.

"When I commenced cutting my clover hay the present season, the prospect for favorable weather was flattering, but in a short time it changed, and it became evident we should have a wet spell. I then dropped the scythes, and put all hands to putting up the grass (then perfectly green, but exempt from external wet) into cocks of about 200 pounds cured hay, building them compact and high, to avoid the introduction of rain as much as possible. Rain came on before I secured all the cut grass, but the next day was fair, and I succeeded, by unremitted attention, in getting the water dried out of the remainder, and put it up in the same way. *It continued rainy* TEN DAYS, and afforded no opportunity to cure in the sun; the cocks were examined daily, by running the hand and arm into them, and, contrary to all expectation, gave no indications of fermentation. At the end of ten days the weather became fair, the cocks were opened, *and found to be in a perfectly sound condition*, except so far as the rain had penetrated, and the external wetting alone, in my opinion, made it necessary to open it at all. Tell farmers they need not fear losing their hay on account of unfavorable weather at harvest. I have never seen worse weather in hay harvest, *and I saved mine entirely well*. IT IS MOST EXCELLENT HAY."

Our practice has been, except in cases of necessity, like the one above, to let our hay wilt in swath, that is, to cock in the afternoon that which is cut in the forenoon, and not to have the cocks exceed fifty to seventy pounds hay when cured. We are glad to see that a larger quantity will cure well. Let it be remembered that the cocks must not be made by *rolling*, but by placing, with a fork, one layer above another, till the cock is completed.

Under-draining.—We copy into the present number, an excellent article upon this subject from the Edinburgh Quarterly Journal of Agriculture. Our reasons for publishing so much upon this subject, result from a conviction, that no department of our husbandry has been more neglected than draining,—that few operations are more important to good husbandry,—and that we are wretchedly defective in theoretical as well as practical knowledge, in this branch of farm labor.

CORRESPONDENCE.

Seneca Falls, Nov. 24, 1834.

Sir,—Having recently become a subscriber to your paper, I have ventured to address you on a subject which has for a short time occupied my thoughts, in the hopes of gaining information myself, as well as calling the attention of older and better informed minds to the contemplation of the same subject.

It is this: The universal practice of building with *vegetable cellars* underneath dwelling-houses, considered in connexion with the health of the occupants.

It may *seem* strange that I should trouble you with a subject having so little apparent connexion with the exclusive object of your journal. I do it, because (in my opinion) the persons whom your paper is most especially intended to benefit, are most interested in the subject.

It would be very inconvenient, if not impossible, for those building in crowded cities, or large towns, to spare room sufficient for what is commonly called an "out door" cellar. But the case would be different with those who are engaged in agricultural or horticultural pursuits. The latter also usually store a larger quantity of vegetables in their cellars, and would be more likely to suffer from the evils of the practice, if there are evils arising from it.

Now, sir, it is generally admitted, and indeed well proven by facts, that the gases arising from the decomposition of vegetable matter, are the principal cause of most of the diseases to which the human frame is subject. These gases are usually termed Malaria (or evil air) and Marsh Miasma.

It was formerly supposed that this air only originated from marshes, and had some mysterious character. (It is, indeed, most abundant and most noxious in the vicinity of marshes, because their vegetation is most luxuriant, and decomposition most rapid, from the constant presence of water, a necessary agent in the voluntary decomposition of vegetable matter.) But as the science of medicine has advanced, the cause, nature and connexion of diseases is more thoroughly understood, the mystery has disappeared, and it is ascertained that wherever vegetable matter is suffered to remain "en masse" until decomposition takes place, or in other words, till it rots, there is a very hot-bed for the production of that which causes fevers, small-pox, cholera, &c.

Now I will propose the question, whether the storing of vegetables under dwellings is not the cause of most of the casual *fevers* which afflict the country, and whether much sickness might not be prevented by the construction of vegetable cellars in places disconnected with the dwellings?

The question, in the extent to which I would apply it, is new to myself. I therefore propose it, that if you should think it of sufficient importance, you may notice it in your journal, with whatever light you can throw upon it, and also, that others who may be acquainted with any facts, either "pro or con," may be induced to submit them, with their own thoughts on the subject.

I will very briefly state a few reasons why I am inclined to answer the question in the affirmative; and,

1st. The malaria is lighter than atmospheric air, consequently, it has a tendency to rise through the crevices in the floor of the house, as soon as it is generated by decomposition, especially if the cellar is kept closed, as it usually is during the night, and passing through the house, mixes with the air of the rooms, which is already rendered impure, and its adaptation to the purposes of human life much lessened, by frequent breathing. In this concentrated and doubly poisonous state, it is inhaled by those asleep. This might account for the fact, that a great number of those who suffer from fevers and other diseases, feel the first symptoms of the disease, either in the night, or when they first awake in the morning. Although the malaria is lighter than pure atmospheric air, yet it mixes with it, and as it becomes diluted by it, loses its power of communicating disease, so that if it is under the necessity of passing but a very short distance, either perpendicularly or horizontally, in situations where it is exposed to the free action of the atmosphere, it is rendered comparatively inert. I could, if necessary, cite many instances to prove this, and probably you yourself are acquainted with some, where, when disease has been rife in some districts of a city, the air which caused it has been deprived of its power to infect by merely crossing a narrow street.

2d. Even fresh vegetables, when first buried or secured, undergo fermentation to a considerable extent: witness the necessity of making air-holes in the earth covering vegetables, which are buried out of doors, for the purpose of suffering the gas which is generated to escape.

I will close with one more reason: Cellars are always damp, and frequently very wet, and in the best of them there is sufficient moisture and heat to produce fermentation, so that many of the vegetables kept over winter are found to be decayed in the spring. In some, vegetables in a half-rotten state are suffered to remain month after month. I have frequently heard those who have had much sickness in their families ascribe it to the water which was standing in their cellar, whereas water of itself would, even in this case, be perfectly harmless; but if a quantity of vegetable matter were in the cellar upon which the water might act, as an agent in decomposition, the sickness would, to my mind, be satisfactory accounted for.

For these reasons I am inclined to believe that so much disease as is produced by this practice might be avoided by making "out-door" cellars for vegetables, even though but a small space intervened between the house and the cellar.

Yours, respectfully, W. D. C.

Milan, Huron co. Ohio, Dec. 12, 1834.

Dear Sir,—There are twenty copies of the Cultivator received at this office, and some of us have been looking with solicitude to find something on the cultivation of hedge thorn, but find nothing, or nothing satisfactory. Situated as some of the subscribers are, upon the large prairie, destitute of timber, it becomes a subject of inquiry, "How are our farms to be fenced?"

The object of this communication is to obtain information in relation to this subject. Can you give us information, 1. Whether the hedge thorn has been successfully cultivated in this country? 2. If so, what kind of soil is best adapted to its growth? 3. Where may the seed be obtained, and what is the best method of cultivation? 4. How long will it be before sets from the seed will be sufficiently large to stop cattle and hogs?

The soil of our prairies appears to consist principally of vegetable mould to the depth of from four to twelve inches, with a subsoil of clay, very tenacious, by which means in time of much rain the earth is full of moisture, and very soft. In time of drought, the earth cracks, and its lumps become hard and impervious to the roots of most vegetables. With a proper degree of moisture, vegetable matter is very abundant, corn yielding sixty, and oats fifty bushels to the acre. Trees transplanted upon the prairie usually thrive remarkably well, but those vegetables likely to be greatly affected by a superabundance of moisture, or short periods of dry weather, cannot be expected to do well on the prairie.

Can you inform us of any other live fence besides the thorn, which would be likely to thrive and answer the purpose on our prairies? Would the yellow locust thrive so as to afford posts, &c. in a few years?

We are sorry to trespass upon your time, and the deep interest some of us feel upon this subject must be our apology for troubling you. Very respectfully, your obedient servant,

RALPH LOCKWOOD.

P. S. Our prairie farms are principally fenced with oak rails; but they have advanced in price within a few years from \$1 to \$4 per hundred, delivered on the line of the fence; they will last about ten years. Oak boards may be had at \$1 per hundred feet, and are considered as durable as rails. We are anticipating a further advance in the price of fencing stuff; and that we shall be driven at no very distant day, to substitute some other mode of fencing. What that substitute should be for economy and durability, and when to adopt it, is the object of inquiry. At the above price for rails and boards, the cost of fence would be 15 to 20 cents per rod per annum including interest. R. L.

REMARKS BY THE CONDUCTORS.

The subject of live fences is one of increasing importance to the agriculture of our country. We have many champaign districts of choice land, particularly in the west, and independent of prairie tracts, where there is not likely long to be a reservation of much timber ground, and where there is few or no stone to construct fences. In those districts fencing materials will soon become extravagantly high, and the inhabitants seem to be threatened with the alternative, of either dispensing with enclosures, as in France, or of resorting to live fences, as in England. The latter is decidedly preferable, not only to open fields, but to dead fences, unless in districts where fencing materials are abundant and cheap.

Caleb Kirk, of the state of Delaware, a man of the highest reputation for veracity and practical knowledge in husbandry, published some years ago, in the American Farmer, several numbers on hedging, in which he gives the result of nearly 20 years successful experience. In 1819 he states the actual cost of 1,000 feet of an efficient hedge fence as follows:

1,000 plants, planting and care first year,..........	$8 50
Dressing and care of plants six years following, ...	5 00
Expense seventh year for stakes, splashing, &c.....	11 25
Expense six following years,.....................	4 50
Total expense for thirteen years, ...	$29 25
The posts and rails for 1,000 feet of fence are stated at....	75 00
Showing a gain, in favor of the live fence, of	$45 75

in the thirteen years, besides the advantage of the live fence being permanent,—as good as new—while the dead fence would have gone to decay, and required a new expenditure to rebuild it. In 1823, when Mr. Kirk's judgment had been corrected by four years further experience, he says,—"I find that forty cents a rod will complete the raising to a mature age, and one cent a rod will fully maintain for ever after, if duly attended to and applied with judgment. No failure has ever appeared, except some local cause is present; therefore durability is now well established."

We have considered the subject of live fences of that primary importance, that we intend to publish, in the second volume of the Cultivator, the best information we can obtain on the subject, in connexion with our own experience, which has been something, and to illustrate the subject by cuts or engravings. In the mean time we offer a brief reply to the queries of our correspondent.

If by "hedge thorn," is meant the English hawthorn, (*bretœgus oxycantha*,) our decided opinion is that it will not answer in Ohio, as it does not do well here, in a latitude nearly parallel. We have given it a fair trial, and after patiently nursing it seven years, abandoned the hope of success, and dug up a hedge row of nearly a half a mile of it, and substituted other plants. Neither our summers nor our winters seem suited to its growth or preservation. The yellow locust is wholly unfit for hedges, from the fact that it produces innumerable sprouts from its roots, which would disfigure the hedge, and seriously encroach upon the fields. Yet we do not know of a tree which it would be more valuable to plant upon the western prairies, for wood and timber than the yellow locust. The growth is rapid, it propagates itself, and it affords a valuable material for fence posts, mill works and ship buildings. It will attain a maturity fit for these purposes in twenty-five years from the seed. But the thorns of our country afford excellent materials for live fences, particularly in the districts where they are found growing natuarally. This we state as well from personal experience and observation, as from the information of others. In the middle states we have seen good hedges of the Virginia and Newcastle, or cockspur thorns, and we have a promising hedge composed of several indigenous kinds, gathered from the woods and pastures. But the great difficulty is in managing our hedges well. Our own people have as yet but little practical knowledge on the subject, and too many of the foreign laborers, who profess a knowledge on this subject, are mere quacks at the business of managing them. Besides, our climate differs from that of Great Britain, and demands a different culture from that which succeeds there. We have more cold, more heat, more drought. The ditch and bank wil not do here, nor is it desirable that it should, as it causes a waste of ground, is unsightly, and is too often a nursury for noxious weeds. A bank and ditch require a width of eight or ten feet, while a simple hedge does not occupy more than two or three feet.

It is believed all the species of native thorn will answer for hedges, as well as many others of our native shrubs and trees. The Bostonians speak well of the buckthorn, though we have never seen it assume any thing more than an ornamental appearance,—nothing like a barrier to cattle. We have planted the honey locust (*Gleditschia triantha*,) as a material to experimentt upon; and so far our confidence of success remains unimpaired: though we are not yet prepared to speak with confidence of the result. The best evidence of our confidence in it is furnished by the fact, that we have now a mile or two of hedge row of the plants growing, planted in four or five successive years. The principal fear is that it may grow too large,—an objection which will not apply so forcibly in Ohio, where land is abundant, and where the level nature of the country renders shelter desirable in winter. Yet we think, from our manner of training, the nearness of the plants, and by careful attention to clipping, when the growth of the hedge requires it, we can keep it within reasonable bounds. The honey locust, when cut in, does not throw out numerous shoots, like the thorn, but the principal growth is confined to a single stem. Our remedy for this defect is, to bend down and lay in the plant at a uniform height, when the stocks are from one to two inches in thickness, and to repeat laying the new growth every second or third year till the horizontal barrier is four to five feet high. The tops are wattled to the right and left alternately, of the adjoining plants; and if the top is not depressed below a horizontal position, it continues to live and grow, and sends up shoots from nearly its whole length. The hedge of course becomes firmer and stronger every year.

We will close our remarks by advising Mr. Lockwood and his neighbors, to collect without delay, haws or seeds of the indigenous thorns of their neighborhood, and seeds of the honey locust, which we believe is a native of their forests, and to sow them in the spring in beds of good earth. The first will not come up till the second year, and many seeds of the latter will not germinate in a shorter time. Keep the seed beds free from weeds, and after two years' growth, the plants will be fit to put in a hedge row; and if they continue to take the Cultivator, we promise to instruct our Ohio patrons in the subsequent management, should they require our aid. They may also collect in the spring, from the woods, plants of the thorn of any moderate size, say from the eighth of an inch to two inches thick, saw off the tops near the roots, and having prepared the ground well, make a trench on the site of a desired fence, and plant the roots one foot apart.

OLD-FASHIONED MERINO SHEEP.

I had occasion, in the last number of the Cultivator, to notice a lot of very beautiful South Down sheep, lately imported from England by F. Rotch, Esq. of Butternuts, Otsego county. I have since been favored with a view of twenty-one head of very superior "*old fashioned Merino ewes*," destined to grace the valley and verdant hills of the Butternuts, whose fleeces, I was informed, averaged, last summer, four and a half pounds of clean wool each, besides giving a good lamb.

In October last, four bucks of the same description, whose fleeces weighed from 6¾ to 9½ lbs. each of good fine wool, passed through this city—two for Mr. Rotch and two for Judge P. Franchot of the same town.

These, I believe, are descendants from the famous breed of Merino sheep, first introduced into this country by the late Chancellor Livingston from France, and Col. Humphrey from Spain.

They are a more hardy and thrifty race than our native or Saxony sheep, as is acknowledged by every person who has kept a mixed flock, feeding together either on dry food or grass.

A valuable correspondent observes, in one of his letters to me, "sheep of the above description are now very scarce, and will soon be in great demand, for all wool-growers are aiming at small fine fleeces, whose constitutions will not stand severe wet and exposure to cold. The difficulty is already beginning to be felt, and nothing but a resort to the '*old-fashioned Merino*' will help it."

These sheep have been selected by a person well qualified to the task, and whose experience in sheep and wool has been very extensive; were procured at a very great expense—having travelled over a vast extent of country—selecting some from one flock and some from another, until he collected a small but very superior flock, having in view, *fine quality* and *great quantity* of wool, united with a large and heavy carcass.

Hereafter, I presume, we must look to Mr. R. for the pure breed of "South Down" and "Merino sheep," as well as for the "Improved Durham Short Horned" cattle, of which he has a herd, equalled by few—surpassed by none; for he is a great stickler for blood and pedigree, even to his barn-yard fowls.

Mr. R. certainly deserves great credit, not only of the county of Otsego, but of this state, for his indefatigable exertions in procuring such animals; and we have every reason to hope and trust that he will be amply remunerated by a discerning community, for the very great expense he has already incurred.

I have now in my possession, and propose to give, in the next number of the Cultivator, a cut, exhibiting a very striking resemblance to one of the above bucks, in the form of "Don Pedro," with a short history of the same, imported by Mr. Dupont in 1801—then residing in the vicinity of New-York, and supposed to be the *first buck* of the pure *Merino* breed introduced into this country.

Albany, Dec. 1834. AMATEUR.

Elements of Practical Agriculture,

By David Low, Professor of Agriculture, &c.

I. SOILS.

III. *Properties of Soils as determined by their Vegetable Productions.*

When we regard the distribution of plants in different regions, we perceive that this is determined by causes which have little relation to the nature of the soil on which the plants grow. The soils of all countries are in their essential characters, alike. The same mineral masses, composed of the same substances, exist over all the world, and yield, by their disintegration or decomposition, the same materials for the forming of soils.

But, although the mineral matter of the soils of all countries is thus similar in its constituent parts, it is altogether different with the vegetation by which these soils are characterized. Every zone, from the equator to the polar circle, is distinguished by a different vegetation, and different regions have their peculiar plants. A district of granite, of sandstone, or trap, in southern Asia, will yield the same materials for forming soils as similar districts in northern Europe, while the vegetation produced will scarcely seem to possess any common character.

Amongst the natural causes which effect the vegetation of countries, the influence of temperature is that which is the most obvious to the senses. When we pass from a warm country to a cold, we perceive a change in the whole character of the vegetation. We cannot ascend a mountain without finding such a change in the kinds of plants produced, and in the vigor with which they grow, dependent upon the change of temperature. The degree of moisture, too, the distance or proximity of the sea, and other circumstances connected with the climate and physical condition of the country, affect the nature of its vegetable productions, and show that the influence of soil, with respect to the kinds of plants produced, is entirely subordinate to that of temperature and effects of climate.

When we extend, then, the range of our observation to different and distant countries, we see that the nature of the plants can not indicate that of the soils on which they grow. It is only within narrow limits, and under given conditions of climate, that the kinds of plants afford any indication of the nature of the soils which produce them.

Within certain geographical limits, however, as those of a country having throughout nearly the same climate with respect to temperature and humidity, useful rules may be given for distinguishing soils by means of the plants which they produce. Numerous species of plants, indeed, will grow, with equal readiness, on different kinds of soil; yet, there are other species which affect particular soils, and in their wild state do not grow on any other. Thus, there are plants whose natural habitat is peat, others which grow on soils charged with moisture, and others on soils which are dry; some which, under the like conditions of humidity and temperature, are proper to the light and silicious soils, some to the stiff and aluminous, some to the calcareous.

But, as even within the limits of a single country, pretty similar in its climate throughout, variations must exist of altitude, and, consequently, of temperature,—of exposure to particular winds, and, consequently, of humidity,—of proximity or distance from the sea, and other circumstances affecting the habitats of plants,—it is often difficult to indicate the precise nature of a soil merely by its prevailing vegetation. It is almost always possible, however, to determine from this circumstance, whether the soil be wet or dry, and whether it be fertile or infertile.

It is for the last mentioned purpose, namely, determining the character of a soil with respect to its fertility, that the examination of its vegetable produce is the most important in practice. The nature of a soil, with regard to its texture and composition, will generally be best determined by an examination of the substance itself. But its fertility, or power of production, may be judged of from its natural produce; in part from the kinds of plants which are peculiar to it, and in part from the luxuriance with which they grow.

When we cast the eye over a tract of country, we have generally little difficulty in determining whether this tract be barren or fertile. The general aspect of the vegetation, whether stunted or vigorous, the absence or presence of heaths, the richness of the sward, the cleanness and straightness of the stems of trees, the verdure of the foliage, and the like, present to the eye a general character not readily mistaken.

When we observe a tract covered with luxuriant grasses and other plants, and with vigorous shrubs and trees, we naturally associate these appearances with fertility in the soil itself. When, again, we see a tract of heaths or naked sands, with the plants small or sickly, the soil thinly covered with lichens, mosses, and other inferior plants, the eye alone is sufficient to indicate that the tract is absolutely or relatively infertile.

The same method of judging of the productiveness of the soil may be extended to a field or to a farm. Let us direct the eye over it, and its general character with relation to its vegetable productiveness, will impress us at once with an idea of its fertility or barrenness.

This conclusion, indeed, will not be so securely arrived at if the surface be limited to a single field, and still less if that field shall be cultivated; in which case effects of art, and the stimulus of cultivation, may disguise the natural characters of the soil. But if the range of our observation shall be so extended as to take in a sufficient number of fields and objects, as trees, shrubs, hedges, and natural meadows, we shall scarcely fail, if the eye be at all accustomed to country objects, to arrive at a tolerably correct conclusion as to the general character of the soil in respect to fertility; and our conclusions will be yet more satisfactory and precise, if we know the particular kinds of plants which thus give the character of infertility or productiveness to the soil.

The plants the most important in this species of examination are the heaths, the grasses, and other herbage plants. In the vast forests of the New World, the most common method resorted to by settlers for judging of the comparative productiveness of soils, is by observing the kinds of trees produced, whether pine, cedar, hickory, or oak. This is because the principal vegetable productions of these countries are wood. But with us, the principal vegetable productions are the heaths, the grasses, and other plants that form the sward. These may be said to cover the entire surface of the country when not extirpated by art; and they afford, accordingly, the readiest means which vegetable productions present of judging of the properties of soils.

The fertility of soils, generally speaking, is denoted by their power to yield the useful plants; and it is a law, with few exceptions, that the poorer the soil is, the less nutritious are the plants which, in its natural state, it produces. The soils of the poorest class produce mosses, lichens, and heaths, which are less nutritious than the grasses. As the soil improves in quality, the grasses become intermixed with the heaths, lichens, and mosses. But these grasses are still inferior and little nutritious. As the soil continues to improve, the grasses bcome more valuable in their kind, and more numerous in their species; and in like manner, the leguminous and other herbage plants indicate, by their kinds and greater numbers, the increasing fertility of the soil. A square foot of rich old turf has been found to contain 1,000 separate plants of twenty distinct species;* while a square foot of silicious sand will frequently contain not more than half a dozen distinct plants, and those of a single species.

In the northern latitudes of Europe, the plants most generally regarded as indicative of inferior soils are the heaths. Some of the species of this family characterize, in a peculiar manner, the soils

* Hort. Gram, Woburnensis.

termed peaty. They are found, too, abundantly, on the coarser clays or tills, on the poorer silicious sands, as those lying upon or derived from quartz, on the poorer class of calcareous soils, as chalk, and generally on all soils, low in the scale of fertility.

The soils where this kind of plant prevails, are frequently termed heathy soils or heaths. Heathy soils have, however, their relative degrees of productiveness, and this is generally well denoted by the vigor with which the heaths peculiar to them grow. Thus, a soil of stunted heaths may be regarded as among the lowest in the scale of fertility, whilst a vigorous growth of the plant, may indicate a soil susceptible of improvement and cultivation.

[We omit here the names of many plants which indicate the quality of the soil, as several of them are not found in the United States, and of those that are, little is known, by common readers, of their botanical or common names.]

Various plants are regarded as indicating fertility where they prevail. Of these are:—

1. Cnicus lanceolatus—Spear Plume-Thistle.
2. Urtica dioica—Great Nettle.
3. Arctium Lappa—Common Burdock.
4. Stellaria media—Common Chickweed.
5. Achillea Millefolium—Common Yarrow.

And, generally speaking, all the richer and more nutritious pasture grasses. Such are:

1. Dactylis glomerata—Rough Cocksfoot.
2. Festuca pratensis—Meadow Fescue.
3. Alopecuris pratensis—Meadow Foxtail.
4. Poa trivialis—Rough-stalked Meadow-grass.
5. Phleum pratense—Meadow Catstail.
6. Lolium perenne—Ryegrass.

Those who desire to pursue this investigation more in detail, may consult botanical works descriptive of the plants of particular countries or districts, in which they will find the habitats of plants indicated with more or less correctness. It is not necessary, in the present place, to extend the observations on this subject; for in giving examples of plants, those have been selected which are of frequent occurrence, and the best suited to indicate the characters of soils in this country.

I shall now conclude the subject of soils, by giving the student a few rules for enabling him to distinguish soils in the situations in which they may be presented to him.

First, then, let him make such use of the indications afforded by the natural produce of the soils as his means of information afford. He may not know the names of the plants that are growing naturally upon the surface, but he can always observe whether they are growing with vigor, whether the sward is thickly covered with species, and whether the general aspect of the part to be examined indicates fertility or poverty.

A difficulty, which it will be well that he endeavor, in the first place, to overcome, is to distinguish the peaty soils from the earthy. He will experience little difficulty in this, when they are distinct from each other, and covered by their natural herbage! But when they are subjected to cultivation, or intermingled with the earthy soils of the same field, or when a soil contains a certain portion of peat in its composition without being entirely peaty, then the eye may be deceived, from their resemblance to the dark coloured loams. The one class of soils, however, may be of great fertility, and the other of great barrenness; for it is to be observed that, though peat may be often rendered fertile, its presence in soils is always suspicious.

The soils termed peaty, it was before observed, are dark in their colour, and loose and spongy in their texture, even when improved by art. The soils which they most resemble in external characters are the richer loams, but they are more light and spongy than these, and their colour is of a duller dark than the loams, which approach rather to a hazel hue. Peaty soils, too, very generally lie on a retentive subsoil; but perhaps the best method of discriminating them in the absence of their peculiar vegetation, is by the stones which lie upon their surface. These appear to be acted upon by the acid matter of the peat, and present a white appearance, which, when once observed, will not be easily mistaken again. Coupling this indication with the dull black, as distinguished from the brighter hazel of the loam, and above all, with the peculiar vegetation and sterile aspect of the surface, the student will soon learn to distinguish the peaty soils from the earthy.

In examining the earthy soils, an essential circumstance to be regarded is, the depth of the soil, and the texture of the subsoil. A medium depth of a soil may be held to be from nine to ten inches. But it will be better that it exceed a foot, and this greater depth of the soil is always a favorable indication. If the depth of the soil does not exceed six inches, that is an unfavorable indication. Such shallow soils are rarely good, except sometimes when they occur resting on peculiar rocks, as compact limestone, and certain easily decomposed basalts and porphyries. If a shallow soil shall occur on a retentive clay, or on silicious sand, we may certainly pronounce it to be bad. When in the common operations of tillage the plough is constantly turning up a subsoil very different in colour from the upper stratum, that is an unfavorable indication.

When we find the rain in a furrow of ordinary descent carrying off the soil, and leaving the subsoil exposed, that is an unfavorable indication. It is desirable to see the water in the furrows sink down and be absorbed, instead of carrying of the surface soil.

If the soil be of a dull black colour, and if it present upon the surface the white stones above refered to, that is an unfavorable indication, as it shows that the soil has more or less of peat in its composition.

If the soil produce sub-aquatic plants, it is wet. If we find that such a soil is peaty, or shallow on a retentive subsoil, it is naturally sterile. If we find that the sub-aquatic plants are tall and vigorous, and the soil earthy and deep, the removal of the wetness may remove the cause of infertility, and such a soil may become of the richest kind.

If we find a soil producing naturally the superior herbage plants, and of a good depth, that soil we may infer to be good. When soil of this kind tends to a dark hazel colour, we may safely reckon it among the superior soils.

By attention to these rules, and by a little observation and practice, the difficulty of discriminating soils will gradually be lessened, and at length disappear. Those who have been used to country objects rarely experience difficulty in discriminating soils, in so far at least as these soils are to be distinguished by their texture into stiff and free, or by their powers of production into rich and poor.

Sheep Husbandry.

HINTS ON SHEEP HUSBANDRY.

[*Selected and collated for the Cultivator.*]

In an agricultural view, simply, the importance of sheep is extreme; since, by their assistance alone, thin barren, upland soil, so often the far greater part of a country, can be cultivated to advantage, which otherwise could not generally be cultivated at all. The sheep will subsist and multiply on those barren soils where no other animal would be maintained with equal profit; he is equally calculated for the most deep and fertile, challenging competition, and dividing the palm of profit with the ox, and is excluded from such only as abound in stagnant water, the moist exhalations of which are naturally destructive to his constitution.—*Lawrence on Cattle.*

The bodily constitution of the sheep, as of the goat, the deer, the camel, the hare and the rabbit, is usually called hot and dry; we however kno,w from unquestionable experience, that dry soils, a dry air, dry provender and green food, which does not abound in cold and watery juices, are most appropriate and salutary to them. Indeed the contraries are replete with danger to the sheep, most particulary, which is naturally and constitutionally subject to serous effusion, producing a dropsy of peculiar kind, either universal or circumscribed, but more usually the latter, extending indifferently to all parts of the body. This efflux of water, or rather watery tendency, in all the fluids of the body, gradually produces in the solids disorganization, mortification or rot. Catarrhal affections are the most usual primary causes of rot. These ideas very plainly indicate the proper situations, food and treatment of sheep.

Sheep have often been described as of "a weakly constitution, liable to be exhausted by fatigue, and ill able to bear the extremes of heat and cold, subject to many diseases, most of which are contagious." Such notions are to be received with much allowance, for in truth this useful race seems enabled by nature to accomodate itself to all the vicissitudes of climate, and to nearly the extremes of heat and cold, of which the husbandry, ancient and modern, of both northern and southern countries forms the best proof. We see them accustomed to brave the most rigorous of these extremes unhurt, liable, as might be expected from the nature of the case, to casualty and loss, which timely shelter might prevent. The sheep well fed, from its fleecy covering and gregarious habits, whence results an atmosphere of considerable warmth, remains very little affected by intense cold, if unaccompanied by moisture; he is perhaps more unfavorably affected by great heat, but continues safe under either extreme, with the advantage of sufficient shelter, obviously one of the most important points in the sheep husbandry. The various diseases incident to sheep have their origin almost exclusively in neglect, improper situations and treatment, or errors in feeding. Reverse these, and diseases among sheep would be as few and rare as they are now numerous and rife throughout our sheep districts; another grand point in their husbandry.—*Ibid.*

One of the two species of sheep, the long and the short woolled, having been chosen, as most appropriate to the situation, and wool being made an object, it is most advantageous to select such flocks as are pure as possible of the species to which they belong, and not a mixture of the short and long wool breeds, which must generally produce an inferior fleece, disadvantageous to the manufacturer.—Length of staple in the long, and fineness, elasticity and closeness in the short woolled fleece, will be the best guides in this case.

Whether the wool be long or short, the carcass of the animal ought to be amply and regularly covered; it is a great defect when the belly is bare, and a still greater when the wool is thin and open along the ridge of the back, admitting rain and moisture to a most susceptible part; indeed to descend upon all parts of the body.

It is a piece of good old advice to buy your *rams* a little before shearing time, if possible; and a very necessary modern addition to take the opportunity of purchasing at the farmer's house, whilst you can see the animal in *paribus naturalibus*, and before he has been decked out and trimmed for show by the sheep barber. A thick fleece, covering all parts with as much equality as possible, containing plenty of *yolk*, or retained or inspissated perspiration, is the object. If ewes, equally well bred, can be procured, the shepherd anticipates and reaps an immediate benefit; if not he must patiently await improvement of his wool, through the medium of the superior blood of his rams.

At *shearing time*, examine the bottoms of the fleece, or the lower extremity of the filaments of wool; if it be *stichy haired*, of mixed quality, or if the sheep have a coarse breech, or be not well covered, it must be rejected, as improper for a breeding stock, where it would perpetuate its defects. The quantity of yolk or grease is a good proof of the thickness of the fleece, since, by the closeness and thickness of the wool, the grease or perspirable matter of the animal is retained; hence fine, closed, curled wool has ever the greatest quantity of yolk.—*Bath papers.*

Dentition is commenced and is completed early with the lamb, and I have, within these few hours examined the mouth of one three months old, which has its complement, eight small or lambs' teeth. Two of these, in front, fall and are replaced by two broad or sheep's teeth, at some period previous to the sixteenth month, sometimes, although rarely, within the first year. A similar renewal of two teeth takes place every succeeding year, until towards the end of the third, sometimes during the fourth, or in the commencement of the fifth year, when the sheep is full mouthed or aged, having acquired the eight broad teeth.—*Lawrence.*

Markham advises to "choose your sheep the *biggest boned*, with the best wool, the staple being soft, greasy and well curled, and close together, so that a man shall have much ado to part it with his fingers. These sheep, besides bearing the best burden, *are always the best butcher's ware, and go soonest away in the market.* The *ram* large of body, in every general part, with a long body and a large belly his forehead broad, round and well rising, a cheerful large eye, straight short nostrils, and a very small muzzle, by no means any horns for the dodder, [hornless sheep] is the best breeder, and his issue never dangereth the dam in yeaning as the horned sheep do. A large upright neck, somewhat bending like the neck of a horse, a very broad back, round buttocks, a thick tail and short jointed legs, *small, clean and nimble;* his wool should be thick and deep, covering his belly all over; also his face and even to his nostrils, and so downward to his very knees and thighs."

Cully's description of the ram.—"His head should be fine and small, his nostrils wide and expanded, his eyes prominent and rather bold and daring, ears thin, his collar full from his breast and shoulders, but tapering gradually all the way to where the head and neck join, which should be very fine and graceful, being perfectly free from any coarse leather hanging down; the shoulders broad and full, which must, at the same time, join so easy to the collar forward, and chine backward as to leave not the least hollow in either place; the mutton upon his fore arm or fore thigh must come quite to the knee; his legs upright, with a clean fine bone, being equally clear from superfluous skin and coarse hairy wool, from the knee and hough downwards; the breast broad and well forward, which will keep his fore legs at a proper wideness; his girth or chest full and deep, and instead of a hollow behind the shoulders, that part by some called the fore flank, should be quite full; the back and loins broad, flat and straight, from which the ribs must rise with a fine circular arch; his belly straight, the quarters long and full, with the mutton quite down to the hough, which should neither stand in nor cut; his twist [the junction of the inside of the thighs] deep, wide and full, which, with the broad breast, will keep his fore legs open and upright; the whole body covered with a thin pelt, and that with fine, bright soft wool."

Marks of excellence in long or short woolled sheep. Fleece white (tinged with a red brown hue, if Merino) palate, with the bridge of the nose, horns and hoofs white. No cat's hairs. The horns wide set, otherwise the head liable to the danger of contraction. Yet wide-headed horned lambs are dangerous to the ewes in yeaning. It is said the horns may with safety be twisted off when the lamb is only a month old.—*Lawrence.*

South-Downs.—The number of ribs in a sheep is thirteen. Average weight of tallow from 12 to 16 lbs. exclusive of kidney fat. The finest woolled fat, are fit for market six weeks or two months sooner than the coarsest; and in proportion to the fineness of the wool they succeed each other. The grain of the flesh is in proportion to the fineness of the wool, and the carcass of a fine woolled sheep will considerably out-weigh that of a coarser woolled sheep of equal size and dimensions. If well kept, the ewes will produce more than one lamb, instances not being wanting of the production of five at a birth, but in such cases more than two of them are seldom saved. The coarsest woolled ewes bring lambs with the greatest quantity of wool upon them at the fall.—*Mr. Alfrey, in the Annals of Agriculture.*

The signs of health in sheep are, first, a skittish briskness, clear azure eye, florid ruddy eye-strings and gums, teeth fast, nose and eyes dry, respiration free and regular, feet cool, dung substantial, wool fast and unbroken, skin of a fine florid red, particularly on the brisket. Sheep are often seen in market with nose and eyes running, or, as we should say of a horse, almost glandered. This happens from wet layers, during their travel, in cold, windy seasons; and a continuance of such weather, and perhaps after neglect, lay the foundation of diseases which, afterwards, the cause is not suspected. Great caution is necessary during drift, [driving] that the flock be not suffered to rest on wet and boggy layers, and that they are provided with dry lodging, and sufficient keep to support their strength.—*Lawrence.*

Folding sheep.—The advantages supposed to be derived from it are visionary; being in fact no more than robbing a large part of a farm to enrich a small one. Large flocks, even any number, kept together above one hundred, is a barbarous practice; for in such flocks the strongest will beat the rest from their food; instead of which, the weakest sheep should have the best food; and if folding is necessary on farms that have no commons annexed to them, why not have small folds on different parts of the farm, and for those of different kinds, ages or strength, and thereby save the trouble of driving from one part of the farm to another? for had not the animal, after it has filled its belly, better lie down and sleep, than travel to create an appetite? From my general observation in various parts of the kingdom where folding is, and is not practised, my opinion has been confirmed; nor will I allow any utility to the fold, excepting, perhaps, in the case of a flock feeding on large open commons by day, and considered in the light of mere dung carriers to the arable land.—*Bakewell.*

Covered folds.—In Essex, it is common for the farmers to fold their sheep in covered folds, and mix their dung with ditch earth, mud, &c. which causes the dung to spread and go much farther. In Gloucestershire, &c. the farmers house their sheep at night, and litter them with straw, and when one quantity is converted into soil, they add fresh, so that a whole winter affords a great quantity of dung where a large flock is kept, and it is found, by long experience, to answer the trouble; so that by folding in summer, and housing in winter, all their dung and urine are preserved for the land in tillage. —*Mordant*.

It seems to be admitted on all hands, that if sheep are yarded, they should be supplied with dry litter, both because it is essential to their health, and that this litter absorbs and saves the urine, essential to the increase of manure; and it is no less essential, that the location of the sheep pen should be a dry one. A free circulation of air, though cold, is not so prejudicial to sheep, if they are protected from wet, by a sufficient covering.

Miscellaneous.

[*From the Edinburgh Quarterly Journal of Agriculture.*]

ON UNDER-GROUND DRAINING.

Most occupiers of land are fully aware, that the first and greatest improvement of wet land is draining; but they do not agree as to the most proper means for effecting that desirable object. So much depends upon soil, subsoil, and other localities, no positive rules can be given for the draining process. Experience is the best guide, and the tact or art of effecting the most good at the least comparative expense, can only be acquired by extensive practice, close observation and correct calculation. Hence young practitioners frequently commit great errors, lose much valuable time, and expend large sums of money to little good purpose. But although no positive rules can be given, a few general remarks and practical hints from an old drainer may be of service to the inexperienced; and with that view the present communication is made, by one who has had long and extensive practice in land-draining. As the writer does not pretend to advance any thing new on the subject, his remarks may not be interesting to old practitioners; but as he will endeavor to point out prevalent errors, with instructions for improvement, he is not without hopes his efforts in that way may be of some service to young beginners; and to such he begs leave to address himself.

Extensive bogs are usually drained under the direction of professional scientific men, and any criticism upon their operations would be superfluous in this place. Neither will it be necessary to remark upon open or surface drains, ditches or water furrows, as these are generally well executed by attentive farmers; but under-draining of springy land in all its variety of broken measure, and upon other land retentive of wet, though carried to a great extent by farmers and other land occupiers, is not generally so well conducted by them as surface draining. The following remarks will therefore be confined to under-ground or covered drains, commencing with those usually called

Furrow-drains.—Much injury has been done and serious loss sustained, from the imprudent practice of levelling and straightening high crooked ridges upon retentive subsoil, without taking the precaution of draining the furrows in the first instance. In such cases, the only sure remedy is, by opening the ground in the lines of the old furrows, and putting covered drains into them. Cross-drains do not effect so perfect a cure as furrow-drains, upon land so mismanaged.

In setting covered drains of every description, whether with tile, stone, brushwood, turf, or any other material, particular attention should be paid to securing an open space at the bottom of every drain for a water-channel. Many farmers are not aware of the propriety of that measure, and others too negligent to attend to it. They fill their drains with stones or other material, thrown in promiscuously; those are called rubble drains; and the farmer feels satisfied of their efficacy, because he sees water oozing out at their ends. It is true water percolates through the material in the rubble-drains, but at different levels, seldom at the bottom, and sometimes at the very top of the rubble; consequently they are entirely deceptive in effect. Any person entertaining a doubt on the subject, may readily satisfy himself, by opening a short space by the side of a rubble-drain in wet-weather. He will then see the water issue out of the rubble, and rise in the opening, before he has dug near to the bottom of the drain—a clear proof it does not work well, and that the water, being so obstructed in its course, stagnates in the drain, and saturates the adjoining land. Whereas, had the drain been set open at bottom, the water would have had a free passage, and the land been relieved from superfluous moisture. Obvious as this must appear to every unprejudiced person, it is quite surprising with what tenacity some farmers, even at the present day, maintain a contrary opinion. The writer of this article has frequently met with such instances of perverseness, nor could he by any means induce the sceptics to prove the fact by the simple means here recommended. The advocates of rubble-drains argue—"That water runs out at the ends of such drains, which is quite sufficient; and that, were they set their drains open at bottom, rats and moles would creep into them, and stop them up." Without doubt, such vermin do occasionally creep into drains, but are not likely to stop them up, as they will not lodge in a water course. But even if they did so, the stoppage could only be temporary, for the water in the drains would rise up to the level of the loose material, above the tiles or set stones, percolate between them, and drop into the drain below the obstruction, which would soon be washed away, and the water-course be again left clear.

Tiles, properly made and well burned, are not only handiest, but the best material for setting in the bottoms of drains. They insure a clear water course. A drain two feet deep, set open at bottom, is more effective than one four feet deep filled with rubble, and is not half so expensive. Small stones, or other loose rubbish, should be laid above the drain tiles, or set stones, to act as conductors of wet. In most cases, about one foot deep of such material is thought sufficient. Some farmers fill their drains with small stones and other rubbish, so high, that the ploughshare touches the material in its operations; and the farmer thinks it indispensably necessary the drains should be so filled, under an idea that the top-water would not find its way into the under-drain by any other means. That is a bad practice, prompted by error in judgment, and effected at great unnecessary expense.

It is quite obvious, where the ploughshare disturbs the material in under-drains, it opens a passage for surface water into the drains; but the advocates of this measure should recollect, that water so admitted into a drain carries much earth with it, and soon chokes the drain up. Surface water will find its way into under-drains without the aid of the ploughshare. An old draining adage says, and says truly, "If *one* drop of water finds its way down, *two* will assuredly follow." When water is drained off at bottom, it gives place to moisture descending from above. "You cannot put more liquor into a barrel already full of it; but draw from the tap-cock, you may then pour into the bung-hole." These sayings, though homely, are applicable to the case in point.

The operation of opening furrow-drains is greatly facilitated, by commencing with a common plough, going once about, and throwing out a good furrow on each side. Two cuts or grafts with the spade, will then, in most cases, be a sufficient depth. The curved grafting tool is more effective in cutting out strong subsoil than the common garden-spade. A conic-shaped grafting tool answers best for cutting out the bottom drain. Furrow-drains should be cut narrow, the bottom of just sufficient width to receive the drain tiles. When the cutting is finished, the loose earth should be carefully cleared out of the bottom, with a scoop made for the purpose. Great care and attention should be paid to setting and filling the drains. The tiles being laid in a line along the side of the drain, the workman stands in the bottom of the drain, having one foot placed immediately behind the other. He reaches one tile at a time, and lays it firm on the bottom before him; he then moves his feet back, places another tile, and so on to the end of the drain. Small stones, or other loose rubbish, are then put over the tiles, and a layer of turf or sprinkling of litter is put over the rubbish, to prevent the earth sinking among it. Where no small stones or other loose rubbish can be procured to lay upon the tiles, turf or litter should then be laid immediately above the tiles, and the drain be filled up with surface soil, that being generally more porous than clay or tile dug from the bottoms of drains. Horses should not be allowed to tread upon new made, shallow-covered drains; neither should cart-wheels pass along or over them.

When furrow-drains are intended to be set with stones, it is not necessary, in all cases, to cut the drains so wide at bottom, as to admit of stones being set square on the sides, and have broad covers placed over them as in deep drains. Stones may be set to give a free water course, in drains cut as narrow at bottom as for drain tiles. The workman places himself in the drain in the same form as when laying tiles, and the stones intended for setting being laid along the side, he reaches them as required. There are various methods of setting stones in the bottoms of narrow drains. One only shall be described here. It answers best in strong clay. The drain being five inches wide at bottom, place one end of the set stone in the angle at the bottom on one side, and lay the other end against the opposite side of the drain; the set stones being eight or nine inches long, will then leave a clear triangular-shaped aperture for a water-course at bottom. The workman then selects other stones, and places them above the first setters, so as to form another triangular opening on the opposite side of the drain, thus forming a secondary water-course, if the first should be either obstructed or overcharged with water. Small stones are then put over the set stones, and the drain finished in the same manner as in tile-draining.

Shallow under-drains in the alignment of the ridges, called furrow-drains, are more effective than deep cross-drains upon strong land, impervious subsoil, and where there are no springs, spouts, or oozings of water from broken or irregular measures in the land.—The depth of furrow drains should vary according to the nature of the soil, and other circumstances; average depth about two feet; and, as before observed, they should be cut narrow.

Furrow-drains should not be formed to empty singly at the bottoms of open ditches, as they would be liable to be choked up by treading of cattle, and accummulation of weeds and rubbish in the ditches. It is a better plan to collect a number of furrow-drains into larger and deeper cross under-drain, made at a distance from the lower parts of the fields. Those receivers discharge the collected waters into open ditches or water-courses, and are not so liable to be choked up as furrow-drains emptying singly. Those receivers should not be made to discharge the water at the *bottoms* of open ditches. The water should be made to fall from one into the other, as will be more fully explained in the next section, when treating of

Deep Cross-Drains.—Cross-draining is more difficult than furrow-draining, and great errors are frequently committed in the practice. It is customary, in this description of draining, to commence operations at the lowest parts of the field, and where there are no side ditches for the cross drains to discharge into. A main, or leading drain, is carried up from the lowest to the highest level. The depth of the drains is generally settled in the first instance, without previous investigation of the nature of the soil and subsoil. As the main drain is under operation of being carried up the field, numerous cross-drains are made to lead into it. Those are frequently cut in straight lines, as that suits the workman's convenience, and sometimes at regular distances, whatever the nature of the soil or subsoil may be. In this manner a cure is sometimes effected, though at a great unnecessary expense. But the result is more generally a total failure, when the occupier consoles himself under his disappointment, with a belief that the failure was entirely owing to the nature of the soil, and impediments in the locality of situation, which could not possibly be overcome.

An experienced drainer, professional and practical, proceeds with greater circumspection in his operations, and he seldom fails of success; he, in the first instance, takes a minute view of the field to be drained; he inspects all the spouts or breakages of water in it; he decides upon the different levels of the ground, and facilities for carrying the water off; he then sets down his marking sticks for the workman's direction, not always in straight lines, but bending round the inequalities of the ground, and immediately above where the water spouts or oozings shew on the surface; he then takes other views of the lines of stakes, to satisfy himself the water in the drains will have proper falls, and when he entertains a doubt on that point, he proves it by the spirit level. These preliminaries settled, he ascertains the nature of the subsoil, by digging holes in the lines of the projected drain. These shew the strata in which the water flows, and the nature of the obstruction which forces the water up to the surface of the ground, and the depths of the drains is regulated accordingly. The digging of try-holes, technically called "feeling the way," is a simple and safe process, and should never be dispensed with where there is variation in the stratification.

In some fields, where the soil and subsoil vary in texture, and are irregularly disposed, springs as oozings of water, though they appear on the surface at various levels, not unfrequently arise from the same source, near the top of the field. Where the water issues from crevices in rocks, from loose gravel, or from other broken or loose measure, or alluvial deposite, the water filters through such measures, until obstructed by impervious subsoil. It is then forced up to the surface over which it runs in the declivity of the ground, and when it reaches more porous subsoil, it sinks into it, percolates through it, until it again meets obstruction, and is forced up to the surface, and forms the second line of water breakages; and a third and fourth line of these water-spouts may be formed from similar causes in the same field. These receive the several local appellations of springs, spouts, oozings, sloughs, quagmires, &c. In a field so circumstanced, it is advisable to cut the upper cross-drain in the first instance. It should be cut immediately above the first breakage of water near the top of the field, and be made to discharge into a side ditch, or into a leading drain, carried up for the purpose of a receiver. The effect of that cross-drain will be proved in one year, and when found necessary, other cross-drains may be cut at lower levels in subsequent years. It is frequently seen, where the draining operations are commenced, by cutting cross-drains at low levels; such drains collect, and discharge a great deal of water in the first instance; but when other cross-drains are afterwards cut at higher levels, the first are laid entirely dry, and the money which had been expended in making them lost, without rendering any benefit to the land; it is therefore advisable to cut an upper cross-drain first, prove its effect, and then proceed with the others at the lower levels, as may be deemed expedient.

The bottoms of drains, when not cut deep enough, are sometimes soft and poachy, and the draining material liable to sink into the mud. In such cases plain tiles, or flat stones, should be laid in the drain bottoms for the drain tiles, or setting stones to rest upon. And in quagmires, or loose running sand, it is advisable to drive short wooden piles into the drain bottoms; those ensure good foundations, however soft and poachy the subsoil may be.

It may be thought unnecessary to again mention the propriety of securing open water courses at the bottoms of covered drains. But that is a leading principle in draining which cannot be too frequently inculcated, nor too positively insisted upon, and it is of still greater consequence in deep drains than in shallow ones.

When water springs up in the bottoms of drains, it indicates obstruction at lower levels. The boring rod should then be applied, to give vent to the pent up springs. Every extensive drainer should be provided with a light boring rod, called a "churn-drill." It is made of round bar-iron, half inch diameter, and about eight feet long; the ends beat flat into chisel form, one inch broad, and steeled. In using the churn-drill, the workman stands in the drain; he holds the rod upright with both hands, raises it up perpendicular and drops it into a hole in the bottom of the drain; and at every movement, shifts his hands, and in so doing he turns the rod a little, so as to make the bore hole round, and prevent the chisel wedging in the hard substratum. In working this implement, the motion is something like that of the stick or handle of an upright butter churn, and hence its name. When the bottom is dry, as is sometimes the case before the springs are tapped by the rod, the bore hole should be kept moist by pouring water into it. The churn-drill, though simple, is powerfully effective when properly applied in boggy or springy ground, and frequently saves the expense of cutting additional drains. The great boring-rod, with its appendages, is still more effective, but it is too complicated, and too expensive for common use in land-draining, and is only used in extreme cases.

Some persons who think it necessary that cross drains should have rapid falls, cut them in straight lines at considerable declivities, and by that means frequently miss the water-spouts they intended to cure. This is a great error in practice, for it is by no means necessary, nor is it at all times prudent, to give water in under-drains a rapid fall, particularly in loose subsoil, liable to gutter and sludge up. The bad effects of rapid falls for water, are exemplified in arable land furrows, and other surface drains on hilly land. These are frequently sludged up in heavy rains, the water is thrown over the surface, and its current diverted into other channels. Attentive farmers, therefore, make cross-furrows or drains, with easy falls, to collect and carry off, without injury to the land, the surplus water from the furrow-drains. The same rule applies, and similar precaution should be taken, wherever there is expectation of much water in under-drains. It is not necessary to cut cross-drains in straight lines. They may be made to bend in any direction, to cross the water-spout intended to be cured. But care should be taken in cutting, not to lose the water level in any one place. The workman readily guard against that error; he has only to see that the water in the bottom of the drains runs from him, and does not come back among his feet.

It has been heretofore remarked, that under-drains should not be made so deep as to discharge the water *at the bottoms of open ditches*, but should have a fall into them, for the purpose of preventing their choking up, by the treading of cattle or otherwise. Many farmers commence their draining operations by cleaning out and deepening the open ditches into which they purpose the covered drains to discharge. The object of that deepening is, to get additional fall for the water from the drains. The design is good, and would answer the intended purpose, if those ditches were regularly cleaned out afterwards; but unfortunately that is seldom or never the case, for the farmer's attention being called to other important concerns, the drains being out of sight, are soon out of mind, the ditches are neglected, leaves, coarse grass and other rubbish accumulate in them, cattle get into them and poach them up, and the mouths of the drains are stopped up; the water stagnates in them, and the land again becomes saturated with wet. It is therefore not advisable to gain fall for covered drains by deepening open ditches, when it can possibly be obtained by other means.

Cross drains should not be made to join the receivers, whether open ditches or covered drains, at right angles or nearly so, as they generally do. Neither should they be cut so deep by some inches, as the receivers; and with a view to ensuring a free discharge of water from the cross drain into the receiver, it is advisable, at a point a few yards distant from where the junction would be formed in the usual way, to give the cross drain a sharp bend towards the declivity of the ground, and make it join the receiver in an acute angle, as it then would do at a lower level. This practice ensures a good fall, and prevents choking up, as the weight and force of water from the bend of the drain effectually removes observation at the point of junction, and keeps the mouth of the drain open.

F. B.

[*From the Northampton Courier.*]

CHINESE MULBERRY.

The Secretary of the Hampshire, Franklin and Hampden Agricultural Society, furnishes us with the following facts in relation to silk worms and mulberry trees:

At the late show of the Hampshire, Franklin and Hampden Agricultural Society, Elizur Goodrich, Jr. Esq. presented a claim for premium on white mulberry, set on his farm in Montgomery, in the county of Hampden, and obtained the first premium. He states that in 1833, he had 9,000 mulberry trees set on one acre—the rows 4 feet apart and trees 12 to 18 inches apart in the rows. In 1834, had 20,000 mulberry trees set on three acres—the rows six feet apart, and trees 12 to 18 inches apart in the rows—also 9,000 mulberry trees set on 4 acres, the rows 6 feet apart, and trees 3 feet apart in the rows; that he planted potatoes between the rows, had a good crop, and found the cultivation of the potato was advantageous to the mulberry trees. Expecting to use the leaves in the manufacture of silk, he intends to keep the trees cut down to six or eight feet, for the convenience of gathering leaves. The trees are from three to four years' old and very thrifty.

Mr. Timothy Smith of Amherst, in the county of Hampshire, also presented his claim for premium on the white mulberry, and obtained the Society's premium. He represents that he has 17,443 white mulberry trees, of which 3,638 are set out on about 100 rods of ground in rows 8 feet apart, and the trees 2 feet apart in the rows, the residue set more compact for the purpose of topping to feed worms. He planted potatoes between the rows, had a great crop, and found the hoeing among the potatoes was beneficial to the mulberry trees. From the experience he has had in feeding worms, calculates that half an acre set with white mulberry will produce feed for 100,000 worms—says he has what he considers five species of worms, viz. the black annual worm, producing *one* crop in a year of *yellow* cocoons, also the black worm producing *two* crops in a year of *yellow* cocoons, the grey worm, the large white and the small white worm, producing two crops in a year of *white* cocoons. The present year has fed only about 30,000 worms, but thinks his mulberry trees might give sufficient feed for an *hundred thousand worms.*

He had worms on feed when the late severe frost came, and gathered a quantity of leaves while frozen, packed them in a sack which had been used for salt: in this state the leaves were kept green and in good condition, so that he fed his worms two weeks with them and the worms devoured them with the same avidity as before they had been frozen.

The frost completely destroyed the leaves remaining on the trees. Mr. Smith now thinks that leaves may be preserved through the winter, for winter and early spring use. He has 357 promising seedling plants of the Morus Multicaulis, the product of one paper of the Chinese mulberry seed which he had of the society last spring. On this subject, the committee would remark, that from the source and peculiar circumstances under which the seed was obtained from the interior of China, it is believed to be genuine, and not improbably, the first good seed imported. The seed has been distributed into several towns in the county and generally given a good return, unless when planted or sown too deep. Some seed, however, was lost, and did not vegetate in consequence of sowing too deep. The most favorable depth is about one quarter of an inch, regard being had to the soil.

The seedlings of the present year, standing some distance from each other, gave out side branches, some of which as an experiment, were made into cuttings, set in the ground with one bud exposed, and did well, although done in a very dry and hot season, and while the branches were green and tender. Some seedlings of the present year produced leaves measuring 9½ by 8½ inches before the severe frost, and had the weather continued mild a few weeks longer, it is thought some leaves would have attained the size of 12 to 14 inches. Some seeds were sent northerly and southerly to a considerable distance, and one parcel to the distance of 5 or 600 miles, and did well. Should no more be received from China, there is now a sufficiency of grown trees and seedlings in such forwardness as in a short time to supply the whole limits of the society with the real Morus Multicaulis.

[*From the Library of Useful Knowledge, Farmers' Series.*]

PHYSICKING HORSES.

This would seem to be the most convenient place to speak of physicking horses, a mode of treatment necessary under various diseases, but which has injured the constitution of more horses, and in fact absolutely destroyed more of them, than any other thing than can be mentioned. When a horse comes from grass to hard meat, or from the cool open air to a heated stable, a dose of physic, or even two doses may be useful to prevent the tendency to inflammation which must be the necessary consequence of so sudden and great a change. To a horse that is becoming too fat, or has surfeit, or grease, or mange, or that is out of condition from inactivity of the digestive organs, a dose of physic is often most serviceable; but we do enter our protest against the periodical physicking of all horses in the spring and the autumn, and more particularly against that severe system which is thought to be necessary to train them for work, and the absurd method of treating the horse when under the operation of physic.

A horse should be carefully prepared for the action of physic.—Two or three bran-mashes given on that or the preceding day are far from sufficient, when a horse is about to be physicked, whether to promote his condition or in obedience to custom. Mashes should be given until the dung becomes softened; a less quantity of physic will then suffice, and it will more quickly pass through the intestines, and be more equally diffused over them. Five drachms of aloes, given when the dung has been thus softened, will act much more effectually, and much more safely than seven drachms, when the lower intestines are obstructed by hardened fæces.

On the day on which the physic is given, the horse should have walking exercise, or may be gently trotted for a quarter of an hour twice in the day; but after the physic begins to work, he should not be moved from his stall. Exercise then would produce gripes, irritation, and possibly dangerous inflammation. The common and absurd practice is to give the horse most exercise after the physic has begun to operate.

A little hay may be put into the rack; as much mash may be given as the horse will eat, and as much water, with the coldness of it taken off, as he will drink. If, however, he obstinately refuses to drink warm water, it is better that he should have it cold, than continue without taking any fluid; but he should not be suffered to take more than a quart at a time, with an interval of at least an hour between each portion.

When the purging has ceased, or *the physic is set*, a mash should be given once or twice every day until the next dose is taken, between which and the *setting* of the first there should be an interval of a week. The horse should recover from the languor and debility occasioned by the first dose, before he is harrassed by a second.

Eight or ten tolerably copious motions will be perfectly sufficient to answer every good purpose, although the groom or the carter may not be satisfied unless double the quantity are procured. The consequence of too strong purgation will be, that a lowness and weakness will hang about the horse for many days or weeks, and inflammation will often ensue from the over-irritation of the intestinal canal.

Long continued custom has made aloes the almost invariable purgative of the horse, and very properly so; for there is no other at once so sure and safe. The Barbadoes aloes, although sometimes very dear, should be alone used. The dose, with a horse properly prepared, will vary from five to seven drachms. The preposterous doses of nine, ten, or even twelve drachms are, happily for the horse, generally abandoned. Custom has assigned the form of a ball to physic, but good sense will, in due time, introduce the solution of aloes, as acting more speedily, effectually and safely.

The only other purgative on which dependance can be placed is the croton. The farina or meal of the nut is used; but from its acrimony it should be given in the form of ball with linseed meal. The dose varies from a scruple to half a drachm. It acts more speedily than the aloes, without the nausea, which they produce; but it causes more watery stools, and consequently more debility.

Linseed oil is an uncertain but safe purgative, in doses from a pound to a pound and a half. Olive oil is more uncertain but safe; and castor oil, that mild aperient in the human being, is both uncertain and unsafe. Epsom salts are inefficacious, except in immense doses of a pound and a half, and then not always safe.

RAISING DUCKS AND TURKEYS.

In the *Agriculturist* of last year appeared two articles, one on the best mode of raising ducks, and the other on turkeys. Two seasons have since passed away, and the writer of this has been enabled to test the efficacy of those directions; and in every instance that has come under his knowledge, they have been attended with perfect success. The direction for raising ducks, were to feed them on animal food and keep them dry. Individuals who have adopted this plan, have sent to our markets from 500 to 700 ducks of the finest kinds, and they have had no diseases among them, and found no difficulty in raising them.

Two or three individuals who tried the experiment of driving their turkeys when young, to a distance from the house, where the greatest number of insects were to be found, and feeding and housing them in the manner directed in the Agriculturist, have stated, that they have raised from 100 to 300 turkeys, and have pronounced it to be a method, which of all others, they believed to be best calculated to be attended with success.—*Southern Agriculturist.*

THE MEASUREMENT OF HAY IN THE STACK,

For the purpose of ascertaining its weight, is made by multiplying the length, breadth and height into each other; and if it has been allowed to settle in the stack during the winter, ten solid yards of meadow hay, in good condition, will generally weigh about one ton. The number of yards depending, however, partly upon the old or young state in which the grass was cut before it was made into hay, and partly upon the dry or moist condition in which it was stacked, as well as upon the length of time which it has lain—all these circumstances should be minutely examined; for if it is in a very large stack of more than a year old, nine, and in some cases eight yards will make a ton; clover, lying somewhat lighter in the stack, will generally take eleven or twelve yards to make a ton; and sometimes, when it has been staked very dry, thirteen may be required; but the average of the last year's clover may be assumed at twelve yards.*

* Bayldon on Rents and Tillages, 3d edit. p. 159. The mode of calculation is as follows:—Supposing the stack to be ten yards long at the bottom, and eleven at the eaves; four and a half wide at the bottom, and five and a half at the eaves; and presuming it to be four yards in height to the eaves; and to rise three yards to the point of the roof; in order to find the contents, the dimensions are summed up thus—

Medium length .... 10½ yards
Do. breadth .... × 5
52½
Do. height......... .... × 5 including one-third of tho rise of the roof.
10) 262½ = 26¼ tons, or 29 1-6 loads.

If the stack swells out considerably towards the eaves, the height—if taken against the sides—will appear to be greater than it is in reality; it should therefore be measured by a pole set up perpendicularly to the eaves. When it is required to measure an irregularly formed stack, the contents may be found by giving and taking proportionate quantities of the separate parts, or by measuring or computing it in different divisions. If round, a moro complex calculation is necessary, and can hardly bo ascertained with accuracy without having resource to geometry. Mr. Bayldon, however, mentions a simple method, which consists in measuring the circumference at the bottom, and at regular distances up to the eaves, which must be added together, and divided by their joint number for a mean circumference; the sqaare of which must then be multiplied by the decimal .07958, and this product by the height up the eaves, and one-third of the rise of the roof, added together and this divided by 27 (the calcutation being made in fect) will give the product in decimal yards.

Young Men's Department.

Fairfield, Dec. 6th, 1824.

Dear Sir—The following remarks are from the pen of a young lady of a superior education, and thinking perhaps they may be beneficial to the laboring community, I with much reluctance obtained permission to forward them to you. If you think them worth publishing, you can insert them in your truly useful Cultivator.

L.

THE MIND MAKES THE MAN.

Power cannot arrest the mind, or agricultural pursuits fetter the understanding; and in youth these faculties are to be exerted; the talent given us, however trifling, is to be cultivated; and the principles which we carry with us through life are to be established. It is ere the shade of manhood flits across our brow, that we are fitted for the sphere which we are destined to occupy through life, and when the foundation of our future happiness is based.

An idea is prevalent, that those who move in the middle and lower walks of life, should not search deep into the hidden stores of literature; and this has (considering it to be a fatal error on which thousands have wrecked their frail barks,) elicited the following remarks. The impression to which so many adhere, that learning totally disqualifies the laboring part of community for their various avocations in life, has too long wound its serpentine coil around them, and been an almost insurmountable barrier to improvements in the agricultural and mechanical departments. And from the lack of knowledge, these branches of science have suffered, and doubtless will continue to suffer severely; and if this death like legarthy which broods over our land cannot be removed, our country will be an irreparable loser.

In vain do our boasted patriots and philanthropists write, in blazing characters, *equality*, while the majority of the minds of our citizens remain steeped in the corrupted waters of ignorance and vice! True it is, that the greatest share of those who follow agricultural pursuits can read, write, and have a slight knowledge of geography, grammar and arithmetic; but a very limited number can be found who have proceeded far in the science of mathematics, or entered the rich and varied fields of natural philosophy; who have scanned the deep and majestic wonders of chemistry; traversed the classic fields of Greece and Rome, and imbibed the glowing sentiments, the golden and useful thoughts of ancient times. Yet upon these various sciences are based the mighty fabrics of mechanics and agriculture. Little do such imagine, that a building, however simple, is never erected without the rules of measuration, and if they understand not the art themselves, they are dependent upon the knowledge of others. While these are facts, should not the laboring class improve each moment as it wings its rapid flight towards eternity in storing their minds with substantial knowledge, which not only renders them respectable and valuable members of society, but will greatly contribute to their individual happiness through life. If all agriculturists were intimately acquainted with the study of chemistry, we should perceive that branch of labor reduced to a science. But instead of this, not one in a hundred has ever opened a treatise upon the subject, and evencan not name any of the terms.

Again: Natural philosophy is connected with both the mechanic and farming interests. By it, the mechanic is taught the use and form of the pulley, the inclined plane, the steelyards and their power; the pump and other hydraulics. If a person wishes to become perfect in his trade, let him first enter deeply into this science, and he soon will stand at the head of his profession. Long has public opinion held the mechanical and agricultural world in the chains of ignorance. Yet a few daring spirits have overstepped the narrow limits of prejudice, and perfected these sciences as they now appear.

It is required of a man who wishes to become an adept in the study of divinity, law or medicine, to pursue a course of study from seven to ten years. And shall those who are engaged in the most difficult of all professions, viz. that of mechanics and agriculture, scoff at the idea of book learning?

In the land of which we are citizens, all, to a certain extent, are placed on an equality; therefore, setting aside the utility of study, as applicable to the ordinary business of life, it is necessary to exercise it, on some occasions, in a political point of view; for here, every citizen may, by rotation, be called to stand in official stations. The liberties of our country are placed in the hands of such men; and as we are either learned or unlearned, so will our republic stand or fall. Was it knowledge that overthrew the republics of Greece and Rome? Surely not. The temples of the muses were deserted; ignorance, superstition, anarchy and confusion were exhibited in lieu of order, learning and constitutional propriety.

Ignorance is the soil where ambition ever over-shadows the neighboring plants; surmounts all difficulties, and finally stands triumphant amid general ruin and devastation. Shall the disgraceful farce of Cataline's conspiracy ever be reacted on the happy shores of the once peaceful America? Shall the chains of monarchy ever fetter the sons of liberty? Can it be, that the blood of our fathers has flowed in vain, and their sons have become the slaves of ambition; sold their birthright and bartered away their freedom, simply for the want of education? Our soil is well adapted to agriculture, and shall it, for want of tillage, refuse to yield its products, and become one barren waste? If the young men of these United States would read, and practise what they read, our country would speedily become even more productive than at present and then the sun of prosperity and happiness will continue to diffuse its benignant rays over our land, and peace and liberty will endure forever.

The objection is often raised, that the study of the ancient classic authors is altogether useless except to professional men. But this is a mistake. The Georgics of Virgil is the best work now extant on agriculture. One that was composed when agriculture languished in Italy, and consequently peace and happiness had fled from her borders. The general distress was attributed wholly to the administration of Augustus. The friends of this immortal poet deplored this state of affairs, which threatened the overthrow of the country, and requested him to write upon this subject. He readily acquiesced. Retiring from the jarring interests of politics and the intrigues of court, he performed the arduous task. The Georgics appeared in their elegant simplicity, joined with poetic grandeur.

He traces agriculture to its source; describes the implements proper for its use; notices the prognostics of the weather; the best method of managing various soils; of propagating fruit trees and the vine; the various kinds of cattle and bees. It is asserted, that Virgil did more for the prosperity of his country than he would have done, had he obtained the most splendid victories in the field of battle; for the country assumed a new and flourishing appearance, and peace, plenty and domestic happiness reappeared.

If the young men of this country wish to see their fair republic prosper—the wings of the eagle still spread over the land, then let them seize with avidity every means in their power to cultivate their minds as well as their lands: so shall their days be peace and happiness—their decline, like the setting sun in a calm summer's eve, full of glory.

Small rivulets, oozing from the mountain's brow, wend their way, clear and slow, through their contiguous neighborhood, giving life and refreshment to those within their reach, without attracting notice or applause, save from some humble admirer who tastes their sweetness, until they unite with tributary streams; when rolling on, deepening and widening in their progress, they are noted and admired at a distance from their source, like the majestic Mississippi, the father of waters in the western world, moving every obstruction from its way. Thus rivulets of knowledge flow from mercantile houses, mechanics' shops and farmers' dwellings, that not only exert a salutary influence on the surrounding community, but as they pass along, tributary streams flow in from every quarter, widening and deepening the channel already formed, until they constitute the palladium of our liberties, which can only be supported by the general diffusion of knowledge.

Suppose a man devotes two hours per day to study; in one year he reads seven hundred and thirty hours, or sixty days and ten hours, at twelve hours per day. In ten years, six hundred and eight days and four hours. In thirty years, eighteen hundred and twenty-five days, or five years. What vast stores of knowledge might thus be gathered, simply by spending two hours per day in study! Every person spends more time than this in idleness, and why not devote it to literature? Only spend this time in study, and our country will be blest with scientific farmers and mechanics, together with wise energetic statesmen.

E. A. R.

A TABLE, *to show at a glance the number of hills or plants contained in an acre of land, at any given distance from each rther, from* 40 *feet by* 40, *to* 1 *foot by one, omitting fractious.*

feet.	*feet.*	*per acre.*	*feet.*	*feet.*	*per acre.*	*feet.*	*feet.*	*per acre*
40 by	40	27	8 by	7	777	3 9 ..	2 9	4224
39 ..	39	28	— ..	6	905	— ..	2 6	4646
38 ..	38	30	— ..	5	1089	— ..	2 3	5162
37 ..	37	31	— ..	4	1361	— ..	2 0	5808
36 ..	36	33	— ..	3	1815	— ..	1 9	6637
35 ..	35	35	— ..	2	2722	— ..	1 6	7744
34 ..	34	37	— ..	1	5445	— ..	1 3	9272
33 ..	33	40	7 ..	7 0	888	— ..	1 0	11616
32 ..	32	42	— ..	6 6	957	3 6 ..	3 6	3555
31 ..	31	45	— ..	6 0	1037	— ..	3 3	3829
30 ..	30	48	— ..	5 6	1131	— ..	3 0	4148
29 ..	29	51	— ..	5 0	1244	— ..	2 9	4525
28 ..	28	55	— ..	4 6	1382	— ..	2 6	4978
27 ..	27	59	— ..	4 0	1555	— ..	2 3	5531
26 ..	26	64	— ..	3 6	1777	— ..	2 0	6222
25 ..	25	69	— ..	3 0	2074	— ..	1 9	7111
24 ..	24	75	— ..	2 6	2489	— ..	1 6	8297
23 ..	23	82	— ..	2 0	3111	— ..	1 3	9956
22 ..	22	90	— ..	1 6	4148	— ..	1 0	12445
21 ..	21	98	— ..	1 0	6222	3 3 ..	3 3	4124
20 ..	20	108	6 ..	6 0	1210	— ..	3 0	4818
— ..	15	145	— ..	5 6	1320	— ..	2 9	4873
— ..	10	217	— ..	5 0	1452	— ..	2 6	5361
— ..	5	435	— ..	4 6	1613	— ..	2 3	5956
19 ..	19	120	— ..	4 0	1815	— ..	2 0	6701
— ..	15	152	— ..	3 6	2074	— ..	1 9	7658
— ..	10	229	— ..	3 0	2420	— ..	1 6	8935
— ..	5	458	— ..	2 6	2904	— ..	1 3	10722
18 ..	18	134	— ..	2 0	3630	— ..	1 0	13403
— ..	15	161	— ..	1 6	4840	3 0 ..	3 0	4840
— ..	10	242	— ..	1 0	7260	— ..	2 9	5289
— ..	5	484	5 6 ..	5 6	1417	— ..	2 6	5808
17 ..	17	150	— ..	5 0	1584	— ..	2 3	6453
— ..	15	170	— ..	4 6	1760	— ..	2 0	7260
— ..	10	256	— ..	4 0	1980	— ..	1 9	8297
— ..	5	512	— ..	3 6	2272	— ..	1 6	9680
16 ..	16	170	— ..	3 0	2640	— ..	1 3	11616
— ..	15	175	— ..	2 6	3168	— ..	1 0	14520
— ..	10	272	— ..	2 0	3960	2 9 ..	2 9	5760
— ..	5	544	— ..	1 6	5280	— ..	2 6	6336
15 ..	15	193	— ..	1 0	7920	— ..	2 3	7040
— ..	10	290	5 0 ..	5 0	1742	— ..	2 0	7920
— ..	5	580	— ..	4 6	1936	— ..	1 9	9051
14 ..	14	222	— ..	4 0	2178	— ..	1 6	10560
— ..	10	311	— ..	3 6	2489	— ..	1 3	12672
— ..	5	622	— ..	3 0	2904	— ..	1 0	15840
13 ..	13	257	— ..	2 6	3484	2 6 ..	2 6	6969
— ..	10	335	— ..	2 0	4356	— ..	2 3	7740
— ..	5	670	— ..	1 6	5808	— ..	2 0	8712
12 ..	12	302	— ..	1 0	8712	— ..	1 9	9956
— ..	10	363	4 6 ..	4 6	2151	— ..	1 6	11616
— ..	5	720	— ..	4 0	2420	— ..	1 3	13939
11 ..	11	360	— ..	3 6	2765	— ..	1 0	17424
— ..	10	396	— ..	3 0	3226	2 3 ..	2 3	8604
— ..	5	792	— ..	2 6	3872	— ..	2 0	9680
10 ..	10	435	— ..	2 0	4840	— ..	1 9	11062
— ..	9	484	— ..	1 6	6453	— ..	1 6	12906
— ..	8	544	— ..	1 0	9680	— ..	1 3	15488
— ..	7	622	4 0 ..	4 0	2722	— ..	1 0	19360
— ..	6	726	— ..	3 9	2904	2 0 ..	2 0	10890
— ..	5	871	— ..	3 6	3111	— ..	1 9	12445
— ..	4	1089	— ..	3 3	3350	— ..	1 6	14520
— ..	3	1452	— ..	3 0	3630	— ..	1 3	17424
— ..	2	2178	— ..	2 9	3960	— ..	1 0	21780
— ..	1	4356	— ..	2 6	4356	1 9 ..	1 9	14223
9 ..	9	537	— ..	2 3	4840	— ..	1 6	16594
— ..	8	605	— ..	2 0	5445	— ..	1 3	19913
— ..	7	691	— ..	1 9	6222	— ..	1 0	24454
— ..	6	806	— ..	1 6	7260	1 6 ..	1 6	19360
— ..	5	968	— ..	1 3	8712	— ..	1 3	23232
— ..	4	1210	— ..	1 0	10890	— ..	1 0	29040
— ..	3	1613	3 9 ..	3 9	3097	1 3 ..	1 3	27878
— ..	2	2420	— ..	3 6	3318	— ..	1 0	34848
— ..	1	4840	— ..	3 3	3574	1 0 ..	1 0	43560
8 ..	8	680	— ..	3 0	3872			

THE CULTIVATOR—FEB. 1835.

TO IMPROVE THE SOIL AND THE MIND.

WINTERING SHEEP.

In December flocks of sheep require a little of our time and attention; if these are bestowed, with subsequent ordinary care, sheep will commonly pass through the winter with trifling loss and much to our advantage. For want of attention in the commencement of winter I have seen large flocks nearly lost during its course, which might have been saved with a little previous care. But when it did occur, you could not convince their owners that it was their bad management, as they had made up their minds to impute it solely to their *bad luck*. It is always the best policy for the farmer to have his sheep in good condition when they begin the winter, and then they are sure to go well through it. If however they are permitted to enter it poor and light—good provender and a regular supply of it, which is the best that can then be done, although it may save the lives of some, will not carry them prosperously through it. The foundation of our loss of sheep in winter is laid during the season of pasturing, for the experience of every farmer will teach him that only give them enough to eat during the summer, the natural effect will be that they will put on flesh; and a sheep in good condition is easily and safely wintered, whilst it is a most difficult job to carry a poor sheep safe through the winter. It is wrong to permit them to ramble over the fields later than about the first of December, because at that time there is little nutriment in the scanty herbage on which they feed, and the blade of grass had better remain on the stem to protect it during the frosts and winds of winter, and prepare it for an early and vigorous growth in the spring; besides, as the supply to the animal is small, and innutritious, there is great danger that there will be a falling off in its flesh, which it can illy spare, and which to its subsequent existence it is so necessary it should now retain. I have frequently thought that an open December, which is often wished for by the farmer to save his winter supply of hay, is more prejudicial to his sheep, when they ramble over the fields, and to his own interest, than he is generally aware of. It would certainly comport more with real economy, if he were to bring up his sheep by the 10th or at farthest the 15th of this month, into winter quarters, even if the weather should remain warm and the ground uncovered; for if they lose flesh at this time, they cannot regain it until spring, and the mortality which sometimes costs almost entire flocks is imputable in a measure to this cause.

Sheep in winter should have sheds; the preservation of their health requires this indulgence, and nature prompts to it. Let me ask, if they have the choice, do they remain in the open air in a storm? No, they as instinctively run to their covering as a man does to his house, and if they do not require it quite as much, they appear quite as well for the shelter. For a flock of poor sheep a protection from the weather is all important. Those in good condition do not as much want it, as they have a better coat both of flesh and wool; but for them it is likewise useful, and a good farmer will not omit to give all the requisite shelter. In those countries in Europe which grow large quantities of the finest wool, they find it indispensable to the attainment of their object, that is fine wool, that their sheep are sheltered from storms both summer and winter, and they have made their arrangements accordingly, for they herd them every night and narrowly watch the indications of the weather during the day. They say that rain and snow give a hardness and coarseness to the wool which they can obviate by a sufficiency of shelter. But to our subject; as soon as sheep are brought in to the yard for winter, the different kinds of lambs, ewes, and wethers should be carefully separated and kept apart. It is important that those in one yard should be as nearly of a size as practicable; for by being so, there are no strong ones among them, to drive the weaker from their provender. All will then feed alike and do well. The flocks ought likewise to be as small as we can conveniently make them. It is an invariable rule that a small flock does much better than a large one, even if both, according to their number, are fed equally well. If the flocks in each yard can be reduced to between fifty and one hundred, so much the better; and it is a great desideratum to make them as few as fifty if it can in any way be effected. It is also necessary to have a separate yard for old and poor sheep, and if there are any in the flock that do not subsequently do well they should be removed into what is commonly called the hospital. These hospital sheep, by being few in number, having a good warm shed, a sheaf of oats, or a few screenings from under the fanning mill, once a day, will soon begin to improve. I have had my hospital sheep in a better condition with this care by spring than any other flock, and I must say that for the last three seasons, my sheep were in better condition when I turned them out of my yards in the spring, than when I put them there in the beginning of winter. Sheep ought to be rather sparingly than sumptuously fed, three times a day, and out of racks, to prevent them from running over and trampling on the hay. As soon as one is seen in any of the flocks to become thin, it ought to be removed at once into the hospital where it will be better fed. If you neglect to do this it will soon be too late, and you will suffer loss; for a sheep once reduced to a certain point cannot be recovered. It is of service to give them a feeding of straw, or pine tops, if you please; for it invigorates their health and makes a change in their food. They ought all to be daily watered, and if your hay has not been salted, to have a lick of salt accasionally. The opinion that sheep do not want water is erroneous; repeated observation has convinced me that it is almost as indispensable to their welfare as their food, and the sooner farmers get rid of this notion the better for both their interests and understanding. I have tried the experiment of keeping sheep without water in conformity with this improper custom so often and thoroughly, that I have come to the conclusion that the only safe rule is the opposite one. I could repeat the several occasions when I have acted upon this plan for my own information, were it necessary, but I only add that the result in my hands was invariable, that is, my sheep grew thin, as it was, that they immediately improved when I adopted an opposite practice. With this care you will save all your sheep; or not lose more of them than you would of the same number of horses and cattle. They will have no disease among them. I have often thought of an observation, made to me by an experienced wool-grower from whom I once asked for information of the diseases of sheep; he answered, "What have you to do with the diseases of sheep? take care of them and you will have no need for remedies." This observation struck me as strange at the time, but subsequent experience has amply confirmed it. And now, what will the farmer gain by keeping his sheep well? In the first place, he will save his hay, a fat sheep will not eat so much as a poor one; he will save all his grain—sheep in good condition do not require any. In the next place, he will save all his sheep—he will have more and better lambs in the spring, besides several ounces more of wool to each sheep; and what is better than all the rest, he will in the end save himself loss and anxiety. The saving will at least be from one-eighth to one-fourth of the value of his flock, and all this attending to a necessary work in due season. A.

UNFERMENTED MANURES.

We are decidedly in favor of applying manures, in farm culture, in an unfermented, or partially fermented state whenever it can be conveniently done, for the reason, that the manure of the farm yard, when thus applied, goes twice as far in enriching the soil, as it will if not applied till after it has become completely rotted. The gases which rise from the fermenting mass, and which are dissipated by the winds,—and the liquids which flow from the dung, are as much the food of plants, as the black carbonaceous matter which remains after fermentation. Besides, the very process of fermentation, after the manure is buried in the field, imparts a genial warmth to the soil, and renders it porous and more permeable to the salutary influence of the sun and atmosphere. But there is one important point which should by no means be lost sight of:—*long manure should never be applied directly to the small grains, or crops which are cultivated exclusively for their seeds,—but to hoed crops, and such as are cultivated more particularly on account of their stems, stalks or roots.* The matters first given off in fermentation seem particularly adapted to cause a rank growth of stalk, which is rather inauspicious to a great product of perfect seed. The cow that takes on flesh rapidly cannot at the same time be a good milker, because the food which she takes cannot be converted both into flesh and into milk. The luxuriant growing fruit tree, with straight upright branches, will not give a heavy burden of fruit—because the food required to nourish and mature the fruit, is converted into wood; and hence artificial means are adopted to check the growth of wood, by transplanting, training the limbs horizontally, ring-barking, grafting on dwarf stocks, &c. to induce early bearing, or an increase of fruit. So with farm crops, cultivated for their seeds—a too luxuriant growth of stock lessens the quantity, and depreciates the quality of the seed. The gases which escape from fermenting manure, in the soil, are prepared food, are imbibed immediately by the mouths of plants, and cause a rapid growth. On the other hand, as a general rule, the cow does not take on much fat while she yields a great supply of milk,—the fruit trees does not make much wood while it is sustaining a heavy burthen of fruit, nor do the small grains that mature a heavy crop of seed, generally show a rank luxuriant growth of straw. The decomposition of rotten dung (for even this must undergo decomposition ere it becomes food for plants) is more slow,—little or no heat is evolved, and the process of nutrition goes on in its natural course, without artificial stimulus, which unfermented manures may be considered as imparting.

It may be alleged, that corn, if not potatoes and turnips, affords an exception to the proposition we have laid down, inasmuch as it is cultivated for its seed, and is not injured by long manure. A moment's consideration will show a marked difference between this and the small grains. The latter mature their seeds during the intense heats of the summer, when the fermentation of vegetable matter in the soil is most rapid, and when long manure is most prejudicial in its influence upon the seed. A surfeit of food, at this time, by inducing rank growth, often causes a disrupture of the sap vessels, and destroys the organization of the plant. Not so with the voracious maize: This season of heat and fermentation is precisely the time when its appetite craves an abundance of gaseous food, to mature its stocks and leaves; and before the grain is formed, fermentation has nearly subsided, and the soil then imparts only the food which is congenial to the perfection of the seed. Thus the stock and the seed are supplied with their appropriate food at the precise time when each stands most in need of it. The same remarks will apply in a great measure to the potato and the turnip—their roots are produced after fermentation has exhausted its force upon the manure. Perhaps, indeed, the rule may be narrowed down to this —*that long manure be exclusively applied to crops which come to maturity in autumn*,—and that for all crops which ripen their seeds about midsummer, fermented manure is most suitable, or long manure applied to a previous and hoed crop.

Our own practice has afforded striking evidence of the superior value of long manure to the corn crop. In the winter of 1823, we had a quantity of stable dung taken on to a field designed for corn, and before planting, it had undergone a pretty thorough fermentation. It was applied to one part of the field. On to an adjoining part we carried a good supply of long dung from the cattle yard, principally corn stalks, straw and the droppings of the stock. It had been trodden under foot, and had apparently undergone no fermentation—we were obliged to cut it with an axe in order to load it. The dressing of the long manure was about equal to that which had rotted when taken into the field. Both were planted with corn, and treated alike. The part dressed with rotted dung had a manifest advantage in the early part of the season, and until the long dung began to ferment, when this part of the field gained rapidly, and at harvesting had a manifest advantage. An acre was gathered in an afternoon, husked, weighed and measured, by about twenty persons. It was a general opinion that the long manure gave from a fourth to a fifth more produce than the short dung. The product in shelled corn was over one hundred and eighteen bushels. The shrinkage to the first of May following was nearly twenty per cent, or one-fifth.

AMERICAN SILK.

We have received a sample of exquisitely beautiful silk, produced on the farm of E. Goodrich, Esq. of Hartford, Conn. which we design to exhibit at the anniversary of the State Agricultural Society. The sample was reeled on the Italian reel. It is worth from five to six dollars per pound. A young girl, after, one day's practice, can reel a pound per day.

Mr. Goodrich, we believe, has planted out more mulberry trees than any other person in the United States; and while we tender to him our thanks for the beautiful specimen of silk which he has sent us, we cannot be unmindful of his ability, nor can we doubt his willingness, to lay us and the public under still greater obligations, by communicating, for the Cultivator, some results of his experience and observation in the silk business. Under these impressions, we respectfully solicit from Mr. G. in behalf of the public as well as of ourselves, answers to the following queries, and such other information upon this interesting subject, as he may please to communicate.

1. Can the silk business be profitably managed by the generality of farmers—or by any particular and what class of them?
2. What is the nature of the bounty offered by the state of Connecticut for the cultivation of silk, and its probable advantages or disadvantages?
3. Does there promise to be a ready and permanent market for cocoons—and can the reeling process be managed with economy and profit by the cultivator?

CHENOPODIUM QUINOA—AND THE POTATO.

The first is the botanical name of a Mexican plant, the culture of which is now arresting the public attention in England. Humboldt says, that this plant, in Mexico, ranks in utility with the potato, the maize and the wheat. The leaves are used as spinach, or sorrel, or as greens; and the seeds in soups and broths, or as rice. The plant is an annual, and resembles French spinach. The seeds are small, yellowish white, and resemble somewhat those of millet. In 1834 seeds ripened in abundance in England for the first time, and as a field plant, it is considered a great acquisition. It is believed it may be cultivated as common as barley, and on any ground which will produce that grain. The Quinoa will no doubt ripen its seeds in the United States, even in our latitude, better than in England, and our consular agents, naval officers, or commercial men, might render a public service by introducing it among us.

When we consider the comparative recent introduction of the potato (*Solanum tuberosa*) among many civilized nations, the prejudices which in many nations for a long time retarded its introduction, and the large space it now occupies in domestic economy, as food for man and beast, in almost every part of the civilized world, these considerations should induce us to give a fair trial to every foreign plant which promises to be useful in our husbandry. The first field culture of the potato in Scotland was in 1739, less than a century ago. They were left in the same spot of ground from year to year; a few tubers were perhaps used in autumn, and the parent plants well covered with litter, to save them from the winter's frost. The progress of the culture was afterwards greatly retarded, by the fact, that "potatoes are not mentioned in the bible," which was deemed a sufficient reason for rejecting them. Ignorance of the proper mode of cooking them, (an evil which has not wholly ceased at this day) also retarded their culture. "A person who had been invited to taste the first potato in the county of Forfair, about 1730, related that the roots had been merely heated, and that they adhered to the teeth like glue, while their flavor was far from agreeable. The food was about to be condemned through the ignorance of the cook, when the accidental arrival of a gentleman, who had tasted a potato in Lancashire, caused the rejected roots to be remanded back to the hot turf ashes, till they became as dainty as they had before been nauseous." "It is only within these forty years that any particular attention has been paid in France to the cultivation of potatoes. They were long regarded as an unwholesome plant, and only fit to be eaten by cattle and the most wretched human beings." It required all the efforts of royal authority, supported by royal example, to eradicate the popular prejudice against them. Now so diversified is the manner of cooking the potato in France, that a gentlemen is said to have dined a party of friends, sumptuously, entirely upon potatoes, cooked in thirty-two various modes. "The composition of the potato root is very similar to that of the seeds of the maize and wheat; though, from the dissimilarity in taste and external appearance, this would not be at first suspected; and hence arises the corresponding fitness of all three for food. The principal difference between wheat and potatoes consists in the presence of a substance called *gluten* in wheat."

The detection of this similarity between grain and potatoes, by chemical analysis, led to the experiment of extracting *sugar* from the potato. As we have been inquired of, as to the process of extracting sugar from the potato, we subjoin the particulars, as we find them in the Edinburgh Quarterly Journal of Agriculture—the discovery and the experiments having been first made, we believe in the state of New-York.

The potatoes are first ground or grated in a mill, similar or the same, as we denominate the grater cider mill, by which they are reduced, with surprising rapidity, to a fine pulp, and from which, by the aid of a sieve and water, the starch, in great purity, is readily obtained. The starch thus obtained, is then dissolved completely in water, heated by steam let into it. A certain quantity of sulphuric acid, or vitriol, is then mixed with it, and heat being applied, the whole of the starch is converted into syrup. This is to be purified from the acid by adding quick lime, with which the acid unites, and then evaporating the liquid. The sugar remains after evaporation, and is used for all domestic purposes. Its taste is that of delicious sweet, and as an article of diet is probably more healthful, and less oppressive to the stomach, than any other sweet substance in use. It is particularly useful in making sweatmeats, and may be used at table as honey. A bushel, or sixty pounds of potatoes, will give eight pounds starch, and eight or seven and a half pounds sugar. The article, which we here abridge, seems to have been copied from Silliman's Journal, which may contain a more detailed account of the process.

There are various other uses to which this valuable root is now converted, that our ancestors never dreamt of. From the potato may now be procured bread, starch, jelly, sugar, treacle, beer, brandy, cheese, butter, coffee, tapioca, dye-stuffs, size, cleansing liquids, and medicine.

The Russians, (and we have seen a notice of the same having been done in Ohio) obtain from it *treacle* or molasses. The Swedes and English obtain from it brandy by distillation. Dr. Anderson obtained a gallon of *spirits* from seventy-two pounds, of a mild agreeable flavor. The Saxons make from it a kind of *cheese*, which retains its freshness for years if kept in a close vessel. It is prepared by boiling the potatoes, and reducing them, when cold, to a pulp, rejecting the skins; sour milk is added, or else sweet curd, with the whey pressed out, in the proportion of a pint to five pounds of pulp. It is kneaded several times, drained in small baskets, and simply dried in the shade. A French chemist has converted the potato into a substance resembling, and he says superior to, *coffee*. He mixes some best olive oil with a certain portion of dried potato-flour, and then adds a small portion of coffee powder. The Germans incorporate it, after being steamed and reduced to a paste, with the *butter* to be spread over bread. Chemical ingenuity has likewise converted it into substitutes for *arrow-root, chocolate, tapioca*, and *vermicelli*. The Danes have discovered in the flowers the material for a beautiful yellow dye, solid and durable, which by being afterwards plunged into a blue dye, becomes a perfect green. The potato is always used with excellent effect in steam boilers, for preventing the gathering of a calcareous incrustation on their bottoms. The liquor drawn off in the process of making potato starch, will clean silks, woollens or cottons, without damage to the texture or colour. The French administer it, roasted, and with success, medicinally, to their sailors, as a preventative of, and even cure for, the scurvy.—*See Quarterly Jour. of Ag.*

AGRICULTURAL INSTRUCTION IN PRIMARY SCHOOLS.

The agriculture of Bavaria is said to have improved more rapidly, in the last half century, than that of any other country, Scotland, perhaps, excepted. Before the French revolution it was behind that of the other German States. The lands then mostly belonged to the religious establishments. The cultivators merely lived; they did not thrive. When these lands were sold, they were made into small parcels, and almost every man became the proprietor of the portion he cultivated, upon a long credit. The great impulse to improvement was given to the young generation, in the primary schools. In these were taught, both by books and examples, AGRICULTURE and GARDENING. For this purpose, catechisms of gardening, of agriculture, of domestic economy, of forest culture, of orchard culture, &c. in small 12mo. volumes, with wood-cuts, were introduced as class books for boys, and the like on the management of silk worms, household economy and cookery, for the gnls; and there was attached to every district school at least half an acre of land, for experimental gardening, where the scholars received recreation and instruction, in the hours of exemption from study, from the master, in the practice of gardening. And it was made an indispensable qualification in teachers, to be competent to give this instruction. "Since these schools have come into action," says a late traveller, "an entirely new generation of cultivators has arisen, and the consequence is, that agriculture in Bavaria is carried to a higher degree of perfection than it is any where else in the central states of Germany." "The result of the whole of the information procured, and of the observations made, is, that we think the inhabitants of Bavaria promise soon to be, if they are not already, the happiest people in Germany. The climate of the country will prevent its agriculture and gardening from advancing beyond a certain point, but to that point both will very soon be carried."

The salutary influence of agricultural and horticultural instruction, in common schools, has not been confined, in Bavaria, to the improvement of the soil. As consequences which naturally follow the improvement of agriculture, the roads, bridges and other public works have undergone a corresponding improvement; individual comforts have been greatly multiplied, business of every kind has been improved, and human intellect, reanimated as it were, by the magic pen of a Hazzi, has burst its cerements, and become an efficient aid in the noble work of improvement. The public roads are all lined with ornamental fruit-bearing or forest trees—and furnished with guide-boards, mile-stones, and seats, at intervals, of stones or sods, for the weary traveller. This novel sort of education, and the blessings which have flown from it, and the still greater blessings which appear in prospect, have resulted from the wise provisions of the government, aided, and efficiently aided, by the active and patriotic philanthropy, of M. Hazzi, the editor of an agricultural journal at Munich, and author of the school catechisms of which we have spoken.

Nineteen out of every twenty of the children of our common schools, would be benefitted, while the twentieth would not be injured, by the elementary studies which have proved so beneficial to Bavaria. "*As the twig is bent so is the tree inclined.*" Early impressions have an influence through life; and it is all important that these early impressions should be of the right kind—such as are best calculated to advance the interests of the individual, and the good of the public. What can conduce more to these desirable ends than to instruct our youth in the elementary knowledge of the business which they are to follow through life, and upon their success in which must materially depend their respectability, their happiness and their worth to society. Husbandry is a business in which there is always something to learn, even in the longest term of life. The sooner the study is began, the more proficiency will be made; and the more one becomes acquainted with its varied sources of true enjoyment, the stronger is his attachment to its pursuits.

Hoven in Cattle.—We find in Lawrence, a high authority, the following prescriptions for this disease, which we copy on account of the safety and facility with which they may be tried, believing, without however knowing, that they may prove efficacious. The first is—an ounce of gun powder given to the beast in a pint of milk, or a less quantity of gin. The second—give an egg-shell full of tar.

Rhubarb.—This is one of the many plants which a farmer may have in his garden, and which may be made to contribute to the delicacies of his table, and to the health and comfort of his family, with very little expense or labor. The plant is perennial, and resembles much in its habits the burdock, though the leaves and their stalks may be somewhat larger, in a good soil. A dozen plants will serve to supply a family. The leaf stocks are the parts used. The skin or cuticle is pealed off—they are then cut into quarter or half inch pieces, and used without further preparation, with sugar and spices. like unripe gooseberries, for pies and tarts, which fruit it very much resembles in flavor. It may be used in the spring, and till midsummer. Medical men ascribe to it a salutary influence upon health, particularly to children, when used in this way. The seed ripens about midsummer, at which time it may be sown.

Dried Fruits.—The general failure of fruit throughout the country in the last year, induced us, as it did many others, to substitute, for family use, dried fruits of the preceding year. From the quantity we found in the hands of a single retailer, we were led to form a new estimate of this proffered source of gain to the farmer. The gentlemen upon whom we called had about 600 bushels of dried apples, 500 bushels of peaches, and a large quantity of dried damson plums. The prices were $2.50 for the apples, $4 for the peaches, and $8 for the plums, (freed from the pits,) and these prices, we understand, subsequently advanced. He informed us that they mostly all came from Ohio. Here there was some five or six thousand dollars saved by the prudent industry, we presume, of our fair country women. We state these facts for the benefit of those who have been accustomed to overlook this source of farm profits. Dried fruits will always be in demand, not only for our cities and towns, but for exportation.

To make Currant Jelly.—Take the juice of red currants one lb. sugar 6 oz. Boil down.——*Strawberry Jelly.*—Take of the juice of strawberries 4 lbs. sugar 2 lbs. Boil down.

MAXIMS.

The passions act as winds to propel our vessel—our reason is the pilot that steers her;—without the winds she would not move;—without the pilot she would be lost.

I should prefer being indisposed, to being idle.—*Seneca*. The evil of a slight fit of sickness is transient, while the bad effects of idleness are permanent, and lead to vicious habits.

The most sure method to be deceived, is to consider yourself more cunning than others.—*Rochefaucault*.

Moderate things last long.—*Seneca*. All the blessings of Providence, all the possessions of this world, may be exhausted by excess, or turned into evils by misapplication or abuse.

Good fortune and bad are equally necessary to man, to fit him to meet the contingencies of life.—*French*. Few men, who have not experienced the vicissitudes of fortune, know how to bear them with firmness—are fit to meet them.

CORRESPONDENCE.

DON PEDRO.

Mr. Buel,—I now redeem my pledge, in the last number of the Cultivator, of giving a representation and history of "Don Pedro." The cut* was executed by Mr. Hall, a young artist of great promise, now a resident of this city. It is copied from a copper-plate engraving by Murry, and published in the "*Archives of Useful Knowledge*," at Philadelphia, in 1810, from which the following history is extracted.

Several gentlemen have promised to have correct drawings made of superior cattle, sheep and swine now in their possession, which the editors have proposed to have engraved on wood, (of which the above is a specimen,) and published in the next volume of the Cultivator, with an account of their usefulness and superior qualities, &c. &c. AMATEUR.

Don Pedro was imported into the United States, in the year 1801 and is believed to be the first full-blooded Merino ram introduced into North America.

Mr. Dupont de Nemours, then in France, had persuaded Mr. Delessert, a banker of Paris, to send to this country some of those valuable sheep, and he having been at the head of a commission appointed by the French government to select in Spain, 4,000 Merino sheep out of the number of 6,000, which, by the treaty of Basle, the Spanish government had stipulated to present to France; it is natural to suppose that those which he selected for his own flock, were among the best. Four fine young ram lambs were accordingly shipped, two were intended for Mr. Delessert's farm, called Rosendale, situated near Kingston, on the Hudson river; one was intended for Mr. Dupont de Nemours, who was at that time settled in the vicinity of New-York, and the other was to be presented to Mr. Thomas Jefferson. Mr. Dupont embarked in the ship Benjamin Franklin, on board of which ship the four lambs were shipped, and was unfortunately detained upwards of twenty days in England; his subsequent passage to the United States was long and boisterous, in consequence of which three of the sheep died, and it was with the greatest difficulty that Mr. Dupont preserved the fourth. The ship arrived at Philadelphia on the 16th of July, 1801.

In 1801, Pedro tupped nine ewes at Mr. Dupont's place near New-York; he was then sent to Mr. Delessert's farm, and served a large flock during the years 1802, 3 and 4. In the course of 1805, Mr. Delessert having determined to rent his farm, and to sell all his stock, the progeny of Pedro were sold at public sale, at reduced prices, to the neighboring farmers, who had no idea of the treasure which was offered to them; being unacquainted with that breed of sheep, they neglected those valuable animals, great numbers of which have perished in their hands, or were sold to butchers; the rest would probably have shared the same fate, had not Chancellor Livingston become acquainted with the existence of those sheep, and purchased at advanced prices some of the ewes, which he put to his fine Merino rams of the Rambouillet stock. Pedro, like the rest of the flock of the Rosendale farm, was sold at vendue, and Mr. Dupont's agent bought him for sixty dollars.

In July, 1805, Pedro was removed to E. I. Dupont's farm situated in the state of Delaware, near the borough of Wilmington. That gentleman had a very small flock at that time, but was anxious to see that valuable breed propagated in the country, and with a view to attain that end, he offered the farmers of his neighborhood the use of his ram, gratis; they could not be prevailed upon to think much of what was offered to them free of cost; the consequence was, that very few ewes were sent to Pedro during three seasons, and only by way of experiment.

In 1808, however, Mr. Dupont, with a view of increasing his own flock, purchased from the farmers, his neighbors, as many half or three-quarter blooded ewes of Pedro's breed as he was able to collect, which measure raised his character among the farmers. Since that time, Pedro has served every year, from sixty to eighty ewes; the vicinity of Wilmington will therefore be supplied with a large stock of fine woolled sheep, and as Mr. Dupont & Co. are erecting works for the purpose, cloth of any fineness may be made.

Pedro is now (1810,) ten years old, but very strong and active: he is stout, short and woolly, and of much better form than Merinos commonly are; and even better than that of a ram figured in a superb engraving lately received by the Agricultural Society of Philadelphia from Paris. His horns are large and spiral; his legs short, and he weighs 138 pounds; his fleece carefully washed in cold water, weighs eight and a half pounds, is extremely fine; the staple one and three-fourth inches long, and lying very thick and close upon his body; it is entirely free from loose coarse hairs called jarr. Every part of his fleece, moreover, is nearly of equal fineness; even the wool of the hind legs and thighs, which is long and coarse upon many Merino sheep, is short and fine upon Pedro. This point, which in the case of wool so valuable as that of Merino sheep is of great consequence, will be transmitted to his progeny, and proves the value of stock derived from him.

Owego, Tioga co. Dec. 29, 1834.

J. Buel, Esq.—Dear Sir—Will you please give to the public, through your valuable agricultural paper, (the Cultivator) the following recipe for the cure of that formidable disease of the horse, called

THE POLL EVIL.

As soon as the tumor appears, make a strong decoction of the root of the meadow plant or vine, known by the name of *poison ivy*, and sometimes by that of mercury; bathe the tumor with this decoction every day, as hot as the horse will bear it; and heat it in with a hot iron. In a short time it will begin to diminish, and in six weeks it will wholly subside. A very valuable horse of mine was attacked with this disease last summer, and two months, after we first discovered it, were consumed in experiments of various kinds, when I became discouraged, and gave up the horse as lost. The tumor became appalling, so much so, that the best of our farriers declined to undertake a cure, and advised me to sell my horse for the best price that I could get; when shortly afterward, I accidentally heard of the above remedy, I tried it, and with complete success. No trace of the disease remains, although when I commenced the application, the horse was so bad that he could not drop his head low enough to drink, unless he was driven into deep water. I have no doubt the remedy is a specific, if applied in time. How long, before the tumor breaks, the application, to be successful, must be made, I am not able to say—but the tumor on my horse must have been three months advancing, before we commenced our application:

As I am ignorant of veterinary nosology, I hope you will give the technical name of the disease, and for the same reason, I hope you will give the botanical name of the plant which effected the cure.*

I have the honor to be, your obedient servant,
IRA CLIZBE.

A NEW MATERIAL FOR MAKING PORK.

We have long known that apples would fatten hogs, but until we received the following communication, it had never entered our mind, that *apple pomace* could be successfully employed for this purpose. The statement of our correspondent would have been more satisfactory, if the weight and value of the hogs, in the spring, or previous to their having been put up to fatten, had been stated. There is little doubt, however, that the apple pomace contributed essentially to augment the quantity of pork, and the more so in consequence of the cooking process, and so far as it did so, was manifestly a clear gain.

"While addressing you, permit me to give you an account of my experiment on hogs this season. On the 15th October last, I shut

* Since the first edition of the Cultivator was printed, the cut above referred to has been lost or destroyed.

* The technical name of the disease is *Poll Evil*—the botanical name of the plant *Rhus toxicodendron*, var. *radicans*.

up to fatten eleven hogs, about fifteen months old, and six shoats which were pigged the 15th May last, having given to the whole nothing during the summer but the wash from the dairy, with a small orchard of about an acre and a half of ground, where they ate the premature apples that fell. I proceeded to fatten them by steaming six bushels of small refuse potatoes with fourteen bushels of apple pomace, and one hundred weight of buckwheat canal [bran], the whole incorporated well together while hot from the steamer with a wooden pounder, adding to the mixture the dairy wash, and supplying them with a plenty of charcoal and pure water. They were divided into three lots, and closely confined. I continued to give them this mixture until nine days before they were killed, during which latter period they were fed with corn. They were slaughtered on the first of December. The expense of fattening, and the product, in pork, pigs, &c. are as follows:

30 bushels small potatoes, at 2s. 6d.	$9 37½
8 cwt. buckwcat canal, 8s. per cwt.	8 00
21½ bushels corn given the last nine days,	13 43
Apple pomace, say	00 00
Total expense of food,	$30 80½
Cr. By 36 cwt. 50 lbs. pork, at $5,	$182 50
50 roasting pigs sold during summer,	50 00
6 shoats sold alive,	12 00
4 do. on hand, worth,	6 00
	250 50
Deduct expense,	30 80
Balance,	$219 70

Respectfully, THOS. MIDFORD.

Ball Farm, Hyde-Park, Jan. 1, 1835.

Nile Mile Prairie, Perry co. Illinois, Dec. 14, 1834.

Amongst the means of improving not only agriculture but the condition of society at large, I would beg leave to suggest the importance of placing common schools upon the manual labor system. Land is not yet so dear in almost any part of the United States, but that a small experimental farm might be attached to the common schools; and certainly there must be a superiority n a system of education, in which the books of children should treat on subjects tangible to the senses; subjects by which they should be continually surrounded, and circumstances of every day occurrence, over the common system, which too frequently places in their hands books which neither child nor teacher can understand. Any one who has attended to the nature of the infant mind, well knows that books which treat on the domestic animals, insects, flowers, and the various articles used either as food or clothing for the human race, and the different processes which they undergo in order to render them fit for our use, interest children above all others. Shall not children, whilst they eat fruit, learn both theoretically and practically, the proper mode of cultivating it? or is it irrational, to teach them how to raise grain and manufacture it into bread? or why should they be left ignorant of the management of the cow, or of the nature of milk, butter and cheese? What can produce greater delight to the infant mind, than the discovery of the various changes of the silkworm?—changes which belong nearly to the whole tribe of insects, but which changes are unknown to a large majority of our agriculturists. If we consider not only the superiority of a such a system of education, in rendering the rising generation rational, but likewise the profit which attends the employment of the children in healthy occupations, certainly it ought to be sufficient to induce every lover of his country to endeavor to effect so desirable a change.

J. BRAYSHAW.

J. Buel, Esq.—Sir—In the September number of the Cultivator, under the head of "*Improved cheese shelves,*" I noticed the description of Mr. Blurton's machine for turning cheese, and resolved to test the utility of his plan by actual experiment, and accordingly constructed a machine upon that principle, but instead of twelve we used but seven shelves of sufficient length to accommodate three cheeses each, and framed into the heads of the frame at a proper distance from each other to admit the hand between the cheese and the shelf next above it, for the purpose of rubbing them, (say three inches more than the thickness of the cheeses.) This frame when filled, holds eighteen cheeses, weighing from 100 to 170 pounds each, and being placed on the shelves so that they will as nearly balance each other as possible. The whole are turned by one man in as little time, and with less exertion than is required to turn one cheese of the former size, in the usual method of taking them off the shelves to turn them. We found it necessary for large soft cheeses to have semi-circular bearers made to fit about one-sixth part of the circumference of the cheese, which are singly laid in and allowed to remain between the cheeses and the "bars" that support them while turning, which effectually prevents them from flattening or breaking on the side exposed to the pressure, while in the act of turning. We have used this machine since the middle of last September, and it succeeds to our entire satisfaction, and have since made more on the same plan. It is our opinion, (although we have not had opportunity to test its utility in the heat of summer,) that upon this plan, cheeses of any size, however soft, may be turned at any season of the year, with as little injury as in any manner with which we are acquainted. The principal advantages which attend the use of this machine are, a great abridgment of labor in turning cheese, which in large dairies, as now practised, is very considerable and fatiguing; also that of having every day, dry shelves to turn the cheeses upon, as the sides of the shelves on which the cheeses drop, have in the former position of the frame, been above the cheeses, and exposed to a current of air for twenty-four hours previous, which in a great measure prevents mould, and the necessity of rubbing the cheeses; and a room filled with these machines will hold much more cheese than it will on shelves at the sides, or on counters. As the expense of a single machine, or frame, is trifling, I would recommend the trial of them to dairymen who are disposed to try experiments.

Yours, respectfully,
EPHRAIM PERKINS, Jr.

South Trenton, December 22d, 1834.

P. S. For further descriptions, see number seven of the Cultivator.

Elements of Practical Agriculture,

By David Low, Professor of Agriculture, &c.

MEANS OF INCREASING THE PRODUCTIVE POWERS OF SOILS.

The means at our command of increasing the productive powers of soils may be comprehended under the following general heads:—

1. Supplying to the soil those organic and earthy substances which may be required.
2. Altering its texture, depth and properties, by tillage and other means.
3. Changing its relation with respect to moisture.
4. Changing its relation with respect to temperature.

Vegetable and animal matters, in a decomposing state, appear to act in various ways, in increasing the productive powers of the soil. They improve its texture, and they may be supposed to increase its power to absorb and retain moisture; but above all, they supply that matter, which, in whatever form conveyed to the organs of plants, tends to nourish them. This matter being absorbed by the roots of plants, it must be supplied when exhausted.

Experience has in every age accordingly taught the husbandman to supply those substances to the soil; and the doing so forms one of the most important means at his command of maintaining or increasing its fertility.

Besides the animal and vegetable matter which is mixed or combined with the mineral part of the soil, and is essential to its productiveness, the mineral parts themselves, it has been seen, require to be mixed together in certain proportions, and in certain states of division, in order to produce the greatest degree of fertility.

Silica and alumina form the principal mineral part of the soil. If one or the other of these earths be in excess, the soil is defective in its composition. If the alumina prevails the soil is too adhesive; if the silica prevails, it is too loose. A medium is seen to be the best; and although the precise proportion in which the alumina and silica should exist have not been determined, it is safer that there be a tendency to an excess of alumina than silica.

Further, the fertility of the soil depends on the state of division, chemical or mechanical, of these minerals.

It would appear, then, to be a means of improving the composition of a soil, to add to its silicious matter when it is found to be too stiff, and aluminous matter when it is found to be too loose; and further, to reduce the substances to their greatest degree of mechanical or chemical division.

Sometimes, accordingly, we have the means of improving the constitution of soils, by mixing sand with clay, or clay with sand.—But, in practice, the direct mixing of these two substances, for the purpose of producing a soil of better texture, is rare; *First*, because the expense of this species of improvement is considerable; and, *Second*, because in the state in which sand and clay are usually available for this purpose, it seldom happens that the aluminous matter of the one, or the silicious matter of the other, is in that state of minute division which is favorable to fertility.

It is otherwise with earth lime. This can, in all cases, be reduced by heat to that state of minute division which is favorable to the productiveness of soils; and hence can always be applied with benefit to those soils in which it is wanting.

Lime is sometimes mixed, in its natural state, with aluminous and silicious matter. It then forms a marl, a substance which is frequently applied to soils as a means of improving them; it is chiefly to the lighter soils that lime is applied; for then, is not only lime applied, but alumina, to improve the texture of the soil. It is by means of this mixture that some of the greatest improvements on silicious sands that have taken place in Europe, have been effected.

There are cases in which even calcareous matter is in excess in soils. This occurs especially in districts where the chalk formation exists. When the earthy stratum resting upon chalk is very thin, the chalky matter becomes mixed with it, and being then in excess, forms a barren soil.

An obvious means of amending the composition of a soil of this kind, is by adding any of the other earths, whether silicious or aluminous. We need not here scruple to apply them because the clay is coarse or the sand silicious. We may add them in almost any form in which they can be conveniently procured; for the effect will be to improve the composition of the soil.

There is another case in which, in like manner, silicious and aluminous matter may be applied directly in almost any state in which it may be found. This is in the case of peat. Here the vegetable matter is in excess, and the addition accordingly of any other earths is an amendment of the composition of the soil.

We see then, that the composition of soils may be improved by the addition of animal and vegetable matter, and also in many cases, by the addition of the earths in which they may be deficient, and in an especial degree, of lime, which we can always apply in the form of minute division best suited to improve the composition of the soil. This is the first of the means referred to of adding to the productive power of soils, and will be considered in detail under the head Manures, and other divisions of the management of the farm.

The *second* mean referred to of increasing the productive power of a soil, is altering its texture, depth and properties, by tillage and other means.

The mere effect of that comminution of the parts of soil which it undergoes in the common operations of tillage, is seen to have a beneficial influence on the productive powers of the soil. Whether the soil imbibes from the atmosphere any thing but aqueous vapor or not, it is known that the exposure of the matter of the soil to the atmosphere, and the comminuting of its parts by tillage, add permanently to its fertility. Thus we learn from experience the good effects of tilling lands well; soils once tilled are rendered for the most part more productive by the process. Peaty turf, if suffered to remain in its original state, may continue to produce nothing but heath and the most useless plants; but, if merely ploughed, and exposed to the influence of the atmosphere, it will at once tend to produce grasses of a better kind, and of greater variety; and again, if a subsoil of coarse clay be exposed to the atmosphere, for the first time, it is generally at the first very unproductive, and it is not until after long exposure to the air that it becomes productive. This is most remarkable in the case of clay marl, a substance in itself, containing the materials of a fertile soil, but which is often barren, until after pulverization and the influence of the atmosphere.

It is, indeed, conformable to analogy, as well as to experience, that soils should be improved by pulverization and exposure to the atmosphere. In our examination of the constituent parts of soils, we have seen that their fertility is in a great degree indicated by the proportion of minutely divided earthy matter which they contain.

The effect of tillage, therefore, may be reasonably supposed to promote this division, both by the mechanical action of our instruments, and by exposing the particles of the earth to the action of the air.

Another object sometimes produced by tillage, and subservient to the amendment of the soil, is the deepening of the upper stratum.

The subsoil, it has been seen, is distinguished from the soil so called, by its containing less vegetable and animal matter, and so being less suited to the nourishment of plants; and in many cases it is even found to be injurious to vegetation. It is generally important, however, that there be a good depth of soil, and thus it is often expedient, as a means of effecting a permanent improvement of the surface, to plough up and mix with it a portion of subsoil, even though that subsoil should in itself be infertile.

These, then, are the principal mechanical means by which we can improve the soil, and they will be considered in detail, under the various heads which relate to the operations of tillage.

Another mean, indeed, of changing the composition of soils, is incineration, commonly called *paring and burning*. This process will be described as connected with the operations of tillage, and may be considered as one of the mechanical means possessed by us of adding to the productiveness of the soil.

The *third* mean referred to, of adding to the productive power of soils, is changing their relation with respect to moisture.

In warmer countries the soil is comparatively little injured by an excess of water, and more frequently suffers from the insufficiency of it. In climates like that of Britain, however, the operation of conveying away the water which is in excess is an essential one, and if neglected, the devised scheme of improvement may fail. The surplus water is either stagnant upon the surface, or penetrates below the surface. The freeing of cultivated land of water upon the surface, gives rise for the formation of land into ridges, by which the water escapes without stagnating upon the ground, or sinking into the subsoil below. This is an object necessarily connected with tillage, and will be described when the manner of cultivating land is treated of.

The freeing of the soil again from that superfluous water which is contained below the surface, forms a peculiar branch of agricultural improvement, and will be described under the head of Draining.

As draining is more required in colder countries, so irrigation, or the watering of land, is less required than in those countries where the heat and evaporation are greater. Irrigation, however, is a curious and interesting branch of rural economy, derived by us from very ancient times. In this country it is chiefly employed in watering the lands in grass during the months of winter and spring.

The last of the means referred to of adding to the productive power of soils, is by changing the relation with respect to temperature.

This mean of adding to the productive power of soils, is less within our control than any of the others. It is only by slow degrees that we can improve the climate of a country. It is chiefly by draining, and the raising of hedges and wood; all of these, accordingly, form important objects of rural economy, and will be partially treated of in this work.

The means, then, of adding to the productive powers of the soil,—namely, supplying the organic and earthy substances which may be required; altering its texture, depth and properties, by mechanical means; and changing its relation with respect to moisture,—will all be treated of under the different divisions of our subject; and we shall begin with that which is most closely connected with the nature and property of soils, the nature and property of those substances which we apply to the soil under the name of manures.

Sheep Husbandry.

HINTS ON SHEEP HUSBANDRY.

[*Selected for the Cultivator.*]

Shelter.—It is obvious that housing sheep at night, and providing them, during the day, a shelter from the rain and sun, must preserve and improve the wool; and also essentially conduce to the health, comfort and preservation of the animal.—*Bakewell.*

I would have sheep winter fed, to the degree of commencing the grass season in good store order, and without having sustained any check, in carcass or wool; and winter sheltered in yards or sheds, as much as the sheep themselves may affect, throughout even the mildest climates of Britain. For neither merino, nor half breed merino lambs, nor indeed those of any other breed, ought to be exposed without some kind of shelter, to the rigors of the winter and early spring; and the sheep, when arrived at their maturity or full strength, will still require the same, with regular and good feeding, if it be intended to force the growth of their fleece, to its utmost weight, and to preserve the quality in its highest degree of condition and fineness.—*Lawrence.*

One of the completest sheep yards I have seen, is that which Mr. Thurlow has made at Gosfield, partly by means of stubble stalks, but the space well enclosed; a large flock may be under cover or exposed, at their pleasure. In the centre is a thick stubble stack, which forms a double shed. He finds it of incomparable use, insomuch as he intends to convert all the straw of his large farm into dung, and to leave off buying bullocks for that purpose.—*Arthur Young.*

The late Gen. Murray's standing folds were equally well contrived, enclosing an area of 57 yards in length, and 20 broad, containing 1,140 square yards. Above 700 ewes were folded in it at night, and for that number it is more than a yard and a half for each sheep. All around it was a shed nine or ten feet wide, and also across the middle, which latter was open on both sides. A rack for hay, placed against the wall, which was boarded, surrounded the whole; and another, which was double, to be eaten out of on both sides, stood along the central shed; under the rack was a small manger, in which the food was given.—*Ib.*

A cool, moderate temperature is more favorable to the production of fine wool, than excessive heat; and were the sheep of Spain like those of England, unprotected against the effects of climate, I should have no hesitation in saying, that the situation of that country would be, in some respects, worse than that of our own island, and more unfriendly to the growth of a fine even staple. But to the other qualities, the soundness and softness of the fibres, our frequent rains are very prejudicial, unless the sheep be sheltered and protected from their effects.—*Bakewell.*

To preserve all the best qualities of wool in the Spanish breed of sheep, it will be necessary to attend to the three following objects: The first in importance, is the purity of the breed. The next, that the fleece be covered by nature with a copious yolk, or being deficient, that it be supplied by art; nor should the unctious covering of the wool be absorbed by a mixture with the soil on fallows, or washed away by the rain. Lastly, that the sheep be kept dry, sheltered from the extremes of heat and cold, und their quantity of nourishment regulated.—*Ibid.*

The bad effects of water upon the pile, while growing, may be owing to the readiness with which it mingles with the yolk, and carries off a quantity of that animal soap, which is so necessary to the good quality and even existence of the fleece; for if care be taken to prevent this, by the skilful application of tar mingled with butter, which act as repellants to the water, the wool part of the staple which grew after the mixture was applied, contains a sufficient supply of rich and nutritious yolk, and is a much superior sort of wool to those parts of the pile which have been exposed without protection, to the dripping wetness of the wintry season.—*Luccock.*

Mr. Bakewell is so fully convinced of the utility of greasing, that he advises it immediately after shearing, and again in October. In his opinion, the trouble and expense of it, twice a year, will be well repaid by its beneficial effects upon both the carcass and fleece of the sheep, in every part of Britain. He observes, by the first greasing, the wool will be covered and defended from the action of the soil, when the particles are most pulverized and active, and it will be kept soft and moist during the parching heats of July and August; and that he has reason to believe, that the top of the staple of a greased fleece, would not become harsh and discoloured, which is frequently the case with English wool. Additional and very powerful inducements to spring and summer greasing, are the following: The ointment destroys the sheep tick, and has a tendency to prevent cutaneous distempers, and to preserve sheep from the stroke of the fly. Farther—a considerable quantity of wool will be saved, which is torn off by sheep when rubbing themselves, in order to allay the irritation of the skin, occasioned by those causes. The ointment resists the action of the moisture more powerfully than could the natural yolk of the wool; and Mr. Bakewell gives an example of the superior warmness and dryness apparently enjoyed by greased sheep, on the mountain sides, where greased and ungreased browsed together.

The following is given as the Northumberland preparation:—From 16 to 20 pounds butter, are placed over the fire and melted; a gallon of tar is then added, and the mixture is stirred until the two substances are well incorporated and form a soft tenacious ointment. The care always necessary in the application of ointments to the sheep, is especially so in this case; for, says Mr. Bakewell, *if the ointment be merely rubbed on the wool, it collects on the top of the staple, attracts and mixes with the soil, and is rather injurious than beneficial to the fleece.* The staples of the fleece are to be divided with one hand, and the ointment applied to the skin with the finger of the other hand, by which means the ointment is softened by the warmth of the skin, and equally diffused throughout the fleece.—The quantity required will in course vary with the size of the sheep, but generally, and in the lighter mode of greasing, one gallon of tar, and 20 pounds of butter will be sufficient for forty or fifty sheep.—*Lawrence.*

An unfavorable change takes place on shorn wool, kept long in a very warm and dry temperature: the fibres become indurated, rigid and elastic, and acquire the properties of the hard wools. The greater the degree of warmth, the more speedily will the effect be produced. Wool which has been shorn three or four years, will not spin or fill so well as when kept only one year. A dry situation is necessary for the preservation of wool, which however at length loses it natural moisture, and becomes hard, like wool of limestone districts.—*Bakewell.*

Sheared sheep, turned into a newly mown pasture, their coats attract the short ends of grass left by the scythe, and remain sticking in the bottom of the fleece, until in the end they are rolled up with it. These with any dried vegetable particles, such as hay seeds or chaff, falling from the rack into the coat of the sheep, occasion much extra trouble and expense in the manufacture of the wool, since if left, they would be wrought into the substances of the cloth, whence they must be extracted by holes made, to be afterwards repaired at the fulling mill, or by the fine drawer. Hay in racks should be upon the level with the heads of the sheep, and the staves by no means too wide apart, since some sheep, particularly the Spanish, are the most wasteful animals in the world of their provisions.—*Luccock.*

The wool grower is counselled to place no dependence upon accidental and external circumstances, for the production of good fleeces, but to rely entirely and with confidence upon the properties with which nature has endowed his sheep. The perpetuity of animal properties being scarcely anywhere more strikingly exhibited, than in the certainty and regularity with which the parent sheep convey to their offspring their own distinguished characteristics. Breed is of the utmost consequence. It is the basis upon which all the improvements of the flock must be founded; the only source of hope, that attempts to produce fine wool will be followed with success.—The kind of wool depends entirely on the species of sheep which bears it, and the soil and its products, or other external circumstances, have no other effect than to vary the quality of the sample, the wool itself still remaining true to its species, long, short or mixed. Long and universal experience has established the fitness of heavy, coarse woolled sheep for rich and grazing grounds and marhes, confining the light and short woolled stock to the hills and higher pastures. Nevertheless, fitness and propriety, not absolute necessity, have given birth to such arrangement; since short and fine wool might be grown in the low grounds, and long wool in the upper, with an additional expense of winter keeping.—*Lawrence.*

Miscellaneous.

[*From the Genesee Farmer.*]

RUTA BAGA CULTURE.

In giving you last year an account of my first experiment in turnip culture, I mentioned my intention of continuing to raise them, as I was convinced few things could be more profitable. In order to be certain of having first rate seed, I sent last winter to Mr. Buel, at Albany, and procured half a pound of seed, having a quantity of my own raising to make up any deficiency, should there be any.—The ground selected was a wheat stubble, was not manured, but thoroughly ploughed, and then thrown into ridges, as described last year. On these ridges the seed was sown by hand at the distance of ten inches. The seed procured at Albany was sufficent for the whole acre, and a small quantity was left. The time occupied in sowing was about a day and a half. I sowed them a few days earlier than last year, viz. on the 16th of June; as they appeared last year to be in full vigor at the time of pulling. I gathered them the first week in November, and from the acre sown with the Albany seed, measured 450 bushels of very fine smooth turnips. Nearly one-fourth of the ground sown was inclining to clay, and in some places produced no turnips; thus furnishing another proof of the correctness of Judge Buel's remark, that clay ground is unsuited for a turnip crop. Owing to an unusual pressure of farming business, my turnips were hoed but once, which was at the time of thinning—the first week in August. My account with ruta baga for the year 1834, will stand as follows:

Ploughing twice, and ridging,	$3 00
Seed,	75
Six days, work, thinning and hoeing,	4 50
	$8 25

The tops will pay for the use of the land and the gathering.—Four hundred and fifty bushels of turnips, at twenty cents per bushel, would be $90 leaving a profit of something like eighty dollars.

There is an impression among some people, that capital employed in farming is but poorly invested. It may in some cases be so, but such is not the result necessarily. The land on which my turnips were this year raised, was part of a small field of four acres, which had been a meadow for several years, but the grass becoming thin and poor, it was, after the mowing in 1830, turned carefully over, dragged on the furrow with a light drag, and sown with wheat. After the wheat was taken off, a quantity of manure was, in the fall of 1831, put on the stubble, and the whole ploughed in. In the spring of 1832, it was again ploughed and sown with barley. The barley stubble was ploughed in and the field again sown with wheat. In the spring of the present year, the wheat stubble was turned in, and the piece rolled down smooth, and three acres planted with corn. As the ground had been carefully levelled, the corn was planted in rows two feet and a half apart, and the hills eighteen inches from each other in the rows; at the first hoeing three stalks were left in a hill. It was hoed twice, the principal part done with a cultivator, and the corn was hilled as little as possible. At gathering it was estimated to yield from 65 to 70 bushels an acre; and one acre was sowed with the turnips. The avails of this four acres for the four years will be as follows:—

1st crop,	100	bushels wheat, 8s	$100 00
2d	120	barley, 4s	60 00
3d	90	wheat, 8s	90 00
4th	195	corn, 4s	97 50
	450	turnips 20 cts	90 00
			$437 50

No account of the expense of culture was kept except for the last two years, and as it will be seen at a glance that it was performed in the simplest manner possible, on comparing it with recorded results, I am confident that thirty per cent would be a liberal allowance for seed, labor, &c. leaving a profit on the four acres for the four years of about three hundred dollars.

It has been frequently remarked that small farms were more profitable than large farms. This is no doubt in most cases true; and it is easily accounted for by the fact that on well cultivated small farms, much more capital is employed on the land in the shape of labor, manure, &c. than upon large farms. A small farm bears the same relation to a large farm in this respect, that the garden of the small farm does to the remainder. Where the soil is naturally equally good throughout the whole farm, let it be small or large, it might be made as productive and profitable as the garden, were the same capital employed upon it. In farming, as in most other kinds of business, it is idle to expect something for nothing; the returns in nine cases out of ten will be in proportion to the labor bestowed.

Otisco, December 5, 1834. WILLIS GAYLORD.

EXTRACT FROM THE VALEDICTORY OF MR. LEGARE TO THE PATRONS OF THE SOUTHERN AGRICULTURIST.

The subject of the Rotation of Crops and Manures—should command your serious attention. Without referring to the mooted point of what is the cause, or entering in the least into the discussion, it is sufficient for us to know, that any vegetable grown long on the same soil deteriorates, even when the ground is annually manured, unless the manure used possesses the peculiar nutriment fitted for it, and so true is this admitted to be, that it is acted on even by the market gardeners, near London, where rents are enormous, and manures made free use of. It is stated, moreover, on high authority, that it is a practice with them to lay down a part of their grounds in grasses, finding that the rotation of garden vegetables is not sufficient, and that by pursuing this course, their profits are increased.

If then it be so necessary, where manures are used to such an extent, as would astonish us in this country, how much more necessary must it be where so little is used, and where the supply is so limited? Rotation of crops, is in some measure, a substitute for manuring, and it is well known, that after plants of a certain class, have exhausted the soil of all nutriment which will support them, other plants will grow most luxuriantly on it, and be for sometime very productive. These, in turn, exhaust the soil of their peculiar food, and have to yield their places to others. And such is the course pointed out by nature throughout the vegetable world, whether it be in the forest or in prairie, the cultivated or uncultivated lands.

But a rotation of crops can seldom, if ever, be substituted for manuring, and should never be considered in that light, for although each plant may have a certain specific food, without which it cannot thrive, and which it may obtain by a change of soil, and which is not necessary for the healthy growth of other plants, which are to succeed, yet there are certain elementary constituents necessary for all plants, and which are required by all and consumed by all, and which can only be supplied by the annual decay of the vegetables which grow on the soil, or by manures. Where the operation is left to nature, the first takes place, but when man interferes, the second must be resorted to. The object, however, of manuring should not be merely to keep the soil at its pristine fertility, but to improve and make it more productive. To effect this, care should be taken that a greater quantity is added to a field than is taken from it. Nor should it be a matter of indifference what manure is carried into particular fields, for while some manures would be exceedingly beneficial in one field, they might be inoperative or the very reverse in another. Nor is it always necessary that the manure should contain either vegetable or animal substances. To a stiff clay soil, the addition of pure sand very often proves highly beneficial, and clayey is the proper corrective of a light soil. Wood ashes, lime and marl, are most excellent manures when properly applied. But of all manures, that which is obtained from the stable and farm-yard, is the most beneficial, and consequently most to be prized. The greatest attention, therefore, should be paid to the collecting and augmenting of it. We need not here enter more fully into this branch of our subject. Our readers need only to refer to the back volumes of this journal for all information necessary. The subject is undergoing investigation daily, and as these investigations shall bring to light new discoveries, they will be given in the *succeeding numbers* of this work.

The next subject we call your attention to, is the care of your *Live Stock*. It is all important to a planter, that he should have an ample supply of manure; with it he goes on to realize a fortune, and without it, he will at best, but remain stationary. How many planters have been ruined, and how many are there, who scarce make their income and expenditures meet; in many cases this is more owing to a neglect of collecting and applying manures, than any other cause. Content with what the natural fertility of the soil yields, the productions of their fields become less in each succeeding year, and instead of supplying the waste which takes place, by the application of manures, they, in many cases, emigrate to the "far West," leaving all the comforts of civilization, and tearing asunder all the tender ties of early life. Others are content to drag on thus, provided they can but live; when it would require but little exertion on their part, to place them in comfortable, if not affluent circumstances.

A proper attention to the stock of the plantation, (for all have more or less,) would go far to relieve the embarrassments of the planter, in this respect. Let his horses and cattle, his sheep and hogs, be properly attended to; let them be taken care of, during winter, and have their pens well littered, and he will be amply repaid by the quantity of manure he will have in the spring, to enrich those spots which are poorest. But even apart from the additional quantity of manure which would be made by proper attention, the many comforts yielded by a well kept stock of cattle, sheep and hogs are sufficient inducements of themselves, to cause us to pay more attention to them than we do. Instead, therefore, of permitting them to roam at large during the winter, and losing a large number annually in the bogs of the swamps, let them be housed, fed, and well littered. Let no one say that this cannot be done, or only accomplished on a small scale. The success which has attended Dr. H. Ravenal, refutes this opinion. His stock is large, they are all housed and fed during the winter, and this is done by him, on three separate plantations, on each of which, the number of cattle, sheep and hogs, are considerable; nor does Dr. Ravenal possess any facility for feeding them, not within the reach of all planters; but he is provident, and his cattle fare well.

EFFICACY OF SPIRITS OF TURPENTINE IN DESTROYING INSECTS.

M. D. Thosse, in Silliman's Journal, after describing the efficacy of spirits of turpentine in destroying lice, &c. upon animals, gives the following narration of his experiments with trees.

"Having learned these facts, I soon found occasion to try its effects on some of my trees, which were attacked by a multitude of worms. These I destroyed entirely by putting into a bowl a few handsful of earth, on which I poured a small quantity of the spirits—then adding water, and stirring the whole together until it had a proper consistence to be rubbed or brushed over the ends of the branches. The insects perish with their germs; and the odor remaining several days about the tree, repels fresh invaders. A mixture of earth is necessary, because spirits of turpentine swims upon pure water and will not mix with it; and if used in too great quantities, might burn the leaves.

"The drought which occurred a few years ago in the canton in which I live, produced a mange in cattle and horses, very extensive and injurious; and those who escaped this infection were filled with lice, from which they were promptly relieved by sponging them with water impregnated with the spirits. This infection caused horses fatigued with labor to rub themselves so much against their mangers and the walls of the stables as to deprive them of much of the rest so necessary to their comfort.

"I cannot therefore doubt, from the trials that have been made, that much benefit might result from the use of turpentine in clearing fields and trees from insects of different kinds; and that a mixture of ashes with which a portion of this liquid has been incorporated, would remove, by its odor, ticks and other insects which infest turnips. Its odor is more penetrating in the open air than that of sulphur, and some other materials used for this purpose."

[*From the Genesee Farmer.*]

QUERY TO FARMERS.

Winter has come, and what provision have you made for passing the long evenings for the four ensuing months pleasurably and profitably to yourself and others? The farmer who thinks it will do now, as formerly, to sit by the fire and drink cider, and tell stories through the winter, has not kept pace with the spirit of the times; he is lamentably behind the spirit of the age in which we live. There has, it is evident, a certain class of individuals grown up in our land, who speak of and treat the cultivators of the soil as an inferior caste, men who cannot understand the leading topics of the day, whose utmost abilities are confined to the merit of being able to discuss a boiled potato and a rasher of bacon, and who ought not to be entrusted with legislating for themselves, much less for others. If as a body the farmers are obnoxious to this reproach, we surely should lose no time in correcting the evil—if, as is believed, these aspersions are calumnious, they must be lived down. The farmer has no excuse for ignorance. Information on all the useful and necessary subjects which come before us as men, and citizens, is presented in shapes so easily accessible, that he who remains ignorant deserves to be a reproach and a by-word. Let no one think, then, that he is prepared for winter, who has not made arrangements for a liberal supply of food for the mind as well as the body. Well conducted papers, able periodicals, and valuable books must be procured, and they must be read and studied. Universal education is our boast, but it is foolish and vain-glorious, unless it is turned to useful purposes. Every farmer should be a practical utilitarian; "Cui bono," should be his motto; every day should witness some profitable acquisition of knowledge. A few dollars a year paid out for well selected and standard works will, in the course of a few passing years, provide a farmer with a valuable library. The farmer who has a family, is inflicting on them a cruel and irreparable wrong, if he by his negligence or his parsimony deprives them of such a resource. The young cannot be idle, and their time if not profitably employed will be perhaps worse than thrown away. W. G.

[*From the Maine Farmer.*]

From unpublished papers of the Kennebec County Agricultural Society.

ON THE CULTURE OF TEASELS.

As teasels are very excellent materials to card cloth, and as no cloth can be dressed so well without them as with, I have thought proper to communicate the mode of their culture to the society.

In the spring I sow the seed in rows six or eight inches apart; as soon as the plants are up enough, I weed them. In the fall of the year, I cover them with bushes, and in the spring I dig holes down to the plants to prevent their winter killing. The next spring I set them out, four or four and a half feet distant; it is not proper to nourish them this year, for if you do, there will more of them go to seed than otherwise would. I sow more seed the second year, to set out in the missing places, as they will die as soon as they have been to seed. The third year I nourish them as much as possible, to make them as large as I can, as they will be better. As soon as the blossoms are fallen, I cut and spread them on a floor to dry.

I get for the best, one dollar per hundred, and down to twenty-five cents.

Communicated by ELIJAH WOOD.

To the Committee of the Kennebec County Agricultural Society, appointed to award premiums on honey, hives of bees, &c.

Having entered my name for premium on honey and on hives of bees, I will inform you how I have managed them for a few years past. I keep them in boxes—my boxes are thirteen inches square on the outside, and from six to seven inches high, with thin slats across the top about an inch wide, with just space enough to let the bees pass between them. For a young swarm I fasten two boxes together with a board on the top, put in the swarm, and when I set them on the bench, put under as many more as I think they will fill —a large early swarm will fill four or more. I had some this season that filled three in about a fortnight, and then swarmed, and the young swarms have filled four boxes. After my old hives have swarmed once, I usually put under one or more boxes. I prefer that course, to letting them swarm again, for second swarms are generally worthless. When the weather becomes cool, if the hive is well filled with honey, the bees will all leave the upper box,—it can then be taken off without disturbing the bees in the hive. I usually take from my old hives and early swarms one box containing from twenty to twenty-four pounds, and leave enough for the bees to live on through the winter, or I can take a part, and return the box if I think the remainder is insufficient for them. If my bees grow lazy after the swarming season is over, and hang out on the hive, which is in consequence of the hive being full, I add more boxes. I had a few small swarms which I have taken up otherwise. I have not destroyed any bees. I have taken up on my own farm this season, 289 pounds of good honey in the comb, and I now own, including those that I have taken up, twenty-six hives.

Leeds, Dec. 15, 1834. JOHN GILMORE.

M. Rennici, a French chemist, has discovered and described the *itch insect*, sometimes denominated the *Scotch fiddle.* It is the *acarus scabici.* Like the mole, it has its fore legs strongly developed, while its hind quarters are comparatively feeble; it is thus enabled to burrough under the cuticle, and to make a road for itself as it proceeds. M. Raspael, whose skill in exploring minute objects is so celebrated, is engaged with his microscope in procuring farther details.—*Medical Gazette.*

The cost of producing and marketing a crop of hops, has been computed, by those well acquainted with the business, not to exceed *eight cents* per pound; and the common yield at full fifteen hundred pounds to the acre. The price in the market this year, is from eighteen to twenty cents per pound, yielding a nett profit to the farmer of full twelve cents on every pound of hops, after paying outlays of every description. This computation gives *one hundred and eighty dollars* clear income for every acre of land in growing hops.—*Sag-Harbor Telegraph.*

Potatoes.—It has been a mooted question whether it is a good plan to cut potatoes in planting. A correspondent of the New-England Farmer, Ellsworth, has made an experiment, by planting an acre in alteratte rows. The rows of uncut potatoes produced 458 bushels; the cut potatoes produced 336; making a difference of 123 bushels in favor of the uncut. He however used 22 bushels more of seed in planting the uncut potatoes.—*Kennebec Journal*.

Young Men's Department.

[*From the Farmers' Register.*]

ON THE PLEASURES OF AGRICULTURE.

Independent of the actual profits arising from agricultural pursuits there is something in the cultivation of the soil, eminently calculated to dispose the philosophic mind to serious and sublime contemplation. With your permission, Mr. Editor, as I have seen no communication of this character in the Register, I shall endeavor to show wherein consist the real delights which the philosopher and man of science derive from agriculture. And I undertake this service the more willingly, from the fact that there are many young men, who, from the mere consideration of gain, can never be induced to lay aside their prejudices and become tillers of the soil, but who might be induced to make the experiment, and finally become good farmers, could the subject be presented to them under a pleasing aspect. To those speculative young men who desire amusement as well as profit in their avocations, the present and succeeding numbers I may find leisure to write upon this interesting subject, is respectfully dedicated.

Although the desire of gain is a principal and most necessary inducement to follow the plough, yet all must admit, that he who sees no other pleasure in agriculture than that which results from the anticipations of pecuniary profits arising therefrom, is, to say the least, a *grovelling and penurious wretch.* There is something really mean and sordid in overlooking all the beauties of the vernal spring, and the maturing loveliness of autumn, merely to contemplate the amount of *dollars* to be received in return for the daily toil and anxious solicitude of the farmer. Such a disposition reminds one of the folly a man would evince, who should prefer a dark and loathsome cell to the cheerful beams of day, and the pleasing aspect of creation. But to him who looks from nature up to nature's God, and who can recognize the Diety in every expanding, opening flower, and purling rill, agriculture offers charms, calculated to compose the mind, and dispose it to tranquillity and cheerfulness. To such a mind—

"———Not a breeze
Flies o'er the meadow; not a cloud imbibes
The setting sun's effulgence; not a strain
From all the tenants of the warbling shade
Ascends, but whence his bosom can partake
Fresh pleasure unimproved———."

Who can look upon a field of wheat, gradually rising in vernal loveliness to the delighted eyes of the contemplative beholder, and mark it in all its different stages, until the ripe grain crowns the hopes of the husbandman with a golden harvest of plenty; and then have the heart to distrust the protection of Providence, or doubt the existence of an All-wise Intelligence, pervading and governing all things; assigning bounds to the elements, and transcribing the limits of nature? There is not a blade of grass or ear of corn, that does not afford matter of curious and endless speculation to the inquisitive and well cultivated mind. And although upon philosophical principles only, no man can ever understand the process of nature, by which the earth in spring is clothed with verdure, and in the autumn filled with her bountiful productions, gradually maturing for the sustenance and pleasures of man; yet the heart by such inquiries, must be ultimately greatly benefitted. No man who sees, and contemplates the design and wise contrivance of all the plants and vegetables, that clothe and adorn a well cultivated farm, and reflects upon the inexplicable nature of their existence, fructification, and preservation, under so many adverse circumstances, can have the heart to be a sceptic in regard to our holy religion—because many parts of it are surrounded with mystery. He finds that mystery is inscribed upon the face of all things, and what he cannot understand upon principles of reason, he learns to adore as the production of an infinite and incomprehensible Being. The man of reflection sees much to admire in the great care which nature manifests for her productions, even in the protection she affords to the grasses which cover our meadows and fields. For not only do they clothe and adorn the fields, but they afford sustenance for all animated existence. The leaves afford food for the cattle, the smaller seeds for birds, and the larger for man: for few readers need be informed that the plants producing our bread corn belong to this class. In those tribes *more generally* considered as *grasses*, I will mention the following as instances which appear to coinside with the intention of nature concerning them, viz: their extraordinary means and powers of preservation and increase, their hardiness, their almost unconquerable disposition to spread, and their faculties of reviviscence, each of which qualities, considered in detail, would afford interesting matter for a separate communication. In this, therefore, I can only observe the following things in relation to their general properties. They thrive under a treatment by which other plants are eniirely destroyed. In proportion to the consumption of leaves is the increase of the roots. The more the cattle trample them under foot the thicker they grow. Many of the seemingly dry and dead leaves of grasses revive and renew their verdure in the spring. In lofty mountains, where the heat of summer is not sufficient to ripen seeds, we are told that the grasses are viviparous, and consequently able to propagate themselves without seeds. It is also an observation frequently made, that herbiverous animals attach themselves principally to the leaves of grasses, and if left at liberty in the pasture to range and choose, will leave untouched the straws which support the seed. These general properties of vegetables, or properties common to large portions of that kingdom, are all that the extent of the present communication will allow me to notice, as I am afraid of being deemed too prolix by that class of society for whose benefit I write. But I may here be permitted to ask, whence this admirable contrivance of nature, this adaptedness of the productions of the earth to the peculiar condition in which they are placed, and their perfect subserviency to the uses for which they seem to be designed? Shall we inscribe it to the operations of nature herself? Or looking through nature, shall we desern an ever present wise Deity, though "invisible or dimly seen in these his lower works," yet superintending and graciously directing all things for the comfort and convenience of his creatures?

In conclusion, I would only observe, that I have just entered the threshold of the ample subject before me. I hope, however, that I have said enough in this communication to impress this general truth, that in the cultivation of the soil, there are thousands of objects calculated to expand the mind, increase the understanding, soften the heart, destroy scepticism, and exalt our ideas concerning the Ruler of the Universe. In my next, should the subjects of the present communication come within the design of a journal exclusively agricultural, I will resume the subject more in detail. W. H. P.

Gillespie's, Buckingham, Oct. 14, 1834.

MAXIMS.

How can a mean man serve the state? When out of office, his sole object is to *attain* it; when he has attained it, his only anxiety is to *keep* it; and in this uprincipled dread of *losing* it he is ready to go all lengths.—*Confucius.*

The generality of men expend the early part of their lives in contributing to render the latter part miserable.—*La Bruyere.*

A rolling stone gathers no moss.—*Latin.* This may be applied metaphorically to many dissatisfied mortals, whose "unstaid tendencies" will not permit them to remain long in any one place; who waste their substance in their migrations, and whose circumstances consequently never improve.

The discovery of what is true, and the practice of that which is good, are the two most important objects of philosophy.—*Voltaire.*

Money is a good servant, but a dangerous master.—*Bonhouse.* When we employ it to good purposes, money is a great blessing; but when we use it for wicked ends, or become so devoted to it as to endeavor to acquire it by dishonest means, it is then indeed a bad master.

Advancement is to merit, what the ornament of dress is to handsome persons.—*French.*

Merit often proves an impediment to prosperity; the reason is, that it always has two bad effects, producing feelings of envy and fear.—*Fr.* Envy from those whom we excel, and fear from those whose pretensions we might set aside.

The most delicate, the most sensible of all pleasures, consists in promoting the pleasures of others.—*La Bruyere.* How happy would it be for the world, if all men were to make this sentiment the rule of their actions!

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THE CULTIVATOR,

A MONTHLY PUBLICATION,

DESIGNED TO

IMPROVE THE SOIL AND THE MIND.

CONDUCTED BY J. BUEL.

VOLUME II. SECOND EDITION.

ALBANY:
FROM THE STEAM PRESS OF PACKARD, VAN BENTHUYSEN & Co.
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1838.

☞ Some of the cuts which appeared in the first edition are omitted in this, having been lent, lost or destroyed. They are, however, of no great moment.

THE CULTIVATOR:

A MONTHLY PUBLICATION, DEVOTED TO AGRICULTURE.

ALBANY, MARCH, 1835.

THE CULTIVATOR—MARCH, 1835.

TO IMPROVE THE SOIL AND THE MIND.

In commencing the second volume of the Cultivator, and before the farming operations of the season have commenced, we are desirous of drawing the attention of our readers to some prominent objects of improvement in their farming operations. We know the distrust which farmers generally entertain to new practices in husbandry, and are fully apprized, that what we are about to offer forms already a part of the practice of many who will peruse our remarks. Yet if we should be instrumental in inducing a few, by adopting our suggestions, to improve the condition of their farms, and to render their labor more productive, our object will be effected, and we shall be satisfactorily compensated for our trouble.—All we ask is, that our recommendations may have a fair trial, sufficient merely to enable the experimentor to judge of their utility, and on a scale that shall involve neither great labor nor expense. And we shall offer nothing which we have not ourselves tested, and believe beneficial. We will begin with

MANURES,

Which are the basis of all fertility in the soil, precisely in the same way that forage, grain and roots are the basis of fatness in our farm stock. All animal and vegetable manures have once been plants, and are capable by a natural process, of being converted nto plants again. They should therefore be husbanded with care and applied with economy. Every crop taken from a field diminishes its fertility, by lessening the quantity of vegetable food in the soil. Unless, therefore, something in the form of manure is returned to the field, an annual deterioration will take place until absolute barrenness ensues. This fact needs no other illustration than is afforded by every bad managed farm. The object of the husbandman should be to INCREASE the fertility of his farm, because upon this materially depends the profits of his labor. To do this, we advise that cattle yards be made dishing, so as to collect the urine and liquids in the centre, and that these be kept well littered with straw, stalks, and the refuse vegetables of the farm, to take up and preserve these liquids, which are a valuable part of the manure:—That these yards be thoroughly cleaned in the spring, and, their contents, together with the manure from the stables and pig pen, applied to hoed crops, as corn, patatoes, beans, &c., before fermentation has progressed far;—that it be spread broadcast, ploughed in as fresh as possible, and the ground rolled or harrowed before planting. Thus *all* the manure will be saved, the hoed crop greatly benefitted by it, the weeds destroyed, and as much fertility left in the soil for the grain crop which is to follow, as the same manure would have afforded had it lain in the yard till after midsummer, and been then applied. But if manure *has* rotted, it may be applied to the turnip or small grain crop. In these cases it should not be buried deep, and may with advantage, at least on dry soils, be harrowed in with the seeds, where it serves frequently a beneficial purpose in protecting the young grain from the severity of winter.

DRAINING.

It is necessary, for the perfection of most crops, that they should enjoy all the benefit of our summer heats. When a soil is saturated with spring water, though water does not appear on the surface, the roots of the crop which grow upon it, penetrate the wet part, which may be supposed to possess a temperature never above 60 degrees. The crop consequently fails for want of the necessary heat in the soil. Decomposition of vegetable matter, the food of the crop, is also seriously retarded by this cold temperature. Stagnant waters are as unhealthy to cultivated crops as they are to animals. We have now in our mind an extensive inclined plane, which we examined last summer, of more than half a mile slope, embracing 70 or 80 acres, and possessing a rich soil, one-fifth of which was rendered unfit for tillage or the finer grasses, in consequence of springs which burst forth near the top of the plane, the waters of which passed down its whole extent, and principally in the soil, in gentle depressions or hollows. We are confident the evil here might be remedied at a slight expense, which would be remunerated in a single season, by draining.—Grounds habitually wet, either from springs, or water stagnating in the soil, for want of declivity of drains to carry it off, will not produce good crops. Draining is an effectual cure for the evil. Open drains will alone answer to carry off surface water, and in situations where much water may occasionally pass. These should hardly ever be less than 3 feet broad at surface, and two feet deep; the sides sloping so as to leave the bottom 8 to 12 inches broad. A greater depth and breadth are ofen requisite. Long experience has convinced us, that good drains, in the end, are always the cheapest drains, and that when they are well constructed, they constitute one of the most profitable improvements of the farm. But we consider under-drains, in soils which are habitually wet, cheaper, better and more profitable to the proprietor, either to carry off stagnant water from flat surfaces, or to arrest that proceeding from springs, than open drains. They are more efficient, because they generally lay deeper, and are not so liable to be choked up. They are more economical, because they seldom, if well made, require repairs, and do not waste any land. They are beneficial on all flat surfaces which have a retentive subsoil, and upon all slopes rendered wet by springs. They are wanted wherever water, at midsummer, rests upon the subsoil, or saturates the soil, within the reach of the roots of cultivated crops. We do not here mean to discuss the principles, or describe the mode of draining, as we have published much upon this subject, and design to publish more, with such pictoral illustrations as shall serve to render the subject perfectly familiar to the readers of the Cultivator. A very simple means of determining whether a field is likely to be benefitted by under-draining, is, in June or July, to dig a hole, like a post-hole, say two feet deep, and the presence of water at the bottom, and the height to which it rises, will at once decide whether the land is to be benefitted, and to what extent, by under-draining. Draining effectually is almost an untried experiment with us. We are not familiar with the process, and startle at the expense: yet if we compare the cost with the advantages which will accrue for a succession of years, we shall find the operation to be a very economical one.

N. B. Well drained grounds may be sown or planted ten to fifteen days earlier in spring than those which want draining, and the crops are much less liable to be injured by heavy rains.

CLOVER

Will grow on pretty much all soils that have been laid dry by good drains. It is the basis of good farming, on all lands susceptible of alternate husbandry. Its benefits are threefold: it breaks, pulverizes and ameliorates the soil by its tap roots, and it furnishes a cheap food for plants as well as animals. A good clover lay is worth to a crop, by the food which it affords, as much as five tons of manure to the acre. To ensure a good lay, at least ten pounds of seed should be sown to the acre, and the ground well rolled.—Its value, as food for plants, depends more upon the quantity of roots than upon the luxuriance of the stems, though the abundance of the latter will depend in a great measure upon the number of the former. To obtain the full value of this plant, we must cultivate it as a food for our *crops*, as well as our cattle; and in this case we should use it as such the first or second year before it has run out. There is economy in always sowing clover with small grains, though it is to be ploughed in the same or the next season. Ten pounds of seed costs upon an average one dollar—the labor of sowing is comparatively nothing. Its value to the next crop cannot be less than quadruple that sum, to say nothing of the feed it may afford, or its mechanical amelioration of the soil. We cannot avoid again urging a trial of the method of making clover hay *in cocks*, as we have heretofore recommended, notwithstanding the rebuke we have had upon this head from our esteemed friend and correspondent, Mr. Perkins. We have followed the practice twelve or fifteen years, and hence speak from experience, and with confidence, of its manifest advantages over the common method of spreading from the swath. Put it into small cocks, with a fork, from the swath, as soon as it is freed from external moisture, or well wilted, and then leave it to cure. An hour or two exposure to the sun, previous to its being carted from the field, is all the further care it will require. This mode saves labor, prevents injury from rain, and secures the hay in the best possible condition.

INDIAN CORN.

There is no crop which habit has rendered more indispensable to the wants of our families and our farms than this. The late John Taylor, of Virginia, termed it our "meat, meal and manure."—Holding this high rank in our farm economy, it is a subject of moment to adopt the best mode of culture. As many districts are shy in producing wheat, and as this crop is seriously threatened by the new (to us) wheat insect, it becomes more a matter of solicitude to render our corn crops productive. But as this grain demands more labor in its culture than other grain crops, so it is more important on the score of profit, that it should be well managed: for if thirty bushels an acre be considered only a remuneration for the labor bestowed on the crop—all that the product falls short of this must be a loss—and all that it exceeds, a nett gain to the cultivator. The first consideration in regard to the corn crop, is to give it a dry mellow soil; the second, that this soil be rich, fat or fertile; and the third, that the seed be timely put in and the crop well taken care of. Neither wet grounds, nor stiff clays, nor poor grounds, will repay by their product, the labor required on a crop of corn. He who has no other lands but these, should not attempt to raise it as a field crop. He had better bestow his labor upon other objects, and buy his corn. We think the best preparation for corn is a clover lay, well covered with long manure from the barn-yard, well ploughed, and well harrowed. It is better to give sixty loads of dung to three acres than to ten, upon the ordinary lands of our neighborhood. The difference in product will not make up for the difference in labor. Corn can hardly be dunged too high. What we have to recommend, that is not common in the culture of this crop, is—that double the usual quantity of seed be applied—the number of plants to be reduced at the weeding—in order to ensure three or four stalks in each hill—that the roots be not broken, nor the manure thrown to the surface, by the plough, but that the harrow and cultivator be substituted for it, which will sufficiently mellow the surface and destroy weeds; and that the hills be but slightly earthed. By ploughing and hilling we conceive the manure is wasted, the roots broken and bruised, and limited in their range for food, the crop more exposed to injury from drought, and the labor increased.

If the fodder which the stalks and shucks afford is an object to the farmer, as they certainly will be when their advantages are appreciated, the securing these in good condition is a matter of importance. To effect this, as well as to secure the crop from the effects of early autumnal frosts, we recommend the practice we have long and satisfactorily followed, of cutting the crop at the ground as soon as the corn is glazed, or the surface of the kernels has become hard, and of immediately setting it up in stooks to ripen and cure. This we have always been enabled to do early in September, and once in the last week in August. The quality of the grain is not impaired, nor the quantity, in our opinion, diminished, by this mode of management, while the fodder is greatly increased, and its quality much improved. We refer the reader, for a corroboration of the correctness of our views upon this subject, to the article in to-day's Cultivator, signed Agricola, which we copy from the Baltimore Farmer and Gardener.

PRUNING FRUIT TREES.

We deprecate the old practice of trimming fruit trees in autum, winter or spring. Vegetation being then dormant, the tree can make no speedy effort to cover the wounds inflicted by the knife and saw. These wounds, exposed to searching winds, and a scorching sun, become diseases, and often bring on premature decay. Besides, an attentive observer must have noticed, that whenever pruning is performed in the spring, three shoots are often thrown out where one has been cut away, so that the very evil which it is intended to remedy, a redundancy of useless spray, is increased rather than diminished. If pruning is performed in summer, after the first growth, say in the first fifteen days in July, or the last seven in June, the tree then abounds in elaborated sap, the wounds are speedily healed, and amply protected, by the foliage, from the malign influence of the sun and winds. We have remarked in successive years, and the fact is noticed by others, that when a tree is pruned in summer, there are very seldom any sprouts seen to shoot from the parts where the knife and saw have been employed. If the reader will try the experiment of summer pruning upon a few trees, we have little doubt he will agree with us, that it has a decided preference over that performed in any other season. The grand error of our farmers consists in not pruning at all, or only at long intervals, when it becomes necessary to take out large limbs, and in doing this, the axe is too often employed, which mangles the trees so badly that they seldom fully recover from it. Pruning should be performed annually, while the limbs to be taken off, and the spray, are small. The operation is then trifling and safe, and the wounds speedily heal. We want no better evidence of a slovenly farmer, than to see his fruit trees so enveloped with succors as to render it doubtful which is the parent—a case which, bating a little fiction, is often witnessed by the traveller.

ROOT CULTURE.

Presents many advantages to the stock farmer. Roots are less exhausting to the soil than grain; they are admirably fitted to form a part of a course of crops; are very beneficial in pulverizing the soil; afford abundance of food for farm stock: may be substituted for grain; and serve to augment and improve the valuable product of the cattle yard. An acre of ground under good culture, will produce, on a fair average, twenty tons of Swedish turnips, mangel wurtzel, carrots, parsnips, or potatoes. Supposing a lean animal to consume one bushel a day, and a fattening animal two bushels, the produce of an acre will then subsist three lean bullocks 110 days, nearly the period of our winter, and three fatting ones 55 days. We merely assume these as reasonable data, and ask, if the result does not prove the profitableness of their culture. But we are not permitted to doubt upon this subject, if we credit the testimony of those who have tried them, and whose continuance in the culture is the best proof of their value. Roots enter largely into the system of Flemish husbandry, which has been extolled as inferior to none other, and in many parts of Great Britian, turnips are considered the basis of profitable farming. In our country, root culture is winning its way to notice and to favor. Few who have managed it judiciously have been willing to relinquish it; while others are annually commencing it. The great obstacles to the more rapid extension of the culture among us, is the want of experience, the want of proper implements, as drill barrows, cultivators, &c., and the labor of securing the crop in winter. The apparent magnitude of these obstacles is daily diminishing, and we shall ere long discover, that root crops may be cultivated, and secured for winter use, as easily as other farm crops. We have had very little experience in cultivating carrots, parsnips or mangel wurtzel as field crops; but the Swedish turnip has been a favorite crop for some years; and we can truly say, it has been one of the most sure and profitable that we have taken from our grounds.

BARON VON VOGHT'S PATTERN FARM.

We find in one of our recent foreign agricultural periodicals, the British Farmers' Magazine, some account of the successful experiments in husbandry of this distinguished German, highly worthy of notice. We give an outline of his practice, under the persuasion, that it will be found interesting and useful to the readers of the Cultivator.

In 1813, the Baron undertook to improve the condition of an estate denominated Flottbeck, as a pattern farm, and to make it an experimental farm for the north of Germany. In 1829, he had carried his improvements to so high a state of excellence, that he published for the benefit of the visitors who thronged to see him, a pamphlet, developing the principles, by the adoption of which, his soil, naturally bad, had been raised to a state of high productiveness. It is from a portion of this pamphlet, for we have not seen the whole of it, that we collate the following facts.

The soil of Flottbeck is a mixture of sand and clay. Its original depth of krume (mould) was only 3 inches; the surface was uneven, and the soil wet, water standing for a long time, and manure ineffectual on account of the consequent low temperature.—Fields could not be sown, owing to quagmires, often till June.

The winter crops were full of tares and perennial rooted weeds; summer crops abounded in wind radish and mustard, the clover with wild chamomile, sorrel, &c., and the fields with dog's grass and other noxious plants. How many of our farms now forms a counterpart to this description of Flottbeck?

The means of improving which the baron instituted to raise the condition, and increase the fertility of this farm, consisted principally in,

1. Levelling the surface, and thorough drainage.

2. Deepening the krume, or soil, at least one inch a year, till he had gained a depth of 14 inches—this depth being requisite, in his opinion, for the roots of plants to penetrate, and as a reservoir for moisture, to supply the crop in time of dry weather. To obtain this depth, trench ploughing (*rayolt*) was resorted to when necessary.

3. Increasing the fertility with the increasing depth of the soil, by ploughing in green crops, and by husbanding and judiciously applying manures—the latter applied to the potato and rape crops, and before it had become exhausted by fermentation.

4. Throwing the land into one-bout ridges in autumn (it being generally flat and rather stiff) and cleaning the intermediate furrows with a double mould-board plough. This operation enriched the soil by atmospheric influence, broke down its stubbornness, and laid it dry, so that the spring operations could be commenced two or three weeks earlier than formerly.

5. Thorough pulverization preparatory to putting in seeds, and giving these only a superficial covering of earth.

6. Graduating, by a scale which the Baron's long observation and numerous experiments had enabled him to contrive, the manure to be applied, to the precise demands of the soil and crop—thus receiving the whole benefit which it was capable of imparting, without loss by excess.

7. A judicious rotation—in which green crops often intervened. The rotation was one of six years, as the clover, which he observes forms the basis of agriculture, cannot return oftener. The intermediate crops were wheat, oats, mixed fodder, barley, rye, potatoes, vetches, rape, &c., the climate of Germany not admitting of the culture of Indian corn.

In 1829, Flottbeck exhibited a far different appearance from what it did in 1813. All the fields showed a level surface—the krume or mould had every where a depth of 14 inches. The fields rendered dry by ditches, and under water carried off by 27 under drains—no noxious plants infesting the ground, save the dog's grass when the clover happened to be frozen out—and the produce so much increased, as that the same area which, in 1813, would yield only 14 bushels rye, in 1829, was found to produce 24 bushels of wheat.

We think there is much in Baron Von Voght's practice that commends itself to the notice of our farmers. The means which he employed are within our reach, and the advantages of using them manifest. The climate of Germany is not very dissimilar to ours, save that ours is rather the most mild. That the readers of the Cultivator may understand the principles upon which the improvements at Flottbeck were based, we subjoin them in the Baron's own words.

"The few general principles adopted here, with all kinds of produce, are the fruit of thirteen years' experience, and several thousand experiments.

"1. The soil must have 11.280 to 14.100 inches of krume, in order to admit of the roots penetrating into the ground; that in wet weather, the water which in a flat soil might drown the crops, may be absorbed, and formed in the deep into a reservoir, from which the extremities of the roots may imbibe a nourishing moisture, impregnated with carbonic gas, which it draws from the manure fermenting in the earth.*

"The krume must have a depth of 14.100 inches, in order that the exhausted surface, being buried at a greater depth, may reimbibe the lost moisture.

"This I obtained by having the land ploughed in autumn, at a depth of about 5.640 to 7.520 inches, then having it finely harrowed, and finally rayolt it with two ploughs, one behind the other, (the last with four animals;) this requires, of course, swing ploughs, as it is absolutely necessary to plough before rayoled.

"The latter operation is usually performed by oxen.

"2. In autumn, all ditches must be opened, and all the drains examined, so that the water may not be stopped in any place.

"3. All rayolt land must be laid in high furrows, by means of ploughing, always two furrows together, after the rayoled and furrowing, so as to make a water furrow at every 16.920 inches, which is deepened and cleaned by means of double struckbutt, (boards fixed to the plough;) with a clayey soil: this operation is *indispensable*.

"The advantage of this mode of treatment is, that it keeps the soil dry, and renders it capable of being cultivated three weeks sooner than other shallow land; that it avoids stiffness, and, on the contrary, the high ridges being frozen through in winter, are found very mellow in the spring. I cannot deny that in autumn this requires four kinds of ploughs, (the two last of which may certainly be considered as only half kinds of ploughs,) instead of one kind generally used on large farms. Moreover this depth of mould cannot be obtained in less than ten years, when, at the same time, the disadvantage of an inferior sub-soil can be repaired by manure, which will add about one inch of mould a year—a method quite impossible on large farms, and on small ones, attainable only by a proprietor, and never by a farmer.

"These high furrows are separated in spring with the four horse split plough; if the land is quite clean, it may, after being harrowed in the manner which will be mentioned hereafter, be immediately sown; but if it is not, it is hooked crossways.

"4. All the land which is not rayolt,—because there remains from the preceding harvest too much manure on the surface, which, *if the next crop should want it*, must not be removed too far, is, if it bears no manure crop, ploughed in autumn, first shallow, then deep, and lastly laid in high furrows. In spring, in which there is as little ploughing as possible, it is, after the splitting, according to the necessity of the crop and soil, first harrowed, and then hooked crossways, or only harrowed in the manner prescribed.

"5. It is a principal maxim to sow a green crop for ploughing in, in the rape seed stubble, as well as in the corn stubble, where no clover has been sown. In August, I use for this purpose rape seed; in the beginning of September, turnips; from the middle of September to the middle of October, rye; then there is but one ploughing in autumn, a method which I recommend, on large farms.

"The manure crop is in the spring shallowly rayolt in, and is equal in its effects to 3.914 to 5.811 loads of manure per acre.

"6. One observation which leads to the most important results, was the certain conviction, that it is the vital power of plants, which by the incomprehensible faculty of decomposition and assimilation, by means of their leaves and stalks, constantly imbibe an incredible quantity of substances, in the shape of gases and manures, and convert them into their own elements, rejecting what they do not want, changing what they have received into a new body, and so continuing till they have formed their blossoms; that the root, which till then keeps growing and oozing out moisture, only begins when its growth is perfected, powerfully to decompose that which surrounds it, and alone supports the fruit, whilst the leaves and stalks are fading; that the vital point of the plant has its seat exactly in the centre of the germ, from which it forces the root into the earth and the stalk upwards; that every thing depends, in the first growth of the plant, on keeping this point in health and activity; that this should be done in sowing.

"1. When the surface is as much as possible pulverized, in order that the seed-corn or potato shoot be surrounded by, or rather laid on earth finely divided, in which the fibres of the root may quickly shoot, and where air, moisture and warmth may operate with facility.

"2. When the shoot, laying on such a pulverized surface, being covered only a couple of lines, in order that light, air, warmth, dew, and other atmospheric moistures, may immediately excite the vitality in this point, and thereby promote the development of the germ and procure nourishment to the first leaf.

"I refer with regard to this, especially to the specimens of dried plants kept ready for the inspection of the visitors, which so

* Thaer mentions the following proportion of the value of the soil, with a flat and deep mould. "If," says he, "the soil, with a mould of 3 inches, is worth 38, that possessed of 5 inches of mould will be worth 50; that of 8, 62; and that of 11, 74;" and this entirely agrees with my experience at Flottbeck. Should we then hesitate to spend a few years, and some manure, thus permanently to enhance the value of our field?

strikingly show what difference there is in the vital germ lying on the surface, where roots and leaves immediately, numerously and powerfully shoot from one point, and the weakened vital germ, which, lying at a depth of 1.680 inches, shoots forth few roots, but a white thin tube, which rises as far as the surface, where the knot is formed, whence the weakened germ pushes forth a single and sickly plant.

"The result of this observation was, that we took every possible pains to give to the surface a depth of from 1.880 to 2.820 inches, the necessary state of pulverization, to divide the thickly sown seed equally upon it, and to give it as thin a covering of the pulverized soil as possible. But for this we were entirely without implements.

"The grubber, indeed, gave looseness to the surface, but did not destroy the small clods. The roller pressed the soil too firmly, and if it happened to rain, a fresh process became necessary. The usual harrow, with teeth 6.580 inchesa part, drew, even in a ground previously harrowed, lines in which the seed sown by the best sower would fall, and then stand too thickly, while a surface of 2.820 inches was left between these lines, which contained few plants, but became a nursery for weeds.

"Then it occurred to us, (after the grubbing and usual harrowing,) to pass with the iron Mecklenburgh harrow reversed, the upper side of it being flat upon the surface, till all the small clods were pressed into a powder; then I had harrows made, the teeth of which are only from 1.410 to 1.880 inches apart, and in the Flemish fashion, placed in a slanting angle. With these we passed sharply over this finely pressed soil, with the horse fastened in the middle and afterwards in one corner, after which we sowed. The corn came to lie in lines 1.410 apart, and was harrowed in crossways, with the *drag* teeth of the close harrow,* and by this means the seed was but slightly covered, and not a grain displaced.

"By this mode of cultivation it was found that every germ immediately shot forth strong roots and several stems at once; and an experience of several years has shown an increase of produce of from 20 to 30 per cent, occasioned by it, as we continued to cultivate a peice of ground next to it in the usual manner.

"7. I must further mention as the last, but not less important principle and cause of success, that each of the manured fields has been brought to that point of fertility in which it can yield the greatest produce; so that with less manure, it would not yield its full produce, and more manure would cause the crops to lie down, even if the year were not wet. The difficulty of being able to fix this point, for every field and kind of crop with certainty, was removed by the now perfected geometrical method, by which, with the help of a scale formed on twenty years' experience, the degree of productiveness may be marked, in which the field has been left in the last crop; i. e. seldom below 100 degrees, which denotes a field capable of yielding 24.02 bushels of wheat per acre, and below which it is not advisable to let a field sink."

A FEW DAYS AT HOLKHAM.

Holkham is the residence of Mr. Coke, celebrated as one of the first agriculturists of Great Britain and among the most successful breeders of Devon cattle and South Down sheep. The editor of the British Farmers' Magazine, the Rev. Mr. Berry, himself a distinguished breeder, paid a visit to this distinguished man in 1833, and from his memoranda of that visit, we have extracted the following facts, for the benefit of the readers of the Cultivator.

Mr. Coke's estate, which is very extensive, consists of a hungry sandy loam, or light gravel of the same character, with occasional interruptions of small patches of bog which with us would be called swamps. When Mr. Coke came into possession, some of these lands let at 1*s*. per acre, and subsequently at 3*s*. This same land now yields, in consequence of the superior management which has been bestowed upon it, from 70 to 80 bushels of barley, and 34 of wheat per acre.

Mr. Coke prefers the Devon cattle, as being best adapted to his light soil, and he has improved their quality in an eminent degree, by careful attention to breeding. The dairy of Devon cows is highly productive; each cow, no matter what her other excellencies, being rejected, which proves a bad milker.

* With the teeth slanting forward. They are called *drags* when the teeth slant backwards.

Mr. Coke's flock were for many years the South Downs, which he brought to a great degree of excellence, but he had recently improved his flock by crossing with the Hampshire, a more hardy breed. No breed in the island, says our Rev. narrator, now equals in profit, that of Holkham. By this cross he lost nothing in early maturity, while he gained in the constitution of his flock; increased the lean meat of the animal, a desideratum; and so improved the quality of the wool, as to render it the most valuable in the island. His shearlings of this improved flock, sold, on an average, wool and carcase, at £2 10 each, ($11.)—The fault of the old South Downs, like the Leicesters, was, that they had a tendency to run fat, and to want, in both fat and lean condition, *lean meat*, an important consideration there, as it should be here, in fine table mutton. It is an important advantage, too, which the Devon and Scotch cattle possess over the improved short horns, that the fat and lean of their beef, are better interlarded, and the meat more delicate, and consequently worth more in the market, than the beef of the latter. The desire in England, both in beef and mutton, is not to obtain the greatest quantity of fat meat, but rather, if we may use the term, the greatest quntity of *fat lean* meat. The advantages particularly resulting from Mr. Coke's cross of the Hampshire upon the South Down sheep, are stated to be, the possession of more *useful* frame—(a description comprehending much that is highly important)—a superior quantity and quality of wool and a greater product of sufficiently lean meat per acre, without a sacrifice of the early maturity of the South Down breed. A lot of the improved sheep cut one pound and a quarter each more wool, and of a better quality, than a like number of pure South Downs. Of the Hampshire South Downs here described, a lot has been imported by Mr. S. Hawes, our friend and neighbor.

Mr. Coke had growing 430 acres of Swedish turnip and mangold wurtzel, for winter feed of his extensive stock. The Swedes are sliced for the use of sheep, in a superior machine, at the rate of two bushels per minute. Under this management, 40 acres of turnips held 400 sheep three months.

On one of Mr. C.'s estates there was, a few years ago, a bog of 50 acres, impassable, in which a man was lost in attempting to cross it. It has been reclaimed, and is now a beautiful water meadow, worth three pounds, ($13 to $14,) per acre per annum rent. The fifty acres kept more than ten sheep per acre, 20 bullocks and ten horses. This affords a fair demonstration of the utility of draining and reclaiming swamps.

The writer commends Mr. Coke's management of a naturally bad soil for wheat. This crop is drilled in, on a clover lay, manured with rape dust, drilled in. The drills are nine inches apart. One machine drills eight acres per day, and the quantity of seed varies from three and a half to four, and even five bushels per acre. An essential part of the management is the rolling, which is effectually performed by heavy iron rollers.

The effect of Mr. Coke's management is illustrated by the example at Elmham Park. In 1817, he commenced improving this property, by means of draining, clearing ditches and top-dressing with the soil taken from them. In these labors, a sum of £510 15*s*. was expended, by means of which the annual value of the estate had increased from 1817 to 1827, to the amount of £500, and a progressive increase of value has, since the last named year, regularly continued.

CULTURE OF THE MULBERRY.

It seems to be a matter well established, that at least the white mulberry will do well in our state. We wish we could affirm as much of the morus multicaulis, but our experience compels us to say, that its success in the northern section of the state, is at least doubtful. The next question to be solved is, can the silk business be rendered profitable? That it can, in families who have females and children, who will gather the leaves and take care of the worms, we have no manner of doubt. The last Farmers' Register contains an interesting letter upon the subject of silk culture, translated from the French, which the restricted limits of a monthly sheet prevents our publishing in detail, as it does many other articles of interest. It is written by M. Carrier, of Aveyron, into which department the silk business has been recently introduced, to M. Bonafous, director of the royal garden at Turin, giving an account, among other things, of the product and profits of his silk business in 1833. This is stated in the following extract:—

"I will now show you," says the writer, "the account of the sale of my silk of 1833. I shall take care to subtract the expenses, and you may see the clear profit.

29 1-5 kilograms white silk, at 63 francs the kilogram,		1,830f. 60c.
2 11-12 inferior silk, at 18 fr. the kilogram,		44 95
		1,884f. 55c.
Deduct for portage,		16 00
		1,868f. 55c.
Value of the different remains, coming from the remains of the filatures used at my house,		115 00
Sum realized,		1,983f. 55c.
For the expense of management,	171f. 75c.	
For the filature, reeling,	263 85	
		435 60
Profit,		1,548f. 95c.

"To appreciate the advantages of the cultivation of the mulberry, one must remember, that this sum 1,548 francs of profit, (after deducting all the expenses,) is the product of leaves furnished by trees which have occupied for eight years, on an average, a piece of ground, rather less than half a hectare, or at most two sétérées, a local measure."

The kilogram is two pounds two ounces and four grains, avoirdupois; the franc is 18¾ cents; the c. (centime) one hundredth part of a franc; the half hectare is about 1¼ acres. Hence, the gross product in silk, from one and a quarter acres in mulberries, was 69½ lbs., which sold for $350·25, or about $5 the pound, and after paying all expenses, afforded to the proprietor, a nett profit in one year, of about $290·40.

We quote again from M. Carrier's letter:—"The proprietor who wishes to occupy a plantation of mulberry trees, supposing he had already at his disposal a quantity equal to those which I stripped last spring, and in the same condition, that is, producing 160 quintals of leaves, at four francs the quintal. Well, this proprietor could have obtained from half a hectare (about 1¼ acres) of ground, with no other expense than that of cultivating the trees, a revenue of 640f., or 320f. for each *sétérée*, composed of 640 square fathoms.

"The person who would have bought this quantity of leaves to devote himself only to the raising of silk worms, would have had (as I did) 928 pounds of cocoons, and would have sold them at 1f. 50c. a pound, according to the course of that time: this sale would have produced, 1,392f. 00c.

Deduction of expenses, purchase of about 8 ounces of eggs, at 3f. the ounce,	24f. 00c.	
Expenses of all kinds for the management,	171 75	
Price of 160 quintals of leaves, at 4f.	640 00	
Rent of the room,	60 00	
		895 75
His part of the profits for 40 days attendance,		496 25
The filature who buys the cocoons, obtains a quantity of silk equal to mine, and sells it in the same manner,		1,868 55
He draws from the remains,		115 00
Total,		1,983f. 55c.
It is necessary to deduct from this sum, as the cost of 928 pounds of cocoons, at 1f. 50c.	1,392f. 00c.	
Expenses of the filature,	263 85	
		1,655 85
Clear gain of the winder,		327f. 70c.

"The laborer, with a family, takes for his share the remains of this filature, employs his wife and children to prepare and wind the low and different qualities of silk, which are in much request and readily sold. These products can be valued, after having received all the suitable work, at 165f.

Deduction for the purchase of the first materials,	50f.	
Hand work, although gained by the family,	30	
		80
Profit, without including his work, already paid,		85f.

"A simple recapitulation will make the result better understood than this division of the labor, which division certainly agrees, in many cases, with the taste or situation of persons who neither wish, nor are able, to undertake all parts of the business.

The land owner, who sells 160 quintals of leaves, at 4f. receives,	640f. 00c.
The person who buys them, and manages the raising, gains,	496 25
The winder, who takes charge of the cocoons, winds them, and receives for his labor,	337 70
The laborer who works up the remains, does the labor for 30f. and gains besides,	85 00
Sum equal to the total profit which I have made by the union of all these operations,	1,548f. 95c.

"The calculations which I have just presented, speak loudly enough without my adding the least observation to make the evidence more sure; I will only say, one of the great benefits of this direction of industry is to make a considerable mass of work for all classes of society, and for all ages."

A plantation of mulberries may soon be obtained, by procuring the young trees from the nurseries, or by sowing the seed. An ounce of seed will produce from two to three thousand plants. Sow early in May, upon a bed of good earth, well pulverized, in drills a foot apart: cover with half an inch of fine mould, compress the surface slightly with a hoe, that the soil may better retain moisture and come in contact with the seeds, and if the weather is dry, water occasionally, to aid germination, and to enable the young roots to get firm hold of the earth: keep the bed free from weeds, and after one or two years, prune out the plants in nursery rows, three feet apart, and in two years more they will be fit to set out where they are to remain permanently.

ITALIAN RYE GRASS.

The following communication relates to a grass of great promise, if it will withstand our winters. The French and Scotch commend it as highly as the Germans, though it is of but recent introduction among them; and our personal observation tallies with the high character which all give it. We sowed some in Sept. 1833;—it promised remarkably well—but the winter killed it. We supplied some friends with seed, which was sown last season; it is of course not yet known what effect the winter has had upon it. The State Society have directed a quantity of seed to be provided for distribution, with the view of giving it a fair trial among us.

Description and culture of the Italian Lolch.

(Translated from the German.)

The Italian Loich *(Lolium perenne italicum aristatum)* yields the most abundant fodder of any kind of grass that is known. Its extraordinary yield has, for several years past, extended the culture of it, in one part of Germany and Switzerland, very rapidly, and also in France some agriculturists have made experiments with it which were completely successful.

If sown in October,* its growth being very rapid, before winter sets in, it makes a thick sward equal to that on old grass land, and the first crop of hay is double to that of a common meadow. The Italian Lolch is entirely different from the English Ray grass, which latter serves only as a means of making a sward on the land for pasturage, does not grow over 2½ feet in height and gives but two ordinary crops in one season, while the former commonly grows to a height of 4 feet, on a soil more moist than dry, and gives always four abundant crops in one season, and frequently more.

The haulm is covered with leaves of a light green colour. The most proper time to sow it, is in the fall. After a crop of grain is taken off from the land, turn the stubble over, harrow it and sow the seed. And frequently it grows large enough to cut before cold weather; but it is advisable not to cut it, because it will take better root if left. Such a meadow, shows itself before winter thick and well overgrown, like an old one, and the first year's crop was, by haying time a full one. Sowing it in the spring, or month of April, requires moist weather and more seed. The plant is lasting. And at the end of the seventh or eighth year, these meadows are as vigorous as they were in the first year. If, however, light places are to

* *Note by the translator.*—The winter in those parts of Germany where the lolch is cultivated, does not set in so early as in this section of country.

be seen, they may be renovated by letting the seed get ripe, and shell out, on such places, or they may be sown with new seed.—A soil more moist than dry is generally best adapted for this plant, but it has been tried on high lands and on the Alps, where it likewise perfectly throve.

After grain or potatoes (or other hoed crop,) a shallow tillage is sufficient. After clover or lucerne a deeper tillage is necessary, but on old meadow it is advantageous to cultivate first a crop of potatoes or grain, and after these being harvested in the fall, sow the Lolch. These meadows are treated like other meadows: every three years they receive a manuring—top-dressing—and the first one is incorporated with the soil at the time of sowing the seed.—The ground ought to be well harrowed. The seed is sown broad cast—about 40 pounds to the acre. If sown in the spring, 8 to 10 lbs. more are necessary, and one chooses as much as possible, a wet time to sow it. After the seed is sown, harrowing may be dispensed with, but the ground ought to be rolled with a heavy roller. This operation has the double advantage to press the seed into the ground, and smooth the land for mowing.

H. D. GROVE.

Hosick, Rensselaer Co. N. Y., Jan. 31, 1835.

Receipt for the cure of American blight, or mealy aphis, on apple trees.—"Dilute three-quarters of an ounce measure of sulphuric acid with 7½ ounces of water, made slowly." This liquor to be applied all over the bark of the stem and branches, by means of rag-mops, taking care not to let it touch the young shoots, which it would kill, or the operator's clothes, which it will injure. This fluid kills every insect it touches.—*I. Couch, in Gardener's Mag.*

Train oil, applied with a brush, or soot and oil, laid on in the same way, or even clay and water applied like a coat of paint, are all used for destroying this destructive insect. Nor is there occasion for applying the remedy to the entire bark, as the insect is found almost entirely at the separation of the branches, or near the surface of the ground, where alone the application need be made.

How to preserve pigs in good health and in good appetite during the period of their fattening.—Mix with their food a few gall nuts, bruized with charcoal. We are unable to account how this operates so beneficially on the economy of the health of these animals, but we are wishful to make it public, as we have experienced the result to be decidedly good.—*British Farmers' Magazine.*

It is known to every farmer, that hogs, when fattening in a close pen, are liable to lose their appetite, become sick and die. There are several preventives for this evil—as occasionally mixing a little sulphur with their food, giving them charcoal, rotten wood, or permitting them to root in a small yard appended to the pen.—Some of these precautions are necessary.

Hot Beds, we are aware are very little employed by farmers; yet many would employ them, we believe, if they were aware of their advantages, and knew how to construct and manage them.—The expense is trifling. They are employed to raise early salads, early cabbage plants and cucumbers, and to bring forward plants of other garden products, as tomatoes, egg plants, flowers, &c. and which may be transplanted into the open ground as soon as the season will permit. By means of hot beds, under ordinary management, salads may be had for the table in April and May, cucumbers in May and June, and cabbage and other plants in May, or earlier if desired. There is no specific rule for making a hot bed, yet we will give such directions as will enable those who wish, to make an experiment of their use.

The first thing is to obtain, say three sashes, which are usually about 6 feet long by 3 feet four inches broad. They consist of a stout frame made of plank, with five longitudinals astragals or strips, for the glass to rest upon without any cross pieces, so that each sash will contain six strips of glass, six inches broad, which lap slightly, to throw off the rain. These are the most common form, though the size is not material. Whatever may be the size of the sash, a frame, generally made of plank, must be provided to fit two or three of them, with strips running from front to rear, for the sash to slide upon. The frame may be 14 to 18 inches on the back side, and about 7 inches less in front, so as to give the glass, when on it, a slope nearly at right angles with the rays of the meridian sun. Having thus a frame and sashes, lay down the former in the place designed for the hot bed, mark out a space extending round the frame 8 to 12 inches, and take out the earth from the enclosed space to the depth of 12 to 15 inches deep, and fill this with unfermented horse dung, separated and equally distributed with a fork, and rai e the dung at least 18 inches above the surface of the ground. Put on to this the frame and the glass, and in a short time a rapid fermentation will take place. In two or three days, the dung may be covered with four to six inches of good earth, and if cucumbers are intended to be planted, a hole should be made in the manure under each sash of four or six inches, for the hills, that the depth of earth may be ten or twelve inches. Whenever the violence of the heat has sufficiently subsided, which will be in two or three days more, seeds may be planted, which will appear above ground in 24 to 48 hours. Care must be taken to raise the upper ends of the sash occasionally, to let off the heated air, and to draw them partially down, after the plants are up, when the weather is mild, and to cover the glass with a mat when it is cold, and during a merid an sunshine, to protect the plants from frost and sun. The middle of March or first of April is early enough to prepare a hot bed for plants designed to be transplanted into the open ground.

THE NEW THEORY.

We endeavored, in a late number, to show the fallacy of the new theory, which teaches, that the matter thrown off in the soil by a species of p'ants is poisonous to the same species, and that this is the reason why a rotation of farm crops is rendered necessary in good husbandry. We instanced the fact, in disproof of its correctness, that in our western counties, wheat was frequently grown fifteen or twenty successive years without material diminution of crop. We have since been assured of the same fact in regard to oats, in the south part of Erie and Chautauque counties. As a further corroboration of our position being correct, that the excrementitious matter of plants *is not* prejudicial to the like species, we state, from a letter before us, from a highly respectable correspondent, that in the valley of the Sciota, near the Ohio river, "many fields have been cultivated in corn for 20 or 30 years in succession." The soil of that valley is a rich alluvial deposite, possessing like fertilizing properties to the depth of 15 or 20 feet, and containing so inexhaustible a stock of the specific food of maize, that the supply has not been sensibly impaired by 20 or 30 successive crops of that grain.

The article which we publish to-day, from Professor Low, on manures, is graduated for the husbandry of North Britian, where the climate is more humid and cold than with us, and where Indian corn will not ripen. Hence the remarks relative to partially fermenting manures, previously to their being applied to the soil, lose their force in our practice. The necessity there arises from the fact, that decomposition will not take place in the soil in time to nourish the crops which they raise, on account of the cool climate. Here the fact is different, as is also the main crop to which fermented manure is principally applied. Manure upon which fermentation has not begun, will, with us, if spread broad cast, and well ploughed in while moist, invariably decompose, in a warm corn soil, in time for the wants of a corn crop. The heat of climate, too, and the present state of our husbandry, render unnecessary, or too expensive, some of the more tedious processes which are resorted to in Europe for preparing manure.

Madder.—We are authorized to say, that any gentleman disposed to embark in the culture of Madder, can be supplied with some thirty bushels of roots, in Bridgewater, Oneida county. We refer to Russell Bronson.

CORRESPONDENCE.

Canaan Centre, Feb. 14th, 1835.

Sir—In the February number of the Cultivator, I noticed an extract on wintering sheep, to which I would wish to call the attention of wool growers, and to the truth and importance of which, I can fully attest. I have long believed that the principal cause of any great mortality among sheep, arose from want of sufficient feed, and proper care. It is undoubtedly very wrong to let sheep ramble over the fields after the nutriment of the grass on which they feed is materially injured by severe frosts. Sheds, for the shelter of sheep in winter are all important, as exposure to storms is very injurious to them, and I am of opinion, shelters built on the highest part of our pastures for flocks to flee to, in severe storms in summer, would be of great service, as they undoubtedly frequently contract diseases from exposure to long and cold rains, from which they never recover. During such exposure they contract violent colds, which finally become permanently seated on their lungs, and is, in my opinion, the cause of the loss of many sheep. This may be evident to all observing persons, (as they will notice that sheep after such rains are many of them troubled with the snuffles,) and shows the necessity of being very particular to house them during cold nights, and storms, immediately after shearing; the contrast being so great after losing their clothing, that a trifling exposure may prove fatal; and this precaution is more necessary with fine flocks than with coarse, as they are naturally more delicate, and less able to endure great changes. Water, I also consider very important for sheep in winter, and when it is practicable, should be brought into their yards, so as to be convenient to them at all times. I have four flocks that drink at one trough, and I observe, that when they are feeding at the racks, the water trough will be thronged with sheep; some of them constantly leaving their hay for water, which satisfies me that convenient access to water, adds to their comfort, and consequently to the improvement of their condition.

The above remarks, if you think them worth it, you are at liberty to publish, but my principal object in this communication is, to give to the public, the result of my experience in rearing lambs; and which I am sensible will be lost to all those that neglect their flocks, and to most of those that do not attend to them personally; as care and prompt attention to all their wants is the great secret. To insure the life and health of every lamb, bearing ewes should all be in good condition; then lambs are as likely to live as the young of other animals; but if the ewes are feeble, they will have no milk to support their lambs if they should chance to be strong and healthy. Feeble sheep are often exhausted in bringing forth their young, and consequently will take no notice of them, and strong as well as feeble ones, sometimes need help at such times, which should be done with great caution; they should never be helped except when their pains are on, and when they are trying to help themselves; and the lamb should not be taken entirely away, but left so that the sheep will have to make a little exertion after she is left, otherwise if the sheep is at all wild, she will from fear of the person helping her, make her escape and take no notice of her lamb. I am in the habit of helping every sheep in that situation which I can come at, as it undoubtedly saves them much pain and exertion. Sheep should invariably be housed nights and stormy weather during the time of dropping lambs, and I have been in the habit of housing mine nights, till I wash them, to secure them from the ravages of the foxes. Sheep should have all the facilities for procuring fresh grass that is possible to give them, before and after the time of dropping their lambs, which adds greatly to the quantity as well as quality of their milk; but turning them out on the fields without close attention, is often the cause of losing lambs, as when they are dropt on the cold ground they often become chilled, so as to be unable to get up, and in a short time will be past recovery. When I have neglected mine in that way, and found one that has any life left, I take it immediately to a warm room, and put all but its head into a pail of warm water, and then rub it with a dry cloth till it begins to struggle for life; and I have never failed of restoring such lambs the use of their limbs, though I have found them so far gone as to be unable for some time to observe any expansion of the lungs; with their limbs perfectly stiff, and their jaws almost immovably fixed. With such attention, you may have them running about in one hour, and to all appearance as strong as if nothing had happened to them; though they require a warmer atmosphere for some time than if they had not been chilled. Care should be taken not to feed them with milk, till they are sufficiently recovered, as there is danger of strangling them by the milk entering their lungs. I have had them injured in that way, which though they lived, would be a long time recovering from the effects of such treatment. Lambs will live twenty-four hours and even longer without any nourishment, and should not as a general rule be fed, till by their actions, you discover they are seeking food, and then they will in most cases drink without much trouble. Many lambs that it becomes necessary to feed, are lost for the want of sufficient food, through fear of over-feeding; but my experience teaches, that they should have all they will drink, and I let their own appetites govern. I have often had lambs of twenty-four hours old drink a pint of milk at once, and when they drink the most, feel the most assured of success in raising them. There will always in a large flock, be some that will not get milk enough. I am in the habit of making all such ones drink that I can, by taking a basin of milk and giving them my thumb to suck, so as to have a full supply once or twice a day, till the milk of the sheep increases by the growth of feed. The milk of such sheep as lose their lambs should not be lost, but kept for the support of those that have not a full supply; such sheep I manage to make own the lambs of others, so that I often have lambs that draw their living from two sheep through the season; this I do when I find the dead lamb before it is dry, by rubbing it over the lamb I wish to make the sheep own, and in that way deceive her, and make her think it hers. Where that will not answer, I skin the dead one, and sew the skin on to the live one, which generally answers the desired end; but in case of failure in both the above experiments, I tie up the sheep and fetter her in a small pen with the lamb and the other sheep, and hold her for the lamb to suck several times in a day, till she will own it. As a proof of the truth of what I have asserted, that care and prompt attention are the great secret of success, I will relate my success last year, which I am far from attributing to any good luck I have over others, as I believe that prosperity or adversity, in all such cases is the result of good or bad management, of care or neglect. Of one hundred and thirty-one lambs I had dropt last spring, I raised one hundred and twenty-six.

A few words as to future management and I have done. Lambs should always be left at home when sheep are to be washed, as they are saved much fatigue where the distance is considerable, and many accidents incident to a pen, crowded as they are at such times; besides the advantage of having the sheep go directly home without any trouble, after washing. Ticks are very injurious to sheep of all ages, but more so to lambs, as they have the trouble of them in summer; the ticks leaving the old ones for a more secure retreat on the lambs. To destroy ticks, I take 10 or 12 lbs. of tobacco stalks for one hundred lambs, (which I buy of the tobacconist for as many pence,) and at the time I shear sheep, put it into a tub sufficiently large to dip them in, and fill it with water, and let it soak six or eight days, when I get up my lambs, mark, dock, and alter them, then dip them into the tobacco juice; this not only kills the ticks, but is serviceable to the wounds made by docking and altering, and is all the remedy I ever apply to such wounds. Dipping the lambs in that way, two successive years, will destroy all the ticks in the flock.

The method of docking lambs by taking hold of the tail and cutting it off while the animal is struggling to escape, is very cruel; as it leaves the bone longer than the skin, which not only makes it very sore, but induces the flies to work at it, which endangers the life of the lamb. My method is, to have a man take up the lamb, and place the tail bottom upwards on the square edge of a block; then with a large knife, I crowd the skin which is loose up to the body, and strike the knife with a hammer, which leaves the skin longer than the bone, and consequently it closes together over the bone, and the wound heals in a short time. I alter lambs by cutting the pouch off close to the body, which leaves nothing to impede the shears, more than cording, and is attended with less trouble. Lambs that have much wool on them, should be sheared about the pouch, to prevent the blood and wool from becoming so hard as to obstruct the discharge of matter from the wound. Lambs should be weaned the last of August, and have a good chance for feed till November; then oats in the bundle two or three months, as their condition may require. I might write much more which would be useful to wool growers who are inexperienced, but I am already admonished that the length of this, may preclude its admission into your valuable paper.

J. Buel. DANIEL S. CURTIS.

LARGE SHEEP.

Attracted a few days since, by a notice in one of the daily papers, of the exhibition of some fat sheep in the rear of Bement's Hotel, I was much gratified to find eight very superior wethers of the Leicester with a cross of the Cotswold breed. They were bred and fattened by Mr. Thomas Dunn, of this city, on his farm in the town of Guilderland, fourteen miles west of Albany.

They were purchased by Messrs. Kirkpatrick & Co., butchers in the Centre Market, at fifteen dollars per head, who deserve great credit for their exertions to procure superior meats for their stalls.

The carcases were exhibited on the 20th ult., and excited the admiration of a numerous body of spectators, for their great size and general appearance: and if their mouths did not water for a cut from one of their saddles, accompanied with a little currant jelly, then I *must say*, they were destitute of *good taste.*

In addition to the mutton, were exhibited at the same stall, the beef of a very superior steer, and a calf six weeks old.

Their nett weight averaged, when dressed, 35 lbs. per quarter; or 140 lbs. per animal. Wool on an average, say 8 lbs. It must be remarked, however, that these were the *refuse* lambs, which he declined to sell for breeders. The pelts sold for $2·50 each.

They were fed by Mr. Kirby, Mr. Dunn's shepherd, since last October, on corn and oats.

To the late Christopher Dunn, Esq. we are indebted for this very valuable race of sheep. About twenty-five years ago he procured some ewes and a buck from a Mr. Lax of Long Island, (who smuggled some of the Bakewell breed over from England,) and commenced the foundation of his flock. During the late war, some very superior Leicester sheep, destined for Canada, were captured by one of our privateers, and sent into New-York and there sold at auction. Our zealous and spirited citizen, repaired thence and procured one of the bucks, at a very high figure. Since then additions of superior bucks, by importations and selections from other flocks in this country, have been made, and none with more advantage, than the celebrated Dishly buck, owned by Charles H. Hall, Esq. of Harlaem. From this buck some of his finest specimens have originated. But his last cross of the Cotswold, has given more size and strength of constitution, with at least one quarter more wool. His Cotswold buck was imported in 1832, and is, perhaps, the largest sheep in this country—weighing alive, at least 250 lbs.—and giving at one shearing 15½ lbs. of wool, 14 inches long!

Mr. Dunn's flock consists now of about 150 head, old and young, from which he supplies, in part, the great demand made every fall—selling his ewes from $12 to 15, and bucks from $30 to 50 each.

From the above stock has originated the flocks of Mr. Bullock of Bethlehem—Wilkinson, Duane and North, of Duanesburgh, &c.

I should be doing great injustice to Mr. H. Y. Webb, were I to omit to notice his well filled stalls of very superior beef and mutton. My attention was particularly attracted by three very superior wethers, two years old, bred and fattened on ruta-baga turnips, by S. Hawes. It was the first exhibition, in our market, of the Hampshire Downs, imported by Mr. H. about 3 years since. Their carcasses would nett about 124 lbs. each. The mutton of this breed is considered of very superior quality. B.

Elements of Practical Agriculture,

By David Low, Professor of Agriculture, &c.

DRAINING.

Principles to be ever kept in mind by the tillage-farmer are to keep his land dry, rich and clean. The first in the order of these principles, and an essential one to be regarded in cold and humid countries, is to keep the land dry.

While a certain portion of water is essential to vegetation, an excess of it may prove greatly injurious. In the colder countries an excess of water is one of the main causes of infertility, and a primary object of the husbandman there is to carry it away from the ground.

The water which falls from the atmosphere does not sink to an indefinite depth or to a great depth in the earth. It is easier retained at or near the surface where it falls, and whence it is evaporated, or it finds its way to a lower level, by channels upon the surface, or in chinks of rocks, or beds of gravel, sand, and other permeable substances beneath the surface.

The purpose in draining is, when water stagnates at or near the surface, or when, having penetrated to pervious substances below the surface, it is finding its way to a lower level, to confine it to a determinate channel, and to carry it away by some conveient outlet, in order that it may not overflow or saturate the soil.

The substances through which water finds its way with facility are the looser earths, sands, and gravels, the crevices of rocks, and beds of loose or decomposing stones: the substances which resist its progress are clays and the harder rocks.

When the soil rests on a retentive sub-soil, whether of clay or pervious rock, it forms a species of reservoir for water, absorbing and retaining it. The object of the drainer in such a case is to give egress to the water in fixed channels or drains. This is partly effected by the common ditches of the farm, partly by the open furrows of ridges already described; and, when these are insufficient, by cutting trenches in the hollows, or where best suited to effect the purpose. These trenches are either left open, or they are filled to a certain depth with small stones or other substances, through which the water may percolate; and then they are covered again with earth and soil, so that the plough may pass over them in tillage.

When water overspreads the surface, or is absorbed by the soil, and is unable to penetrate to the looser strata below, the carrying it away in channels is termed *surface-draining.* When it has already penetrated into the earth, and is contained in reservoirs there, or is finding its way to a lower level through permeable substances below the surface, the confining it to a fixed channel is generally termed *under-draining.* These two purposes of the drainer are constantly combined in practice, but yet they are in some degree distinct. It is the intercepting of water below the surface that constitutes the most difficult part of draining, and which requires the application of principles which it is not necessary to apply in the case of surface draining.

If we shall penetrate a little way into the looser portion of the earth, we shall generally find minute stratification, consisting of gravel, sand, or clay, of different degrees of density. These strata are frequently horizontal, frequently they follow nearly the inclination of the surface and frequently they are broken and irregular. Sometimes the stratum is very thin, as a few inches in thickness, and sometimes it is several feet thick: and sometimes the traces of stratification disappear, and we find only, to a great depth, a large mass of clay or other homogenous substances.

Fig. 1.

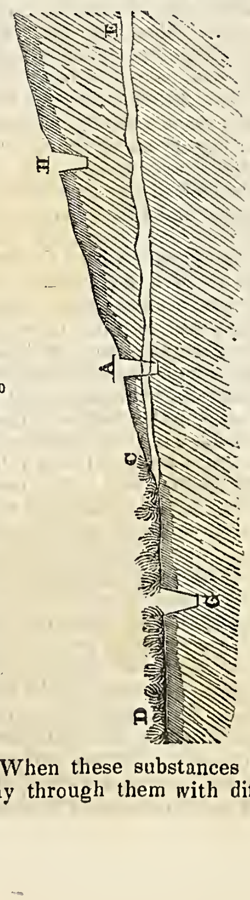
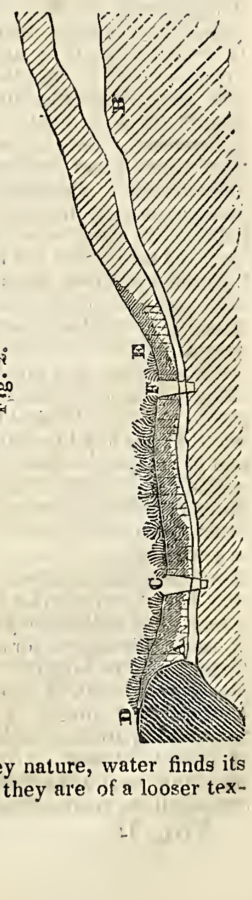


Fig. 2.



When these substances are of a clayey nature, water finds its way through them with difficulty; when they are of a looser texture, water percolates through them freely. These, accordingly, form the natural conduits or channels for the water which is below the surface, when finding its way from a higher to a lower level.

When any bed or stratum of this kind, in which water is percolating, crops out to the surface, the water which it contains will flow out and form a burst or spring, oozing over and saturating the ground, as in the foregoing figure 1, which represents a section of the ground, from C to D.

When water is, in like manner, percolating through one of these pervious strata, and meets any obstruction, as a rock or bed of clay at A, Fig. 2, it is stopped in its progress and, by the pressure of the water from a higher source, it is forced upwards, and thus saturates the superjacent soil, as from D to E, forming springs, or a general oozing.

In either of these cases, and they are the most frequent that occur in practice, the object of the drainer is to reach the water in its subterraneous channel before it shall arrive at the surface, and to carry it away in a drain.

By cutting a drain at A, Fig. 1, the water of the stratum of sand CE, is cut off before it reaches the surface at C, where it forms the swamp CD.

In like manner, in Fig. 2, by forming a drain at C or F, the water is cut off in its channel AB, and thus, in relieving the pressure from the higher source, by giving egress to the water through the drain, the cause of the wetness from E to D is removed.

In looking at the sloping surface of any tract of ground, as a field, in which there is an oozing or bursting out of water, we shall generally distinguish the line where the wetness begins to appear on the surface, extending over a considerable space, *x x x x x*, Fig. 3,

Fig. 3.

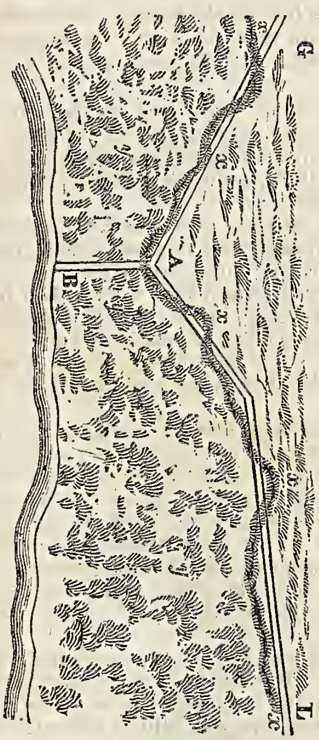
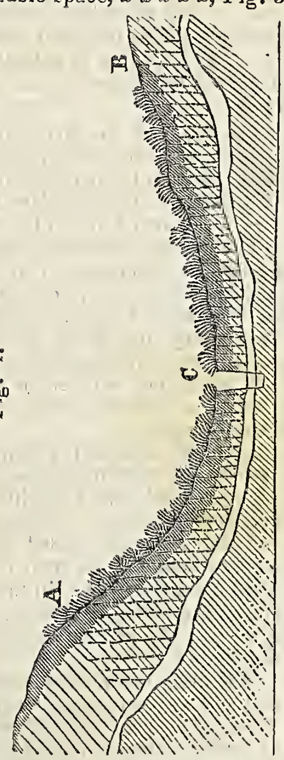


Fig. 4.



the effects appearing in the wetness of the ground farther down the slope, as *y y y*. The line where the wetness begins, and which is generally rendered perceptible by the change of color of the soil, the tendency to produce subaquatic plants, and other indications of wetness, marks for the most part nearly the course which the line of the drain should follow. By cutting a drain nearly in this line, as from G to A, and from L to A, sufficiently deep to reach the porous stratum in which the water percolates, we shall intercept it before it reaches the surface, and by carrying it away in some convenient outlet, AB, remove the cause of wetness.

This accordingly forms, in the greater number of cases, the rule adopted in practice for the laying out of drains upon the surface, the line is drawn nearly at or a little above, the line of wetness, or, to use the common expression, between the wet and the dry.

Should the line of drain be drawn too much below the line of wetness, as at G, Fig. 1, then the trench would fail to intercept the water; and further, if it were filled with earth, stones and other substances, in the way to be afterwards described, the whole, or a part, of the water would pass over it, and the injury be unremoved.

Again, should the line be too much above the line of wetness, as at H, the drain would fail to reach the channel of the water, and so would be useless.

It is for this reason that, in common practice, the rule is, to draw the line of the drain nearly between the wet and the dry, or a little above it, taking care to give it the necessary descent, and to form it of sufficient depth to reach the pervious bed or stratum in which the water is contained.

But as water may arrive at the surface in different ways, and the wetness be produced by different causes, so variations from this rule of lining out the drain may be required, and the judgment of the drainer is to be shown in adapting the course of his drain to the change of circumstances.

Sometimes, in a hollow piece of ground, feeders may reach the descent, as in Fig. 4; and the water may be forced upwards by the pressure from each side of the hollow, and thus form the swamp from A to B. It may not be necessary here to cut a trench on each side along the line of wetness at A and B; a single trench C, cut in the hollow, and giving egress to the water, may relieve the pressure and remove the swamp.

Sometimes upon a sloping surface, one pervious stratum, in which water percolates, may produce more than one line of springs, as B and A, in figure 5. Here a single drain cut at B will remove the cause of wetness at both swamps, without the necessity of the drain at A.

And, in practice, it is well to wait to mark the effect of a drain cut in the higher part of the slope to be drained, for these effects often extend further than might be anticipated, removing springs, bursts, or oozings, at a great distance.

Fig. 5.

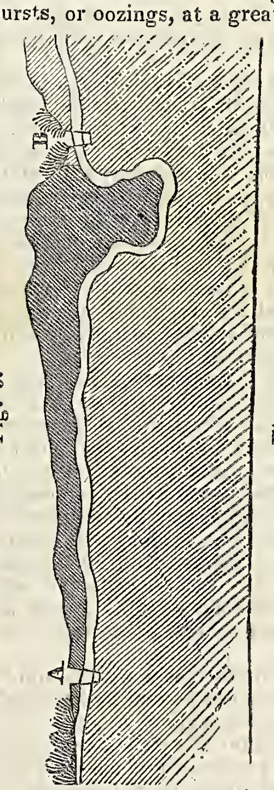
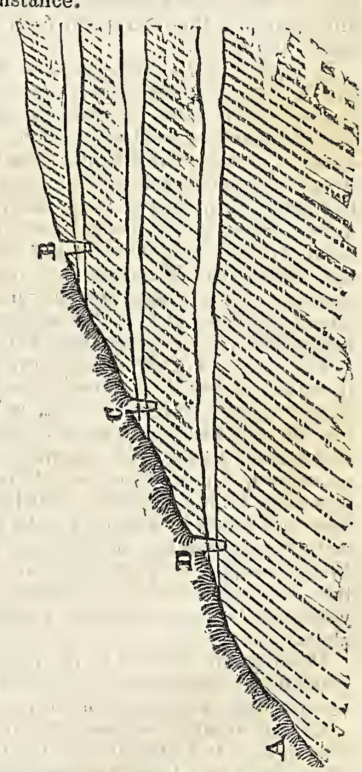


Fig. 6.



On the other hand, a single swamp, as from B to A, in the fig. 6, may be produced, and yet one drain at B may be insufficient to remove it. In this case, the water being brought to the surfaceb more than one channel, it is necessary to form several drains to reach the several beds in which the water is contained, as at B, C, and D.

These examples will show, that one rule, with respect to the laying out of drains, is not applicable to all cases, but that the drainer should adapt his remedy as much as possible to the cause of injury. One object, however, to be aimed at in all cases of underdraining, is to reach the bed, channel, or reservoir, in which the water is contained.

MANURES.

All substances which, when mixed with the matter of the soil tend to fertilize it, are, in common language, termed manures.

Manures may be composed of animal or vegetable substances; or they may consist of mineral matter; or they may be partly derived from mineral and partly from animal and vegetable substances. They may therefore be classed, according to their origin, into—

1. Animal and vegetable manures,
2. Mineral manures,
3. Mixed manures.

In describing this class of substances, it is not my design to treat of their chemical mode of action. This investigation forms one of the most interesting parts of the chemistry of agriculture; but it is not essential to that practical knowledge of the subject which will suffice for the common purposes of the farmer. The remarks to be made, therefore, on the mode of action of these bodies, will be of a very general nature.

1st. *Animal and vegetable manures.*—Chemical analysis shews us, that all plants, and all the products of plants, are resolvable into a small number of simple bodies, in various states of combination. These bodies are—carbon, hydrogen, oxygen, and, in smaller quantity, nitrogen or azote. These form the essential constituents of all vegetable substances. But there are likewise formed in plants, though in comparatively minute quantity, certain other bodies, consisting chiefly of the four earths, silica, alumine, lime, and magnesia, of the oxide of iron, and of the alkalies, soda and potassa, but chiefly the alkali potassa.

Now, all these bodies, or the elements of all these bodies, exist in animal and vegetable manures; for these being animal and vegetable substances are resolvable into carbon, hydrogen, oxygen, and nitrogen, with the intermixed earthy and other bodies, existing in the living plants.

In supplying, therefore, animal and vegetable substances to the soil in a decomposing state, we, in truth, supply the same substances which enter into the composition of the living plants.—The substances indeed exist in the dead matter of the manures, in states of combination different from those in which they exist in the living vegetable: but still they are present, and must be believed to supply the matter of nutrition which the plants in growing require. Science has made known to us the truth, that the living plants and the dead manures are resolvable into the same elementary substances; but experience has not the less taught the husbandman in every age, that all animal and vegetable substances, mixed with the matter of the soil, tended to fertilize it, by affording nourishment to the plants which it produced.

The simple bodies which form the substance of manures exist in various states of combination, and often in the solid state. Now, there is reason to believe, that, in order that these solid matters may be absorbed by the roots of the growing plants, they must be dissolved in water. The absorbing pores of the roots of plants are so minute, that they are only to be discovered by the microscope. The solid bodies, therefore, which find their way into these pores, may reasonably be supposed to be held in solution by that aqueous matter which enters into the roots of plants, and forms the sap. Water is apparently the medium by which all the matter of nutrition, in whatever form, is conveyed into the roots of plants, and without which, accordingly, vegetation is never known to take place.

Holding this opinion to be just, the substances which form vegetable and animal manures, before they can be rendered available, as nutriment to plants, must be rendered soluble in water.

Of the means which nature employs for this purpose, fermentation appears to be the chief. By this process, the elementary parts of the substance fermented assume new forms of combination, and become fitted to supply the matter of nutrition to plants in that form in which it can be received, by the pores of the roots. The fermentative process is completed after the substance to be used as a manure is mixed with the matter of the soil; but it is common also to cause it to undergo a certain degree of fermentation before it is mixed with the earth. This is the method of preparing this class of manures for use, which is employed in the practice of the farmer.

Animal matters decompose with facility when acted upon by moisture and the air, the greater proportion of their elementary parts making their escape in various forms of gaseous combination, and leaving the earths, alkalies, and carbonaceous matter, remaining.

When this decomposition takes place beneath the surface of the ground, these gaseous compounds, as well as the carbon, (which there is reason to believe assumes also the gaseous state by combining with oxygen,) may be supposed to be partially or wholly retained in the earth to afford the matter of nutrition to the plants.

Purely animal substances, therefore, which thus readily decompose, do not absolutely require fermentation before they are mixed with the soil. Yet even in the case of purely animal substances, certain beneficial consequences result from subjecting them to a previous state of fermentation. Thus the urine of animals, when applied in its recent state to the soil, is not found to act so beneficially as a manure, as when a certain degree of previous fermentation has been produced.

And there is another purpose promoted by causing even pure animal matter to undergo fermentation, and this is, that, being mixed with vegetable matter it promotes the more speedy decomposition of vegetable fibre.

Vegetable fibre is, under certain circumstances, a slowly decomposing substance. When vegetables are green and full of juices, they readily ferment; but when the stems are dried, as in the case of straw and other litter, they decompose with slowness, and the mixing them with animal matter hastens the putrefactive fermentation. This mixing of animal with vegetable matter is the process employed for preparing the greater part of the dung of the farm-yard.

The dung of the farm-yard is the produce of the hay, straw, turnips, and other substances used as forage or litter upon the farm. It is collected into one or more yards, and fresh litter and all other refuse being added to the mass, it gradually accumulates, until it is carried out to the fields for use.

The manner of feeding cattle in their houses and yards will be afterwards explained. It is sufficient with relation to the present subject, to observe, that the larger cattle may either be fed in stalls in close houses, or in yards in which they receive their food. When they are fed in close houses, their dung and soiled litter are carried to the heap in the yard, where it gradually accumulates, and when they are fed in the yards, then dung, in like manner, accumulates there, being in the mean time compressed by their treading upon it.

In the practice of the farm, to be afterwards especially described as suited to the circumstances of this country, the larger cattle of different kinds are brought home to their houses and respective yards before winter. Some are kept in their stalls in close houses, and their dung and soiled litter are carried out daily to the yards, whilst others receive their food in the yards themselves, and thus tread upon the heap. In this manner the mass of dung accumulates during the period of feeding, and at the proper period, in the following spring or summer is carried out to the fields and applied to the land.

The dung of the farm-yard is thus sure to be a collection of animal and vegetable substances. It consists of the excrements of the animals kept and fed upon the farm, together with the straw or other materials used as litter, and generally of the refuse and offal produced about the homestead. This mixed mass is collected during the period of feeding, when it undergoes a certain degree of fermentation. When trodden by the feet of the animals kept in the yards, the effect is to exclude the external air, and to prevent the fermentative process from proceeding with that rapidity which would take place were the mass not compressed.

The principal animal substances which are mixed with the ligneous fibres of the litter, and which cause it to undergo decomposition, are the dung and urine of the animals.

The properties of this dung, to a certain extent, depend upon the kind of animals, and the nature of their food. The dung of horses is easily fermented, and is more readily decomposable in proportion to the succulence and nutritive qualities of the food consumed.—This also holds with respect to the dung of oxen. When the animals are fed on straw and the dried stems of plants, the dung is less rich and decomposable than when they are fed on turnips, oil cake and other nourishing food; and the same thing holds with respect to the dung of the hog and other animals. The dung of the different feeding animals is mixed in greater or less proportion with their litter, and the greater the proportion of the animal to the vegetable matter, the more readily will it ferment and decompose.

The urine of the animals,again, is in itself a very rich manure, and contains, in certain states of combinations all the elements which enter into the composition of plants. It is necessarily mixed with, and partly absorbed by, the litter and other substances in the yards, of which it hastens, in a material degree, the fermentation.

The urine however, is apt either to make its escape by flowing out of the yards, or to be imperfectly mingled with the litter. It becomes, therefore, a part of the management of the farm-yard, to provide against either of these contingencies.

The farm-yard should be made level at the bottom and paved if the sub-soil be loose and sandy, and the bottom should be sunk somewhat below the surface of the ground. As a portion of the liquid will flow from the stables and feeding houses, gutters of stone should be made to convey the liquid from these into tanks or other reservoirs adjacent to the yards. The same means are to be taken for conveying away any excess of liquid from the yards themselves. This is not done for the purpose of draining the yards of moisture, which would be an error, but for the purpose of preventing any excess of liquid from being lost. The principal cause which produces a great flow of liquid from the yards is an excess of rain, which, falling upon the heap faster than it can be absorbed, washes away the urine.

Three methods may be adopted for the management of the liquid which is obtained from the feeding houses, or which oozes or is washed off from the mass in the yards.

1. It may be pumped from the tank or reservoir into which it had flowed, conveyed back to the farm-yard, and spread over the surface of the heap. In this manner it will be imbibed by the litter, and tend to hasten the decomposition of the mass.

2. It may be pumped up when convenient, and conveyed in barrels to the field, and spread over the surface, a species of manuring which, under certain circumstances, is exceedingly efficacious.

3. In the bottom of the tank or reservoir to which the liquid is conveyed, may be placed absorbent earths, stems of plants and other matters. These being saturated, will become very rich manure, and may either be carried from the tank to the field, and applied to the ground, or put into heaps or composts, until the period of using them shall arrive.

This method of collecting the excess of the liquid from feeding houses, and yards, is perhaps the best in the common practice of the farms in this country. In Flanders, where extreme care is bestowed in the collection and preparation of liquid manures, there is a smaller proportion of straw and hay produced on farms, than in the mixed system of agriculture of Britain. There is not, therefore, so great a proportion of ligneous fibre to be decomposed.—The Flemings, accordingly, pursue the mode of managing their manure, which the circumstances peculiar to their agriculture render expedient. They can always ferment sufficiently the fibrous matter of the heap of their farm-yards, and therefore they have always a spare supply of liquid in a separate state. But in this country, where we aim on producing a large quantity of hay and cereal grasses, we require nearly all the liquid from the feeding animals, to moisten and ferment the general mass of the farm-yard.

When the animals of the farm are fed on tolerably rich and succulent food, and when the proportion of straw is not too large, there is no difficulty in fermenting the mass of the farm-yard to the degree required; but when the quantity of straw is very large in proportion to the more moist and succulent food consumed, as sometimes occurs in the case of clay land farms in certain districts, then there may be considerable difficulty in getting the straw sufficiently fermented and decomposed for use. This may arise from want of moisture, as well as from a deficiency of animal matter; and as we may not at the time have the power of supplying the latter, we must endeavor to keep the heap moist by soaking it, in the absence of rain, with water. But the permanent remedy for this evil is to increase the quantity of such nourishing food as the farm will produce,—namely, cabbages, tares, clovers, and other succulent and nutritive plants.

Sometimes, even when there is no extraordinary excess of dry litter, the fermentation of the heap in the yard after proceeding to a certain degree, suddenly stops, by which the manure is much injured. This action is termed *fire-fanging*. It arises from the want of moisture, and when it happens it is often very difficult to renew the fermentation. The best remedy is to turn over the heap, soak it with water, and mix it with horse dung, or any animal offal that can be obtained.

With these exceptions, the management of the farm-yard is not attended with any difficulty. We have seen that the mass consists of a collection of the excrements of the animals kept upon the farm, of the straw and other substances employed for litter, and generally of any refuse or offal produced at the homestead; and that this mixed substance is accumulated chiefly during the months of winter, undergoing during this period a certain degree of fermentation and decomposition in the yard where it lies.

The substance thus collected and partially fermented, is to be applied to the grounds during the months of spring, summer, or autumn, immediately following the winter in which it has been prepared. It should be always applied as soon after it is prepared as possible, there being a waste either in retaining it too long, or in causing it to undergo a greater degree of fermention than is required.

In the process of the putrefactive fermentation, the elements of the body fermented, in assuming their new forms of combination, partly make their escape in the gaseous state. In the fermentation of manures the decomposition may proceed so far that the great mass of the substance shall be exhaled, leaving behind only the earthy and alkaline, and a portion of the carbonaceous matter of which it is composed. In the treatment of this class of substances, therefore, the putrefactive fermentation should neither be continued longer, nor carried to a greater degree than is necessary for the purposes intended.

In practice, our object is to produce certain kinds of crops; and certain kinds of plants, it is found, require a greater action of manures at particular stages of their growth than others. Thus the turnip, the carrot, and the beet, which are sown as will afterwards be seen, in the early part of summer, require that the manure applied shall be in such a state of decomposition as to act upon and nourish them in the first stages of their growth, and if this be not so, the crop may entirely fail. In these and similar cases, accordingly, a complete preparation of the farm-yard dung is an essential point of practice.

Certain plants, again, do not require the same state of decomposition of the dung. Thus the potato requires less in the first stages of its growth, than the turnip, and hence it is not necessary to subject the manure to be applied to the same degree of fermentation. The same remark applies to Indian corn.

In some cases, too, as in the process of the summer fallow, to be afterwards described, the manure is mixed with the soil some time before the seeds of the plants to be cultivated are sown. In such case the manure undergoes the necessary fermentation in the soil itself, and does not require that previous preparation which, in the case of the turnip and some plants, is required.

But where no necessity exists for fermenting the matter of the farm-yard beyond the degree requisite for the special purpose intended, it is always a point of good practice to ferment it to that degree. In order to know when dung is sufficiently fermented for the particular use required, a very little practice and observation will suffice. When it is fully fermented, the long stems of straw which formerly matted it together, are in such a state of decomposition, that the parts can be readily separated by a fork. It is not necessary in any case that it be in that extreme state of decay in which we often see it used by gardeners, and when it can be cut with a spade like soft earth. Whenever farm-yard dung has been fermented to this degree, it has been kept beyond the proper time, and the management has been bad.

The mass, we have seen, is collected chiefly during the months of winter, and will always be ready to be applied to the ground in the spring, summer, or autumn immediately ensuing; and there is no case in which it is advisable to keep it beyond the year in which it has been collected.

The common and convenient practice, is to carry it out from the yards where it has been collected, to the field where it is to be used, and there to pile it up in one or more large heaps, so that it may undergo tho further decomposition required, before being applied to the land.

When, accordingly, after the dead of winter, as towards the end of December, and during hard frosts and snows, the men and working cattle upon the farm cannot be otherwise employed, we may begin to carry out the dung to the fields where it is to be used. It is carried out in the carriages of the farm, into which it is lifted by large forks to be afterwards described. This partial carrying out of the dung from the yard proceeds when occasion offers, or when the state of the weather prevents the other labors of the farm from being carried on. And when the feeding cattle are finally removed from the houses and yards, and turned out to pasture, which, in the north of England, is generally by the middle of May, the whole remaining dung may either be carried to the fields, or remain in the yards till required for use.

The dung, as it is carried out to the fields, is to be laid in the large heaps, which may be about four and a half feet high, and of such other dimensions as may be convenient. When the dung is placed in these heaps, it is in a state very favorable to further fermentation; for it is to be observed, that in all cases, the turning over of the dung, so as to give access to the air, causes an increase of fermentation, and this is the method adopted by farmers and gardeners, when they want to give a greater degree of fermentation to any heap. Should the dung in these large heaps not ferment to the degree required, they are to be turned over, and formed into new heaps, the upper part being placed below, and what was before below at the top. By this means the fermentative process will be renewed: and should this turning not be found sufficient, the heaps must be again turned over, so that they may be brought to the degree of decomposition required. The large heaps of this kind should not be placed in a very exposed situation, so as to be too much acted upon by the winds, and it is often a good precaution, and a necessary one in very warm countries, to face up the sides with a little earth or turf and to strew some earth upon the top so as to prevent the escape of decomposing matter. When it is wished to hasten the putrefactive process in these heaps, it is better that they be not compressed by the carriages going upon them to unload; but where there is no peculiar necessity for hastening the putrefactive process, the carriages and beasts of draft can go upon the heap without injury. When peculiar care is required, as when the dung has been injured by fire-fanging, or otherwise imperfectly fermented in the yards, it should be spread over the heap in layers, so that one layer may undergo a slight fermentation before it is compressed by that which is to be placed above it.

Sometimes the mass may be turned over in the yards where it lies, and allowed to ferment before it is carried out to the fields for use. In this case the workmen begin at one side of the heap and with large forks, turn it over, laying that which was before uppermost underneath, so as that the whole may be reversed. If after this process of turning, no treading of cattle is allowed, the fermentation of the mass will proceed with rapidity, and then the whole may be led out at once from the yards to the fields for use.

When the dung produced is very rich and well decomposed, as when cattle have been feeding in stalls on juicy and nutritive food, it may not appear to require this turning over to fit it for use; yet even in such a case it is generally beneficial that it be turned over at least once before being used, the effect being to ferment the mass not only sufficiently, but equally, and to mix its different parts together. It may be observed also, that when the mass of vegetable and animal substances is thrown into a common yard, some care should be bestowed in spreading it equally, so that one part of the yard may not be filled with rich dung, and another with poor. The dung of horses, for example, is more susceptible of quick fermentation than that of oxen. When the stable, therefore, opens upon a common yard, the horse dung should not be suffered to accumulate in a mass about the stable door, but spread abroad upon the heap.

Farm-yard dung is chiefly applied to the soil, by being spread upon the land when in tillage, and covered by the plough. The periods at which this is done, and the manner of doing it, will be afterwards pointed out. By being covered by the earth, the dung soon passes through its course of fermentation, and becomes decomposed and mixed with the matter of the soil.

This valuable substance must be economized in the manner of applying it. The soil must be kept as rich as the means at the farmer's hands will allow; but it is an error in practice to saturate it at one time with manures, and to withhold them at another.—They ought rather to be applied in limited quantity, and frequently, so as to maintain a uniform or increasing fertility in the soil.

The produce of the farm-yard will necessarily afford the chief part of the manure consumed upon farms which do not possess extraneous sources of supply. But besides the produce of the farm-yard, there are certain vegetable and animal substances which in their separate states may be applied to the manuring of land. An example of the application of vegetable substances, in this state, is where certain plants are allowed to come in flower, and are then ploughed down in their green state, and mixed with the matter of the soil. This is a practice derived from very ancient times, and is yet followed in Italy, and other parts of Europe.

Vegetable matter, when thus covered by the soil in its green and succulent state, readily undergoes decomposition, and forms a very enriching substance. The practice, however, is chiefly suited to the warmer countries where vegetation is very rapid, and even then it argues a somewhat low state of the art, and is not the best way for producing decomposing matter for manures. When we are able to raise green food of any kind, it is better that we apply it in the first place to the feeding of animals, for then it not only yields manure, but performs another and not less important purpose.

When, however, the practice is for any reason adopted, the period at which the plants should be ploughed down is just when they are coming in flower, for then they contain the largest quantity of readily soluble matter, and have the least exhausted the nutritive substance of the soil. The plants employed for this purpose by the ancients were chiefly the leguminous, as the Lupine, which is still used in Italy for the same purpose. Buckwheat is also employed, and appears to be the plant best suited for the practice in northern countries, for it is easily cultivated, and soon arrives at the necessary maturity. For the same reason, Spurry has also been cultivated for this purpose: nay, the clovers have been thus employed at the suggestion of speculative writers even in England, and thus the error has been committed of employing a valuable article as a manure, which might have been employed in the first place in supporting live stock of the farm.

The leaves of trees also form a vegetable manure, though not a good one: for although leaves enrich to a certain degree, the surface upon which they fall and decay, they will rarely pay the expense of collecting them expressly for manuring land.

The roots of plants disengaged from the soil in the process of tilling and cleaning it, are also employed as a vegetable manure. Some of these, however, as the couch grass, being very vivacious, would readily spring again: and therefore it is necessary that their vegetative powers be destroyed, which may be done by mixing them with lime, and forming in this way a compost. Many farmers, however, to save time or to prevent the risk of the plants springing again, burn them in little heaps upon the ground at the time of their being collected, and spread the ashes upon the surface. This may be sometimes convenient, but the effect is, that the principal nutritive part of the plant is dissipated, and nothing left but the carbonaceous, earthy, and other insoluble matter.

Tillage Husbandry.

[*From the Farmer and Gardener.*]

CORNSTALK FODDER.

In some late numbers of your "Farmer and Gardener," I read with much pleasure a detail of the management of the Cornstalk as a food for cattle, &c. First induced to turn my attention to this subject by the different communications to be found in the "Farmer," for some years back, I began in 1830 to test the value of the refuse of corn, when subjected to the process of steaming. I was not long inventing a strong, rough apparatus for my purpose, which succeeded well, and in which I prepared about twenty bushels at once. Previous to this, I had, however, fallen on a plan of saving my corn and stalks, &c. somewhat different from my neighbors; but in a way that the columns of your valuable paper had been long laboring to persuade the corn planters of the country to try fairly, viz: *to cut down the stalk at the ground*, at a certain stage of maturity, and at one effort to cure corn, stalks, blades, &c. in the field. I had seen this first practised on the south branch of the Potomac, as far back as 1812: and about 1817, I determined to try the process in this section of the Union, not being able to discover any solid reason why it should not succeed as well here as on the south branch of the Potomac, or elsewhere; but indeed compelled to believe, from a recollection of the climate I was in, that it must succeed here much better. In 1817, I tried six acres—cut it down at the ground, about a week after the *blades* were ready for stripping. I found a little shrinkage in the grain, but I felt satisfied, that as my corn was not like Pindar's razor, "*made to sell*," but to eat, that what was lost by the shrinkage was no part of the *nutritive principle;* and I did not despair of getting over that difficulty, by further trial, and by improving the mode of proceeding.

The following year I cut down *five acres*. I began the *saving* of this field of corn by going through it, as soon as a few of the under blades appeared ready to pull, and gathered and brought them home, throwing them in an old out-house to cure, and which, by a little turning over, I readily effected. I will remark here, that this *five acres* was a piece of corn on which I was trying the effect of rotten cotton seed as a manure, by planting four stalks in the hill, on light land, at the distance of *five feet* by *four*. On this field I had determined also to try the full effect of an economical management, in saving the result of labor bestowed on the earth—"Save all" was my motto, and I literally saved every blade.

Before my corn required a *second* pulling of blades, I found the *shuck* on the *ear* in that state, which authorized, I believed, the next step and the principal one I had in view, the new mode of saving the balance by one "*coup de main.*" The result of observation and reflection induced this determination, viz: that in the saving process, the mode of stacking the corn stalks that would permit them to cure the most *gradually*, would certainly admit the least loss by shrinkage, from evaporation, &c.* To effect this, I selected four strong, careful hands, to cut and lay down, taking *eight* rows at a through. On getting to the end of the rows, they turned round, and gathered together *sixteen hills*, each bringing to one who attended the stacking. As each man placed his armful on the ground, the butt ends were pressed by him as far *into the earth* as possible throwing the tops together, so that when the sixteen hills were brought together at the tops the mass presented a sugar-loaf appearance, spread well at the bottom, to admit the entrance of air—tying at the top with a bandage of crab grass found among the corn, and twisted into a small rope in a few minutes. In this way I cut and stacked my field. On the 10th day I found by an examination of the inside of the stacks, that the whole was cured in a way that I could not have exceeded by any other process, although the weather had been *rainy* occasionally. I hauled the whole home, and packed it away under open sheds, and in old out-houses. In this state it continued, until winter's bleak and stormy weather admonished us that in-door business was to be attended to; when all hands went to stripping "*corn* and *fodder* from *stalks*." In doing this, I observed the following order, viz: each individual threw his ear of corn, as he pulled it off, *behind* him, and *stalks* on one side, laying them down with attention to *regularity*; and the fodder on the other—as soon as he had an armful of stalks to remove, he rose and placed the *stalks* in a *pile*, casting the fodder into another depository.† All this precaution, as regarded the *stalks*, was to have them in a situation that with expedition and convenience they could be placed in the *cutting-box*, to which they were to be subjected. In one day's work, I had a prodigious pile of stalks thus stripped. The next *rainy* day I brought in my "*Eastman*," and a man and a boy soon reduced the pile to pieces, half an inch in length. Here, sir, I would just remark, what a quantity of this *labor* I got through with in a short time, by pursuing every moment systematically, and being prepared for every operation before I commenced it. It will now be readily granted, that I have saved as much of the *nutritive qualities* of the *stalk, shuck*, and *blade*, by my mode of curing, as was possible to effect; and also, that I had prodigiously *diminished the labor* usually bestowed in the common mode of saving *corn* and its *refuse*. At the same time that I was preparing the *stalks*, I also *shucked*, so that in cutting up the *stalks*, I cut, at the same operation, a proportion of *shuck* with *stalk*.

But the principal object was yet to begin, viz: to prepare these cut *stalks* and *shucks* in such a way as would render them the most *nutritious* and *palatable* food for cattle. To effect this I proceeded thus: I placed three *strong* hogsheads, made of cedar, *well pitched*, on the outside, on a platform, about three feet from the ground, having at the bottom a large spigot to let off their contents. Just before these, I had a large *trough* placed, at the distance of twenty feet, and well enclosed along with the hogsheads. Between the *hogsheads* and the *troughs*, I had the steam apparatus placed, all under a shed. Into these hogsheads I threw a *small quantity of boiling water*, and into the water a *portion of corn meal*, (coarse ground) just sufficient, when the cask was filled, to produce the *vinous fermentation*, as if going to distil; with a good straw mat top, for each cask. After an hour, and well stirring, I filled up with cold, soft water, and left the mass to ferment. As soon as my liquid was ready, or just as the acetous fermentation was about to commence, I worked off in my steaming-box a turn of the *stalks* and *shucks*, mixed up, and as soon as sufficiently steamed, I placed a quantity in my trough, *pressing them well down*, with a *false* top, moveable as I wanted, and now drawing the spigot from the cask *ready*, the liquid was permitted to *cover them*, running along a portable, light trough, such as distillers use for conveying water. This I did in the evening, and by morning I took up in light buckets the quantity required for the morning's feeding of my oxen and cows, &c. placing it in the *feeding troughs*, stepping only a *few feet*, sprinkling a little salt over the mass. The cut *stalks* and *shucks* had become perfectly charged by absorption with the *liquid*, at once one of the most *palatable* and *nutritious* preparations yet discovered—of this food I gave them plenty. The effect on the *flesh* and *milk*, exceeded my most sanguine expectations. My cattle became excessively fond of it, and I so fed as to "lose nothing."

My casks by a little *management*, I had always "*under way*," one always ready. I now ascertained to my full satisfaction, that I could not bestow too much *trouble*, as it is *called*, in SAVING my CORN STALKS!

Satisfied of the value of my *labor*, I have since added to the *steaming-box* all refuse potatoes, turnips, cabbage leaves, beets, parsnips, carrots and pumpkins, squashes, cucumbers, &c.; in fine all the vegetable productions of the *field, orchard* or *garden*, as the season may afford, "that nothing may be lost"—and I find that I am well paid for the labor bestowed. The last, after absorbing what they will contain of the liquid, goes to the support of "*old Ned.*"

AGRICOLA.

* The usual practice in the south is to strip the blades or leaves from the corn stalks, cure and preserve them for fodder, and to make little or no account of the stalks as cattle feed.

† We think our practice has a preference over this mode; it is to pick the corn from the stalks in the field, and immediately to bind and stack the stalks. The corn is then husked in the evening, or on rainy days. Few have sufficient barn room to stow away a large crop of corn in the manner recommended by Agricola.

Miscellaneous.

[We commend to the particular notice of our readers, the following excellent remarks, which we copy from the *Genesee Farmer*, and which form a portion of an address to the patrons of that valuable paper, and the agriculturists of Western New-York.]

That an improved state of farming has within a few years been introduced into this country—that the cultivation of the soil is beginning to be treated on more rational and scientific principles—that the slavish adherence to the maxims and methods of Europe, which have so long obtained among us, are being discarded in favor of systems more adapted to our soils and our climate—that multitudes of worn out and unproductive farms, especially in the eastern counties of the state, have been rescued from that condition and rendered valuable and fruitful, are facts which cannot be denied, and which augur well for our agricultural prosperity. These results are to be mainly attributed to a few things, such as the diffusion of knowledge on farming subjects, the regular and skilful rotation of crops, and the extensive use of plaster in connexion with clover. It is true much more attention is paid to the preservation and proper use of manure than formerly, and much may justly be granted to this; but manure has always been freely used, while our farms were growing poorer, and had not the rotation of crops with the use of plaster and clover been introduced, the deterioration would have continued in spite of all the manure ordinary farms could have produced. The rotation of crops is founded on the obvious principle that in drawing their nourishment from the earth different kinds of food are required by different plants—for instance, that peas or barley do not deprive the earth of the important principle which furnishes the best food for wheat—that some plants derive more of their support from the air, and take less from the earth than others—and that no two crops which require the same food should be taken in succession from the same piece of land. To this doctrine there may be a few seeming exceptions; such as plants that require for their perfection little besides heat and a small quantity of moisture, as onions have been grown for half a century on the sandy plains of Weathersfield, and the finest melons of the world on the shifting sands of Egypt. Every one must have noticed in some sections of this district a disposition to put in wheat after wheat, and instances have occurred in which such a course has been partially successful; but from the invariableness of the laws of nature, it may be relied on that such farming must be ruinous in the end, and if the abundant materials for wheat in our soils at present should, with such treatment hold out for years, still an impoverished and nearly ruined country must be left to our successors. Of all plants for the renovation of the soil, none can be considered equal or superior to clover, and it may be deemed a happy dispensation of providence that those soils best adapted by nature to wheat, are also the most congenial to clover, and derive the most essential benefit from plaster.

I have said that more attention is paid to the preparation and application of manure than formerly, but still this is a point on which we are most culpably deficient as farmers. There are soils in every country, on which plaster produces little or no effect, and which must speedily, under a course of cropping, become valueless unless frequently and thoroughly manured; and on all soils manure must be considered a most important and powerful auxiliary. Hitherto from the extraordinary fertility of our western soils, the necessity of inquiry respecting this branch of farming has not been very urgent; but the experience of every year is rendering the propriety of giving this subject increased attention, more and more apparent. In Holland and in some parts of England, the business of farming is carried to a higher degree of perfection than in any other part of the world, and perhaps the greatest returns are received for the capital and labor employed, and no where does the subject of manure receive so much attention as in these very places. In those countries quantities of manure, which in proportion to the farms cultivated would appear utterly incredible were not the facts placed beyond the shadow of a doubt, are produced by the skill and labor of the occupants; and if in the Empire State, every rood is to maintain its man, this example must be followed. In Holland, instead of a ton or a ton and half to the acre, which may be considered about the maximum in New-York, from fifteen to twenty tons to an acre are considered as not an extraordinary production of manure, and the results from the application of such a mass of compost are such as might rationally be expected.

But though our grand staple is, and probably will be wheat, still there are many farms where this grain cannot be profitably raised, the owners of which must of course look to other articles of produce for a renumeration of their labors, and to these different sources of wealth the public attention should be properly directed. Those lands in the western district which cannot be called wheat lands, are in general admirably adapted to grazing, and in raising cattle and horses for market, in enlarged dairies, and in the production of wool, there seems to be a ready and profitable employment for skill and capital. To carry these branches of farming into effect, care should be taken to provide the best animals, and to commence with the best breeds for the particular purpose aimed at. It is rarely the case that in cattle the qualities of size and aptitude for fatting, are combined with those of large quantity and richness of milk. Of course the object intended must be considered in the commencement of stocking a farm, or much time and expense may be thrown away. There are multitudes who are engaged in the dairy business, who have never dreamed of testing the quality of the milk given by their different cows, although it is very easily done, and the milk of some cows will at the same expense of keeping yield nearly double the quantity of cream to that given by others. Deep slender glasses are used for this purpose, where the business is properly attended to, but the usual tall champaigne glasses, or where these are not to be had, deep common tumblers will answer the purpose. It ought to be remembered however that the deeper the column of milk in proportion to its diamater, the more satisfactory will be the test. Fill these glasses of the same depth, with milk from different cows, and when they have stood a sufficient time, the thickness of the risen cream can be easily measured on the outside of the glass. By doing this a few times the value of each cow as a dairy cow can be fully known.

In order to breed cattle with success, more attention must be paid to green crops. By green crops I mean common or Norfolk turnips, mangel wurzel, ruta baga, carrots, &c. In no way can so large an amount of food for cattle, horses, hogs, or sheep, be drawn from an acre of land as in one of these crops, or one which in every way is so profitable to the raiser of stock. In estimating the value of green crops there is no necessity of taking the extraordinary yields which are sometimes obtained, as a standard. A thousand bushels of ruta baga and eight hundred of carrots have been raised to the acre, but taking the amount at only one-half—and under almost any ordinary circumstances that amount can be produced—and it may be seen at once that a crop of corn, oats, or potatoes cannot be compared with the ruta baga or the carrot for profit. The man who wishes to make the most of his farm, must raise root crops; for if wheat is his object he can spare much more of his land for that purpose, and yet keep the necessary stock, and if raising stock is his business, he may depend on seeing his herds and flocks through the winter in much better order, and with less expense, than if he relied on hay alone.

Another source, and I believe an exhaustless mine of wealth, has been too long overlooked by our farmers, and our citizens generally. Such is the perfection of machinery and the competition of manufacturers, that most articles of clothing which formerly were made by female industry at home, are now made at these establishments. The wheel and the loom as implements of domestic economy, are now rarely seen or heard; and the woollen, the linen, and the cotton, instead of being the production of the fair hands of wives and daughters, owe their existence to power looms and spinning jennies, and are purchased at the store as would be an article of foreign importation. This is well enough, if the time formerly spent in these domestic avocations, is more profitably employed: on this subject I express no opinion; but can assert with confidence, that the introduction of the silk worm would be in most families not only a source of great profit, but the care and feeding of them an innocent and healthy amusement. The procuring a few mulberry trees is the first step, and there are few places where these cannot readily be procured; this done, the rearing and feeding of the worms, and the whole process to the finishing the cocoons for market, is extremely easy and simple. There is not the least reason why millions should be sent from this country every year, for an article which might be produced here in perfection, and which only requires the care and labor of females and children for a few weeks in a year.

Farmers are more remarkable for their deference to antiquity than perhaps any other class of practical men. They are content to follow on in the routine of their predecessors without inquiring whether the course they are pursuing is not erroneous, and does not admit of decided improvement. "As our fathers did, so do we," is held a sufficient justification of the most absurd systems of culture. To the agricultural societies which have existed within the state during the last fifteen years, much of the improvement in farming which has certainly taken place within that time, may fairly be attributed. These societies awakened a spirit of emulation and inquiry—they brought together men of kindred minds, men ardently engaged in the same honorable and peaceful pursuits, and the meetings were places where opinions and facts were freely and beneficially interchanged. Never were the funds of the state more profitably appropriated than in the trifling sums annually distributed from the treasury among these societies; and the day when the voice of the people shall be so far heard as to cause their revivification under the patronage of the state, may be hailed as a proud one for the resources and spirit of New-York. It is not to the comparatively paltry sum divided that we look for the benefit, but to the spirit of inquiry it will create, and the public attention that will be directed to the interests of agriculture generally.

Next in benefit to agricultural societies, and in a great measure springing from them, is to be placed the influence of agricultural journals. While their beneficial effects have been almost unlimited, they have injured no one, and now that their utility has been fully tested by experience, that farmer has been guilty of an unpardonable inattention to his true interests, who neglects to provide himself with a well conducted journal of this kind. I am sensible there is a prejudice, an inveterate, but most unfounded and untenable prejudice, against what is termed by some of our cultivators, book farming. With such men it is enough to condemn any proposition, or discredit any statement, that it comes from a book or a journal. They reason thus:—our fathers for a century have been content with thirty bushels of corn, or ten bushels of wheat to an acre, and why should we undertake to be wiser than they? They never heard of a chemical analysis of soils, of turnip culture, of rotation in crops, and agricultural books, and why should we bother our heads about such matters? With such reasonings thousands resist all improvement, and rest contented in an ignorance not the less prejudicial because so shamefully prevalent. And what is this book farming, about which such unreasonable notions prevail? A few cultivators of the earth agree to communicate to each other the results of their experience in farming—raising cattle, sheep and hogs—the best modes of preparing and using manure—the most profitable crops and the best modes of raising them—the best breeds and the best modes of fattening animals, and in short, all things of general interest relating to the occupation of a farmer. These results are committed to writing, go through the press and become a book. He who chooses to follow the results of enlightened experience as there detailed, is guilty of book farming. A gentleman who has money, inclination and leisure, following nature as a guide, commences a series of agricultural experiments which result in doubling the means of existence from a given quantity of land, or in other words, makes two blades of grass, or two bushels of wheat, grow where but one grew before. Such a man is a benefactor to his country; but, if actuated by a noble regard for the general good, and anxious that all should partake with him in the benefit, he sends a history of his proceedings to a journal, that others may avoid his errors; it is denounced as a mere whim, as nothing but book farming. No matter how important or how valuable the published accounts may be, if they add one-half to the productiveness of a farm, there are many, too many, who scout them as unworthy of notice. If, however, we were required to point out the men who had done the most to advance the agricultural interests of the state or country, who have introduced the most successful methods of raising crops, and improving the soil, we should be obliged to fix on those who are emphatically book farmers; men who were bred to other pursuits, but have relinquished them for the safe, honorable, and in their case, eminently successful cultivation of the soil. It is to such men as Powell, Colman, Buel, Bradley, and the lamented Thomas, that the farmer who wishes to adopt the easiest and most profitable course of farming must look as guides, and these are the most thorough book farmers in the country. It is time that this unworthy prejudice against that knowledge of farming which may be derived from books was done away—that farmers should not deem themselves so far advanced towards perfection in their pursuits as to be beyond the teachings of recorded experience. We know there are visionaries in agriculture, as well as in every thing else; men who are mere theorists; who from their studies put forth their vague notions and crude ideas as facts, without submitting them to the ordeal of experiment, the test of time. But the practical, well informed farmer, and such all should be, is not deceived by such fantasies; from the premises laid down, and comparing them with his own experience, he perceives the absurdities to which they lead, and rejects them without hesitation. But the theoretical farmer, who with time, and money, and nature for his guide, submits his ideas to the test of experiment, may obtain results astonishing to himself, and which, when laid before the public, demand its lasting gratitude. To books then we must continue to look for practical instruction in the most approved modes of agriculture. A journal is a reservoir in which is accumulated the experience of ages and the practice of thousands; and to it the young farmer may profitably go for information on a multitude of topics respecting which the inexperienced and uninformed must necessarily be ignorant. To all then who aspire to the honorable title of an intelligent tiller of the soil, we say, take some standard agricultural work—to every present subscriber to the Farmer we say, not only continue your subscription and endeavor to promote its circulation among your neighbors, but become a contributor to its columns, of the results of your farming experience, your success and your failures—preserve the numbers carefully, and see when each volume closes they are well bound—read carefully, compare thoroughly, reduce your knowledge to practice, and you will be singularly unfortunate indeed, if you do not find yourself remunerated ten-fold.

WILLIS GAYLORD.

Young Men's Department.

INDUSTRY.

Nothing is more important to your usefulness and happiness in life, than habits of industry. "This we commanded you," says St. Paul, "that if any would not work, neither should he eat." Now this would be the sober dictate of good sense, had the apostle never spoken. It is just as true now as it was two thousand years ago, that no person possessing a sound mind in a healthy body, has a right to live in this world without labor. If he claims an existence on any other condition, let him betake himself to some other planet.

There are many kinds of labor. Some which are no less useful than others, are almost exclusively mental. You may make your own selection from a very wide range of employments, all, perhaps, equally important to society. *But something you must do.*—Even if you happen to inherit an ample fortune, your health and happiness demand all this. To live in idleness even if you have the means, is not only injurious to yourself, but a species of fraud upon community, and the children, if children you ever have, who have a claim upon you for all you can conveniently earn and do.

Let me prevail with you then, when I urge you to start in life fully determined to depend on your own exertions, and to be, in this respect, independent. In a country where the general rule is that a person shall rise—if he rises at all—by his own merit, this determination is indispensable. It is usually idle to be looking out for support from some other quarter. Suppose you should obtain a place of office or trust through the friendship, favor or affection of others; what then? Why, you hold your post at uncertainties. It may be taken from you at almost any hour. But if you depend on yourself alone, your mountain stands strong, and cannot easily be moved.

He who lives upon any thing except his own labor, is incessantly surrounded by rivals; his grand resource is that servility in which he is always liable to be surpassed. He is in daily danger of being outbidden: his very bread depends upon caprice, and he lives in a state of never ceasing fear. His is not, indeed, the dog's life, "*hunger* and idleness," but it is worse; for it is "idleness with *slavery;*" the latter being just the price of the former.

Slaves, not unfrequently are well *fed* and decently *clad;* but slaves dare not *speak.* They dare not be suspected even to *think* differently from their master, hate his acts as much as they may; be he tyrant, drunkard, fool, or all three at once, they must be silent, or nine times out of ten lose his approbation. Though possessing a thousand times his knowledge, they must feign a conviction of his superior understanding; though knowing it is they who, in fact do all that he is paid for doing, it is destruction to them to *seem as if they thought* any portion of the service belonged to themselves.

You smile, perhaps, and ask what all this tirade against slavery means, in a part of the country where no slavery exists. But remember, there is slavery of several kinds; there is *mental* slavery as well as bodily; and neither is confined to any particular division of the United States.

Begin, too, with a determination to labor through life. There are many who suppose that when they have secured to themselves a competence, they shall sit with folded arms, in an easy chair, the rest of their days, and enjoy it. But they may be assured that this will never do. The very fact of a person's having spent the early and middle part of life in active usefulness, creates a necessity to the body and mind for its continuance. By this is not meant that men should labor as *hard* in old age, even in proportion to their strength, as in early life. Youth requires a great variety and amount of action, maturity not so much and age still less. Yet so much as age does, in fact, require, is much more indispensable than to those who are younger. Children are so tenacious of life, that they will not *suffer* much, at least *immediately,* if exercise is neglected.

Hence we see the reason why those who retire from business towards the close of life, so often become diseased, bodily and mentally; and instead of enjoying themselves or making those around them happy, become a source of misery to themselves and others.

Most people have a general belief in the importance of industrious habits; and yet not a few make strange work in endeavoring to form them. Some attempt to do it by compulsion—others by flattery—some think it is to be accomplished by set lessons, in spite of example—others by example alone.

A certain father who was deeply convinced of the importance of forming his sons to habits of industry, used to set them to pulling down or removing heaps of stones, and then putting them back again. He has been known to employ them many a day in this alternate removing and replacing of stones. This was well intended, and arose from regarding industry as a high accomplishment; but there is some danger of defeating our own purpose in this way, by *disgusting* the young. Besides, an abundance of labor which is obviously profitable can usually be obtained.

All persons, without exception, ought to labor more or less, every day in the open air. Of the truth of this opinion, the public are beginning to be sensible; and hence we hear much said, lately, about manual labor schools. Those who, from particular circumstances, cannot labor in the open air, should substitute in its place some active mechanical employment, together with suitable calisthenic and gymnastic exercises.

It is a great misfortune of the present day, that almost every one is, by his own estimate, *raised above his real state of life*. Nearly every person you meet with is aiming at a situation in which he shall be exempted from the drudgery of laboring with his hands.

Now we cannot all be "*lords*" and "*gentlemen;*" there must be a large part of us, after all, to make and mend clothes and houses, and carry on trade and commerce, and, in spite of all that we can do, the far greater part of us must actually *work* at something: otherwise we fall under the sentence, "He who will not *work* shall not *eat*." Yet so strong is the propensity to be thought "*gentlemen;*" so general is this desire amongst the youth of this proud money making nation, that thousands upon thousands of them are, at this moment, in a state which may end in starvation, not so much because they are too *lazy* to earn their bread, as because they are too *proud!*

And what are the *consequences?* Such a youth remains or becomes, a burden to his parents, of whom he ought to be the comfort, if not the support. Always aspiring to something higher than he can reach, his life is a life of disappointment and of shame. If marriage *befal* him, it is a real affliction, involving others as well as himself. His lot is a thousand times worse than that of the common laboring person. Nineteen times out of twenty a premature death awaits him: and, alas! how numerous are the cases in which that death is most miserable, not to say ignominious.

Sloth, a seductive syren, should be most carefully avoided.—*Horace*. The indolent man can never be useful, either to himself or to promote the well being of others.

He is indeed a conqueror who overcomes himself.—*Sat.*

THE CULTIVATOR—APRIL, 1835.

TO IMPROVE THE SOIL AND THE MIND.

THE GARDEN.

There are few subjects more apt to excite the surprise of intelligent foreigners, than the almost total neglect of our farmers to cultivate a garden: and the inference they draw from this omission, is neither complimentary to our good sense, or our good taste In most European countries, a well cultivated garden is not only common among farmers, but even the humble cottager, who lives upon his daily earnings, prides himself in the neat cultivated patch that surrounds his cottage, which administers largely to the sustenance of his family, and affords a variety of grateful delicacies, which cheer his toils and multiply his enjoyments. But we need not cross the Atlantic for evidence of the economy and comforts of a garden. We are not wholly destitute of gardens nor of taste; and there is perhaps no branch of rural improvement that is making greater progress among us than this. We have probably advanced farther in improvement in horticulture during the last twenty years than in the preceding century. The work will progress. Who among us that has known the pleasure of daily partaking of fruits and vegetables, in all the variety of our climate, freshly plucked or gathered from his garden, does not esteem them among the choicest blessing of life. Our old men yet remember the time, when potatoes were hardly deemed worth cultivating, or when they were considered as innovating upon the settled rules of the farm, and when half a dozen bushels were the extent of a farmer's crop. Yet this root is now deemed indispensable, and its cultivation, on a large scale, considered as a matter of economy. It forms the principal food, in countries where it was once unknown. What the potato was a century ago, many fine fruits and garden vegetables are now—treasures unknown or misprised by the mass of farmers. The products of a kitchen garden materially lessen the consumption of more expensive food, afford a grateful variety for the table, and are highly promotive of health. They are besides matter of substantial profit to the cultivator, for there is scarcely a district of our country which does not furnish a market for any surplus that is produced. What man would consent to have destroyed a fine vine, or peach, plum or pear tree, which produced him choice fruit, for ten times what it cost him? We have in our mind a friend, who cultivates two acres in fruit and vegetables: and we know he has repeatedly sold in a year, of the former, more than a thousand dollars worth, and had a constant supply of both for his table. The outlay for all this was but trifling, for he soon became self-taught, and propagated his own fruit trees. A greater income this, from two acres, than many farms of a hundred yield.

To decend somewhat to detail. Say a choice grape vine will cost two or three shillings—a plum four—a pear three, and a peach two, and currants and gooseberies enough to make up, in the whole two dollars. We give nursery prices for the choicest fruit. In a few years, the vine will yield him a bushel or two of grapes, and the trees a bushel or more of fruit each, which will be worth in market, or in his family, at least ten dollars, with a fair prospect of a rapid increase in the product. Having formed the nucleus, the boys, with a little practice, will soon acquire the art, which every farmer ought to possess, of increasing the quantity and variety, by budding, grafting, layering, &c. And the labor, that will be required in doing this, need abstract nothing from the profits of the farm—the hours that are misspent, or wasted in idleness, will suffice for the task. Every plant thus produced, will become an object of interest. In 1832, the fruit from two pear-trees sold for $45, at the fair market price.

It is not alone from mercenary views, and the mere gratification of the animal appetite, that we recommend the cultivation of a garden. The garden administers to the wants of the mind as well as of the body. We are endowed with senses other than the sense of taste, which may be made to contribute much to the higher enjoyments of life, and which receive gratification in the beauties and fragrance of the vegetable kingdom. He who realizes in the trees and flowers of the garden, the wonderful handy-works of his Creator, provided for the wants and comforts of man, possesses a scource of happiness unknown to the mercenary worldling. The pleasures which arise from the beauties of the natural world, are pure and unalloyed, and are frought with humility and benevolence.

In order to facilitate a knowledge of propagating, and the introduction of good fruits, we have procured cuts illustrating the most popular modes of grafting, and will give brief directions for managing the process; and we shall in due time speak of the other methods of propagating, and give a list of the most approved garden and orchard fruits. From a pretty general acquaintance with fruits, native and foreign, acquired by critical observation for many years, in our business as a nurseryman, and from being somewhat of an amateur, we venture to say, that nine-tenth of our farmers are unacquainted with the choice fruits which the garden yields, particularly of the peach, pear and plum; and that the best fruits are yet but partially disseminated among them.

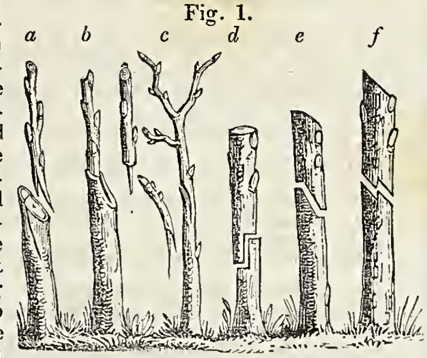
April is the general season for grafting in this latitude, though it is sometimes performed in March, and sometimes omitted till May. The grafts should, however be cut before the buds begin to swell. The scions are most likely to live if inserted when the sap is circulating freely, for then the wounds soonest heal.

The materials and implements required for grafting, are—1. A sharp knife to cut and pear the graft and stalk;—2. A strong knife and mallet, to split the larger stalks, and a small hard wood wedge to put into the cleft while the scion is fitted to its place;—3. Strips of bass matting, or other soft string, to tie around the stalk and graft; and 4. Some good grafting wax or prepared clay, to cover over the worked part. If clay is to used, it should be previously well beaten, and a portion of fresh horse dung mixed with it during the operation. A grafting wax, which we have used for years with success, is made by mixing and melting together four parts of rosin, two parts of tallow, and one part of bees wax;—the whole to be afterwards incorporated and worked by the hand, like shoemaker's wax. This may be applied over the grafted part in a thin layer, or first spread on a cloth and then applied in strips of proper size. The wax or clay is applied, 1. To prevent the extravasation of the sap from the wounds; 2. The too sudden drying of the wood; and 3. The introduction of rain water into the wound or cleft. It is evident, therefore, that whatever sort of coating is adopted, it should be applied without delay, and so as effectually to exclude air and water.

The object to be aimed at in the process of grafting, is to bring the inner bark, and the sap-wood of the stalk and scion, in nice contact, so that the ascending sap of the stalk will pass freely into the sap wood of the scion, and the decending sap of the scion, which has been elaborated and prepared in the leaves, and which descends through the inner bark, to pass freely into the inner bark of the stalk. This elaborated sap soon hardens into wood and covers and heals the wound.

There are more than forty different modes of grafting, practised by professional nurserymen. We shall only speak of those which are best adapted to the practice of the orchard and garden.

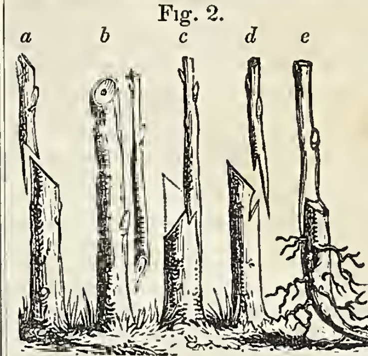
Fig. 1.



Cleft-grafting, (fig. 1, *b.*) is most practised upon strong stalks, or in heading down, or re-grafting old trees. There are two methods of doing this: one described in the cut, where the stalk is first cut off obliquely, and the sloped part is then cut off horizontally, near the middle of the slope; a cleft nearly two inches long is then made with a sharp knife or chissel, in the crown, downwards, at right angles with the sloped part, taking care not to divide the pith. The cleft is kept open by the knife, or the small wedge; the scion has its extremity, for about an inch, cut into the form of a wedge: it is left about the eighth of an inch thick, on the bark side, and brought to a fine edge on the inside. It is then inserted into the opening prepared for it, and the knife or wedge being withdrawn, the stalk closes firmly upon it. The other, and the more common mode is, to saw off the stalk horizontally, make the cleft through its centre, and insert either one or two grafts in the outer edges. In both cases the stalk should be tied and covered with the wax or clay.

Whip-grafting, (fig. 1, *a.*) or as it is sometimes called, tongue grafting, is mostly adopted in nurseries, where the stalks are generally small. It is desirable that the stalk and graft should be of nearly similar size. The scion and stalk are cut off obliquely, at corresponding angles, as near as the operator can guess; then cut off the tip of the stalk obliquely or nearly horizontally; make now a slit nearly in the centre of the sloped face of the stalk downwards, and a similar one in the scion upwards. The tongue or wedge-like process, forming the upper part of the sloping face of the scion, is then inserted downwards in the cleft of the stalk; the inner barks of both being brought closely to unite on one side, so as not to be displaced in tying, which ought to be done immediately, with a ribbon of bass, or other soft string, brought in a neat manner several times round the stalk. The next and finishing operation, is to cover the whole wound with the prepared wax or clay already described. The French mode of whip-grafting, which is also in common use here, differs from the English, in their never pareing more off the stalk, however large, than the width of the scion, (fig. 2, *a. b. c. d*) In both, the stalk is sometimes left a few inches above the graft till autumn, to tie the young shoot to, lest it be blown off.

Fig. 2.



Side-grafting, (fig. 1, *c.*) resembles whip-grafting, except it is performed without taking off the top of the stalk.

Shoulder, or chink grafting, is performed with a shoulder, and sometimes also with a stay at the bottom of the slope.—It is chiefly used for ornamental trees, where the scion and stalk are of the same size, (fig. 1, *d. e. f.*)

Grafting in the root, is sometimes performed in nurseries, where stalks are scarce, as described in fig. 2, *e.*

PRUSSIAN SCHOOLS.

We have perused, with much interest, the report of M. Cousin, on the state of public instruction in Prussia. It presents, in our opinion, the best model of instruction that can be any where found; and although some of its features may not be exactly suited to a republican form of government, yet we doubt whether there is any system from which we can draw more important lessons of instruction. It contains much worthy the high consideration of the American public: and it may be read with profit by teachers, pupils, parents and public authorities. It contemplates, and virtually accomplishes, the education of an *entire nation*, in the knowledge and habits which fit them for the duties and business of life, and which tend to promote the good order and happiness of society. Although this model has originated under an arbitrary government, we should not be squeamish about adopting such parts of it as may promise to be beneficial here. "The true greatness of a people (or of an individual, does not consist," says M. Cousin, "in borrowing nothing from others, but in borrowing whatever is good, and in perfecting whatever it appropriates. I am as great an enemy as any man," he continues, "to artificial imitations, but it is mere pusillanimity to reject a thing for no other reason than because it has been thought good by others."

The schools of Germany, whether for elementary or the higher branches of instruction, have for a long time maintained an elevated rank; and it has been admitted, that literary and scientific knowledge has been more generally diffused there than in any other country. Of the German States, Prussia has held a high place in respect to learning. The great Frederick did much to improve public instruction; but it was not until 1819, that the system was matured which has given merited celebrity to the Prussian schools. M. Cousin was sent to Prussia, to examine personally into the method of public instruction. Every facility was afforded him by the public authorities to prosecute his inquiry, and arrive at correct data. The report under consideration, which was made to the minister of public instruction in France, contains the result of his labors—so far as regards elementary or the lower order of schools.

As the subject of instruction is one of primary importance in a free government, and particularly to the agricultural community, who with us must ever, from their numbers, give the impress to our national character, and constitute the safeguard to our liberties, we feel that we are doing an acceptable service, and are perfectly within the line of duty, in laying before the readers of the Cultivator, some of the more prominent, as well as some of the commendable features, which distinguish the Prussian system of instruction.

The Prussian schools, from the highest to the lowest, are under the supervision of a minister of public instruction, and who is responsible to the king only, aided by a council of distinguished men. The kingdom is divided, to facilitate instruction, into provinces, departments, circles and parishes, which, for the sake of comparison, may be likened to our states, counties, towns and districts. Each has an organized board of officers, who have in special charge the execution of the school laws in their several spheres, and who receive their instructions, and make their reports to a higher authority. The prominent object, and every class of citizens is made to feel a deep interest in its literal fulfilment, is, to *educate every child in the kingdom*, by keeping him at school at least *seven years;* and to ensure him a good and useful education, by employing none but *competent* teachers, prescribing the course of studies, and watching over his habits and morals: It is to do that for *every* child which a wise and prudent parent would wish to do, and ought to do, for his offspring. Popular instruction is recognized as a social duty, imperative on all for the sake of all. Some insist, that it would be an infringement of constitutional right, to make the educating of their children a compulsory duty of parents here. It may be so: but it may be urged on the other hand, that education is an obligation which the parent not only owes to the child, but to the state; and that if he has a natural right to bring up his child in ignorance, it is like other natural rights which he is bound to give up, and which he does give up, upon the altar of public good. It cannot possibly work an injury to the child. It may be said that all children belong to the state, and that their education devolves on the state, whenever parents fail, for want of ability or inclination, to fit them to become wholesome and useful members of society. We consent to give up personal rights, and to perform personal duties, for the common good. We contribute to build jails and poor-houses, to punish vice and alleviate want, both of which would be materially lessened by a seven years' instruction of our youth in a good school. But we are wandering from our object, which is to give some of the prominent features of the Prussian system of education. This we can only do in a brief manner at present.

Duty of Parents.—The law compels all parents, or those on whom children are dependent, to keep them at school from their seventh to their fourteenth year. Children must be put to the school of the parish, unless the parent shows that he is educating them at some other school, or giving them private instruction. In case of neglect, admonition is first employed, and if this fails, coercive means are resorted to. The child is taken to school by the police, and the parent may be punished by fine, imprisonment and disqualification for local office. "Care is to be taken every where to furnish necessitous parents with the means of sending their children to school, by providing them with the things necessary for their instruction, or with such clothes as they stand in need of." Adequate means are provided for enforcing these regulations.

Duty of the Parish, &c.—Each parish is bound to maintain a primary school; each town at least one burgher or middle school; small villages, not able to maintain a primary school, may associate with the surrounding district for this purpose. The children must not exceed one hundred to a master. The law declares what is required for the complete maintenance of a school, in order that it may answer its end,

"1. A suitable income for masters and mistresses, and a certain provision for them when they are past service.
"2. A building for the purpose of teaching and of exercise.
"3. Furniture, books, pictures, instruments, and all things necessary for the lessons and exercises.
"4. Pecuniary assistance for the necessitous scholars."

The school committee are charged to make the salaries of teachers as high as possible, and a minimum is fixed, below which the salaries shall not be reduced, in order to command the best talents and qualifications. The school-house is required to be placed in a healthy situation, to be roomy, well aired, and kept with the greatest neatness.

"Every school in a village or small town shall have a garden, cultivated according to the nature of the country, either as kitchen garden, orchard, nursery-garden, or laid out for raising bees; and this garden shall be made available for the instruction of the scholars.

"Whenever the nature of the spot will admit, there shall be a gravelled plain or court, in front of the school, for the children's exercise.

"The materials necessary for instruction consist, above all, in a sufficient collection of books for the use of the school.

"There shall be, according to the degree of every school, a collection of maps and geographical instruments, models for drawing, writing, music, &c.; the instruments and collections necessary for studying mathematics and natural history; lastly, according to the extent of the system of instruction, there shall be the apparatus necessary for gymnastic exercises, and the tools and implements suited to the teaching of the mechanical arts or manufactures in the schools in which that branch of knowledge is introduced.

"Moreover, every school is bound to furnish gratuitously to poor scholars, books and other necessaries.

"That on occasion of any division or allotments which the parishes may make, sufficient land shall be allotted to the school-master for the cultivation of his vegetables and the feed of a cow; about two acres of good land, or more if the land is bad."

No master is allowed to collect the school moneys. These must be collected by the school committee, who pay the teachers. The teacher is not permitted to follow other business for profit, lest it should abstract his attention from his school, or lower his dignity or morality. The orphan children of school-masters have a special right to all the benefit of establishments for education, and pensions are granted to widows and orphans of school masters.

"Masters and inspectors," says the law, "must most carefully avoid every kind of constraint or annoyance to the children, on account of their particular creed, &c.

"In towns, public education and the maintenance of it are not to be postponed to any other of the parochial necessities or claims whatever. They are to be reckoned among the objects to be provided for in the first place.

"No one shall refuse to pay the rate levied upon him under pretext that the school of his parish, or of religious persuasion, are flourishing, since it is necessary to provide for the general education of the parish, and all schools are open to all, and may be equally profitable to every individual."

General objects and different gradations of primary instruction.—There are two stages of gradation in primary instruction, elementary schools and burgher schools.

"The elementary schools have for their object the regular development of the faculties of man, by more or less instruction in the branches of knowledge indispensable to the lower classes, both in town and country.

"The burgher schools bring the child to that point at which peculiar aptitude for classical studies, properly so called, or for some particular profession, may manifest itself.

"*The paternal attachment of the masters, their affectionate kindness towards all their pupils, will be the most powerful means of preserving them from immoral influences, and of inciting them to virtue.*

"*No kind of punishment which has a tendency to weaken the sentiment of honor, shall, on any pretence, be inflicted;* corporeal punishments, in case they shall be necessary, shall be devoid of cruelty, and on no account injurious to modesty or to health."

Incorrigible scholars, or who persist in bad habits, may be expelled.

"Primary instruction shall have for its aim to develop the faculties of the soul, the reason, the senses, and the bodily strength. I shall comprehend religion and morals, the knowledge of size and numbers, of nature and man; corporeal exercises, singing, and lastly, imitation of form, by drawing and writing.

"In every school for girls, without exception, the works peculiar to the sex shall be taught

"Every complete elementary school necessarily comprehends the following objects:—

"1. Religious instruction, as a means of forming the moral character of children according to the positive truths of Christianity.
"2. The German language, &c.
"3. The elements of geometry, together with the general principles of drawing;
"4. Calculation and practical arithmetic.
"5. The elements of physics, geography, general history, and especially the history of Prussia.

"Care must be taken to introduce and combine these branches of knowledge with the reading and writing lessons, as much as possible, independent of the instruction which shall be given on those subjects specially.

"6. Singing, with a view to improve the voice of the children, to elevate their hearts and minds, to perfect and ennoble the popular songs, and church music or psalmody.
"7. Writing and gymnastic exercises, which fortify all the senses, and especially that of sight.
"8. The simplest manual labors, and some instructions in husbandry, according to the agriculture of the respective parts of the country."

"Every scholar, on leaving school, receives a certificate of his capacity, and of his moral and religious disposition, signed by the masters and the school committee.

Every burgher school shall afford instruction in religion and morals, the German language, Latin, mathematics, drawing, writing, singing, gymnastics, and

"Physical science, so far as is sufficient to explain the most remarkable phenomena of nature.

"Geography and history combined, in order to give some knowledge of the earth, of the general history of the world, of the people who inhabit it, and the empires into which it is divided."

Masters are charged to study the particular character and qualities of each pupil. No special books are prescribed, that no shackles may be imposed to improvement. Masters are to adopt the methods which gradually and constantly enlarge the understandings of the children, and not such as instil mere mechanical knowledge. Examinations must be public. The authorities, the clergy and the masters are required to unite their efforts to strengthen the ties of respect and attachment between the people and the school.

We have gone thus far in explaining the organization, objects and gradations of elementary schools, and in particularizing the studies and exercises which are pursued in them. In our next number, we intend to give some account of the normal schools, that is, schools for the education of masters, to teach in the elementary schools. In this branch of instruction, we have hitherto had little experience, and yet it is one on which the efficiency and usefulness of our whole system of public instruction, and indeed our religious, moral, and we may add, political character, very materially depends.

BOOK FARMING.

We have been told of the following facts, and have only to regret that the like to them are not of more frequent occurrence. A number of intelligent farmers, residing in a neighborhood, somewhere, we believe, in Dutchess county, concluded to form a farmer's association—to make a common stock of their knowledge and observation—believing that knowledge, like money, would be productive in proportion to the capital. It was known that A. raised the best horses, and got the best price for them; that B. was far more successful in his wheat and corn crops than his neighbors; that C. reared the finest neat cattle, and kept the best cows and oxen; that D. excelled in sheep husbandry; and, in short, that some individual excelled the rest in a particular branch of husbandry. Each possessed not only some excellence, but some glaring defec in his management. Thus the farm stock of one was sickly, and many died, because the owner did not know how to manage them; another's farm had become dreadfully impoverished, from neglecting the manure, and from close cropping; while the farm of a third was neither fit for plough land, or for sweet grass, on account of the water which every where saturated the soil, and rendered it poachy, cold and sour. Unlike too many now a days, each of these men was conscious he could learn much from his neighbor's practice, which would enable him to manage his farm with more profit—and that he could teach his neighbors something in return. These expectations were amply realized; but as the members lived somewhat remote, it struck them that it would save much time, and be a more sure way of rendering the improvements of all available to each, if they were to write down their practice in the particular branch in which they respectively excelled, and the principles, or science, upon which that practice was based. This was accordingly done, and for their mutual convenience, as well as for the benefit of others, the whole was printed, and these men were afterwards denominated, by some of their envious neighbors, *book-farmers*, because they took their instructions from a *printed book*. This did not disturb them; for they got from their book the secrets by which the others had excelled in their particular department, and each profited by the good management of his neighbors. The consequence was, that all gained by the interchange. The defects of all were speedily remedied, and in a few years prosperity crowned their labors; and they now exhibit, we are told, the best models of profitable farming any where to be found in the land; and they enjoy the felicity of reflecting, that while they have greatly benefitted themselves and their families, they have by their example and instruction, done much good to others. They have afforded a fair illustration of the advantages of book farming, when combined with intelligent practice.

Were this example extended to the farming community of our country, how greatly the work of improvement would advance, and the comforts of the human family be multiplied: were each to contribute his mite of practical knowledge, in the branch in which he most excels, what a treasure of information would be collected, to guide us in our practice, and to stimulate us to habits of industry. And do we not already possess, in a considerable degree, these precious advantages? What are our agricultural journals, but a record of instructions, by the best farmers of our own and every other country—a detail of the methods by which they have succeeded—have excelled—in the various departments of husbandry? There is not a man in the community who may not profit, in some degree, by the teachings of these journals. The self wise are ever the most profoundly ignorant; for as we advance in knowledge, we become more and more humbled by the consciousness of our comparative ignorance.

We beg that the readers of the Cultivator will take this matter into serious consideration, and remember, that an obligation rests upon them individually, to requite the favors which they are monthly receiving from others, by communicating whatever of their practice that may promise to be beneficial to their brother farmers.

A correspondent recommends the rubbing of the limbs of the plum, with soft soap, to prevent the black canker. He says he has tried it with success.

MADDER—(RUBIA TINCTORUM.)

This plant has a perennial root, and an annual stalk. It is cultivated for the roots, which, after being dried and ground, are employed in considerable quantities in dying a fine red color, and likewise as a first tint for several other shades. It is principally cultivated in Holland, the province of Zealand being almost entirely covered with it, from whence it is exported to every part of Europe and America, yielding almost incalculable profits. The imports of this article, for the use of our manufactories, is stated to amount in value, to more than two millions of dollars annually. Our soil and climate are found to well adapted to its culture, and some successful experiments have been made in raising it in the counties of Madison and Otsego. We refer the reader to the communications of Mr. Bronson, a cultivator of it, which will be found in pp. 85, 141, of our first volume. We invite the attention of our farmers to the subject, as a matter of importance to them and the community at large.

Madder does best in a deep rich sand loam, moist but not wet. It requires three summers to come to perfection; and as the roots strike deep, the ground should be ploughed and mellowed to the depth of two and a half or three feet, for its reception. Miller says it should be planted with a dibble, (it is propagated by off-setts from the old roots,) in rows from two to three feet apart; while Beechstein says they should be planted only six inches asunder. The practice in this country, we believe, for we are not personally familiar with it, is to plant in rows four to five feet apart, and to cultivate rows of corn or potatoes between them, at least the first year. The season for planting is in May or June. The acre produces from ten to fifteen and twenty hundred weight. The price in the market is about 20 cents per pound.

GRAIN WORM.

We promised to insert the memorial of the State Agricultural Society to the Legislature in this number; but as we understand that the committee to whom it was referred, deem it not worth reporting upon, we shall content ourselves with stating its purport. The journals of the day noticed it as being an application *for aid.* The fact is not so. The memorial states, that the ravages of the grain worm have become alarming; that in some of the northern and eastern counties, the loss incident to their destruction of the wheat crop has already exceeded, by computation, two hundred thousand dollars; that it is progressing south and west, at the rate of 40 to 60 miles a year; and that unless some means are devised to check the evil, it threatens to become destructive to the great staple of the west. Viewing the magnitude of the evil, and the prospect of its greatly increasing, the society thought it might comport with the duty and the dignity of the legislature, who are appointed to watch over the interests of the state, to endeavor to arrest it, by holding out pecuniary rewards for the discovery of an efficient remedy. This, they supposed, would tend to call the attention of scientific as well as practical men, particularly to the subject, and might eventuate in the discovery of a preventive of the evil—in which case the state would be benefited a thousand times the value of the premium to be paid;—and if no such discovery should be made, then the money would remain in the treasury. There are men who still believe it is impious to raise rods to avert the lightning from our buildings. The money which is often spent in a day's useless debate, at the shrine of personal vanity, if offered to check this evil *might* save the state many millions of dollars; and could not possibly do any harm.

PEACH TREES.

A correspondent of the Farmer and Gardener says, that having cleared his peach trees from the worms, he took some fine screenings of anthracite coal, and having cleared away the dirt from about the stock, put about a quart or two of screenings to each; and that the trees thus served, were, a year afterwards, wholly free from worms. In corroboration of the efficiency of this remedy, we add, that we have applied the ashes, blended has they always are with fine coal, in like manner, and with like apparent success.

Stock and Pattern Farm.—A petition is before the Legislature of New-Hampshire, for establishing a farm of this description in some central part of that state. Though late, the agricultural community seem to be awakening to a sense of their importance in society. They are not only the main source of national wealth, but they constitute the source of political power. They are the main earning, paying, and, when necessary, fighting class. If the fountain is impure, the stream will be impure also. The high responsibilities, and important duties, which devolve upon the farmer, demand, that he should be well informed.

CORRESPONDENCE.

Communications read before the State Agricultural Society, by H. Hickock, Esq.

THE CULTIVATION OF WHEAT.

There are two causes which, when our winters are open, operate injuriously on wheat crops. One is, the high and dry winds, which prevail in March; these blow off the soil in many situations, and, by leaving the roots of wheat exposed, occasion their destruction. Another cause is the heaving of the soil, occasioned by the alterations of cold and warm weather. The water in the soil, in the act of freezing, expands and raises up the earth, and also the roots of the wheat-plants which the earth embraces; when a thaw succeeds, the earth being heaviest, falls down first and leaves the roots of wheat a little elevated, and by repeated changes of the weather, the roots are so far thrown out as to perish.

Farmers when convenient, usually sow their winter grain early in September, upon a supposition which guides their common practice, that grain thus early sown withstands best the action of unfavorable seasons. This supposition is founded upon the very plausible theory, that as the oldest roots will be longer and more numerous and take a firmer hold of the soil than those which are younger, they will be the least exposed to be thrown above it, and at the same time, from their greater strength, be more tenacious of life. But experience informs us, that wheat, sown as late as the first or even the second week in October, very often survives with less injury than that which is sown in the early part of September. Indeed farmers very generally admit, as the result of their experience, that rye, whose laws of vegetation must be nearly the same as those of wheat, sown so late in the season as barely to come up, is most likely to withstand an unfavorable winter. Still the very plausible theory which has been mentioned very generally induces them to sow rye early as well as wheat, in direct opposition to conclusions which have been drawn from actual observation.

An experiment was made last autumn for the purpose of collecting some further information on this subject. On the first day of September last I excavated a spot of ground six feet square. On the one side, the excavation was about six inches deep, on the opposite side, its depth did not exceed one inch. Seed wheat was placed over the bottom, so that the kernels were about four inches distant from each other, the excavation was then filled up. The was a suitable mixture of gravel, sand and clay, for wheat, and of ordinary fertility. This was the latter part of the extreme drought which prevailed last summer, and the soil was dry, warm and finely pulverized before it was thrown on the wheat. These circumstances, except the extreme dryness of the soil, were highly favorable to the vegetation of seed at the greatest depth in the earth. On the fourth of the month there was a heavy shower which not only wet the soil, but beat it down close and hard. On the ninth of the month the plants began to show themselves; but none came up from a greater depth than about three and one half inches. Two or three days after the second leaf had displayed itself, some of the roots were taken up and examined. It now appeared that nearly an inch below the surface of the ground, a new joint was found which was the basis of the second leaf, and also of a new system of roots. There were now two tiers of roots; the seed or knot adjoining it, had generated the lower tier, and the new joint the upper one. These two tiers or systems of roots were connected together by a root resembling a cord or thread, and, in one instance, I cut off this connecting thread and transplanted the upper part. This grew with little apparent check from its curtailment; but the under part died, although the soil above it was opened so as to afford it the advantages of air and solar heat. On the 20th day of September, I examined another plant, which had its two regular formations as expected, and, what was not expected, a blade was discovered about an inch long, which had started from the lower system of roots, and would doubtless have found its way to the surface, had it not have been disturbed. It is to be remarked, that this plant sprung from seed placed under cover of nearly four inches of soil, which was about an inch deeper than any of the other plants examined, and that some of the tops of the wheat plants had been eaten off and trodden down by accidental intrusion; a fact unregarded at the time. On the 26th day of September I examined another root, expecting to see the blade from below more perfectly developed, none however was discovered; but a third tier of roots was found at the surface of the ground, which proceeded from the second as that had from the first system of roots. On the 16th day of October I placed some seed wheat about two inches in the ground; their delay in coming up induced me to suppose that they had perished from cold and wetness; but at the expiration of 3 weeks they made their appearance, and although the ground remained open several weeks longer, no second leaf appeared, of course no joint or second system of roots had been formed. The very different formations in the roots of wheat, which this experiment has disclosed, proceeded from causes appropriate and capable of being ascertained, but to distinguish them with certainty, other trials must be made and conducted with greater accuracy than the one of which an account has been given.

From these experiments, though inaccurate, some conclusions may perhaps be drawn of practical use. All plants, which live over winter, possess an apparatus, by which they supply themselves, in autumn, with food for their sustenance in spring. This food consists mostly of saccharine matter which is enclosed in a proper receptacle. When this receptacle is formed near the surface of the earth, the fermentation of its contents is excited by frequent changes of weather, the sacharine matter is decomposed and the plant perishes from the want of food, and perhaps also from the rupture of its vessels.

All wheat, shallow sowed, must have its reservoirs of food but slightly covered with soil, and of course they are fully exposed. When wheat is sown early at any depth, a second and, sometimes, at least, a third system of roots is formed within an inch of the surface. In these many stems originate, each of which has its receptacle of nourishment as its base, and it is quite certain that in most instances, the food which was contained in the seed and the adjoining knot is entirely exhausted by the supplies of nourishment it affords the upper portions of the plant. The life of early sowed wheat must then, like that which is shallow sowed, depend upon the preservation of the reservoirs of saccharine matter which are placed at or near the surface of the ground, and of course exposed to the unfavorable action of variable weather during winter.

Wheat, which is late sowed, generates no second blade or new system of roots, and of course the nourishment for spring's use is retained in the receptacle which adjoins the seed. If then we sow sufficiently late in autumn, and place the seed deep in the soil, we shall provide every security against the hazards of bad weather which the nature of the case admits of.

In the ordinary course of husbandry, some of the wheat is necessarily deposited at considerable depth in the soil, and when this takes place sufficiently late in the season, the receptacle of food will be protected by its covering of earth, and a partial crop will often be realized, although there may be, when the spring opens, no signs of life on the surface of the field. In such cases as the destruction of the blade, which issues from the seed-roots in autumn, can be of little importance, one would suppose that the surviving plants would grow the more vigorously, from their being less in number, and, by tillering, produce many stems with large well filled ears; such however is not the fact; usually the stems are single and the heads are not large. To account for this, it must be recollected that, after the ground has thawed in spring, the earth settles and often becomes so extremely hard that doubtless many plants die, in their struggle to overcome the opposing resistance, and the surprise is, that any should possess vigor enough to protrude even a single stem through the hard earth that covers it.

From this view of the subject, the practice may be recommended, of effectually harrowing the field in the spring after the ground has settled, in order to supply the plant with fresh air and give a free passage to its upward growth. After the harrow has been used, the roller ought to be employed to reset such roots as have been displaced and diminish the evaporation of moisture.

In England a wheat plant was taken up, seperated into eighteen parts and replanted, and by successive divisions and replantations, a crop of three and one-third pecks of wheat was obtained in less than 18 months from the time the seed was sown. If the roots of wheat can be so minutely divided and successfully replanted, there is little danger than the freest use of the harrow can be injurious, provided the roller be also used. The fact appears to be, that nothing is necessary to the vernal growth of the plant, but the preservation of the apparatus which contains the saccharine matter which is its proper vernal food; so that if the roots and top be cut off, and the bulb be planted in a genial soil, the plant will grow.

Notwithstanding the argumen s which have been urged in favor of sowing wheat late, it must be conceded that, when early sown and our fields are cultivated in the usual manner, it produces the largest crop, if it survive the cold season. Whether such improvements may not be made, as to combine the benefits of a sure and large crop, is a question still open to investigation; the probability is, that both advantages may be secured, by a more correct knowledge of the proper time to sow, and of the best methods of culture.

In the first volume of transactions of the society for the promotion of agriculture, arts and manufactures, instituted in the state of New-York, it is stated that, in Huntington, Suffolk county, fifty two bushels of wheat had been raised by manure on an acre of land, and Mr. Downs is said to have raised on a poor gravelly dry soil, by the use of fish as manure, at the rate of 128 bushels of rye an acre. In this case, the rye would doubtless have lodged and been of little value, were it not that it was twice eaten off by his neighbor's sheep which broke into the lot; once when the rye was nine inches high, and again when it was about six inches high.

The purduction of so large a crop of wheat and of rye must have proceeded from causes which are steady and unifotm in their operation, and if all the circumstances which had occurred to produce them, had been distinguished and noted down; similar crops might have been again raised. Some things which occurred during the cultivation of this rye crop, may be ascribed to accident or chance, so far as Mr. Downs' sagacity was concerned, but the causes which proximately accasioned the crop, did not work by accident or by chance, but agreeably to laws or rules from which they never deviate. This uniformity of operation lays the foundation for making future discoveries, and brings within the grasp of our faculties the knowledge of increasing our crops by methods the least laborious and expensive.

The period may arrive when the farmer shall pursue his methods of culture with an anticipation of the consequences which will result, analagous to that of the mechanician in the construction of a machine, and when by direct means, he shall procure greater crops than ever were obtained by mere empirical trials.

Time was when the greatest philosophers taught the doctrine, that all things pertaining to the surface of the earth were too irregular and too much under the governance of chance, to admit of scientific inquiry; this error has, within the two last centuries, been dispelled. But a similar error, in regard to rural affairs, is embraced by almost all our practicial farmers, and the task of correcting and exposing it, is devolved, it would seem, upon the unaided efforts of a few individuals. Here then is the difficulty.

MOWING AWAY GRAIN.

It is desirable in mowing away grain not only to guard against the depredation of vermin, but also to obtain the greatest stowage. To accomplish these objects it is necessary ,first to lay a course of sheaves round the outside of the hay with their buts out and close together. The buts of the second course should just touch the bands of the first; those of the third course, should lay on the bands of the second, and the same rule of placing the last course a little higher up on the preceding one, ought to be observed throughout, so that the layers of sheaves should have a convex form, gradually rising from the outside towards the centre, and for this purpose the centre ought to be well filled in. By this arrangement every layer will be a little more crowning than the previous one, and so it ought to be. The centre of a mow will always settle more than the outside, and if the layers are made level, they will soon become concave or dishing, as it is termed, and there will be a general pressure of the exterior sheaves towards the centre, of which the consequence will be an unoccupied space between the buts of the sheaves and the sides of the barn. But if the layers of grain are of a convex form, the outside sheaves will, as the mow settles, be pushed back by the central ones, close against the sides of the barn, upon the same principle on which both sides of a log will be pressed out by the force of a wedge driven between them. For a similar reason, if hay be put at the bottom of a mow of grain, the surface on which the grain rests ought to be a little crowning. But still the mow, as our barns are usually constructed, will not have that compactness which it ought to possess; the buts of the sheaves which rest on the girts are prevented by the girts from settling, so that a space is left beneath them, which both occasions a loss of stowage and affords a passage into the mow for mice. To correct this evil, the girts should not be more than three inches broad, and further strength, if necessary, should be supplied by giving them greater depth.

DESTRUCTION OF WEEDS.

The spirits of turpentine, I have found a subtle poison to all plants experimented upon, and among others I have applied it to milkweed, burdock and Canada thistle; a tea-sponful dropped on the stem, will run down and destroy it to the ground, and if the root is not, on the first trial, destroyed, a repetition will be sufficient. This remedy may be of particular use where weeds start up from under stone walls or other inaccessible places.

Johnswort is regarded by many farmers as more noxious than the Canada thistle. It frequently usurps whole fields to the exclusion of all the valuable grasses. On some spots of land covered with this weed I spread gypsum, at the rate of three bushels an acre, and had the satisfaction to find that the spots were soon covered with a thick mat of white clover and other grasses; while the Johnswort was part running out. It is quite possible that a less quantity of gypsum per acre might answer a similar purpose.

COMPOST.

There are two ways of making a compost, or mixture of earth with manure. Agreeably to one method, a mound is formed in the barn-yard or near it, consisting of alternate beds of manure and earth; when the manure has fermented, the mass is turned over with the spade and partially mixed. After a renewel and subsidence of fermentation, the materials are again turned over with a spade, and more thoroughly blended together. The compost is then drawn out and spread on the field.

The other way of mixing earth with manure, is much less laborious and expensive, and is thought to be, in many respects, more advantageous. The method is this. In the spring of the year, draw out all the manure, including straw, cornstalks, cobs and all other coarse materials fit for the purpose, into the field; spread it and turn the whole under the soil, from six to twelve inches deep, with the plough. In order to have the work well done, one or more persons must follow the plough, and with a rake, or hoe, or fork, place the coarse manure in the bottom of the furrow.

When the manure is not spread over the whole of the field as in common cases, and the coarse materials cover a still less portion of it, one person is sufficient to follow the plough. But when a lot is entirely covered with coarse manure, two followers will be required, and even three if the business is not properly arranged. The following regulation will save the labor of one hand, by rendering unnecessary the passing and repassing of the rakers, which the method suggested by our first thoughts would require. The first raker must set in after the plough, and continue his course; when the plough has performed one bout, the second raker begins. The first raker upon completing his round will stop; for he will find the furrow here filled with manure by his companion; but his stop will not be long, for the team will be close upon him, barely allowing time to step aside and permit it to pass; when he again sets in with his rake, or hoe, or fork. In this way the business will be conducted with great regularity and to the best advantage.

When the manure has been thus buried under ground, it is usual to plant corn in the field, that plants may be present to partake of the food which the manure furnishes during its decomposition, and also, to keep the field constantly producing valuable crops. In autumn, after the corn is gathered, the soil is turned over with the plough and, with the assistance of the harrow, the decomposed manure and the soil are well mixed together. The compost is now perfected and the field is in a state of preparation for winter grain.

To this method, it has been objected, that the gases, which first escape during the fermentation of manure, are poisonous to plants, and that their disengagement should be effected, in places where they could not exert their efforts injuriously. The results of several experiments which I have made, would appear to speak a different language from this.

I excavated a spot in my garden, about a foot deep, and filled it half full with clean wheat straw; over this was thrown the soil which had been displaced, and melon seeds were planted. The fruit was the largest and best I had ever raised. Upon examination, I found that the straw had undergone a thorough decomposition.

Another spot in the garden I trenched, to the depth of two feet, and deposited in it manure from the horse stable six inches deep, and then filled the trench with the soil which had been thrown out. On this bed were sown parsnip seeds; when the roots had attained the size of a goose quill, I dug some of them up. The roots had passed straight down to the manure, and at this depth, which was eighteen inches, they were of two-thirds of their size at the surface; the roots when dug for the table, were rather long than large, and they were excellent.

I excavated another spot in my garden, three feet in diameter, and a foot deep, and threw in fresh manure from the horse stable, without any admixture of straw, to the depth of six inches, after it was pressed down. In the centre of the manure I placed a stake two inches in diameter, and completed the filling up with damp clay well stamped down with a spade. The stake was then withdrawn, and the hole, having the capacity of about a pint, was filled with garden mould; in this were planted two kinds of corn. The stalks of these plants were not large; but, from the first, they preserved a healthy color, and each one produced a fair ear. The particulars of this experiment were so arranged as to cause the gases evolved from the manure, to act with the greatest force on the tender roots of the corn plants as they become developed; and when we consider the effects of the extreme drought which prevailed last summer, and that the roots of these plants were confined to about a pint of fertile earth, it is reasonable to suppose that t e manure supplied them with wholesome nourishment, rather than concentrated poison. If coarse manure be but thinly covered over with earth, the soil will be too puffy and dry to produce healthy plants; but I can assert from repeated observations, that the hottest kinds of manure, buried a few inches deep, warm the soil and give additional vigor to vegetation as well in the gardens as in the fields.

MANAGEMENT OF CALVES.

Hyde-Park, Feb. 15, 1835.

Mr. J. Buel—Dear Sir—Having experienced the benefits of correspondence on subjects of Agriculture, and not noticing the subject of raising calves for stock fully explained in the valuable Cultivator—with a hope to promote a better information on the subject, permit me to state the plan we adopt, in which we have been very successful.

E. Holbrook, Esq. can now produce from twenty to thirty calves (raised with little expense,) equal for *age, size, condition* and *fine symmetry,* to any in this country, say pure *Devon*, a cross with *Devon* and *Durham*, and *Devon* and *Alderney*, some of which Mr. Holbrook intends to send to Albany next fall for sale, when I shall feel honored by a personal introduction by Mr. Holbrook.

When the cow has dropped its calf we allow it to suck its mother about seven or nine days, always careful to milk the cow during the time the calf is sucking, to draw off the whole of her milk during this period, in order to promote a large, soft fine bag, during the summer, for the dairy use; at the end of this time the milk comes away freely, of a good color and quality; the calf is then taken from the cow, and with the finger learned to drink, allowing it about four quarts of skimmed milk night and morning. The milk should stand about twelve hours before it is skimmed, increasing till it is six weeks old; from then till ten weeks old, about twelve quarts per day; when ten weeks old diminish the milk for two or three weeks, and increase then from twelve to fourteen weeks. During this period, hay must be placed between split sticks, to invite them to eat, and which very soon gives them what is termed the cud; likewise place small troughs within their reach, containing wheat shorts, turmeric, powdered yellow rosin and salt—the turmeric possessing in a moderate degree an aromatic stimulant—the yellow rosin a weak diuretic; their combination prevents diseases to which calves are subject, swelled legs, yellows, &c.

I must remark, the skimmed milk given to calves, should be boiled, and stand till it cools to the temperature of milk from the cow: it is much better boiled than warm only. Cold milk will cause a calf to purge. If this is the case, put three spoonfuls of rennet into the milk, and it will stop it. If bound, a little pork broth will loosen it. When turned out to pasture, they must be provided with an open dry shed, containing hay, &c. to which they will retire for shelter, from storms, the powerful rays of the sun, or for comforts which nature mysteriously dictates to animals. Symmetry being of great importance, to obtain this, we do not allow them to struggle through the first winter, without care or attention; but provide them with a comfortable dry shed, allowing plenty of good straw for bedding—regularly feeding them with good hay, ruta baga, or small potatoes, with plenty of water ad libitum. We allow to ten calves per day, one and a half bushels of ruta baga, or small potatoes, smashed with a pounder immediately before feeding them, in order that they may not enter their stomach in a frozen state, placing as before, within their reach, turmeric, rosin, &c. of which they will take no more than nature requires. In the summer we turn them out on rough land, the winter following they require only ordinary care. If you think our method worthy attention, or likely to invite the attention of those interested in breeding stock, or the means of improvement on the subject, you are at liberty to insert as you think proper, after correcting errors in expression, &c. &c.

Yours with respect, THO'S MIDFORD.

N. B. In the statement given of our experience in fattening hogs with apple pomace, I forgot to state that the six shoats included in the number, were produced from one of the young sows which was killed, in the statement, making the credit greater than stated. I am fully convinced that apple pomace is as good to make pork as any material I am acquainted with, if managed systematically. It is unreasonable to believe otherwire, when we reflect on the quantity of apples it takes to produce a bushel of pomace, leaving all their solid substance, seeds, which produce an aromatic stimulant, pulp, core and peeling, when cooked with potatoes, &c. &c. and the acidity corrected by eating charcoal, of which they consume considerable. If any correspondent wishes more minute particulars on the subject stated, a line addressed to E. Holbrook, Esq. New-York, proprietor of the estate, will be cheerfully attended to and given; being myself his superintendent or manager of his farm. THO'S MIDFORD.

HINTS TO MOTHERS.

Moreau, 24th of 2d Month, 1835.

I have been gratified by occasionally seeing productions of the female mind inserted in your truly valuable paper. I say gratified, because it is an evidence of the march of improvement. I therefore take the liberty of forwarding to you a compilation from female authors, and if you think them consistent with the plan of your work, and worth attention, they may, perhaps, by publication be serviceable to some of our farmer's wives.

"There's naught our higher progress does preclude,
"So much as thinking we're already good."

Very respectfully, &c.
A FARMER'S WIFE.

In the management of domestic concerns, order and method should be observed, and all hurry and confusion ought to be carefully avoided. If we would begin at the right end of the thing, it must be in the morning of the day and in the morning of life; this is an essential point.

Sleep should never be considered as a luxury, but as only a necessary refreshment to invigorate the body and prepare it for further exertions. Therefore the propriety and advantage of early rising should be by example and precept, fixed on the youthful mind.

When these ideas are fixed, and the practice of them becomes habitual, business may be pursued without anxiety, and scolding and hurrying, which tends to irritate the temper, avoided. By pursuing this method, the numerous cares in a farmer's family are rendered easy and agreeable, and to a woman who has been properly instructed, and who has a knowledge of her own concerns, it is a source of peculiar satisfaction to know, that what she requires of her domestics, is consistent with the obligations they are under to her.

The mistress who treats them with mildness and suitable attention, is generally much better served, than she who treats them with harshness and severity. Their love and attachment create a desire to please, and these mutual interests contribute very much to the quietude and happiness of all around.

By this mode of procedure, there is much time for literary pursuits, which are highly important.

It is from the mother, that the early education of children is mostly received. It is the example at home that will educate them; your conversation, the business they see you transact, the likings and dislikings they hear you express; these will educate them, employ what teachers we may. The influence at home will have the mightiest influence in education.

Schoolmasters may cultivate the intellect, but the things done and said at home, are busy agents in forming the character; hence the importance of our families being well regulated; and if a mother would faithfully perform her duty to her offspring, she must be willing to make many sacrifices. The comfort and improvement of her family must be her principal object. Social visiting and virtuous intercourse with those we love, are some of the greatest comforts of life, yet even these must be under such restrictions that nothing may suffer by her absence.

While her children are young, and their minds susceptible of suitable impressions, she should sow the seeds of virtue, benevolence, and all those amiable qualities that will, in riper years, render them honorable and dignified in their pursuits, respectable and useful members of the community, and virtuous and exemplary heads of families.

EXPERIMENTS WITH INDIAN CORN.

Conway, Mass. Feb. 20th, 1835.

Messrs. Editors—I send to you a detailed account of an experiment with regard to the cutting of corn stalks, which I tried last fall, and which you are at liberty to make such use of as you see fit. I went into my field of corn the 15th day of September, and cut in the middle of the piece, four rows ten rods in length. I cut four rows in succession, thinking that the sun would have a better opportunity to ripen the corn where the stalks were cut, than it would if they were cut in alternate rows; and calculating to take at harvest the four rows on the outside for comparison. There were four acres in the piece, and it was planted so that four rows occupied a rod in width, or four feet and an inch and a half from row to row, and meant to average three feet from hill to hill. Thus you see that the whole of my experiment being eight rows, ten rods in length, was equal to 20 square rods of land. When it was ripe, I harvested it, taking the two rows first on the left side, being uncut, and side by side of those that were cut. These for distinction, we will No. 1. I then harvested the two left rows of those on which the stalks were cut; and which we will call No. 2; then the remaining two on which the stalks were cut, which we No. 3; and then those on the right side which were uncut, and called No. 4. The four parcels were all husked and laid away separately in the chamber to dry. At shelling time, the result of the experiment was as follows:—No 1 shelled out 115 lbs. of good hale corn, which gave, it being the 1-32d part of an acre, reckoning 56 lbs. to the bushel, which is lawful weight, 65 bushels and 40 lbs. to the acre. No. 2, shelled out 91 lbs. or 52 bushels to the acre, making a difference of 13 bushels and 40 lbs. to the acre, in favor of those rows where the stalks were not cut. No. 3 shelled 107½ lbs. or 61 bushels and 24 lbs. to the acre. No. 4, 121½, or 69 bushels and 24 lbs. leaving the difference of only 8 bushels in favor of those rows on which the stalks were cut; thus showing that though rows may be selected which are apparently equal, and side by side, yet the produce will not be the same, as is seen by comparing No. 2 and 3. I forward this to you without note or comment, barely remarking that the land was fitted in the same manner with manure, and selected for the sole purpose of trying the experiment in an impartial manner, and likewise to know the average yield of the piece. The fodder, where the stalks are left to remain till harvest, I consider two-thirds the value of those that are cut when the corn is green. Although this experiment is somewhat unsatisfactory to my own mind, in consequence of the variation in the results, yet still I forward it, hoping if you see fit to publish it, that it will induce others to try the same, and make them public, till it shall be established with a degree of certainty which is the most economical way of cultivating that useful and profitable crop of which we are treating; for if the above results are correct, no farmer can afford to give even eight bushels of corn for an acre of stalks.

For your own encouragement, I would remark that your useful and interesting paper is well received and much valued, by the few who take it in this place, and not only by the practical farmer, but also by some of the ladies, who do not consider it beneath them to take an interest and participate in the enjoyments and advantage which science can render, not only to the culinary, but to the farming art. G. DICKINSON.

Tillage Husbandry.

ON POTATOES.—BY T. A. KNIGHT, ESQ.

In a letter which I published last autumn, I stated that I had obtained a produce of potatoes equivalent to 887¼ bushels and 3 lbs. (each bushel weighing 60 lbs.) per statute acre, and I then expressed an intention which I now fulfil, of pointing out the means by which such an extraordinary crop was obtained, and by which, of course, other crops of equal magnitude may be again obtained; and I look forward with confidence to obtaining in the present year a produce equivalent to 1000 bushels per acre of potatoes of first rate quality.

The first point to which I wish to direct the attention of the cultivator of the potato is, *the age of the variety*; for it has long been known, that *every variety cultivated, gradually becomes debilitated, and loses a large portion of its powers of producing; and I believe that almost every variety now cultivated in this and the adjoining counties has long since passed the period of its age at which it ought to have resigned its place to a successor.*

No variety should ever be cultivated which uselessly expends itself in the production of seeds, nor even of full grown blossoms, unless it possesses some valuable redeeming qualities.

The distance of the intervals between the rows should be regulated wholly by the length required by the stems in each peculiar soil and situation. If the utmost length required by the stems be four feet, let the intervals between the rows be four feet also: and if the variety be of dwarfish habits, and its longest stem does not exceed two feet, intervals of two feet will be sufficient.

The rows should be made from *north to south*, that the mid-day sun may be permitted fully to shine between them, for every particle of living matter found in the tuberous root of the potato plant, has been generated in the leaves, (which act only when exposed to light,) and has descended beneath the soil.

Each set should weigh *at least six ounces*, and they should never be placed at greater distances from each other, than six inches from centre to centre, and a preference should be given to *whole potatoes*, when such can be obtained. If the growth of the plant be very dwarfish, four inches between the sets from centre to centre, will be preferable; and if the form of the potato be long and kidney shaped, a good deal of advantage will be gained by placing them to stand upon their ends, that end which joined the parent plant placed downwards.

The largest produce will generally be obtained from varieties of rather early habits, and rather low stature, there being in very tall plants much time necessarily lost in carrying the nutriment, which has been absorbed from the soil, up into the leaves and down again, in the state of living sap, to the tuber.

Varieties which have strong stems and erect form, are to be preferred, because such are least subject to fall upon, and shade the foliage of each other.

It is much more advantageous to incorporate the manure with the soil by means of the spade or plough, than to put it in with the sets; for in the latter case, a large majority of the roots, during the summer and autumn, do not derive advantage from it.

Early planting is, under almost all circumstances, best; and the period, except for some very peculiar varieties, should never be later than the middle of the month of April.

I possess, though at present in small quantities necessarily, many new varieties, which promise to prove valuable both on account of the quantity and quality of their produce, and I shall be happy as soon as I have the power, to make them useful to the public. I obtained, in the last year, from some of these under culture with the plough, (the soil being shallow, and naturally poor, and manure not having been given, in more than ordinary quantity,) a produce equivalent to more than 650 bushels of potatoes, of first rate excellence per acre, and a good deal larger produce from others of inferior quality, but I have not any reason to believe that I possess any variety which, either in quality for immediate human food, or in quantity for affording food to the inferior animals, has reached, or ever approximated the greatest state of excellence which the potato is capable of acquiring.—*British Farmers' Magazine.*

From the Genesee Farmer.

CULTURE OF BARLEY.

I send the following account of a crop of barley, not that it was a *very* large one, but that it afforded a handsome remuneration for the labor bestowed, and left the ground in beautiful condition for sowing wheat.

Three acres—strong gravelly loam—eastern exposure—year preceding in wheat.

1834, 4 mo. 8th—commenced ploughing—too late by a week.

		Dr.
Ploughing, 3 days,	12*s*	$4 50
Harrowing, before sowing, ½ day,	12*s*	0 75
4 mo. 13th—Sowing, ⅓ day,	6*s*	0 38
4 mo. 13th—Harrowing, 1 day,	12*s*	1 50
4 mo. 14th—Rolling, ½ day,	12*s*	0 75
Seed, 6 bu. 3 pecks,	4*s*	3 38
7 mo. 18th—Cutting,	12*s*	1 50
7 mo. 22d—Drawing, 2 days,	12*s*	3 00
12 month—Threshing,		6 12
Interest on land, at $50 per acre, 4 months,		1 16
		$23 04

Cr.—By 122 bushels barley, (by measure,) 4*s*. $61 00
Nett gain, $37 96

I have not taken the straw in account, though I think it much more valuable than wheat straw.

WILLIAM R. SMITH.

Macedon, 2 mo. 10th, 1835.

Cattle and Sheep Husbandry.

From the New-York Farmer.

Albany, Jan. 27, 1835.

D. K. Minor—Sir—Your favor of the 24th inst. came to hand last evening, soliciting some account of my stock, experience in farming, &c. Now, I would cheerfully comply with your request were my abilities adequate to the task. My experience in farming matters must necessarily be very limited, for I have only had possession of one since April last, and that one was considered none of the best, having been skinned and fleeced to that extent that it would hardly produce half crops. Notwithstanding the situation of the farm, and the lateness at which my crops were necessarily put in, and the excessive drought, still they were tolerably fair. I cut about sixty-five tons of hay on the same ground that only yielded about thirty tons the year previous. This great difference of product I attribute to the free use of plaster. With the aid of plaster and manure, of which I have a plentiful supply, I am in hopes of doing better for the ensuing season.

My cattle suffered very much in the fore part of the summer for the want of shade, as the skinning had even been extended to the trees, for there are only about five small ones left on about eighty acres! After harvest they were turned into my grain stubble, which had received in the spring a plentiful supply of clover and other grass seed designed entirely for pasture with about twenty acres of pine wood, where they improved with astonishing rapidity, notwithstanding the excessive drought the latter part of the season, and went into winter quarters in as good condition as I could wish.

On the first of December I had thirty-one head tied up in my stable, of which twenty-four were of the "Durham Short Horn" breed, consisting of bulls, cows heifers and calves, of various ages, and some of them imported. Since then I have sold one cow and calf, one bull, and two heifers, leaving now on hand nineteen head of the Durham cattle. The others were my working oxen, and one cow and calf of the Polled breed.

Having all my cattle in stables, and chained up separately, it has given me a fair opportunity of testing their qualities in keeping, contrasted with our native breed. The stronger has no advantage over the weaker; each animal gets its allowance. The usual allowance for full grown animals is 1 bushel of cut hay, straw, and corn stalks, mixed with half a bushel of brewers' grains, one half in the morning, and the other half at night, with a little long hay at noon, by way of relish. The smaller animals were fed in proportion to their age and size; and with this feed the Durhams have improved, while the native, (though smaller,) have not held their own. Another cicumstance leads to the same result.

A friend of mine wishing to raise a calf from a very superior milker of our native breed, applied in the fall to me to keep her through the winter with my calves, to which I consented. On the first of December she was received at my farm, and put in the stable by the side of my own animals, was fed at the same time, and with the same kind of feed; still she does not grow so fast, and is far behind them in condition and appearance. It is contended by many, that it requires more food to keep the Durham than our native cattle, owing to the greater size, &c. &c. of the former. In answer to this I can only say, such has not been the case with my herd.

I will now, at your request, proceed to give you a description of some of my animals, and begin with

"Carlos," a red and white bull, six years old, got in England by Mr. Whittaker's Charles; dam Galatea, bred by Mr. Whittaker, and got by Frederick, sire of the "Duke of York," lately imported by a company in Ohio, for which they paid £170 sterling in England, and must have cost them about $800 at the Sciota. Carlos is not large, but beautiful; fine in the head and horns; short and clean neck; deep and broad chest; large round barrel; great breadth of loin; small and short in the legs; fine and silky hair, with a soft and mellow skin.

"Superior," a roan bull, three years old, got by Frederick, a son of Wye-Comet, dam Yellow Rose. Superior is not large, but very compact and well made; of fine symmerry and form, straight and fine in the leg, remarkably deep and broad in the chest, deep and heavy carcase, straight in the back, and wide across the hips and loin. His stock, though young, promises well. Great prices for some of his calves, from native cows, have been refused.

"Damon," a red and white bull calf, three months old, got by Superior; dam, imported cow Dulcibella. Damon is a calf of great promise, having in an eminent degree all the good points generally found in calves of his age.

"Dulcibella," white, with some red on her head and neck; eight years old; bred in England by Mr. Whittaker; got by Frederick; dam, Delicia. She is a part of my *capital*, from which I expect large dividends. She is a large animal in a small compass; she is of great length, deep, and round in body, immense breadth across the hips and loins, large and capacious chest, brisket dropping within 15 inches of the ground, straight on the back, short neck, and good head; keeps in good condition, and gives a good mess of very rich milk.

"Dorinda" is white, with a red neck and head; three years old; got by Carlos; dam, Dew Drop; grand-dam, Dulcibella. She is a heifer of good promise, of fine size and form, has had only one calf. A good milker.

"Georgiana," "Delia," "Gertrude," are from ten to eighteen months old; all got by Carlos; and are very superior animals of their age.

The above are all "Herd Book," and high bred animals. My other cattle are all very good, but nothing very peculiar or superior to the others, therefore a description is superfluous.

My swine consists of the "improved China," introduced here by the late Christopher Dunn, Esq., of this city; also, the Berkshire breed, imported and introduced in this vicinity by S. Hawes, Esq., who removed from England, and settled about three miles west of this city. This, I think, is the farmer's hog, for they are of great length, round body, short in the leg, and a little larger bodied, than the China; easy keepers; and may, I am informed, be fatted to 5 or 600 pounds! And though last, not least, is a beautiful sow, eight months old—a combination of all the good points that are required in the hog, being long and round in body, short and small legs, short, small head, with very small upright ears, &c., &c. She is one of three that took the first premium at the Berkshire Agricultural Fair held at Pittsfield in October last. When I applied to the owner to ascertain what particular breed they were of, he said, "*They were the best breed he could find.*" They will attain with ordinary care, at nine months, about 200 lbs., and with a little extra care, 225 to 250 lbs. This sow I intend to cross with my favorite little China.

My sheep are few in number, but some of them very superior, especially the New Leicesters. The others are two South-down bucks, some half blood South-down ewes, &c. &c.

Very respectfully yours,
CALEB N. BEMENT.

Accumulated wealth brings care, and a thirst for increasing riches. He who requires many luxuries, is always in want of many. Happy is he to whom God has given a sufficiency with a sparing hand.—*Horace.*

Man is blind to his own faults, but clear sighted in discerning those of others.—*Phæd.* He quickly sees the "mote in his brother's eye."

He who defers the hour of beginning to live correctly, is like the peasant who waits to have the river flow past; but it continues to flow, and will flow till the end of time.—*Horace.*

Timid dogs bark more violently than they bite.—*Sal.*

Elements of Practical Agriculture,

By David Low, Professor of Agriculture, &c.

DRAINING.

(Continued from page 12.)

Before beginning to drain a field or tract of ground, it is frequently well to ascertain, by examination, the nature of the substances to be dug through.

At the upper part where the wet tract to be drained appears, or between the wet and the dry, let a few pits be dug. The place of each pit is to be marked out nearly in the direction of the proposed line of drain, six feet long by three in width, in which space one man, and if required, two, can work. Let the earth be thrown out to the lower side, and to such a distance from the edge of the pit as not to press upon and break down the sides. Let these pits be cast out to the depth of five or six feet, or more if necessary, so that we may reach, if possible, the porous bed in which the water is contained. Should we find no water, then let us apply to a boring rod, in order to ascertain at what depth the porous substance lies in which the water is contained.

Sometimes water will not be found until we come to a great depth. It may be so deep that we cannot reach it by any drain, or even by boring with the auger. In this case, we are saved the labor of making the drain unnecessarily deep. Sometimes we shall proceed to a considerable depth without finding any appearance of water, when, all at once, by breaking through some thin stratum, we shall reach it. The water is frequently seen, in this case, to boil up like a fountain, and this affords the assurance that we shall succeed in our object.

This species of preparatory examination by means of pits, is therefore, in many cases useful. It affords the means of judging of the proper depth and dimensions of which the drain shall be formed; it prevents the committing of errors in the laying out of the lines of drains; and it enables the drainer to enter into contracts with his workmen with precision.

When we have thus, by sinking pits in various parts of our intended lines, obtained an idea of the nature of the ground, of the substances to be dug through, and of the depth of the water, we mark our lines of drains upon the ground.

This may be done by pins, or by a plough drawing a furrow along the intended line.

It is at this time very convenient to make a hand-sketch of the piece of ground to be drained, marking each line as it is laid off in the field, and noting the depth and direction in which the water is to run.

The lines being marked off in the manner described, these are to form the upper edges of the drains.

The width of the drain at the top depends upon its depth, it being usual, except in the case of very hard and tenacious substances, to make it slope from the top to the bottom. Thus, if it be six feet deep, and from 18 inches to two feet wide at bottom, it may be 2½ feet wide at top.

The workman, in forming the trench, works up to the higher ground, and never from the higher ground to the lower. The instruments which he uses in the operation are the common spade, a shovel for throwing out loose substances, a pick or mattock, for raising stones and breaking the earth when hard, and the foot-pick.

The materials to be used for filling the drain may be stones, tiles, or other hard and durable substances. When stones are to be employed, if they are inconveniently large, they may be broken to the weight of three or four pounds. They may be laid down for use, before the cutting of the drain is begun, along the upper line of the drain, the earth being thrown by the workmen to the lower side; or else they may be brought forward while the work is going on, and thrown from the cart into the drain.

In the larger class of drains, it is regarded as beneficial, and even necessary, to form a conduit at the bottom. This is done by building a little wall roughly on each side at the bottom, about 6 inches in height, and so as to leave an aperture or conduit of about 6 inches in width. The workman then covers it with such flat stones as he can procure, filling up also the interstices of these covers with small stones, so as to defend the conduit from earth and other substances that might fall into it. When this is done, the remaining stones are thrown in promiscuously to the height of 18 inches or two feet above the cover. The stones are then to be made level at the top, and either covered with the sod which, on breaking the ground of the drain, had been laid aside for that purpose, or with a covering of straw, heath or the like. The object of this covering is to prevent the loose earth from falling among the stones.

When these operations are completed, the earth which had been thrown out of the trench is shovelled upon the stones until it be above the level of the surface. The object of raising it higher than the surface is to provide for the subsidence of the loose earth, which is generally found to be rendered more compact and to occupy a smaller space than it did in its original state. When a portion of the earth is shovelled, it is an economy of labor to employ a common plough for filling in the remainder.

Fig. 1.

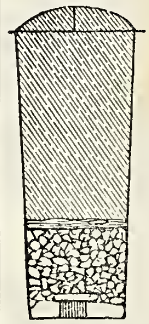


Fig. 2.

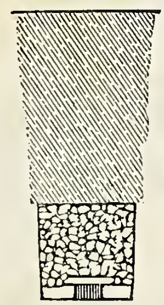
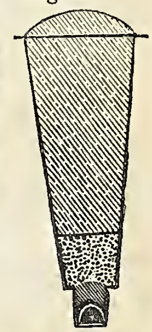


Fig. 3.

Fig. 4.



A drain thus formed will appear on a transverse section, as in fig. 1, and after the subsidence of the earth, as in fig. 2. Where the soil is very soft, it is of benefit to pave the lower part of the drain with stones or slates. In the whole operation of forming the trench and conduit, great care is necessary in seeing that all the parts of the work are executed well.

The stones used for this species of drain may be sandstone, or any of the harder stones that can be obtained. But in many cases, stones are not to be obtained, in which case tile may be substituted.

The tiles, which are made with an arch, as in figure 3, may be formed of separate pieces of about 14 inches in length. Flat soles are made of the same materials, on which the arched tiles are to rest.

The method of forming the drain when tiles are the material employed, is somewhat different from that adopted when stones are used.

The drain is carried down as narrow as a man can work, and at the bottom an excavation is made by means of a narrowmouthed spade, to fit the dimensions of the tile, which is then placed upon its stand or sole. Above this, should be laid some loose materials, as clean gravel or sand, for allowing the filtration of the water. Even brushwood and such materials, may be used. for, though they are not of great durability, they serve the purpose, even after they have decayed, of rendering the earth more open and pervious to water.

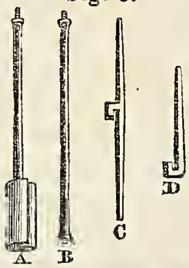
Drains formed in this manner, whether the material employed be stone or tile, will be found efficient when they are laid out in the proper direction, and when the pervious substances are reached in which the water is contained.

But it is often impracticable to reach these substances with a drain of common depth. In this case, apertures may be formed at the bottom of the drain, by boring or sinking down at the proper distances, until the pervious beds in which the water is contained are reached. By this mean, the water will be allowed to flow up from below into the cavity of the drain, and so will be carried away.

The application of this principle had been familiar from the remotest times in the sinking of wells. But it was not till after the middle of the last century that the same principle was applied to the draining of land. This was done by Mr. Elkington of Warwickshire, who employed the auger and the boring-rod for the purpose of reaching the channels and resorvoirs below the surface, when an ordinary drain could not reach them.

The auger employed for this purpose, is similar to a carpenter's wimble. It may be from 4 to 5 inches in diameter. Square iron rods are made to be screwed into each other, so that the length of the line of rods may be increased in proportion as the auger penetrates the ground. In the annexed figure, A is the auger, B one of the rods, C a key for turning it round and working it, D another key for holding the rods when they are to be unscrewed by means of the key C.

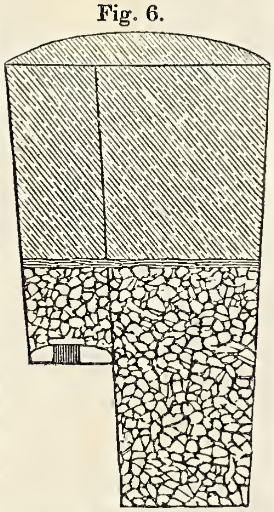
Fig. 5.



This instrument may be frequently found useful when the channels and reservoirs of water can be reached in this manner. The apertures are formed by the auger in the bottom of the drain. When the water is reached, it will spring up into the drain in the same manner as water in the bottom of a well. It is not necessary to employ any artificial means for keeping the apertures open, as the flow of the water will suffice to maintain for itself a passage.

Sometimes, in place of an auger hole, wells are sunk at intervals along the side of the drain, and filled with stones in the manner shown in the figure.

Fig. 6.



In all cases of under draining, the drains should be made of sufficient dimensions. They should not be less than four feet deep, even when the pervious strata lie at less depth; and the reason is, that they may be more permanent, and better defended from mud and sand, carried down by surface water. It is not necessary that they be made deeper than four feet, when that is found to be sufficient; but they must be carried, if necessary, to the depth of six feet, or even sometimes of seven feet, though the expense and difficulty of executing the work increase, in a great proportion, as the dimensions of the drain increase.

The importance, in this species of draining, of proceeding upon principles in laying out the lines of drains, instead of acting at random, as so many do, cannot be too strongly impressed upon the attention of the drainer. Every drain, however rudely devised, and imperfectly executed, may do some good. But one drain well laid out, and of the required dimensions, may perform a purpose which no multiplication of minor and insufficient drains can effect.—These may lessen the effects of wetness, but the other is designed to remove the causes of it; and the more perfect practice will usually be found in the end to be the most economical as well as the most efficient.

The drains of the larger class described, it will be seen, are intended solely for the removal of water which is contained in reservoirs and channels below the surface. They do not supercede the necessity of carrying away water which is at or near the surface. From this latter cause, an equal or greater injury may arise, and must be met by a corresponding remedy.

Surface-water may be carried away either in open drains, or in covered trenches.

The open drains are—the ditches of fields, which ought to be so laid out as to favor the descent of water—the open furrows which are formed by the ridges—and open trenches cut in the places necessary for allowing a passage for the water.

In the forming of open trenches, the dimensions must be fixed with relation to the quantity of water to be carried away, and the direction determined by the natural flow of the water, or by the particular course by which it is expedient to carry it off. In general, open drains are formed in the hollows or lower parts of the land to be drained, so that the water may find access to them from the higher grounds.

In forming open drains of whatever depth, the sides should possess a declivity from the bottom to the top, to prevent them from crumbling down and being undermined. Except in the case of rock, this inclination should not be less than 45°; and when the earth is soft, and the flow of water considerable, it should exceed 45. In all cases, the earth should be spread from the edge of the trench backwards, so that the water from the lands on each side may have access to it.

The next class of surface drains consists of covered trenches. These are formed in the same manner as the larger drains already described, with this difference, that no conduit is required, and that they need not be of the same depth and capacity. They may generally consist of a small trench, from 2½ to 3 feet deep, filled with stones or other loose materials, to within a foot of the surface, so that there may be a sufficient passage for the plough above.

These drains are generally carried through hollow places where water may stagnate, or obliquely along the line of descent, and sometimes in regular lines along the surface of flat lands.

When the soil rests on a subsoil of considerable depth, the water that falls upon the surface is unable to penetrate freely down, and is absorbed and retained by the soil and upper part of the subsoil. The object in such a case is to give a ready egress to the water with which the soil is saturated, which will be done by forming for it various channels towards some convenient outlet. A good arrangement of ridges and furrows will sometimes of itself effect this purpose; but as the water constantly tends to sink below the level of the furrows, drains may become necessary to assist in carrying it away.

A system of draining having relation to this condition of the soil and subsoil, has been termed the Essex system, from its having been extensively practised in that flat and clayey district. This system consists in running small drains parallel to each other in every furrow or alternate furrow. The object of this species of draining is not to intercept springs flowing in channels and pervious strata below the surface, but to convey away that water from the surface which, from the tenacity of the soil and subsoil, cannot find its way downwards.

The best materials to be used in this species of draining is tiles, formed into a semi-cylinder or arch, and resting upon a flat sole, fig. 3. The diameter of the semi-cylinder may be from three to four inches. The tiles are to be placed on their stands in the bottom of the trench. The water finds its way into the arched conduit thus formed at the crevices formed by the junction of the tiles. Sometimes, in addition, are formed through them small holes, so that the water may more readily find its way into the conduit.

The trench for the reception of the tiles may be from 18 inches to 2 feet deep. The tiles may be covered, first with the sod inverted, when there is any sod upon the surface at the time of draining, second with the looser soil next the surface, and lastly with the more tenacious subsoil. But it is always an improvement in the case of this kind of drains, to lay over the tiles some gravel, sand, or other pervious matter, before shovelling in the earth.

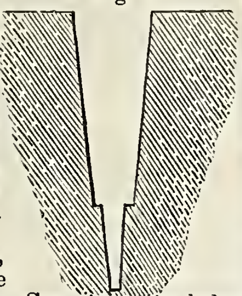
Drains of this kind, when properly made, and when the tiles are good, will last for a considerable time. When choked at any particular part, they can be easily taken up at that part, and the tiles replaced, or new ones substituted.

Though this species of draining is well suited to particular cases, great care should be taken that it is not applied under circumstances to which it is not suited. When employed where under-draining is the proper remedy, it is neither so durable nor efficient as the system of larger drains, formed upon correct principles.

Thorns, brushwood and branches, are frequently employed in the filling of drains. They serve the purpose of affording a more pervious channel to water, but they soon decay, and the drains are very apt to be choked. Sometimes, indeed, the channels formed by the water remain, when there is a considerable current, long after these materials have decayed. But this cannot be depended upon, and such materials, therefore, ought not to be used if better can be obtained.

Sometimes a species of draining termed wedge-draining, has been employed. The general method of performing this is to form a narrow trench with a long narrow shovel. The spit being taken out as deep as the shovel can go, a scoop is employed to clear out the mud and loose earth at the bottom. Then another shovel corresponding with the first is used, and a second spit taken out, and then a narrower shovel still to clear the whole out—forming a trench with a ledge, as in figure 7.

Fig. 7.

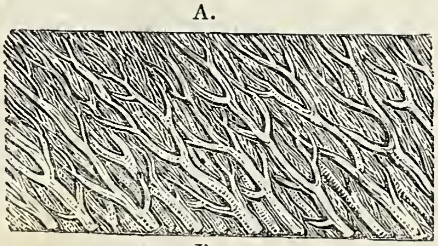


A piece of sod with the grass side below, is then forced down, and resting upon the ledge, a space is left for the water below. Sometimes the ledge is dispensed with, and the sod is merely formed into a wedge, narrowed towards the grassy side, and this, when the little trench is cleared out is pressed into it and covered with earth; and as it does not reach the narrow bottom, a channel remains below, through which the water percolates.*

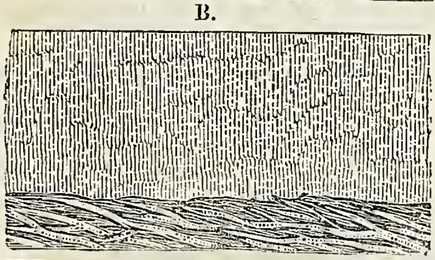
This simple species of drain has been extensively adopted in some districts; and as it is easily formed, and as the number of drains may be multiplied at little expense, considerable benefit has resulted from the use of it. But although drains of this kind will remain open for a considerable time, yet they are exceedingly apt to be closed up; on which account, the use of tile is in most cases to be preferred.

* There are two other materials for under-draining which we have employed, for want of stones, both equal if not superior, to sod, viz: brush-wood and straw. For brush-wood, the trench may be made like fig. 1, 18 or 24 inches wide, and three or four feet deep. The brush we have used, have been pine saplings, from two to six inches at the but. They are cut into lengths of four or five feet, and commencing at the upper end, placed diaganolly in the trench, the buts down and towards the outlet. When completed, the ditch is apparently full. The brush is then all brought within the edges of the ditch, well trod down, and the earth thrown in. Bundles of faggots are sometimes employed. When straw is to be used, the ditch is made to conform to figure 7. The lower part is cut by a spade, ten inches long, three broad at top, and one inch at bottom, and the loose dirt carefully removed with a scraper, which we may hereafter give a figure of; the straw being twisted into ropes, is then pressed gently with a spade into the narrow cut, the sod placed over it, and the earth thrown in. A side view of a brush drain is shown in the annexed cuts; A. shows the form of placing the brush, and B. its position after the trench is filled with the earth. In both cases, the sides of the main trench may be cut perpendicular.—*Cond. Cult.*

A.



B.



Miscellaneous.

Extract from the Address of Mr. S. Blydenburgh, read at the annual meeting of the Rensselaer County Agricultural Society, October 7, 1834.

Science and art, which were designed by Nature as twin sisters, for the mutual benefit and support of each other, have been from time immemorial alienated and estranged by the artifices of designing men. But, thank Heaven! they are becoming happily reconciled. Science, tired of spinning hypothetical cobwebs in secret, has at length found out that she is indebted to her long despised sister, not only for the common comforts of life, but even for the instruments with which she makes her discoveries; and *Art*, finding herself no longer insulted, instead of groping in darkness, as heretofore, is now making rapid advances in the perfection of her labors, as she pursues them by the light of science. Every branch of the useful arts is now assuming an improved character, as it begins to be conducted on scientific principles; but in no branch whatever is the knowledge of those principles of more importance than in agriculture.

The same overbearing spirit, which has heretofore monopolized all the honors, all the respectability, and most of the wealth, has endeavored, and still endeavors, to claim all the learning. We have two or three professions, which, however necessary, (and I have no disposition to question either their usefulness or their respectability,) cannot produce a single article even for their own subsistance, but which are with great emphasis styled the *learned* professions; while the farmer who feeds them, and who furnishes the materials to clothe them, is in grateful return greeted by the sweet sounding appellation of clodhopper. There can be no shadow of objection to giving learning to the man who labors for our spiritual good—to the lawyer, who settles our temporal disputes—or to the physician, who heals our maladies. But why, in the name of common sense, is it not equally necessary for the farmer? I would not dispute with either of these learned professions for the monopoly of the dead languages, but for the ever-living natural sciences—for mathematics, mechanics, chemistry, botany, zoology, and their subordinate branches. I contend that where the clergyman, or the lawyer, has one professional occasion for their use, the farmer has fifty. By botany and chemistry, he learns the physiology of his plants, the nourishment and treatment they require; and, by analyzing his soil, he discovers what is necessary to maintain and increase its fertility, Zoology and natural history teach him the characters and constitution of his animals; and mechanics, the structure and use of his imolements. In short, his whole business of life is a series of illustrations of the principles of science, and his whole establishment is a scientific laboratory.

May we not confidently hope that the worthy gentlemen of these learned professions will at some day be willing to admit the scientific farmer to an equal rank in the scale of being with themselves? But the number thus favored, however, must, for some time to come, remain very limited, for though we have colleges of distinguished reputation dispersed throughout the country, yet the course of education they pursue is of too abstract a nature to be of any essential service to the interest of agriculture. There can be no doubt that those who have no faith in book farming will smile at the idea of a college-learnt farmer. But how many things have been smiled at as ridiculous at one period, and at a subsequent period hailed and applauded as wonderful improvements? We have theological seminaries, and medical seminaries, and law seminaries, and military seminaries, and each endowed with splendid and costly libraries, and all the paraphernalia of scientific illustration and experiment, and furnished with able teachers, liberally supported. But poor agriculture whose hand sows the seed, and whose arm gathers the harvest and the vintage, on which our earthly comforts and even our very existence depend, she can have no seminary in which to teach her sons the most valuable of all arts. No matter—they are nothing but clod-hoppers; if they can learn their letters and read the bible, what more can they want to know? Even our wise legislatures can grant supplies for literary and other public institutions with a liberality which does them great credit, but touch the string of agriculture, and it refuses to vibrate; the whole instrument seems paralyzed and makes no music.

But let me entreat the friends of agricultural improvement still to persevere, notwithstanding all these discouraging circumstances. Let the disciples of the old school ridicule *book* farming and laugh at the idea of an agricultural college, or of schools to teach the farmer how to hoe his corn. As I have already stated, the spirit of improvement is awake! Our State legislature already has the subject before it, and the agricultural society of the State will doubtless pursue it with persevering attention. It is true, we cannot have the credit of setting the example and leading the way. Such institutions are already established, and are producing most happy results in several parts of Europe; and young men are attending them even from this country. Let us then have the praise of setting the example in our own country, and let this State take the lead of all the others. Where is the man of so much apathy as not to be cheered with the anticipation of beholding such an institution: an extensive and handsome edifice, where our young men shall be taught, in theory and in practice, those immutable principles of nature which form the only infallible guide to all the substantial comforts of life! Where, by mingling the useful with the sweet, they will become inured to habits of industry; where science and art shall combine to inspire them with laudable emulation to excel each other! if we are charmed with viewing a garden, upon a small scale, the work perhaps of a single, but skilful individual, how infinitely more charming must be the view of three or four hundred acres, planned and laid out with all the accumulated skill of ages, aided by all the lights which science has thrown on the subject, with all the beauties of the vegetable world, and all that is useful of the animal! Could any earthly prospect be more delightful? I answer, yes; that of two hundred young men, vying with each other, in skill and industry, not only in improving and beautifying the establishment, but in improving their minds by study and their bodies by manly labor, infinitely more pleasing and more to their credit than the mountebank feats of a gymnasium; thus fitting themselves as brilliant lights to guide, instruct, and adorn the succeeding generation.

This view of the subject, or rather the subject itself, far surpassing any picture I can draw of it, will soon become reality, if those interested in its progress do their duty; and that they will do their duty, the talent and integrity already engaged are sufficient guarantee. Let this state set the example, and all the other states will imitate it. And what will hinder the same from taking place in every county? Should one county lead the way, there can be no doubt but all the others will follow. But the county institutions will of course be small, compared with that of the state. One hundred acres of good land, with other suitable investments, might be sufficient; and what mighty thing would the cost of a hundred acres of land and a little expense in buildings and apparatus be for this county? There is abundant reason to believe that such an institution in each county would be an immediate source of pecuniary profit, independently of all its other advantages. But the state institution must necessarily lead the way. That institution, then, as the parent or head, would furnish teachers for all the others, and it would also furnish seeds, plants, and animals, of every description; and as it would be foremost in all untrodden ground, it would protect the county institutions from all loss in new and untried experiments, and afford a pattern for them to follow in all their operations. The state could afford expenses in books and apparatus, as well as in the introduction and acclimation of rare and valuable exotic plants; and also in procuring valuable and extraordinary animals, which would be altogether beyond the reasonable means of a county, much more so of an individual; and yet these valuable acquisitions would be less so, either to the county or the individual, because they cost comparatively nothing. There are probably more than a hundred thousand respectable farmers in this state. Many of these have been at very considerable expense to introduce some valuable breed of animals, or even the seed of some extraordinary vegetable. Now, suppose the expense so incurred should, in some cases, be a hundred dollars,—and it has been in many cases much more; this would be a heavy tax for an individual; but divide this tax among the hundred thousand farmers, and it amounts to one mill a piece. And suppose this introduction were effected by the United States, the expense to individuals would be still less; the liability to imposition would be also less; and the chance of its being distributed over the states, and consequently the public thereby benefitted, still greater.

Let this parent, or state agricultural school be attended as it would be, and as I venture to say it will shortly be, by pupils from each of the counties, each of whom will be an interested respresentative of his own county; and let each county have, as there is reason to hope it will have, a school after the same model, but upon a smaller scale; and when this system shall even begin to be in full operation, how abundant will be its benefits to every farmer in the state, as well to those who have not, as to those who have been its pupils. If any new and valuable production is introduced, as fast as the course of nature will suffer it to multiply it will, of course, be distributed for the benefit of the whole. Are new agricultural implements invented, here their comparitive merits will be tested; and if, upon fair experiment, found not good, they will be condemned, without suffering individuals to be imposed upon. Here, also, every farmer in the county may, without much expense, go and view the operations and improvements himself, and not listen to stories which he as no faith in, or read books on the subject which he does not understand.

BOILED FOOD FOR CATTLE.

Having for some years turned my attention to the most economical and profitable mode of fattening cattle, and especially hogs, I have found that preparing their food by the process of boiling is unquestionably the greatest improvement that has yet been discovered—a slight fermentation following previously to feeding it away as certainly adds to the capacity of food for affording nutrition. And I have also further fully ascertained, that the nutritive qualities of many species of food can *only* be obtained by boiling, and in many others is only fully developed, or prepared for the action of the stomach by that procees.

The Irish potato furnishes a case in point of the first kind, and the apple of the last. It is extremely rare that you will find a hog that will eat a *raw* Irish potato, but put it through a culinary process and it is rare to find one that will refuse them.

Boil the apples, let them get cold, and feed them to the hogs, and you will double their capacity for producing flesh.

But, sir, the result of fairly conducted experiment has equally convinced me that the mixing of different kinds of food, adds prodigiously to the capacity of the different materials for affording nutrition, from the effect of combination. The increase of the quantity of food, as well as the addition to its nutritive quality, by the simple absorption of water in the act of boiling, is familiar to all well informed persons. But I am assured that the combination of different materials, produces a greater mass of nutritive matter, than the whole could separately yield; and that to find out the art of mixing food, along with the best mode of preparing it for the action of the stomach, is the great art of feeding economically, and I believe to secure animal flesh, health and vigor.

The late improved mode of keeping up in flesh working horses in England, by the admixture of food, may be cited as a corroborating proof in point. It is now I think rendered certain that the combination of two articles of food, produces a new nutritive matter, more effectual than either could separately, or that could be produced from the nutritive matter contained in each fed separately. Boil Irish potatoes, pumpkins and apples; combine them by mashing together, and add a little salt, and it will be found most nutritive food for hogs, producing flesh rapidly. Now a hog on Irish potatoes raw, would starve to death, and do little better confined to pumpkins; on raw apples he would live tolerably; on the boiled and combined he fattens kindly and rapidly.

The result with me has become an anxious desire to ascertain the simplest and most economical mode of steam boiling food on a large scale, say pumpkins, potatoes, &c. Some of your readers may have seen, or be in possession of some plan not generally known, and valuable.

I have no hesitation in saying that the individual whose talents would devise some plan, which would come within the reach of every description of planters, uniting economy in the expenditure of capital, with despatch, would confer a solid benefit on our country.—*Southern Planter.*

From the Genesee Farmer.

THINGS A FARMER SHOULD NOT DO.

A farmer should never undertake to cultivate more land than he can do thorougly—half tilled land is growing poorer—well tilled land is constantly improving.

A farmer should never keep more cattle, horses, sheep or hogs, than he can keep in good order; an animal in high order the first of December, is already half wintered.

A farmer should never depend on his neighbor for what he can, by care and good management, produce on his own farm; he should never beg fruit while he can plant trees, or borrow tools while he can make or buy; a high authority has said, the borrower is a servant to the lender.

The farmer should never be so immersed in political matters, as to forget to sow his wheat, dig his potatoes, and bank up his cellar; nor should he be so inattentive to them as to remain ignorant of those great questions of national and state policy which will always agitate more or less a free people.

A farmer should shun the doors of a bank, as he would an approach of the plague or cholera; banks are for men of speculation, and theirs is a business with which farmers should have little to do.

A farmer should never be ashamed of his calling; we know that no man can be entirely independent, yet the farmer should remember that if any one can be said to possess that enviable distinction, he is the man.

No farmer should allow the reproach of neglecting education to lie against himself or family; if knowledge is power, the beginning of it should be early and deeply laid in the district school.

A farmer should never use ardent spirit as a drink; if, while undergoing severe fatigue, and the hard labors of the summer, he would enjoy robust health, let him be temperate in all things.

A farmer never should refuse a fair price for any thing he wishes to sell. We have known a man who had several hundred bushels of wheat to dispose of, refuse 8s. because he wanted 8s. 6d., and after keeping his wheat six months, was glad to get 6s. 6d. for it.

A farmer should never allow his wood-house to be emptied of wood during the summer months; if he does, when winter comes, in addition to cold fingers, he must expect to encounter the chilling looks of his wife, and perhaps be compelled, in a series of lectures, to learn. that the man who burns green wood has not mastered the A B C of domestic economy.

A farmer should never allow his windows to be filled with red cloaks, tattered coats, and old hats; if he does, he will most assuredly acquire the reputation of a man who tarries long at the whiskey, leaving his wife and children to freeze or starve at home.

There are three things of which the man who aims at the character of a prosperous farmer will never be niggardly, manure, tillage and seed; and there are three things of which he never will be too liberal, promises, time and credit. W. G.

CHAPTER OF FACTS.—MEASURES OF CAPACITY.

Measure is length, breadth and thickness, estimated by known lengths, or compared by other known quantities; thus, there are 12+12+12=1,728 cubic inches in a cubic foot, and 3+3+3=27 cubic feet in a cubic yard.

The imperial gallon is 277.274 cubic inches. A gill, or quarter of a pint, is $8\frac{3}{4}$ inches.

The imperial gallon contains 10 lb. avordupois, of distilled water, weighing in air, at 62°, with the barometer at 30 inches. Two gallons, a peck—eight a bushel, and eight bushels a quarter.

Heaped measure, per bushel, is $2815\frac{1}{4}$ cubic inches clear.

The Winchester bushel is $18\frac{1}{2}$ inches in diameter, and 8 inches deep, containing 2154.42 cubic inches.

1,000 ounces of rain water are equal to about $7\frac{1}{2}$ gallons wine measure, or, to a cubic foot.

7 pounds avordupois is a gallon of flour.

A chaldron of coals is $58\frac{3}{5}$ cubic feet.

Twelve wide gallons of distilled water, weigh 100 lbs. advordupois.

A cubic inch of distilled water at 62°, in a vacum, is 252.274 grains.

The imperial dry bushel, when not heaped, is 2218.192 cubic inches; the peck 554.584; gallon 277.274, and quart 69.3185. The bushel is 8 inches deep, and 18.8 wide, with a heap 6 inches high.

A bushel of wheat is 60 lbs.—rye 53 lbs.—barley 47—oats 38—peas 64—beans 63—clover seed 68—rape 48 lbs.

A Scotch pint is equal to four English pints.

A Scotch quart is 208.6 cubic inches.

There are 545,267,000 cubical yards in a cubic mile.

Hogs.—The dealers in this article have generally returned, and we believe, without a solitary exception, have made money. This fortunate state of the market will throw a considerable sum of money into circulation in Kentucky. We are informed 60,000 hogs have passed the Kenhawa route, 82,000 through the Cumberland Gap, and about 40,000 through Tennessee to Georgia and Alabama, making, in the aggregate ,182,000 head. Suppose half this, number to have been slaughtered and packed for N. Orleans market, and we have the grand total of 273,000 head taken from Kentucky this season. This number of hogs, supposing them to average 200 lbs. nett, and supposing the New-Orleans market equal to the other markets, will furnish the handsome sum of *two million seven hundred and thirty thousand dollars.* From the best information we have on the subject, we are inclined to believe our calculations nearly correct. What sum has probably been realized from the sale of horses, mules, beef cattle, we have no data for calculation.—*Kentucky Chronicle.*

GOOD POINTS IN FARMING.

The Massachusetts Agricultural Society have awarded a premium of $100, to Mr. Amos Sheldon, of Beverly, for the best farm offered for premium. The committee enumerate the following *seven* points, for which Mr. S. deserves commendation, and add several others, perhaps equally important, in which his statement is defective. The report is given at length in the New-England Farmer.

1. For having this farm so divided into pieces as probably to make all temporary division fences unnecessary.
2. For draining and reclaiming low or meadow lands.
3. For renovating old pastures by ploughing and sowing down anew with grass seed.
4. For having the food for his cattle prepared by cutting and mixing the hay, &c. with grain and vegetables.
5. For his care in collecting manure, and making a liberal and judicious use of it on his farm.
6. For having, by good management, gotten so much produce from his farm in 1834, with so few laborers.
7. For the small quantity of ardent spirits which he permitted to be consumed, compared to former times by his laborers—an entire abstinence from which, would have a fine moral effect.

On the other hand, Mr. Sheldon's operations as a farmer, taken together, do not come up to the full expectation or wishes of the Trustees. It was hardly to be expected indeed from one whose cares are so divided as his are. It would have been well if he had attended to and stated with some precision, the advantages of a rotation of crops, so far as his experience extends. If he had attended to the cultivation of vegetables, as food for his stock in addition to potatoes, such as mangel wurzel, carrots, ruta baga, common turnips, &c.

If he had made some experiments in ploughing in green crops, as a manure, and given the result. If he had been much more liberal in the use of grass seed. If he had shown more interest in respect to orcharding and fruits of various kinds. If he had turned his mind more to the breeds of stock, &c. &c.

It has been a leading object of the Trustees, in offering these handsome premiums on farms, to bring about something like method in our agricultural operations. In the mechanic and manufacturing arts—in all the sciences—discoveries and improvements are constantly making—and why not in those most important of all arts, agriculture and horticulture, on which all others so essentially depend? Why should not our industrious and sensible cultivators make experiments of no great hazard or expense, and preserve a record, not only of their success, but what would be quite useful to know, *their failures?* Why not endeavor to learn so much of the nature and uses of different soils as to determine what course will probably be the best as to a rotation of crops, and in the different use of manures, and in improving one soil with a mixture of another? Why not keep a diary to which they might turn at any time, and compare one season with another as regards heat and cold, rain and sunshine—the times of planting and harvesting and the many occurrences of the year?

BOTS IN HORSES.

Mr. EDITOR—I have read your articles in the Farmer under this head, and though the sentiments are quite discordant with common opinions on this subiect, still I have no disposition to attempt their refutation. I have a remedy which I have seen applied in a number of cases of what were called bots, with complete success. The prescription is as follows: Mix in a convenient bottle, one pint of good vinegar and a half a pint of good ashes. The horse should be previously prepared to receive the dose immediately on mixing it, as the effervescene produced by the acid of the vinegar and the alkali of the ashes, will render it difficult to retain the compound many minutes after mixing. From one to three bottles will, I think, in all cases be found sufficient. I have known this medicine administered to horses apparently in the last stage of the disease, and havo never known it to fail of producing relief in less than ten minutes. The ashes should be sifted.—*Genesee Farmer.*

Young Men's Department.

Lectures on Self-Instruction, delivered before the Young Men's Association in Albany, by J. Buel.

When the husbandman has prepared his ground, and deposited his seed, his work is but well begun. Were he to stop here, he would be but illy compensated for his labor. He must watch the germination of the seed, nurture the young plants, and eradicate all noxious weeds—he must practise unceasing vigilance and industry, if he would realize the full fruition of the harvest. So with the young mind, which has received the advantages of school education, and been imbued with the seeds of knowledge. It is but *prepared* for useful culture—the main labor is yet to be performed; the experience and maxims of the good and wise are to be brought to its aid; the virtues are to be sedulously fostered; bad habits and propenstities are to be guarded against or subdued, and industry and vigilance unremittingly exercised, if we would have it attain to fame and happiness, the great incentives to action, and the grand pursuits of life. The foundation has been laid in the school, but the individual himself must rear the superstructure. The soil has been prepared and the seed sown, but to him is confided the care of the crop:—to him it is left to decide, whether the edifice shall be a hovel or a mansion; and whether the increase of the seed shall be two-fold, or an hundred fold. It is true, that intellects, like soils, differ very much in fertillity; yet good culture seldom fails to remedy the seeming defects in both, if duly persisted in. Persevering application, with the aid which the example of others always furnishes, has a magic power in surmounting difficulties, of calling into action inert faculties, and of directing them to purposes of usefulness. The field, and even the highly prepared garden, without what is termed *after culture,* will soon be overrun with weeds, brambles and thorns,—its prospects of beauty and usefulness obscured, and the hopes of its owner will end in disappointment and chagrin. Without the after culture, in like manner, the young mind is wont to run wild, to become shrouded with menial passions, and to disappoint the hopes of solicitous friends. It would seem to be a wise provision of Providence, that our prosperity and happiness are made in a good measure to depend upon vigilance and industry; or rather, that the lively exercise of these qualities, under the guidance of correct principles, should receive a certain reward.

To the young, self-instruction offers the most certain means of obtaining the distinctions and enjoyments which constitute the great aim of life. Wealth is held by a precarious tenure at best. The elements may destroy, or unforeseen misfortunes wrest it from us. The habits it begets are also calculated to render its possession transitory. Instead of exciting to active exercise, the mental powers, it too often relaxes exertion, and lures to a disreputable lethargy, both body and mind. Friends upon whom the young too often repose for the means of success in life, are mortal, and changeable in their affections, and dependence upon their favors is precarious, and often humiliating. Friends, besides, are generally found most willing to help those who stand least in need of their assistance,—those who are able and determined to help themselves. And as for distinction of birth, what is it? An artificial eminence, which renders ignorance more conspicuous, and folly more alluring. It seldom makes men more learned or more virtuous. But knowledge is useful, not only as constituting capital in our particular business, but as a means of enabling us to fulfil our public duties with more usefulness, and as constituting a main source of our intellectual enjoyments. Knowledge is power—it is independence, a treasure which one cannot be beguiled of—and which even the process of law respects—a friend which will not forsake us. It is a property which distinguishes the savage from the brute;—an acquirement which elevate civilized, above savage life; a quality which marks the grades in society; and a community is ever ranked in the scale of improvement according to the measure of useful knowledge which it possesses.

Self-instruction not only affords the means of bettering our individual condition, but it teaches and stimulates us to perform the high duties we owe to God and to society. It not only serves to multiply our personal enjoyments, and to benefit those who are immediately dependent upon us, but it enables us to add to the stock of general happiness. The man who makes a useful discovery in science, who improves the condition of a useful art, or who renders the earth more prolific in supplies for the sustenance of man, is in a measure a public benefactor. What are all the improvements, the comforts, and enjoyments which we possess, over the savage tribes who roam our western wilds, but blessings and refinements which have grown out of self-instruction—and mostly of men, too, in the middle or lower classes of society. Such, in our country, were a Franklin, a Fulton, a Sherman, a Whitney, a Rittenhouse, an Evans, and a host of others, all in humble life, who were in a manner self-taught, and who have conferred important benefits on mankind; and even our Washington never enjoyed the advantages of any but a domestic and scanty education. Yet how greatly are we indebted to these self-taught men, for the distinguished privileges which we enjoy as a nation and as individuals.

The poet has said, that

"Man may be happy if he will."

This, however, must be received with poetic qualifications. No one can expect to avert the afflictions to which we are incident by nature; nor would it be well for him if he could; for these often come upon us, like parental chastisements, as blessings in disguise. But he *can* avert most of the evils which are born of his follies and his vices. A little reflection, aided by a notice of what is passing around him, will teach any discreet man, that if he would enjoy health of body, and vigor of mind, he must be temperate in the indulgence of his appetites, and be active and stirring in his employments; that if he would acquire wealth, or retain that which is conferred upon him, he must be industrious and frugal in his habits; and that if he would obtain the substantial distinctions of life, he must first merit them, by storing his mind with useful knowledge, and practising those virtues which command the applause of good men. It will not do to temporize in these matters—to put on our good habits, as we do our Sunday clothes—merely out of respect to others, or for ostentatious show; they must be abiding, every day wear, and adopted from a consciousness that they best become us, and are most conducive to rational enjoyment. I have some where seen it remarked, that the vices are intuitive, while the virtues have to be *learnt:* or, to employ a rural illustration, that the virtues are exotics and require constant care to induce them to develope all their natural beauty and fragrance; while the vices are of indigenous growth, like the weeds of our gardens, which will soon acquire and maintain the ascendency, if they are not carefully extirpated or smothered.

Self-instruction is not only productive of positive good to individuals and to society, but it serves to lesson the measure of positive evils. Neither the mind or the body are long at rest, and if they are not usefully employed, they are too apt to seek indulgence in pursuits that are trivial or directly evil; and what is frequently indulged in, soon becomes habit, which it is extremely difficult to overcome, though we are sensible of its pernicious tendency. The mind that delights in study, is never driven to seek pleasure in the haunts of dissipation: *it can be happy alone.* The wonderful works of creation, and the history of man afford ample matter for study, for reflection and research; and as we ascend the heights of knowledge, every step we advance enlarges the sphere of our vision, the beauty of the prospect, and the measure of our enjoyment. "Next to the fear of God, implanted in the heart," says a distinguished writer, "nothing is a better safeguard to character, than the love of good books. They are the handmaids of virtue and religion. They quicken our sense of duty, unfold our responsibilities, strengthen our principles, confirm our habits, inspire in us the love of what is right and useful, and teach us how to look with disgust, upon what is low, and grovelling and vicious. No man who has a fondness for reading, is in much danger of becoming vicious. He is secured from a thousand temptations to which he would be otherwise be exposed. He enjoys the sweetest, the purest, the most improving society, the society of the wise, the great, and the good, and while he holds delightful converse with those, his companions and friends, he grows into a likeness to them, and learns to look down, as from an eminence of purity and light, upon the low born pleasures of the dissipated and the profligate.*"

The common avocations of life do not prevent the acquisition of useful knowledge. Not a week, and scarcely a day passes, that does not afford hours of exemption, from ordinary business, which may be employed in improving the mind; and these hours amount to years in the aggregate of ordinary life. Labor does not unfit

* Hawes' Lectures.

the mind for study, but rather imparts a freshness and a relish for it, which is seldom experienced by the indolent or the sedentary; while study serves to beguile the tedium of labor, by the interesting matters it furnishes to the mind for investigation and reflection, and which the mind may adapt to the useful purposes of life. While labor tends to sharpen the mental, as well as the animal appetite, it affords the best facilities for a wholesome digestion of the food demanded by either. Thus labor and study are admirably fitted to be companions and reciprocal aids to each other.

Upon this point I speak from personal experience. The limited knowledge which I possess, has been acquired amid the unremitting labors of a very active mechanical employment, and without the advantages of an ordinary common school education. And in looking abroad among the companions of my boyhood, I find, after the lapse of nearly half a century, that their success and standing in life, has been good or bad, pretty much in the ratio of the culture which they have bestowed on their minds, and their habits of close application to their business. It is not the leisure, nor the opportunity, that is wanting, but the disposition, a resolute determination, to improve our innate faculties, which retards the progress of intellectual culture. We respect and admire in others the talents that are usefully employed. Why not then resolve (for to will is almost to do) to acquire that which we so readily concede to be an excellence in others. Among the thousands of instances which I might quote, of men rising to eminence, and great usefulness, by means of self-instruction, amid the cares and labors of an active business life, I shall detain you by the mention of but one, and leave you to call to mind others, which cannot fail to present themselves within the circle of your acquaintance. I cite this case, because it presented itself first to my notice whilst penning these remarks. The late Rev. Dr. Carey, was the son of a poor man; he entered life with a very defective education, and was brought up to to the humble trade of a shoemaker. These disadvantages were not sufficient to repress his thirst for knowledge. Having resolved to enter the ministry, he set himself to acquire a knowledge of the Greek and Hebrew, the original languages of scripture; and while he was yet laboring for his daily bread with the awl, he sought acquaintance with grammars and dictionaries; and he never left them, says his biographer, till those compiled by him had gained, by universal consent, an honorable place among the monuments of human learning. Mr. Carey became a pioneer missionary to India in 1793. The first six years of his residence in that country were spent in active agricultural pursuits, during which time he acquired so perfect a knowledge of the language of the country, that in 1801, he translated the New Testament into Bengalese and during the seven following years, into all the languages of Northern Hindostan. He in the meantime compiled a voluminous Bengalese dictionary, the first ever published, performed the duties of professor of Sanscrit and Mahratta in the College of Fort William and was withal ever active and efficient in his missionary labors. He subsequently became known as an oriental scholar of the first eminence, was celebrated as a man of science, established at Caluctta an Agricultural society, of which he was an efficient member, and was either a prime mover, or a zealous promoter, in every undertaking for the benefit of his adopted country. This distinguished man died in June last, full of years, and full of honors. Who is there in this assembly that does not, from the narration of this brief biographical sketch, of a self-taught great man, feel his capacity for usefulness enlarged, and mentally resolve, that the influence of so worthy an example shall not be lost upon him. Cherish the sentiment—it is a commendable one.

Which of the two will be able, with the greatest security, to confide in his own powers, in a moment of adversity—he who has indulged his mind and pampered his body, in many luxuries—or he who, contented with a little, and provident for the future, shall, like a wise man, prepare in the time of peace for war?—*Hor.* Every man, in his prosperity, should make provisions to meet adversity.

He who envies the lot of another, must be discontented with his own.—*Hor.*

"Those who are happy at home, should remain there."—*Sat.*

Vices often creep upon us, under the semblance and name of virtues.—*Seneca.*

Sloth, a seductive syren, should be most carefully avoided.—*Horace.* The indolent man can never be useful, either to himself or to promote the well being of others.

THE CULTIVATOR—MAY, 1835.

TO IMPROVE THE SOIL AND THE MIND.

CULTURE OF THE GRAPE.

We have, among our subscribers, many, who delight in the grape, and who are desirous of knowing the best and cheapest methods of producing it in perfection. It is in compliance with the wishes of some of these, that we write the following article, though not exactly coming within the plan of our work.

It is known that the ordinary methods of raising the foreign varieties of the grape, in the open ground, are at least very precarious in this latitude. The fruit is either blighted by mildew, killed by frosts, or does not come to maturity so as to develop all the excellence of its natural flavor. And even our finer native varieties, such as the Isabella, Catawba and Bland's Virginia, frequently do not come to maturity in the neighborhood of Albany in consequence of the early autumnal frosts, and in some of the higher districts, they seldom ripen well, particularly the last named, which many think the superior variety. We have seen at Utica, the Sweetwater, Chasselas and Munier in a fine state of bearing, literally loaded with beautiful fruit, and yet we have been assured by an amatuer residing there, that the grapes of Utica never attain the high flavor which distinguishes them in warmer and dryer situations.

To insure a certain and good crop of this delicious fruit, grape houses may be constructed, in which the vines are trained under glass without any artificial heat, the roots being planted in a border on the south side, and conducted into the house near the surface of the ground. We have constructed a house of this kind, which is 54 feet long, 12 broad, 4 feet high in front on the south, and 12 feet high in the back wall on the north, with two tiers or rows of sashes, each 6 feet by three feet 4 inches, solping from front to rear, in an angle of about 33 degrees. The ends and back of the building are covered with plank groved together, and the inside is plastered. The total expense was from 120 to $125. We have in it at present, fourteen vines, foreign and native, the number to be reduced as may be found necessary. Small iron dogs are driven into the under side of the rafters which support the glass, at parallel distances, the lower ends having holes through them for the admission of wire. Tinned wire, of a size we believe denominated 12, is run through these holes longitudinally, the whole length of the house, and at the distance of ten inches below the glass, to which the vines are tied. In the rear, on the inside of the wall, we have the peach, apricot, nectarine and fig, trained as wall fruit. Inside of the building we raise early salladings, which are generally consumed before the vines come into foliage. The principal labor necessary, beyond the ordinary pruning and care of the vines, is to drop the upper sashes, when the temperature will permit, and the sun shines bright, about two feet, at eight or nine o'clock in the morning, and to close them again at three or four in the afternoon. This permits the vitiated air to escape, while the pure air from without, being specifically heavier, presses in and induces a healthy circulation. By closing the house in the afternoon, the temperature is in a good measure preserved till the next day. The covering of the building tends greatly to repel the severity of the cold. During the severe weather of January, the mercury in the house, as indicated by a self-registering thermometer, was at no time lower than five degrees above zero; while outside it was as low as 27 below, showing the difference made by the protection to be 32 degrees. About the 8th of March, the frost being out of the soil, we sowed cress and lettuce in the house; both were up in from eight to twelve days; the subsequent snows and frosts, the thermometer sinking twice to fifteen degrees in the open air, did not affect them, and the cress was fit for the table on the first of April. No artificial heat was applied. The produce of such a house may be estimated by those acquainted with the productiveness of the grape, when they consider that the vines in such a house as this, cover a superficial space of 650 square feet.

There is another method of recent introduction, which it requires some professional knowledge to conduct, and the application of some artificial heat; but which accelerates very much the bearing of the vines, the maturing of the fruit, and probably improves its quality. The vines are cultivated in pots. Pieces of the vine, of two or more feet in length, are coiled in a flower pot, having been first divested of all their buds but one or two at their upper extremity, which are elevated somewhat above the edge of the pot, and the pot filled with fine rich earth. Or, a single eye may be taken, with two or three inches of the adjoining stem. The pots are plunged into a hot-bed, and subseqently transferred to the grape-house. Vines thus treated, sometimes have made fifteen or twenty feet of wood the first year, and produced twenty or thirty bunches of fine grapes the second. These methods have been successfully practised about Boston. The following *particulars of cultivation*, which we copy from the *American Gardeners' Magazine*, a horticultural monthly, published at Boston, by Messrs. Hovey, are the memoranda made by the editors of that work during the process of culture.

" *March 9th*, 1833.—Shoots of the Black Hamburgh and White Chasselas grapes were selected, and formed into cuttings of single eyes or buds; this operation was performed by cutting off the wood in a sloping direction, one inch above the eye or bud, and two inches below. By this method of raising vines from single eyes, they produce a greater number of fibrous roots, which enables them to absorb an abundant supply of nourishment from the soil, and their growth becomes proportionably vigorous and strong. It is of importance, in selecting shoots for the purpose of farming the cuttings, to make choice of wood that is well ripened, short-jointed, sound, and with very little pith; such wood is more likely to be obtained from the middle or lower parts of branches of healthy vines, than near the extremities.

After the cuttings were prepared, pots of three or four inches diameter were filled with a mixture of 1-3d light sandy loam, and 2-3ds leaf soil, in which the cuttings were inserted in a slanting position, and each eye covered about half an inch in depth, finishing off with a gentle watering, and the pots plunged to their rims in a moderate hot-bed.

At the commencement, strict attention was paid to the heat of the bed, as it frequently happens, if the heat is too powerful, the eyes will shoot up before any roots have protruded, and are very liable to be destroyed, either by a powerful sunshine or from too damp an atmosphere.

The cuttings were watered very sparingly until the buds appeared above the surface of the soil; air was freely admitted during the day, and the bed covered at night, in order to preserve an equal temperature as possible.

March 24—being fifteen days from the time the cuttings were put in the pots, they made their appearance above the surface, were shaded from the sun during the middle of the day, until they were well furnished with roots and the leaves began to expand; water was then regularly supplied, and plenty of air allowed, to prevent them from being drawn up weak.

By the ninth of May, the vines had grown to the height of from eight to twelve inches, and were shifted into pots of six inches in diameter, making use of the same kind of soil as the cuttings were put in, at the commencement. In repotting such young vines, they should be handled with great care, as the points of the roots, or spongioles, are exceeding tender, and susceptible of injury; the leading shoots should also be carefully protected, and all laterals removed as soon as they appear. The success depends much upon keeping up the temperature of the bed, which should rather increase than decrease as the vines acquire strength; and, as the least check is very injurious in this early stage of their growth, should the heat begin to decline, it must be renewed by linings; for it is an essential point, that they be continually kept in a vigorous and rapidly growing state, the object in view being to produce one strong shoot for bearing fruit the following year.

June 25*th*,—the vines were from two to three feet in height, and were again repotted into pots fourteen inches in diameter, and fifteen inches in depth; the soil used, was composed of equal parts of light loam and leaf soil, with the addition of about an eighth part of the whole of very rotten manure. After potting, they were removed into the green-house, and placed over the front flue; the shoots were trained upward in a direction corresponding with the slope of the roof, and ten inches from the glass; water was supplied frequently, and occasionally liquid manure, till the wood began to ripen; all lateral shoots were stopped just above the first bud, which bud was retained to prevent the main eyes from starting prematurely.

July 27*th*,—the vines had attained the length of six feet; and, as a sufficient length of wood was now obtained, each shoot was stopped, by pinching off the point; this caused one or two of the uppermost eyes to start, and these were also stopped when they had grown two or three joints. By thus continually stopping the upper laterals, as often as they were produced, the rapid flow of sap upward was checked, and the shoots acquired greater strength and size. When the wood had become prefectly ripened, each vine was cut to the length of five feet, and all the laterals, which had been suffered to grow during summer in order to preserve the main eyes, were cut in close, leaving a straight clean shoot.

In *November*, the vines were placed under the stage of the green-house, where they remained till the first week in March following, and were then placed in their former situation.

March 15, 1834,—the buds began to open, and by the 30th, the fruit buds were distinctly visible; two to four bunches appearing from every eye, with the exception of two or three of the lowest. When the fruit was fairly developed, the shoots were stopped at the second bud above the upper bunch; and *one* bunch only was retained on each shoot, with the exception of two vines; on these, *two* bunches to each shoot were allowed to remain, for the purpose of ascertaining more fully, to what extent vines in pots could support and ripen a crop of fruit. The two last mentioned vines were Black Hamburghs. One of them produced twenty eight, and the other thirty bunches; but it ultimately proved to be too large a number for them to ripen perfectly. Water was plentifully supplied, as often as the surface of the soil in the pots became dry, and the foliage was syringed frequently. No other care was necessary throughout the season, than occasionally to tie up the bearing shoots, to prevent them from being broken by the weight of the fruit.

Five of the vines, viz: three White Chasselas and two Hamburgh, produced from eighteen to twenty-five bunches each, or one hundred and six collectively; and on the 30th of July, the Chasselas grapes were perfectly ripe, the Hamburghs had changed color, but did not arrive at maturity till about the 25th of August. Although from fourteen to tweny bunches are considered by the English cultivators as a good crop for one vine, yet, from the experience which we have had, thus far, in the culture of vines in pots, we have no doubt but that thirty bunches and upwards, of the small growing kinds, as the Sweetwater, Muscadines, &c. may be obtained from each vine, equal in excellence to those grown by any other method. Mr. Stafford, one of the most successful cultivators, says, that all the most delicate sorts are superior, when grown in pots, to any he ever saw grown on the rafters; and he further states, that he has often proved, that a pot placed in the house on the 1st of January, and the same species trained up the rafter, and subjected to the same heat—the former will ripen its fruit at least a month earlier than the latter.

The annexed plan is one we would suggest to those who wish to erect a small house, which would answer the purpose of growing grapes in pots without great expense.

Fig. 1, is a section of the house, which is ten feet in diameter, eight feet high at the back, and four feet in front; it is sunk two feet under the surface of the ground, as at (*a a*), if the situation is dry—otherwise it should be on a level; (*b*) is a flue which may commence at either end of the house, as convenient, and should be carried across the end, along the front, and out at the back; (*c*) is a pit in the centre, which may be used for many purposes; such as raising lettuces, radishes, &c. or for starting annual flowers, early cabbages, culiflowers, &c. to be transplanted out in the garden; as it will not be shaded till the vines have made considerable growth; or vines on the coiling system, which will require bottom heat to grow them, might be plunged. The pit is intended to be filled with leaves mixed with manure, or with leaves alone, as at (*d*). The back and ends may be made of common boards, placed eight inches apart, filled in between the two, with leaves, hay, sea-weed or dry tan (*ee*); the front may be of thick four inch plank. (*f*) is a shelf on the back, four feet from the bottom; it should be about fourteen inches wide, and made very strong; on this and the flue, all round, should be placed the pots of vines; those on the flue to be trained up half way the roof of the house, and those on the back shelf to be trained down to meet them at the same slope of the glass, at the distance of ten inches. The trellis may be made of wire or of wood.

1

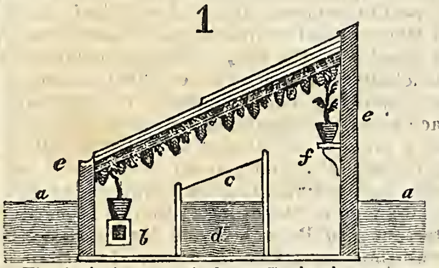


Fig. 2.

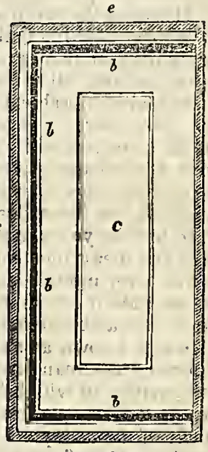


Fig. 2, is the ground plan. Such a house is not intended for forcing in January or February; as it would require more length of flue, and fires to be kept continually burning, which would be attended with considerable expense and attention. One could, however, easily be made for the purpose. In this house it is supposed that, if the vines commenced growing about the 1st of March, ripe fruit would be obtained from the 1st of August to the middle of September, according to the earliness or lateness of the variety. If lower sashes are covered during night with mats or hay, in March, very little fire would be required to keep up the requisite temperature, which should not be on an average, more than fifty-five degrees the first fifteen or twenty days. The expense of erecting such a house would not be great, and it would contain about fifty pots of vines, which would ripen at least three hundred pounds of grapes."

BEES AND BEE-HOUSES.

The use of *houses* for bees, we believe, is of modern date. Some three or four winters ago, in travelling in Otsego county, we were shown the first bee-houses we ever saw or heard of. One was four and another six feet square, and six or seven feet high, made perfectly tight, with a good floor, and with a door for occasional entrance. One had been tenanted two summers, and contained probably about 200 lbs. honey. The other had been occupied but a season, and contained less honey. Neither had sent out a new swarm. We were so pleased with this management, that immediately on reaching home we had a *bee-house* built, and in June following introduced into it a swarm of bees the day they left the parent hive. They filled the hive in which they were introduced, but no more, and the next year sent out two swarms. In the mean time we made a bee-house, or bee room, in our garret, adjoining the eastern brick gable end, fitted the interior for the reception of a hive, and opened an aperture through the wall at the point parallel with that where the bottom of the hive would stand. The first swarm that came forth were placed in it. They not only filled the hive, but nearly covered it with comb and honey the first season. We have taken from their stores a considerable quantity of honey for our table, always delicately white and fine, which has been more than made good the following summer. The quantity of honey in the room must now amount to nearly 200 lbs. No interruption to their labors has been apparent, nor have they sent out in the three summers any new swarm. We built another bee-room in the garret last summer, and put therein a fine swarm of bees. They promise to do equally well with the first. A bee moth has been occasionally seen in the garret, and one in the bee-house, but not the least indication of their web or larvæ about the hive or honey.

It has been said, that where there are a number of hives, the bee-moth concentrate in one hive, and leave the others undisturbed. This has been in a manner verified by our observation during the two last years: for we have, in both years found one hive almost literally filled with the worm, butterfly and web, which we immediately consigned, hive, honey and all, to the flames; but have not found a moth, or the signs of one, in other hives from which we have taken honey. Though it is well to remark, that the honey has been uniformly taken from the uppermost of a double hive, without destroying the bees, which were driven into the lower apartment. The two boxes are of equal dimensions. A hole is made in the top of the lower one, for the bees to pass up, and the upper box set on, and fastened to the lower one by hooks and buttons. The upper box is always filled first, and when the under one is filled, and this is considered sufficient to subsist the bees during the winter, the upper box may be taken off, the honey, which is found to be pure, and free from young and bee bread, taken out, and the box returned. The bees are driven into the lower apartment by blowing tobacco-smoke into the upper one.

In November last, we took two late swarms, which appeared to have scanty supplies for the winter, and placed them on a shelf in a dark cellar. About the 20th March they were examined. The bees in one hive were dead; they had been apparently smothered for want of air or by bad air. Water had got under a corner of the hive and produced mouldiness. The honey had apparently suffered no diminution during the winter. The bees in the other hive were in good condition; not a dead one was seen; and on being removed to the stand, the day being warm, soon became lively. From this experiment, we think weak swarms may in this way be preserved during the winter in a dormant state.

In preparing a bee-house, we recommend, that the hive which is to be put into it with the young swarm, for such we should prefer, be placed above the centre on the east wall, that the aperture through the wall, for the egress and ingress of the bees, be parallel with the bottom of the hive, and that the staging on that side, to sustain the comb, be fifteen or eighteen inches broad. The comb, when extended on the outside of the hive, assumes the form of a cone, the top of the hive constituting the apex, spreading below equally on the front and sides, and extending considerably below the hive. Without a broad staging, therefore, the comb in front, having nothing to sustain it, breaks off from its own weight, and falls to the floor.

NORMAL SCHOOLS.

We gave, in our last, a brief account of the primary schools in Prussia, abstracted from M. Cousin's report; and we proceed now to speak of the Normal Schools, that is, schools for training teachers for the primary schools. The Prussian law declares, that:

"A schoolmaster, to be worthy of his vocation, should be pious, discreet, and deeply impressed with the dignity and sacredness of his calling. He should be thoroughly acquainted with the duties peculiar to the grade of primary instruction in which he desires to be employed; he should possess the art of communicating knowledge, with that of moulding the minds of his children; he should be unshaken in his loyalty to the state, conscientious in the duties of his office, friendly and judicious in his intercourse with the parents of his pupils, and with his fellow citizens in general; finally, he should strive to inspire them with a lively interest in the school, and secure to it their favor and support."

As none can teach to others what they do not themselves know, —and as the example of the master has great influence in forming the habits of the pupils—it is very justly considered indispensable in the qualifications of teachers, that they shall be competent, and of good character, habits and disposition. These qualifications, we cannot but think, are too little regarded in selecting teachers for our common schools.

A normal school, for training teachers for primary schools, is required to be established in each department. No school can receive more than 60 or 70 pupils. The expense of these schools is defrayed in part by the government and part by the department. The pupils before admittance, must have passed a good examination in the primary schools. The age of admission is from 16 to 18, and the course of studies three years. The first year is devoted to supplementary primary instruction, the second to specific and more elevated studies, and the third to practice and occasional experiments in the primary schools, one of which is attached to each normal school, and other schools in the place. Provision is made for the education, in these schools, of poor youth of good promise; and the pupils thus assisted, are obliged to accept, at the expiration of their course, the masterships of such schools as may be assigned them, with the chance of promotion according to merit. It is declared, that

"With respect to teaching, the endeavor shall be, not so much to inculcate theories on the pupils, as to lead them by enlightened observation, and their own experience, to simple and lucid principles; and with this view, to the normal schools shall be attached others, in which the pupils may exercise themselves by practice."

All the studies and exercises required in the primary schools are introduced here, but prosecuted to a greater extent. On completing the course, the pupils are submitted to a rigid examination, and receive certificates of capacity, bearing the distinctive appellations of "excellent," "good or sufficient," or "passable." Such as prove incompetent are rejected, or sent back to pursue their studies. Those who pass examination, have their names inscribed, with the index of the degree of their certificate, upon the departmental list of candidates, which list is published every six months in the official gazette of the department. The teacher receives a brevet of his appointment, in which his duties and salary are specifically stated. He is required to take an oath on entering on his duties, and is publicly installed in the church, in presence of the scholars and public authorities, to all of whom he is to be formally presented.

A process verbal of the installation is drawn up and deposited among the archives of the school. His conduct as a teacher is closely scrutinized. For indolence, carelessness, bad disposition, or neglect, he is first admonished, and may subsequently be fined, and deprived of his employment. Gross violations of modesty, temperance, moderation, or any open abuse of his authority as father, husband, or head of a family, is also punished with the loss of place. Such are the prominent regulations in regard to the normal schools of Prussia; and they are highly calculated, we conceive, to have a benign influence upon the character and happiness of the nation.

As we have before observed, the Prussian system of primary instruction was not matured till 1819. Its happy influence has been manifested in the increase and improvement of the schools. From the returns made in 1831, it seems that the number of children sent to the primary schools exceeded the estimated number of all the children in the kingdom between the ages of 7 and 14; that there were then 21,879 primary, and 823 middle or burgher schools, which employed 23,920 head masters, 983 head mistresses, and 2,811 assistants, and that the pupils averaged about 73 to each teacher and assistant;—that there are 28 normal schools, in which there are fifteen hundred pupils, and that these schools furnish 700 candidates annually for mastership. The expense of a pupil in the normal schools averages about $44 per annum; and the expense of the 28 schools is stated at about $66,000.

School Libraries.—This is a prominent feature in the Prussain system of instruction which we may adopt with unquestionable advantage. However accessible books may be in the cities and villages,—and however multiplied the productions of the press at the present day, it is a fact that will not be questioned, that in a considerable portion of our country the means of acquiring useful knowledge, from books, are very limited; and perhaps we may add, that the desire for obtaining this knowledge is no where sufficiently manifest. There are few public libraries in the country; and if there were many, the opportunity of being benefitted by them could not be general. Besides the generality of the books which they contain are not well adapted to the capacities of juvenile readers, nor to the business which they are destined to follow. The outlay in a school district, of ten or twenty dollars a year, in establishing and replenishing a school library, would be but a small tax in comparison with the benefits which might be expected to flow from it. It would be sowing useful seed, and the community would not fail to reap the harvest. It would serve to diversify the studies, to beget a taste for substantial acquirements, avert bad habits, and lay the foundation of respectability and usefulness. The mental soil is good, but, like the natural soil, it needs culture to render it productive. We vaunt of our knowledge, and affect to believe that we are the most enlightened people on earth. And yet I fear we should suffer, greatly suffer, on the score of education and good habits, the things which eminently contribute to happiness, by a comparison with the *subjects* of the King of Prussia! The truth is, we are deceiving ourselves—we are not so enlightened as we would be thought to be—or as we might be, and ought to be. It is time to get rid of this delusion—to acknowledge and repair our faults—by more liberal and enlightened provisions to fit THE CHILDREN OF THE NATION for the high privileges they enjoy, and the high responsibilities they are to assume.

P. S. A bill has passed the Legislature authorizing the establishing district school libraries.

WORN OUT LANDS.

A friend in Virginia writes us as follows:—"Enclosed I send to you thirty dollars, for the 2d Vol. of the Cultivator. You will judge by this our opinion of the work. Our people have been deeply engaged in the production of tobacco, and our lands have been neglected, injured, and I might almost say destroyed. Give us some instruction, if you please, as to the best plan of stopping the gullies, and healing the galls with which our fields so much abound; and also directions for a farm yard, and for a barn on a pretty large scale."

A substantial compliment like this lays us under an obligation which we are afraid it is out of our power handsomely to requite. We confess we have no practical knowledge as to the best method of stopping gullies and healing galls, for it has been our aim to prevent both on the limited grounds we cultivate; but we have seen much of these evil effects of bad husbandry, and will venture to prescribe for their cure.

Virginia farmers, as well as many further north, have, it would seem, resembled too much in their practice the prodigal son, who, not content to spend the *income* of the patrimonial estate, encroaches annually on the principal, until *that* is exhausted, and he is reduced to want. The soil, or rather the animal and vegetable matter which is blended with the earth, is the farmer's capital. The more this becomes exhausted or wasted, by injudicious cropping, the more this capital is reduced; and consequently, the interest, or product, upon which he depends for a maintenance, undergoes a corresponding diminution,—until, at last, both principal and interest,—capital and soil,—are wholly exhausted. But there is a common remedy for both these evils, which, though slow, is nevertheless sure;—it is persevering industry, guided by prudence, and animated by hope. And it is here that the maxim of Poor Richard, that

> "He that by the plough would thrive,
> "Himself must either hold or drive,"

emphatically applies. We are fearful that too many of the Virginia farmers have trusted too much to overseers and stewards, instead of studying their business, and qualifying themselves personally to direct the operations of the farm. If they will devote their leisure to learn more of the principles of their business, and to directing and superintending the operations of the farm personally, they will soon discover the defects in their practice, and be able to apply suitable remedies: and we can venture to assure them, that they will find this study and this practice among the most pleasant and ennobling that engage the attention of man. The Old Dominion *can* become as distinguished in her agriculture, as she has long been for her hospitality and patriotism. But to do this, the mind must be brought to the aid of labor.

Gullies and galls are occasioned, we presume, by the exhaustion of the vegetable matter of the soil, by severe cropping,—the omission to alternate grass seeds while the soil is capable of sustaining a healthy firm sod,—and the want of artificial drains to conduct the water into natural channels, or to prevent it accumulating in accidental ones. A system of management the reverse of the bad one which has caused these evils, is the best calculated to cure them. That is—less must be taken off or more carried on;—grass seeds must be sown with small grain;—grass must intervene more frequently in the alternation;—all the means of fertility which the farm affords, must be well husbanded and judiciously applied, and extraneous manures brought on;—and the water conducted off the fields in gently inclined artificial drains.

Plants are as much dependant on food for nourishment and growth, as animals are; and there is as much propriety in expecting a horse to thrive at a stall which is never replenished with forage or provender, as there is in expecting a continuation of good crops from a field which is never replenished with manure. Philosophers may *speculate* upon what constitutes the food of plants, but the practical farmer *knows* that a crop is luxuriant and abundant, pretty much in the ratio of the manure which is applied to the soil. The inference is irresistible, that vegetable and animal matters constitute the basis of the food of vegetables. The elements of the dead and the living plant are the same, and they are transmuted, by a natural process, from the former into the latter. Tobacco is among the most exhausting crops, as it takes much from the soil, and gives little or nothing to it in return. We are told that it is a rule in Holland and Flanders, not to sow flax on the same field oftener than once in eight or ten years, on account of the exhausting quality of the crop, which, like tobacco, returns nothing to the soil.

The means of fertility on a farm are seldom either well husbanded, or well applied. Every vegetable and animal matter may be converted into the food of plants; and the urine of the stock, when yarded, and which in Flanders constitutes almost a moiety of the manure, might be mostly saved, by keeping the yard well littered, or bedded with swamp earth, to absorb it. Gypsum is a powerful auxiliary on light soils, where clover forms the basis of improvement; lime benefits stiff soils, and marl, where it is found convenient, is employed as a means of inducing fertility with manifest advantage.

We have seen the following method practised, with success, to render gullies productive, and to cover with a healthy sod, the galls, which are generally on the declivities of gullies. The first object was to prevent an accumulation of surface waters passing down, by drains constructed to carry it off where it would do less injury. The next step was to fill the water course with brush and earth, smooth the declivities, so as to give to the earth a comely appearance, and then to carry on and spread a layer of coarse manure from the cattle yards, abounding in straw, hay and seeds. When necessary, enough earth was spread over this to prevent the litter being blown away. In the course of the season, the grass seeds sprung up, the manure afforded sustenance to the plants; and cattle being kept from the place, a substantial sod was soon formed, which is yet suffered to remain undisturbed by the plough.

Upon the subject of cattle yards, we beg leave to refer to our directions for their construction, published in the first volume of the Cultivator, page 62.

We confess ourselves not sufficiently acquainted with the husbandry of Virginia, to venture an opinion as to the model of a barn best suited to one of its lage farms; but we would respectively solicit an answer to this part of our correspondent's request from a more competent pen.

Seed Corn, should be first soaked, say 12 hours, in water heated to near the boiling point, to saturate the grain, and induce early germination; then having put half a pint or more of tar in an iron dish, with a quart or two of water, heat it till the tar is dissolved or incorporated with the water, when the whole may be turned on to the already soaked seed, which is then to be well stirred. The flavor of the tar thereby strongly impregnates the seed, and prevents the birds or squirrels taking it. Then take the corn from the water, and mix with it as much gypsum as will adhere to the grain; and put six or eight kernels into a hill, reducing the number of plants at the first hoeing to three or four, and them the most thrifty and promising. This will require six extra quarts of seed to the acre, and the consequent increase of product, in consequence of each hill having its complement of stalks, will not be less than six bushels. So effectual is this method of preparing seed in saving the crop from the depredations of birds, that we have dispensed altogether with the use of scarecrows. Last year, one row in a corn-field was accidentally left unplanted. It was afterwards planted with unprepared seed. The crows took up the most of it, while we could not discover that they had taken a hill planted with the tarred seed.

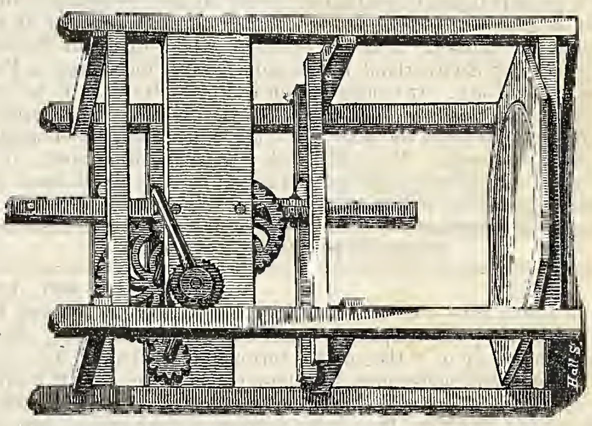
A correspondent inquires at what distance the plants should remain in the drill system of culture, where there are two or three rows in a drill. We cannot prescribe, but recommend from six to twelve inches, according to the richness of the soil, and the variety of the corn cultivated—the richer the soil, and the more dwarfish the growth of the stalk, the nearer the plants may be left. The more rich the pasture, and the smaller the animals which are put upon it, the greater number will it support.

Lucern may be sown till the 15 of this month, at the rate of sixteen pounds to the acre. The soil should be dry and loose, rich and clean, and the subsoil pervious, so that the tap roots may extend down four or five feet, without encountering clay, hard-pan or water. Potatoes are a good preparation for lucern; but they ought to be well dunged, and kept clean of weeds. The seed of lucern may be sown in drills, with a drill barrow, the drills eighteen inches apart, when nothing is sown with it; or it may be sown broadcast with small grains, and the ground should be well harrowed and rolled. Our practice has been to sown half a bushel of winter rye with the seed to the acre. When it has taken root it withstands the drought better than any other grass, on account of its long tap-roots. It may, and if there are many weeds, it ought to be mown the last of August, after sowing. In subsequent years it may be cut as soon as it shows blossom, and, if the soil is good, it will bear cutting three, and often four times in a season. The great economy of this grass is to cut and feed it green. All farm stock, including hogs, are fond of it. An acre of good lucern will keep five or six cows from the 20th May to October. If made into hay, it should be cured in cock, to prevent the waste of the leaves. Partially cured, and mixed in the barn with barley straw, in alternate layers, it saves well, and very much improves the straw. The seed may be had at the seed shops, at twenty-five and thirty cents per pound. It is mostly imported from France.

The Osier Willow is worthy a place on every farm, because it takes up very little ground, requires very little care, and furnishes the best materials for baskets, which are indispensable to the farmer. This, like all the willows, is readily propagated by cuttings. Where it has taken good root, its shoots, in good ground, grow from four to eight feet in a season. These shoots should all be taken off every winter, unless very large willows are wanted, and the number is thereby annually increased. The art of fabricating baskets from them is easily acquired, and may be practised in evenings and stormy days in the winter without cost. For ordinary baskets, the osier is used with the bark on; but for neat house baskets they are peeled. The best way to divest them of the bark, is to cut, sort and tie the osiers in small bundles, say early in March, and place the bundles in a pool of stagnant water; and at the season the leaf buds are bursting, the bark will readily strip off. The osiers may then be laid up to be used when leisure will permit. A well made osier basket is worth three or four made of splits. We have them which have been in wear years, and are yet good. To give them firmness and durability, a good rim and ribs, of oak, hickory or other substantial wood are necessary.

Transplanting Evergreens.—In reply to the inquiry, "What is the best season for transplating evergreens?" we state the last of May, in this latitude, or when, in any place, the new spring's growth begins to shoot. If they can be taken up and removed with a ball of earth about their roots, they may be transplanted at almost any season. But this can seldom be done, unless the plants are grown in a nursery; for here they are generally furnished with a large number of fibrous roots, to which the earth adheres, which forest trees seldom possess. Evergreens require a constant supply of food to sustain their foliage. If they are removed when in a quiescent state of growth, the mouths or roots are necessarily diminished, and the plant is apt to die before the requisite supply is obtained. But if removed after the sap is in circulation, fewer roots will furnish a supply, and new roots become sooner formed. To prevent evaporation, from which the greatest danger arises, the ground about newly transplanted evergreens should be well mulched with a coarse wet litter from the barn-yard, and a pail of water may be occasionally thrown upon it, when the weather is dry.

Kibbe's Patent Cheese Press, a cut of which is given below, is an improvement deserving the attention of dairymen and others, who have occasion for its use. It occupies but little room, being three feet long, sixteen inches broad, and five feet high. It may be managed, by a child, and the pressure graduated at pleasure The patentee, S. Kibbe, resides at Esperance, Schoharie. The price of a Press, of the dimensions given above, is $15.



Winter Butter, it is known, is generally deficient both in color and flavor. This arises partly from the cows being kept at this season exclusively upon dry food, and partly from not managing the churning process under the right temperature. A writer in the New-England Farmer says he finds in the carrot a corrective for both these evils. To adopt his words, his method is, to "take four carrots of the Altringham kind [and other kinds will serve as well] of about one and a half inches in diameter, to cream enough to make ten pounds of butter, and after washing them, to grate and cover them with new milk, and after they have stood ten minutes to squeeze them through a cloth into the cream, and the effect has been to make the butter come quicker, and give it the color and *sweetness* of May butter." We can readily believe that carrots will impart a fine color to butter, and even a rich flavor,—*if given to the cows in sufficient quantity*—the substance, and not the coloring matter, must be required to give much flavor. Cows fed with ruta baga, or mangel worzel, or carrots, will produce butter, at all seasons, defective neither in color or flavor.

Morus Multicaulis.—We have been censured for expressing our doubts whether the Chinese mulberry would withstand our winters. Judge Bradley, of Onondaga, a highly worthy and ardent promoter of the silk business, has expressed to us similar doubts. His Chinese mulberries, he says, are frozen down every winter. This, we are aware, is not the case in some soils and situations; but in this case it is best to err on the side of caution. The peach and cherry, as well as the mulberry, stand the winter better in a clay or stiff soil, than in one which is loose or sandy.

The Silk Culturist, is the title of a monthly paper of eight quarto pages, published by the Executive Committee of the Hartford County Silk Society, at fifty cents per annum, the first number of which has just come to hand. It is particularly devoted to the culture of the mulberry, the rearing of silk worms, and the processes of preparing silk. This work was much wanted; and we commend it to the patronage of every family who are employed, or design to be employed, in the silk business.

Southern Clover.—A farmer remarked to us the other day, that he preferred the seed of northern, or large clover, for the reason, that the winter was less severe upon it than upon the small or southern. It then, for the first time, occurred to us, that since we had used the southern seed, which we have done for the last three years, our clover had been much more winter killed than formerly, when we raised the large kind. We should be glad to learn the experience of others in this matter.

SPELTA—OR SPELT WHEAT.

B. F. Hutchinson Esq., of Middle Island, Suffolk, has asked us to make known, through the Cultivator, the mode of culture, product, &c., of this species of grain. As we have no practical knowledge in its culture, our answer can only apply to a part of his inquires.

Spelt wheat is distinguished hy its stout straw, which is almost solid, and by its strong spikes, with the chaff partially awned. The chaff adheres close to the grain, and is not easily separated. The grain is light and yields but little flour, but yields a greater portion of gluten than common wheat, and hence is superior, in pastry and confectionary. It is the principal wheat raised in Suabia and the north of Switzerland, and is considerably cultivated in France, Spain and Italy. It is also grown in Pennsylvania. It is sown in spring, and ripens in July and August. It is sown on lands, generally, which are too poor for other wheat, and on mountainous or stony grounds. We will thank our friend Mr. Grove, or some of our Pennsylvania patrons, to furnish us with a statement of the ordinary product and relative value of this grain.

CORRESPONDENCE.

Buffalo, March 10th, 1835.

J. Buel, Sir—You will recollect that during the evening I lately spent at your hospitable mansion, while discussing the new English theory of "the matter thrown off in the soil by a species of plant, being poisonous to others of the same kind if cultivated in succession," by which rotation becomes absolutely necessary, I dissented, with you, from the doctrine, as altogether inapplicable to many American soils, particularly those of the western country. And I will here remark, in confirmation of an opinion which I have long entertained, that much of the current English experience as well as theory in agriculture, is altogether inapplicable and useless in our own country, and to succeed thoroughly, the American farmer should, excepting what relates to broadly established and universal principles, depend on American experience alone.

Although rotation of crops, as a system, has been adopted by the best agriculturists in the older settled parts of the U. States, and is no doubt the best which can be pursued in the primitive soils, yet large portions of our country would actually suffer by such a process. I incline to think that it has yet to be settled, what is the most profitable system of agriculture applicable to a large portion of our new states and soils, for they have as yet been so imperfectly cultivated, and with so little regular system, that the full nature and capacity of those soils are little understood. Yielding, as they usually do, abundant crops with slight culture, their occupants have so far been content with their present productions, without examining by thorough experiments what more may be done.

The soils I now speak of, are the great secondary regions of western New-York, and which extend most around the great lakes, and down the Mississippi valley. These are the most productive of our northern soils, and to the present time are mostly cultivated without manure, or the aid of artificial stimulants, by which process the primitive soils would be altogether unproductive. But to the question of succession of crops, in opposition to the above quoted theory.

Throughout a large district of western New-York, wheat is the staple article of cultivation. The lands which produce it, although good for other grains, roots, pulse, and grasses, yield wheat in abundance, and therefore they are for that purpose the most profitable. With many farmers, for forty years past and more, it has been for several consecutive years the only crop of their fields. Again, they have let their fields rest every other crop, and fallowing for seed the season succeeding the harvest, without laying the lands into grass. Others again have laid their lands into clover, sowing the seed in the spring following the sowing of the wheat; pastured the fields after harvest, and the following year fallowed as usual. All these different modes have succeeded well, and many instances may be cited where wheat has followed for many years in continued succession with equal success, and abundant crops. Many wheat soils too, the most unpromising at first, continue to yield without manure or stimulant of any kind, and have constantly improved from their first cultivation. A portion of the best wheat lands in our state, lying in Livingston, Genesee, Monroe and Erie counties, were for years unsettled and neglected; and long after the softer and better timbered lands were subdued, were these stony lime lands cleared up and put into cultivation. They are now the *surest* lands for a crop of *good* wheat. Here the quality may be depended on, when the blast, or rust, or a shrinking of the berry prevails with the wheat of the softer soils. This is also the case with large tracts of land near lake Erie, in Ohio, also in Michigan, and further west. Here indeed the question might be opened to the inquiry, as to how far lime may be the native soil for wheat; and why it is that the continual ploughing of limestone lands, and their exposure to the atmosphere, promotes fertility, which is indeed the fact. But as my present object is to state facts for the purpose of disapproving an unsound but plausible theory, I must omit the subject for perhaps some future communication.

These different varieties of soils, appear each in degrees more than another, peculiarly friendly to the production of certain crops. The alluvial bottoms of many of the streams in this and the western states, are remarkable for the production of Indian corn. I know of large tracts on the Genesee river, the Tonewanda and Buffalo creeks, which for thirty or forty years have been settled by the whites, who have made corn their standing crop, and were the Indian cornfields for all past time so far as the Indians themselves know. Many of these lands scarce ever overflow, are ploughed only to an ordinary depth, yet yield oftentimes eighty bushels to the acre with only common culture. I have seen on the Muskingum, the Sciota and Sandusky bottoms in Ohio, fields of more than a hundred acres each, which would harvest an average of seventy-five bushels to the acre, where corn had been the annual crop time out of mind. The depth of these soils is prodigious, in many instances twenty or thirty feet, apparently of the same quality.

In the fine grazing regions of the south parts of Genesee, Erie, Chautauque, Cattaraugus and Allegany counties, immense tracts of the finest pastures exist, where no grass seed has been sown by the farmers; white clover and blue or spear grass having come in spontaneously on clearing the lands, which remains permanently good. It is now not at all diminished, after thirty years' occupation. While riding through a portion of these counties a few years since, where grazing, dairy, and the raising of cattle and sheep was the principal business of the farmers, I remarked upon the very rough and uneven appearance of the meadows; having never been ploughed, and possessing after many years of cropping, all the inequalities of surface which upturned trees and decayed trunks, although long since removed, had caused. I inquired why these, to appearance, valuable mowing lands, were suffered to remain in so rough a state, when two or three ploughings and a cultivated crop or two would make them smooth? I was answered that ploughing would materially injure their productiveness, being never so good for grass afterwards; that immediately after clearing, the land was either harrowed into wheat or oats with grass seed, and so had since remained in grass after the first crop was harvested; yielding continually without measure, excellent crops, with no deterioration.

In this same region also, oats are raised in great abundance. In the south part of Erie, and I doubt not equally so with the other counties named in this grass district, oats in quantity and quality exceed any that I ever knew. The soils are sometimes slaty gravel, both coarse and fine; gravelly, sandy and vegetable loams, and sometimes clay and clayey marl. But the best oat lands are the slate and loam soils. In these, oats have been raised in some instances, eighteen or twenty years in succession, and I last summer saw many large stubble fields on the hills and table lands, where the oats had lodged, in consequence of their immense growth, which had never been manured, and had yielded frequent and heavy crops. Yet these lands were poor for wheat, and but ordinary for corn. The farmers who cultivate them, seem fully assured that they will last for a long time with such cultivation; and although when on first learning their process, my preconceived opinions condemned their system, yet further inquiry and reflection, convinced me they were correct. The oat crop, particularly, they held to improve with cultivation.

Now do not all these facts prove, or at least imply, that there is some latent quality of the soil particularly friendly to the production of these different crops? And do they not open a new and most interesting field for observation and experiment? And in the relation of these circumstances, is not much of hitherto sound theory and settled experience put at fault? I confess that it seems so. In my own green experience, I find oftentimes that approved modes must be dispensed with, and others more suitable to the new and different soils that we cultivate, adopted. An analysis of some of our western soils, with the best plans of their cultivation, might be amusing, if not instructive to many of your distant readers: and although not prepared to give the former, yet I may at some future opportunity give you a chapter on the latter, and show you how amply they possess in themselves, inexhaustable elements of fertility; and why, contrary to the opinions of many of our Atlantic neighbors who fully believe that all new lands must be in a few years exhausted, and without stimulant by manure, become as impoverished as their own, they may, by judicious cultivation, remain abundantly productive, and an almost inexhaustible source of wealth to their proprietors.

I am so well convinced of the utility of stocking newly cleared lands into grass for mowing and pasture, with wheat and oats, that I shall this spring put in upwards of 100 acres with oats alone, having already sown about fifty acres with wheat. I last June had about 40 acres laid into grass with oats immediately after cleaning, with a thorough harrowing; and a finer, and more promising piece of grass I have seldom seen. Timothy and red clover, with an occasional sprinkling of red-top, is the principal grass used in this region. These lands are excellent for wheat as well as grass, and will bear ploughing and laying down with evident advantage as occasion may require. The white clover rapidly works in, making a thick bottom, and adding largely to the crop of hay. For a rich supply of after feed, no grass can be more valuable and nutritious. Here I am reminded of another fact, which is, that on some portions of our rich *wheat* lands, unless watered, the red clover, timothy and red-top are in a few years run out by white clover and blue grass, which renders their ploughing up and cropping necessary in order to let them again well into meadows; a fact which fully demonstrates to my mind the above expressed opinions, that particular soils are peculiarly fitted by nature for certain crops, and require a totally different course of cultivation from others.

Very truly and respectfully yours, L. F. ALLEN.

QUERIES AND ANSWERS, IN RELATION TO SHEEP HUSBANDRY.

The five queries which are quoted below, came from an anonymous correspondent. They were forwarded to a gentleman pre-eminently distinguished as one of the best judges of stock, and withal an extensive breeder, who has promptly and very obligingly furnished us with the subjoined answers.

1. "*Of what breed or stock had a beginner better compose his flock, his object being the growing of fine wool?*" Pure Merino, crossed with high bred South Downs.

2. "*What are the prices at which the Saxony, South Down. Cotswold, Leicester, Bakewell, or Merino ewes, can be purchased respectively, after shearing?*" From a *good* flock, you cannot *select ewes*, or it would not long remain a good flock; lambs or yearlings may be selected perhaps—price very various—depending on purity of blood, and individual excellence.

3. "*What breed produces wool of the greatest value?*" Saxony *per pound*—Merino *per fleece*. "*And what breed yields the heaviest fleece?*" The great Lincoln, or Romney Marsh sheep.

4. "*What breed is most hardy and best adapted to our climate?*" South Downs, *certainly*.

5. "*On what lands how many sheep per acre can be profitably kept?*" That depends on the breed of sheep, and quality of land, but much fewer than are generally kept.

The Saxon sheep undoubtedly produce the finest wool; but their fleece is light, seldom exceeding 2½ lb. in weight, and is too open to resist our storms. They are feeble in constitution—require great care, are poor nurses, and their lambs are raised with difficulty. The mutton from such sheep must necessarily be of a miserable description.

I believe that in Connecticut, even the pure Saxony sheep may now be purchased at a comparatively low price, say from six dollars to four dollars a head, and perhaps lower still.

The *old fashioned pure* Merino sheep, which were imported by Col. Humphrey, and those associated with him, (but which are now almost extinct) were a much better constitution sheep, and *more* than made up by quantity for the difference in the quality of their fleece—the close, thick texture of their wool resisted our cold wet storms—their lambs were much easier raised, the ewes were better nurses, and on the whole, I am convinced they are a much more profitable sheep than the Saxony. I must, however, remark, there are several varieties of the Spanish sheep; and I would carefully avoid the "gummy"* family fleece, which however, must not be confounded with that, which, though of a dark color, contains only the grease necessary to render it impenetrable to the weather; the former being very objectionable to the manufacturer, while the latter is readily cleansed and worked.

I desire to be understood as speaking of the *pure* breeds, and not of *grade* sheep, which so universally abound in this state, for *they* have no distinctive or fixed character, but vary with their degree of consanguinity to the pure imported blood. Indeed I feel well assured that there are very few individuals of the pure unmixed blood to be found.

The earlier merino flocks of this state, were obtained from the introduction of imported bucks, and those were purchased at great prices, which, with the native ewe, formed the ancestry of our fine wooled flocks: these had not attained nearly to the excellence of the pure merino, in the staple of its wool—its compactness—its uniformity, or softness, when the Saxony cross was introduced, and became almost universal in a surprisingly short time—and this is the true history of almost all our fine grade sheep in this state. It is not, therefore, to these flocks that I allude, when I speak of *pure* merino, or Saxony sheep.

As to price, I presume such merino sheep are more costly now than the Saxony! from the fact that farmers are now aware of their error in using the Saxon cross, which has ruined the constitution of their flocks, decreased their clip of wool nearly one-half, and reduced their produce, until, with ordinary management, more than twenty-five lambs to an hundred ewes, are seldom raised. A merino buck, of *unquestionable* purity, whose ancestry were both imported, will now sell for twenty-five and thirty dollars; the same animal, eighteen months since, might have been picked up at $8 and $10.

The Leicestershire, Bakewell, and Cotswold sheep, are so crossed and mingled in this country, that the distinction is lost, excepting to the practised eye, who can find individuals in the various flocks which partake, as it may happen, more of the characteristics of the one parent or the other. These are a long, coarse wooled sheep, possessing much beauty of form, early maturity, and are quick feeders; but they require rich lands for their pasture, and though their constitutions are good, yet their fleece is sufficiently open to admit the penetrating rains of our severe storms, and then it is, that their heavy fleeces are seen separated along the ridge of the back, thus admitting the wet directly to the skin, until the animal is chilled through. They are good nurses, and make fine lambs; their meat originally coarse and long in the grain, and white in its color, was much improved by Mr. Bakewell, and under his management, become superior to the other large, long wooled sheep. Some of the best flocks of this variety may, I believe, be found in the sheep folds of Mr. Dunn, and Mr. Wilkinson, in Albany county, or of Mr. Adcock, Mr. Musson and Mr. Clark, in Otsego county, all of whom have given much attention to this fine variety of sheep. Average produce in wool, I should think, from five to six pounds, though individuals are found, carrying fleeces of ten and twelve pounds! Price of good lambs, I believe, from ten to fifteen dollars.

The South Downs are as yet but little known in this country, but in my opinion, are decidedly better calculated than any other, for the domestic purposes of our farmers. They are of a medium

* The term "gummy" is in common use with farmers, and will be understood.

size, beautiful in their forms, large loined, broad chested, fine in the head, small boned, and fine in the fleece, which averages 4 lbs. in the ewes; the bucks reach to 7 lbs.; in quality it is equal to half blood merino, but stronger in its filament, and *entirely* impenetrable to storms of snow, sleet, or rain; they are regardless of our coldest weather, and possess hardier constitutions than any sheep I know. The wethers attain to about 28 lbs. per quarter, and are allowed to be the best mutton sheep in England, the meat being dark in color, short grained, mild in flavor, and juicy. They are excellent nurses, and quick feeders. Here again, I beg to be understood as alluding to the *pure* and *high bred* South Down; such as it is found in the sheep-folds of the great sheep-masters in Sussex; not the common, unimproved animal of the Downs, weighing 14 lbs. per quarter, and carrying but 2½ of wool.

As to prices—they are best ascertained from the sources of the respective breeds, and must vary much, according to the *established purity of the blood*, and the excellence of the individuals; the one a much more difficult point to ascertain than the other.

For the last three years, preparatory to commencing my own flock, I paid much attention to the sheep husbandry of this district; visited those who owned large flocks, and soon discovered that they were all on the decline; I corresponded with others, and found the introduction of the Saxony blood was universally followed by a decline of constitution, and all its attendant evils; excepting in one instance, where a gentleman wrote me, that he had just purchased a flock of Saxon merinos. He assured me that in Oneida county, they were a hardy, healthy sheep—shearing on an average about 3 lbs. of wool, *and the purer the Saxon blood the heavier was the fleece!!* This was so contrary to my own experience, having materially injured a flock of nearly two thousand grade-merinos by one single cross of the Saxony, that I still continued my plan of forming a flock from the *pure, full bred*, large merino sheep on the one part, and from the high bred sheep of Mr. Ellman's flock of South Downs on the other. Assisted by the indefatigable perseverance, acute discrimination, and previous knowledge of a friend, (whose father was concerned with Col. Humphrey in his various importations and sales of such sheep,) I collected, after 18 months' search, about thirty full bred merino sheep, pure as imported, *known* to be directly descended from those importations.—Their quality of wool is as fine as perhaps any grade Saxony flock around me. The ewes will average 4 lb. fleeces. My South Downs I imported from the celebrated flocks of Mr. Ellman, in England, whose two year old wether sheep beat all England last Christmas, at Smithfield, and took the first prize. He was judged to weigh 32 lbs. per quarter; and I am happy to say, has been presented to me by Mr. Ellman, as a specimen of excellence, and will probably arrive in this country before long, as he was to be shipped from London the first week in this month, for New-York. From Mr. Ellman, I procured six yearling ewes, and a *yearling* buck; the ewes have wintered in a yard with an *open* fence, and an open shed, closed only at the back; they lambed *there* from the 23d to the 28th of February, on which day the thermometer was as low as 4 deg. On the 1st, 2d, 3d, 4th and 5th March, the thermometer, in the shade, was from zero to as low as 6 deg. *below* zero, at sunrise! and yet my lambs, young as they were, never suffered in the least from the severity of the cold; they never showed the slightest consciousness of its intensity! and are allowed by all who call to see them, to be the finest lambs they ever saw. I find rapid demand for all I can spare from both my flocks, at liberal prices.—The engagements for my South Down buck, for *next* season, have been filled for some months past; and two days since Mr. Musson, a Leicestershire breeder, called to see him, when I took the opportunity of requesting he would weigh him—he very obligingly did so; and his exact weight was one hundred and fifty-nine pounds and a half. I have ventured on these minutiæ in regard to the *high bred* South Downs, as these sheep are very little known in the United States; and facts are more satisfactory than opinions: and again I must insist that I do not allude to the *unimproved* breed; I do not allude to the South Downs of Cully's day, from whose writings I have seen various extracts as descriptive of the breed, nor do I include the Hampshire Downs; I confine myself to the *high bred sheep* of the present day; and if any would oppose to them the fast rooted prejudice of high breeding being inseparable from delicacy, I would refer them to the facts above stated, and ask of them a personal inspection. I would further add, that it is an acknowledged fact, that Mr. Ellman's flock turns out more lambs than ewes! averaging 750 lambs annually, for several years, from 600 ewes.

A strong advocate myself of purity of blood, and a known line of ancestry, which confers excellence by descent, still, I believe, for this country, the most valuable description of sheep may be raised by judiciously crossing the merino and south downs, thus uniting the fine fleece of the one with the beautiful carcase of the other, and gaining at once a constitution suited to our climate.—This was done some years since, on the introduction of the merinos into England, and was attended by the most flattering success, the flock beating every other for the COMBINED excellence of wool and carcase. Both these breeds being fine, close woolled sheep, there is no extravagant dissimilarity, no wide contrasts to be amalgamated, and a more uniform character is easily obtained in the progeny, from which it will do to breed again. This is not the case with a cross between the long and short woolled varieties; the first cross will sometimes make a good animal, but when bred from again, the produce is uncertain, sometimes "taking back" on the long woolled parent, and sometimes on the opposite side; and when apparently combining in the fleece a united influence of the two breeds, a closer examination will shew an unevenness of length and filament that ill suits the manufacturer. R.

Maple Grove, Otsego, March 26, 1835.

DESTRUCTIVE INSECTS.

Not only thorns and thistles, but hosts of noxious insects have been inflicted on degenerate man. My attention has been chiefly directed against the latter evil.

The character of some of these insects will be described in treating of my warfare against them.

The first in my series, is probably of American origin, as in no system of entomology can I find a description of the insect which has proved so destructive to our peach trees. I have to rely on my own observation for its history and description. It was probably unobserved by us prior to the present century.

In the autumn of 1800, I first saw the fatal malady in the peach trees about Philadelphia; the next year it had reached Burlington, and thence continued its march northward, about twelve or fifteen miles a year. In 1807, in a choice collection of fruit of my own, every tree had the premonitory symptoms of the yellows: a few miles north escaped that year. Having made a careful dissection by splitting and barking several trees, I could discover no cause, but ravages of the worms between the bark and wood. Collecting a number of the worms, I confined them in glasses and hatched from them the perfect insect; a moth or miller, small in comparison with the worm; white or light grey, with dark spots, wings convolute, like a section of a crow-quill split longitudinally. This phalena or moth lays its eggs on the leaves of the peach tree; when hatched, the larva or maggot subsists itself first on the leaf, until it has acquired sufficient size and energy to migrate to a more suitable and permanent home for the winter: this is between the bark and wood of the tree, near the ground. Here it enlarges its domicil;—a sickly state of the tree follows, and if they congregate in sufficient numbers to circumvent the tree, certain death is the consequence, by intercepting the communication between the root and body of the tree.

The larva of the peach insect is herbivorous, and in this state of existence subsists on the tender lining of the bark; living in a cleanly manner, it deposites all filth outside the door, by the dark powdery appearance of which, its abode may be detected. In its chrysaloid state, its appearance is smooth and glassy. It frequently happens when seeking these worms, a chrysalis very different is found; this is the sirex or tailed wasp, the natural enemy of the peach worm; the sirex is a restless, fidgetty insect, resembling a wasp; its young, like that of other wasps and hornets, is carnivorous. It may be observed about the neighborhood of the peach worm's habitation, at the door of which it lays its egg; the product, a worm, creeps into the bowels of the peach worms, feeds on its carcase and occupies its coat. Its chrysalis, unlike that of the peach worm, is rough and filthy, caused by the sweat and writhing of the victim of its rapacity.

I have been thus particular in noticing the sirex, because, being a usurper of the abode of its foster parent, it has been falsely accused of being the mother of mischief, instead of a friend y ally, which should be patronized. Among others, the Sussex N. J. Register, had, about six years ago, a belligerent article against this supposed enemy.

Knowing that, even in a moderate degree, *heat* proves fatal to the cut-worm, I was led to try its effect on the peach worm; having placed several in the hollow of my hand, I found that water not uncomfortable to my skin, killed them. I thence commenced applying boiling water, from a watering pot (without the nose,) pouring it around the tree, about eighteen inches above the ground, in sufficient quantity to heat the bark; the quantity was varied acording to the thickness of the bark and size of the tree; this proved completely successful for several years, and as longas it was continued. The time for using the heat, was the last of summer, and again the middle of the autumn, lest some might have escaped or more recently arrived.

The Pea Bug.—This may also be an American insect; we hear nothing of it abroad, and imported seed is without it. Its march through our country preceded that of the peach worm, about twenty-five years, and in like manner travelled from south to north about ten miles a year. This insect is too well known to need a description. It lays its eggs on the half grown pea-pod opposite each grain; the maggot, when hatched, penetrates the pea; the skin closes over and it extends itself to a large size, but contracts into the pupa state to one side the pea, from whence emerges in the spring the perfect bug, ready to perpetuate its species.

To counteract this evil, I have in my garden, sown imported clean seed, seed two years old, containing no live bugs, or I have scalded infected seed, with equal success: that is, the crop was but partially infected, and that I imputed to the proximity of the garden of my less careful neighbors.

These insects would be eliminated from our land, if every body would scald their peas on the day of sowing them; this is easily effected. The farmer may put two bushels into an open flour barrel with one head, pour on them one gallon of boiling and half a gallon of cold water mixed; cover the cask a few minutes; this would produce enough heat to kill the bugs, and would facilitate the germination of the peas.

I have not been able to ascertain the parentage of the insect that attacks the young fruit of the apricot, plum, and other smooth skin stone fruits. Its attacks are probably made in the early morning, (a time not particularly propitious to my habits of investigation) formerly I gratuitously considered it a winged insect; it makes a couple of wounds, as if by pincers, in the skin of the fruit, in which it deposites an egg; the larva or maggot from this, eats to the centre or stone, injures the fruit and causes it to fall prematurely: afterwards the larva penetrates into the earth to winter there; in the spring it works its way to the surface, to renew a similar round of existence for its progeny. In the middle of my garden were two apricot trees, bearing abundance of fruit, but not one perfect. I removed the surface, and formed an area around each tree, similar to the gravelled walks; from these I had the fallen fruit removed daily to the piggery; after this I had plenty of good fruit. Near to these trees was a nectarine and several plum trees, being on my boundaries, were not treated in like manner; they produced no sound fruit. It would thence appear that the insect may not be winged or migratory to much extent, but may belong to the order *aptera*, wingless, and probably of the genus *phalangium*. Of these there are several species, all less and of shorter limbs than the well-known *father long-legs;* I know one variety with claws like a crab, capable of inflicting the above described wounds; they escape observation by their light color and slow movements. Other means than those, I pursued for the protection of these fruits. I have often seen narrow strips of sheepskin, wool on, fastened around the body of the tree before the blossoming season and continued during its ripening. In the absence of these, rolls or bats of coarse wool might answer the purpose against these crawlers, if such they may be. A still better security may be obtained by planting this kind of fruit trees in a yard where pigs and poultry could have free access during the fall of their fruit.

The Cut-worm.—This is the offspring of the *phalena devastator;* wings horizontal; white with small dark spots; under wings orange; conceals itself from the sun during the day; lays its eggs near the root of grasses. These worms are of a bluish color, and they travel only in the night; they cut off young cabbages, beans and corn; the latter is injured, but not destroyed by them. To shun its depredations in gardens, be careful to plant at a distance from any grass plat or lawn. I have lost an entire crop of late planted beans by them, by planting near a grass plat. Frequent superficial hoeing, in the middle of the day, by exposing to the sun, proves fatal to many of them.

Another familiar enemy is the *turnip fly.* I have witnessed many a crop of cabbage and cauliflower plants, also melon and cucumbers destroyed by these minute insects. To obviate this, on the first mentioned small seeds being sown, I have wetted the ground to the depth of an inch or more with boiling hot water; thus destroying the flies and their eggs, and at the same time expediting the germination of the seed. For melons and cucumbers, I sow and rake in radish or turnip seed, on and around each hill; the flies are attracted by these, their more favorite food, from the melons, &c. Against the striped bug, another destroyer of melons, a brood of young chickens is a sufficient protection for a whole garden.

Mr. Editor—I do not presume to think the above the only or best means of abating the evils we suffer from insects; my object is rather to elicit from others the result of their observation and experience; the subject, in my view, is important. Has any one, more fortunate than myself, discovered the insect, for insect it most probable is, that produces the deforming warts and threatened destruction of our plum trees? A knowledge of the agent might lead to the means of counteracting its influence. May we not hope that some means may be discovered for palliating the impending evils from the wheat insect, by fires or smoke of some offensive kind, as of horns or hoofs of animals, made in the evenings, at a particular stage of the opening ear. Many remedies and some of much practical utility have been suggested against the Hessian fly. We ought not to submit to nor look lightly on these pests. Ants, insignificant as they appear in our view, have been suffered to multiply to such an extent on the island of Grenada, that a premium of £20,000 sterling has been offered, from the public treasury, for the best plan for their destruction. Poison and fires are employed.

Let us exert our energies against the whole race of these *destructive insects;* let us devote a few hours each year to this warfare, and a though we may not gather laurels, we shall assuredly reap a rich bounty. SENEX.

Kinderhook, March, 1835.

Canandaigua, 3 Mo. 26*th*, 1835.

Respected Friend Jesse Buel,—Thine of 16th inst. duly reached me. As I am as ready to give as to receive instruction, I hope thou wilt be willing to give me thy opinion as to the proper depth of ploughing a field for corn. It contains 8 acres, is a rich sandy loam, leaning to the south. *(a)* At the time of threshing last fall, had the straw of 40 acres wheat drawn to it and laid in heaps; this will be spread and raked into the furrow. It was my intention to spread it last fall, believing it would become sufficiently tender to be separated by the coulter; but some of my friends who had tried it, found it not to answer, and advised my leaving it in heaps. It is my intention to sow plaster on the straw after it is spread. When ploughed, shall roll it, then harrow—and my opinion is, that it would be an advantage to roll after planting; *(b)* my oats and wheat have evidently been benefitted by the operation. I have come to the conclusion that most seeds vegetate sooner and stronger for having the earth pressed to them. Some late reading has produced a conviction, that farmers *generally place seeds too deep.* What is the proper depth for corn on *sandy loam? (c)* I always harrow my ground *before* sowing wheat.

Thou may think it strange that I should ask thy opinion respecting the depth of ploughing. I will here state that I usually plough 6 to 8 inches; but I have been staggered by the accounts of Earl Stimson's *(d)* abundant crops from 4 inch ploughing. I think such statements, unaccompanied by reasons for the practice, are calculated to do injury. I have always supposed, that crops were less likely to be injured either by wet or drought on deeply ploughed land, and practice has been in accordance with this belief. I am aware that manure may be placed so deep that it will not ferment —but will that be the case at 8 inches? *(e)* My experience says no.

There are certain principles in husbandry, which have obtained among the most enlightened agriculturists. If the adoption of those principles has resulted from a great variety of experiments, so as to satisfy us that they may safely be observed in most cases, would it not be proper, when a satisfactory result of a different practice has been given to the public, by one who stands high as a scientific farmer, to give also the reasons for such departure? Without such explanation, the inexperienced farmer may be led greatly astray. Among those principles, there are no two more important, in my opinion, than *deep ploughing*, and, that *when manure has been turned into the soil, it should lie undisturbed until the field is again laid down to grass. (f)* Now it will strike every practical farmer, that without an attention to the first, the last is impossible. Unless manure and sward are buried 7 or 8 inches, the cultivator cannot be used without disturbing them.

I observe thy recommendation to plant corn nearer than we have been accustomed to do it. I think we cannot use the cultivitor *(g)* where it is nearer than 3 feet; and where wheat is to be sown, I am of the opinion the ground would be in better order, should that implement pass both ways. It is my intention to sow my corn ground, notwithstand it is my opinion that it would be better husbandry for peas or barley to intervene.

Many are in the practice of ploughing oat stubble twice, and some 3 times, but we have discovered a much better method. As soon as the oat crop is taken off, go in with a sharp and heavy harrow and drag it thoroughly; the scattered oats and weeds will vegetate immediately, and, turned in with the stubble by one ploughing, will not only enrich the ground, but it will be left in better order for the wheat crop, than by the old practice.

Impressed with a belief that some legislative action is necessary, to induce our farmers to turn their attention to the raising of the mulberry, and propagation of silk worms, I would propose, that the Legislature should either furnish every poor-house farm, or compel the overseers of the poor to procure 200 mulberry trees (*h*) of good size, to furnish the infirm poor with a light and profitable employment.

If any of the foregoing remarks are worth extracting for the Cultivator, thou are at liberty to use them.

Thy respectful friend, WM. S. BURLING.

NOTES.

(a) We subscribe to the maxim, that *the deeper the tilth the more abundant the crop*. By tilth we mean the true soil, or the stratum which the plough turns over, and with which the vegetable matter, the food of plants, is well blended. The *proper* depth depends on the nature of the soil and subsoil. In corn ground, which is properly a soil of sandy, loamy or gravelly texture we think six to nine inches a suitable depth. The roots strike fully to this depth, if there is food for them; and this serves to brace the stock, and to avert the effects of drought.

(b) It is undoubtedly beneficial to press the earth to seeds, particularly small and light ones, with a roller; but in planting corn our practice is to substitute the planter's foot for the roller, who steps upon each hill.

(c) All seeds should be as superficially covered as a due regard to keeping them moist will permit. Seeds will not germinate without the combined agency of moisture, heat, and air. If buried deep, they in a measure lose the influence of the two latter of those agents. Rolling, or otherwise pressing the earth upon the seeds, slightly covered, tends to prevent the evaporation of the moisture necessary to their germination.

(*d*) Mr. Stimpson's farm, we understand from a gentleman of geological science, is of a peculiar kind, to which ordinary rules will not apply. It is principally underlaid by a porous rock, the debris of which, instead of possessing fertilizing qualities, is considered deleterious. If we are rightly informed Mr. Stimson's system of shallow ploughing is rather a matter of necessity. His system does not answer our turn.

(e) The fermentation of manure, like the germination of the seed, requires the presence of heat and air, as well as of moisture. The fermentation may be retarded by burying it deep; but I have ever found, that, in corn ground, it does ferment, in time for the wants of the crop, at the depth of eight inches.

(f) Upon this point we have some doubts, although the rule laid down tallies with the opinions of Lorrain, whose authority we highly respect. While manure is undergoing fermentation, its fertilizing properties, the gaseous portions, rise towards the surface; but after fermentation has exhausted its powers, the tendency of the residuum is to sink deeper in the soil. Whether, therefore the advantage of having rotted dung near the surface, would or would not be more than counterbalanced by the wasting influence upon it of the winds and sun, is a question we are not prepared to decide.

(*g*) We plant 3 by 2½ feet, and work the cultivator but one way; but were we disposed to have rows both ways, *our* Cultivator would readily pass between them, as its cutting breadth may be contracted to 20 inches. We think this would be an improvement, by keeping the surface more mellow and clean, matters of no little moment.

(*h*) It would save expense were this matter undertaken by the overseers, without legislative provision. An ounce of mulberry seeds would cost, at the extent, but 50 cents, and, if managed with care, would produce from two to three thousand trees, which would afford the material for silk almost as soon as large trees. And besides, we are afraid that any appeal for legislative aid to agriculture will he altogether disregarded, unless it can be made to subserve political party purposes.

ON IMPROVING BREEDS OF STOCK.

Trumbull Co. Ohio, Feb. 1st, 1835.

J. BUEL, Sir.—In reading the Cultivator, I noticed your invitation to the subscribers to communicate their own observations or experience on any subject that comes within the object of your publication. Not accustomed to write for the press, I have no expectation of producing any thing worthy to be presented to the public, for its grammatical correctness, or elegance of composition; but if my observations shall bring the talents of abler writers before the public on the subject selected, it may be highly beneficial to the community.

In the first number of the Cultivator, pages 8 and 9, is found an epitome of Mr. H. Cline's method of improving the breed of animals by putting females of a larger variety, to males of a smaller. The same ideas were several years past copied from agricultural papers into political ones in this section of the country. If I had not seen the evil effects of the theory when reduced to practice, I should not have troubled you with my observations on the subject. For forty years I have been no inattentive observer of breeding and rearing of our domestic animals. Mr. Cline's ideas may be applicable in Europe, but they are directly the reverse of my observations in this country. It is not a little surprising that the example he gave of the ill effects of the Yorkshire farmers putting their stallions to much larger mares than usual, did not lead him to doubt the correctness of his theory. He in another section says, the great improvement in the breed of horses in England arose from crossing native mares with the diminutive Barb and Arabian stallions. But may it not be reasonably supposed, that the improvement was rather the result of beauty of form, and the extraordinary muscular powers of the animal, than of his diminutive size? May it not be reasonably presumed, that those horses had much depreciated from their natural size on the fertile fields of Judea, in the days of Solomon, by passing through a thousand generations in a country and climate less congenial to their attaining their natural size? It appears to be a fact, that these horses have attained a much larger size in England, since they were brought there, less than two centuries ago, not by crossing with native mares, but crossing the Barb with the Arabian. And the purity of the breed of the present English blood horse is ascertained by tracing his pedigree on both male and female side, to pure oriental blood, and a cross of the east breed twenty generations back would ruin his character. It is also admitted that no improvement has been made in England within the last one hundred years, by importing Barb, Arabian, or Turkish stallions.

The theory of Mr. Cline, that the larger flow of blood from the large female to the fœtus, and the natural effect to produce a larger extension of the heart and arteries, with an increased growth of the surrounding bones, muscles and appendages, is admitted: and that the larger quantity of air, brought in contact with blood in the lungs in each inspiration, serves to produce an increase of appetite, is not doubted; but that the powers of digestion are proportionably increased, is not quite so apparent. It is apprehended that the digestion of food so as to change its nutritious parts into chyle, to be taken up by the lacteal veins and carried into the circulating fluids, fit to be incorporated into parts of the living system, is only secondarily dependant on air received into the lungs: but primarily on the viscera of the abdomen or belly. It does not appear to be a fact, that those animals that consume the most food in proportion to their size, fatten the most readily. It is believed that those animals whose chests are disproportionably large, are as remarkably deficient in their hind quarters; are usually large eaters, but slow to fatten, and are such as are not readily purchased for the market. Such has usually been the product of both cattle and horses, as far as I have had the opportunity of seeing the result of a small variety of males put to large females, and the greater the difference in the variety, the greater disproportion between the fore and hind parts of the offspring. My own observations on breeding from large mares and small horses has been—

that the offspring was so disproportionally deep through the chest—thick and bony through the shoulders, as greatly to endanger the life of the mother—and I have known several valuable mares that have died or been ruined from that cause. The offspring has very commonly a deep chest, rendered flat by the pressure of large heavy shoulders; a long back; narrow weak loin; narrow short contracted hips; long large boned limbs, with small muscles and tendons or cords. It is not asserted that such is the invariable result, but it is believed there are few colts from such parents, but show more or less of the above cited disproportions. On the other hand it is believed, that our best horses are the product of males of a larger variety than the females, and often when the disproportion was very great; and I have no recollection of any injury to a small mare, from being in foal by a large horse.

On the subject of breeding cattle from a male of a variety far larger than the female, I have had but a short opportunity of witnessing its results. Not far from the year 1800, some English bulls of a large variety, I think they were called the Yorkshire breed, were purchased at or near Frogs Neck, and taken to Addison county, Vermont; when 6 years old, they were the largest and handsomest cattle I have ever seen—were remarkably broad through the breast and stifle. They were put to cows of the common breed; the calves, when dropped, were commonly smaller than those from bulls of the common breed, but without any extra feed, they attained a much larger size, and were far handsomer animals; the heifers better milkers; ¾ blood calves approximated nearer in form to full blood; but one of ⅛ blood could readily be distinguished from the common breed. But as I left that county in 1806, I had but a short time to witness the result of the cross.

Mr. Cline recommends crossing the large English sow, with the small China boar, but your friend, L. F. Allen, Esq. has probably adopted a more rational method, by a vice versa cross. I have never derived much benefit by crossing the common sow with the China boar.

I have only seen the result on sheep, by crossing the common ewe with the Merino or Saxon buck. The result has been a smaller and less hardy breed of sheep, with shorter and finer wool; but I think not any larger quantity. I should like to learn the result of crossing the large fine wooled English buck, with the Merino, or Saxon ewes.

F.

ADVANTAGES OF MIXED HUSBANDRY.

North Canton, March 20, 1835.

J. Buel—Much is said in this section on the subject of farming, and particularly on raising stock, as being more profitable than raising grain. There are contrary opinions maintained with considerable spirit on both sides. Some contend that farmers should turn their whole attention to raising cattle and sheep, except grain and pork sufficient for the family's use—while on the other hand it is maintained that grain should be the staple of our country, connected with a sufficiency of stock to eat the grass that grows on our lands that are not tilled. I propose to examine the subject, and commit the result to your consideration. If you think it worthy of a place in the Cultivator, it is at your service.

In treating this subject it is necessary to turn our attention to an earlier period of the settlement of this country. Thirty years, or thereabouts, have passed away since the settlement first commenced; and about 25 years may be considered the time when this section began to excite the attention of the eastern emigrants, and for 15 years the settlement advanced with considerable rapidity, since which time the emigration to the west has occasioned a stand in respect to the settlement of this county by emigrants. It happened in this county, as in all others, the ridge lands (for our lands principally lie in swells) were cleared first, and produced excellent crops of winter wheat, consequently we believed that we had an excellent wheat country. But since our farms have become cleared, we have found our mistake; and great losses have been experienced by summer fallowing, which has had a tendency to divert the attention of those farmers who had been fortunate enough to pay for their farms (by good economy or good luck while raising new land crops) from the raising of grain almost entirely, and substituting the raising of cattle and sheep, except so much grain as is necessary for the consumption of their families. Although the raising of stock is considerably practised and more considerably advocated here, as being by far the most profitable way of farming, yet I will undertake to show the contrary,—that is, that the farmer first should raise all the grain that he can without injuring his farm; secondly, he should keep all the cows he can on the remainder; thirdly, make all the butter and cheese he can—and lastly, fatten as much pork as the dairy will keep well. And for a fair test, I will suppose two farms of 100 acres of improvement, each of equal goodness; the one to be stocked with as many cattle as is necessary; the other to raise grain and keep a dairy. In the first place, the cattle farm shall be taken into consideration, and in order that a fair trial should be had, I will allow the farmer only one acre for tilling, which is enough for a garden, for I would not be willing that he should confute his position in the beginning—for it is very plain that if he can raise cattle to greater profit, that he had better do so, and buy his bread stuff, and spread his manure on his mowing land. We will suppose then, that a farm of one hundred acres improved land will keep 60 head of cattle, besides a team, which will be necessary in both cases—say 15 calves, 15 yearlings, 15 two-year olds, and 15 cows, making 60 in all, which I know to be rather over, than under the true number; he will have 60 cattle to winter, which will take 60 acres of meadow to furnish the fodder, leaving 40 only for summering his stock. He can sell yearly 15 two-year-olds in the fall, after they are wintered and summered, \$12 per head, 12 + 15 = 180 dollars; butter and cheese, \$15 per cow, 15 + 15 = 225 dollars; 15 pigs fattened on the dairy slop, 150 pounds each, \$4 per hundred, \$90; two old cows, fattened, \$18 each, \$36, and supplied by three year old heifers, to keep the stock good. You have then left for the nett proceeds of the farm, after deducting \$60 for securing hay, \$471. I then suppose that 60 out of 100 acres improved land, is a fair average of plough land in this county, and that three crops is all that should be taken from a field before it is seeded down, and should be seeded with the third crop invariably. I then have six fields for the plough; one field to be ploughed yearly, one to be laid down yearly; making thirty under the plough at once, and leaving 70 for grass and cattle, which I will reckon at the same rate that I did the other 100 acres. Supposing then, the 60 head of cattle from cows to calves to be equal to 50 cows, putting the calves on to the yearlings and two-year-olds, making them equal to the two-year-olds and cows; then 70 acres would keep 35 cows; then as above the butter and cheese at \$15 per cow 35 + 15 = 525 dollars; 36 pigs fattened on the dairy slops, 150 lbs. each, \$4 per hundred, \$210; three fattened cows, \$18 + 3 = 54 dollars; 30 calves \$3 per head, \$90, making \$879. I then have 10 acres corn, 40 bushels per acre, 50 cents per bushel, \$200; 10 acres of spring wheat, 15 bushels per acre, \$1 per bushel, \$150. Spring wheat is the only wheat crop that we can depend upon in this county, as a general rule. Ten acres oats, 30 bush. per acre, 25 cts. per bush. \$75, making \$425.—Total \$1,304.—To be deducted from this amount, there is the wages of two hired men for six months, \$12 per month, \$144; one boy, \$5 per month, \$30; one woman \$4 per month, to take care of the dairy, \$24; two years' board at \$1 per week, \$104, making \$302, taken from \$1,304—leaves a balance of \$1,002 for the nett proceeds of the grain and dairy farm; deducting the nett proceeds of the cattle farm, \$471, from this, leaves a balance in favor of the grain and dairy farm of \$531. I have supposed each farm to be equally well fenced, and all necessary farming tools and carriages. If it be objected that more worth of farming tools is required on the grain farm, it will not balance the amount of capital owned by the cattle grower, for when you take into consideration the capital employed by each, you will find that much the greatest profit is realized from the same amount of capital on the grain farm,—and that certainly is the best way, that makes the greatest profit from the same capital. It may be seen from the above calculation that a family may be supported, whose support costs \$500, from the grain and dairy farm, and leave a handsome income saved at the year's end; while on the other farm, the husbandman with as expensive a family, would find himself in the rear at the year's end. It may be seen that a dairy and grain farm is more profitable than a cattle farm—that it is more profitable than a dairy farm—and that it is more profitable than a grain farm; for it would be impossible to keep a farm in good heart, without cattle to make manure, and it would be equally impossible to make our dry lands produce as good pasture without the plough. For a short time our lands would produce good grasses by what is called top-dressing with manures, but too soon the grass would become wiry and tough, and our cattle would, if they could have the choice, leave the old for the new laid pasture.

But why is it, that our most wealthy farmers protest that they make property faster now, than they did when they raised grain? For a very plain reason—they say one thing, and do another.—They say they raise cattle and make profit by it—but it is not so; they buy their cattle reared—winter them perhaps one winter, and sell them at a profit,—and why? Because they began the world with some capital, or have been fortunate enough to pay for their farms, while they were raising grain, and thereby became able to make additions to their farms, and to stock them with cattle, and so receive a handsome income without taking into consideration the amount of capital employed. I have no exceptions to make to this way of farming, because one man is richer than another; but this doctrine will not do to preach to a man that has not yet capital to stock his farm, and must support his family from his farm. If this state is ever made to support its man on every rood, I am sure that it will not be by cattle husbandry, nor by sheep, but by the highest state of agriculture, and principally by grain-growing, with a proper proportion of cattle, when every thing is brought into requisition that the lights of science has and will unfold, and made to bear on the culture of the soil; then not unlikely may our fields compare with the fields of any country on the same parallel of latitude. I trust the time is not far distant when the objections that the farmer cannot get manure for his land will not be heard.

If the above should find its way into the Cultivator, I should feel rewarded if some one who has time and ability, should lend their aid, through its columns, in support of grain-growing, for I find there is much said in every number of the Cultivator on the breeding of cattle and sheep. It is time for the grain-grower to lend his aid. D. S. OLIN.

In the last number of the first volume of the Cultivator, there is a partial account of making sugar from potatoes. "A certain quantity of sulphuric acid or vitriol is then mixed with it," as stated in the Cultivator. Please to say in what proportions. "This is to be purified from the acid by adding quick lime." Also what proportion of lime and what the probable cost per cwt. You will oblige a friend by giving information on the above subject.*

Yours, T. D. OLIN, P. M.

* We are unable to respond to these queries.

J. Buel, Esq.—Sir—I wish to inquire, through the medium of the "Cultivator," whether the common red clover is hurtful to an orchard. As I have no experience on this point, and wish to seed an orchard during the current year, it is my desire to proceed understandingly. I have somewhere seen it stated, that it was not hurtful to an orchard to seed with clover: provided, however, it was turned under in the course of two or three years. Your own experience and opinion are respectfully solicited.

I am informed that, for a field crop, you prefer the China Bean. The prevalent opinion in this district of country is, that no beans are saleable except the *white*. Does the China Bean command as high a price, as an article of merchandize, as the white, or any other? I will also inquire—does plaister benefit the bean crop?

Have the goodness to instruct the readers of the Cultivator in relation to the culture of carrots. What soil, and what preparation of soil do they require—when and how sown, and what attention must be given between sowing and harvesting.

Respectfully, &c. A. Z.

Saratoga County, 25th March, 1835.

REPLY OF THE CONDUCTOR.

We do not think red clover prejudicial to an orchard. It is not so exhausting as other crops, though it is true, it derives its nourishment from that part of the soil where the roots of the trees penetrate, more than ordinary crops. Yet it is calculated, by its roots, which seldom abide more than two seasons, to divide and mellow the soil, and thereby render it more permeable to the roots of the trees. Such are the opinions we have formed from experience and reflection.

Our preference for the China, over the white bean, as a field crop, arises from several causes: 1. It is intrinsically the richest and best bean; 2. It ripens early, and comes off in time for a crop of winter grain; 3. We think it gives the best crop; and 4. It brings *us* the best price. Yet we ought in candor to add, that it requires the best ground. The white bean will grow where this will starve. The white bean *is* the most saleable. We think plaister may benefit the bean crop; and recommend that it be sown at the rate of a bushel to the acre, before the last ploughing for the crop.

The carrot is undoubtedly among the most productive crops, and we think it one of the most expensive ones, *on account of the great labor it requires in hand-weeding*, and before the plants acquire much size. The soil which it prefers, is a rich moist loam, which should be ploughed deep, and well manured. The seeds must be sown by the hand, as the drill barrow will not scatter them equally. The preferable way is, after the ground is well pulverized and levelled, to stretch a garden line, the longer the better, draw a shallow drill with the hoe, scatter the seed in the drill, cover lightly, and *press the earth upon the covered seed*, with a hoe or roller. The drills may be twelve to eighteen inches apart. They may be sown early in May. The ruta-baga is sown the last of June, or first of July. The labor on the carrot crop before the first of July, is more than is required for the whole turnip crop, and there is no great difference in the product or value of the two crops.

Canaan-Centre, March 23d, 1835.

Sir—As the great object of the Cultivator is to disseminate useful knowledge among farmers, from various sources, and as its columns are open to all, it is a source of regret to me that amongst your numerous list of subscribers, more have not improved such an important medium of communication, to make public the result of their experiments, and their partial knowledge in relation to the great work of agriculture. The field is certainly extensive; as there is no subject within its range the description of which would not be useful to some; and the views of the practical farmers, derived from observations or from experiments in the science, would benefit all. The aversion of many farmers to experiments in husbandry, renders it more important that those who try them, or acquire any thing new or useful in any way, should make it public, that the weight of testimony may be such as to remove doubt from all minds; so when any thing is advanced that admits of doubt, or is contrary to the opinions of others, a discussion of the subject would give all an opportunity to judge more correctly. In the January number of the Cultivator, I noticed a communication signed Amateur, giving a description of some old fashioned Merino sheep, which were undoubtedly very superior ones, and such as any wool grower might be proud of possessing; but he makes a quotation from a correspondent of his, which does not accord with my view of the subject. His correspondent says, "sheep of the above description are now very scarce, and will soon be in great demand, for all wool growers are aiming at small fine fleeces, whose constitution will not stand severe wet and exposure to cold, and thinks nothing but a resort to the old fashioned merino will help it." My object in noticing this, is to correct an impression which it has a tendency to make on the minds of some, that Saxony sheep must eventually give place to merinos. My opinion is, that a judicious cross of Saxony on merino is nearly as great an improvement as merino on native, and should not be abandoned by wool growers on the scale of profit, as I believe a flock of merinos may be so improved by a Saxony cross, as to make the wool worth from fifteen to twenty cents per pound more, without a corresponding deficiency in weight. I arrive at this conclusion not by any visionary calculation, but by the result of actual experience, having for the last six years greatly improved my flock by a Saxony cross without any diminution in weight. There is undoubtedly a great fault with wool growers in the selection of bucks, either from want of judgment, or attention, or from fear of expense; and the scarcity of Saxony bucks has brought into use all that have been imported, or raised, whether they had good qualities or not; this has had a tendency to depreciate the value of them, and should be guarded against; good qualities being as essential in them as in other animals intended for breeding. Any breed of sheep may be greatly improved by good management, though more easily depreciated by bad. No one supposes but what merinos are far superior to native, and to cross them is a great improvement: yet I recollect when merinos were first introduced into the country, the same objections were made to them that are now made to Saxony; and the remark, that Saxonys have more delicate constitutions than heavy fleeced merinos, and will not endure wet and cold as well, is true, and is an evidence of the superior quality of the fleece, and admonishes the wool grower, that they may be kept from dampness from any source; without this precaution any sheep's fleece will grow coarse and harsher. Such ewes as Amateur describes, their fleeces weighing 4½ lbs. would cross with a good Saxony buck to great profit, and would produce far better stock in my opinion, than his merino bucks, on Saxony ewes, or on ewes of the same breed.

As the season for shearing sheep is at hand, and as I have noticed a great difference in the appearance of different lots of wool of similar quality, owing to different management, I suppose a few hints on the subject might be serviceable to some. It is important that the external appearance of a lot of wool should be good, as well as any other article intended for market; for besides the advantage of a little advance in price, we have the satisfaction of producing an article that displays neatness and skill. After sheep are well washed, they should be kept in a clean pasture till the harshness produced by washing is overcome; eight or ten days is sufficient in dry weather, but wet will require a longer time. Fleeces cannot be made to appear well, unless they are taken off without being torn, and to effect this, a careful attention to the comfort of the sheep should be observed, which will of course have a tendency to keep them from struggling. I approve of a scaffold 18 or 20 inches high, made of planed boards, on which I set the sheep, shearing the left side first, parting the wool from one flank to the other, and shaving towards the back; then turn the sheep round and shear from the back, taking off the belly as I go down; in this way the fleece is kept all the time out of reach of their feet, and may be kept whole as when on the sheep. The fleece should then be doubled so as to have the shoulders appear on the outside, and the fleece when rolled, should not be more than from 10 to 15 inches in length. It should be rolled very tight, and the knee placed on it till the cord is drawn under and tied. It is often necessary to wind the cord once around on each side, half way from the middle to the end, but never should be carried in a contrary direction around the ends, unless the fleece is very much torn.—Cotton cord should not be used; and wool should not be put into sacks that have had cotton in them, as whatever particles of it may chance to adhere to the wool, will in dying take a different color, and give the manufacturer the trouble of picking them out of the cloth. Shears should be ground to an edge on the back, from the points up about two inches; this will be found to be a great improvement, as they will enter the wool much easier.

J. Buel, Esq. DANIEL S. CURTIS.

VALUE OF FRUIT.

Good fruit will be admitted by all, to be one of the almost indispensable comforts of life. Then why do so many farmers neglect to procure it—when, with a little *pleasure*, (I will not call it trouble,) in grafting and inoculating, it could be so easily effected? Many farmers live, or rather, get along, from year to year, without making any effort to accomplish so desirable an object. To such, these remarks are directed, (for to none others would they apply,) in order to stimulate them to action. And as this month is the season for transplanting fruit trees, I presume none will neglect to obtain a supply, and those of the most approved kinds. We should always be well provided with young trees, particularly the peach, as this is a short lived tree at longest, that, as the old ones decay, we may replace them, and thus keep our stock good. I have noticed with regret, that many peach orchards are suffered to decay, and some have entirely disappeared, without a single effort of the proprietors to replenish them. Surely so delicious a fruit is worth paying the utmost attention to. What incalculable benefit may be derived from a little attention—for instance, if a farmer spend one day in grafting, one in inoculating, another in transplanting fruit trees—how is he rewarded ten-fold for his labor in beholding his efforts crowned with success—to say nothing of the profits and enjoyments to be derived therefrom? I am inclined to believe, that an orchard of well selected fruit, where we are not contiguous to a good market for it, might be made profitable in fattening our pork. If farmers would keep an accurate account of the expense of fattening their pork, in the usual method of feeding corn, I think they would readily find that they were losing money. Hence the necessity of devising some cheaper method. I purpose to make an experiment with boiled apples, mixed with a given quantity of meal. Will some other farmers make some experiments of this kind, and communicate the result. Respectfully, GEO. WILLETS.

Skaneateles, Oonndaga county, 1835.

Albany, 16th April, 1835.

J. Buel, Esq.—Dear Sir—In an early number of the Cultivator, vol. 1, p. 63, you inserted a short account of my growing tares and turnips as food for stock. Last season I raised both of them again: the tares were an abundant crop, as to herbage, but like those of the preceding year, promised to yield but little seed, so I had them mowed and made into hay. The produce of seed is so small, as to render the continued cultivation of them impracticable. How they might succeed in other parts of the U. States, I cannot tell; but the same difficulty had been found by Mr. Livingston, several years ago, as is stated in Nicholson's Farmers' Assistant.

For the Swedish turnips, or ruta baga, I had seven acres of land which had borne a crop of oats the preceding summer, and had been ploughed as soon as possible after they were carted off. This was ploughed and harrowed till clean, and the seed was drilled in rows at 22 inches distance, at different times, from the 24th June to the 8th July, as the land could be got ready. They were hoed once over by 1st August, and a second time by the 30th. The great and unusual heat of the summer of 1834, hurt their growth very much, and rendered many of them unsound, so that the tops came off when pulled. The high parts of the field produced better turnips than the low, though these were all underdrained. From the 18th October to the 21st November, we were employed in pulling, drawing home and securing them. The produce from seven acres was less than that of the preceding year from five acres. I had only about 2500 bushels, and this I can attribute only to the extreme heat and drought of the season. I had them just as before, in large piles, and by this means lost full half my crop, for the two seasons were entirely different.

Your plan, as given in the Cultivator, vol. 1, p. 52, is the only safe one, and had I followed it, I should probably have saved more than 1000 bushels of turnips. In December they began to heat, and continued heating all through the severe month of January, till I lost half my crop nearly. The labor of covering such large piles is very great, and they ought by all means to be avoided. The Swedish turnip is a most valuable root, and grows well in the northern parts of the United States; but as to its paying on a large scale, I have some doubts, but an acre or two must be of great service on any farm. All stock are fond of Swedish turnips, and thrive on them; cattle which have never tasted them before, eat them voraciously the first opportunity. Heavy sheep cannot be wintered without them, so as to be kept up to the mark, either in mutton or wool, for no quantity of grain can make up for the want of moist food, such as turnips, mangel wurtzel, &c. A large allowance of such food would probably be injurious to the quality of very fine wool, though it might add to the quantity.

Yours truly, S. HAWES.

Elements of Practical Agriculture,

By David Low, Professor of Agriculture, &c.

PLOUGHING.

[The most common operations in husbandry are frequently the worst performed. Accustomed to them from boyhood, we acquire the habit of doing them mechanically, without scanning well their object, or investigating the principles upon which they ought to be conducted. Our ploughmen would think themselves insulted, if told they did not know how to plough their grounds well. And yet without intending to charge them with this defect of knowledge, we are free to say, we do not find hardly two fields in fifty, *ploughed well*. There are three principal objects that should be aimed at in ploughing:—1. To break up the *whole* surface of the field; 2. To give the *greatest exposure* of fresh earth to the atmosphere; and 3. To induce the greatest pulverization of soil. It is too much the practice to *cut and cover*, and to lay the furrow-slice flat, which neither gives the greatest exposure nor induces the best pulverization. We are persuaded, that what we are about to offer upon this subject, may be read with advantage by even the best ploughmen, however trite and well understood the subject may appear. The principle illustrated in figure 6, is particularly important.]

THE PLOUGH.

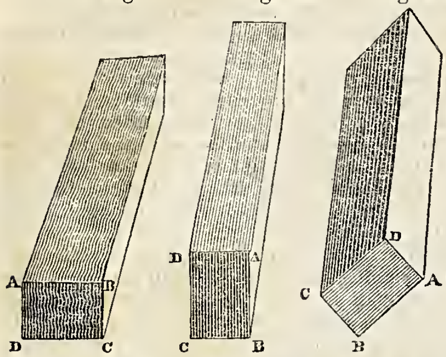
By means of this instrument the earth is to be turned over to a given depth: and this is to be effected by cutting from the ground successive sods or slices of earth, so that each sod or slice shall be raised up and turned over, and all the sods or slices laid resting upon each other, in such a manner as that an entire new surface shall be exposed to the atmosphere.

In the following figures, let A B C D represent the end or transverse section of the slice of earth which is to be turned over.

The slice is first to be raised from the position in which it lies in fig. 1: it is next to be placed in the position shown in fig. 2: and it is finally to be placed in that represented in fig. 3.

In the diagram, fig. 4, let A B C D, corresponding with the same letters in figs. 1, 2, 3, represent a transverse section of the slice of earth which is to be turned over. This slice is first to be raised from its horizontal position A B C D, by being turned upon its corner C as a pivot, and placed in the position C E F G, corres-

Fig. 1. Fig. 2. Fig. 3.



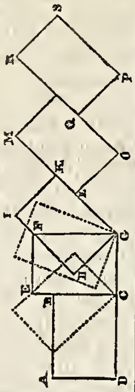


Fig. 4.

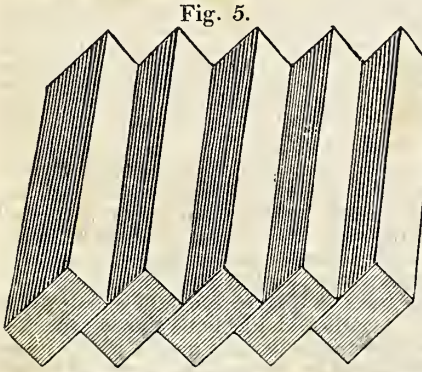
ponding with that of fig. 2. It is then to be turned upon its corner G as on a pivot, and laid in the position G H I K, corresponding with that of fig. 3. In this manner, the side D C, which was formerly underneath, will be above, namely, in the position HI; and if successive slices shall be thus reversed, they will rest upon each other in the manner shown by the sections of the slices P Q R S, O L M N, and G H I K.

The angle of inclination at which these different slices will naturally rest upon each other in the manner shown in the figure, will depend upon the proportion which the width of the slices bears to their depth; and that the greatest extent of surface may be exposed to the air, the angle of their inclination will be 45°. In order, therefore, that the slices may be at this angle, the proportion which the width of the slices bears to their depth is to be determined; and this can be done by simple calculation; for it can be shown that the width of the slice A B, being the hypothenuse of an isosceles right-angled triangle, the depth of the slice B C, will be one of the sides. Supposing, therefore, the width of the sod A B to be ten inches, the depth B C will, by calculation, be 7.071 inches.

If, then, beginning at one side of a field, we shall cut off a slice of earth, the entire length of this field, and place in the position P Q R S, fig. 4, and then cut off a second slice, and place it in the position O L M N, and then a third slice, and place it in the position G H I K, and so on, the various slices will rest upon each other at a given angle, in the manner represented.

A similar operation is to be performed by the plough. Beginning at the right-hand side of the field or ridge to be ploughed, a sod, which we shall now call a furrow-slice, is to be cut from the firm ground, raised up and turned over. A second furrow-slice is in like manner to be cut from the firm ground, raised up and turned over, and so on. In this manner, an entire new surface will be exposed to the atmosphere, and the successive furrow-slices laid resting upon each other, thus:—

Fig. 5.

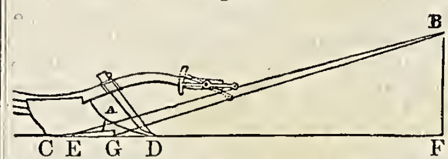


An essential property of the plough is, that it shall move in the earth with a steady motion; and the giving to it, the form and combination of parts necessary for that purpose, is one of the main difficulties attending its construction.

Were it ascertained by experiment on the plough when at work, at a given depth of furrow, and in soil of a given texture, that a cord attached to any point A, fig. 6, and drawn in the oblique direction A B, would so pull forward the plough, that it should press uniformly upon the earth at all points, from C to D, so that the share should neither tend to point upwards nor downwards, but should move horizontally forward, then it is to some part of this line that the moving power should be applied; and further it is known from the principles of mechanics, that it matters not, in so far as regards the force exerted, to what precise part of this line the power is applied. Now, without entering into any mathematical investigation of the principles upon which this line is to determined, it is to be observed, that in a well-made plough, formed on the principles pointed out, this line, drawn from the usual point of attachment of the draught on the collars of the working cattle, will intersect the sole of the plough at E, a little behind the setting on of the share, and a little to the right of the plane of the left side of the instrument.

Now, knowing the height at which the point of draught is to be attached to the shoulders of the working cattle, let us suppose 4 feet, and the distance from the point of the share at which the animals of draught can be conveniently yoked, let us suppose 12 feet, then laying off D F 12 feet, and F B 4 feet, and drawing B E, it follows that the point at the end of the beam, to which the draught is attached, may be placed in any part of the line B E. So that whatever be the length which we shall give to the beam, the line in question will denote the end of it, or the point to which the draught is to be attached.

Fig. 6.



But the angle which the line E B forms with the surface, is not, as can be shown, constant, but varies with the depth ploughed, and the tenacity of the soil. That the instrument may suit itself to these variations, as well as that any defects in the form of its parts may be counteracted, and that the line of draught may be placed in that position which is required to pull forward the plough, without there being any tendency in the share to sink into the ground or rise out of it, the bridle is fixed at the end of the beam, so as to elevate or depress the line of draught as may be required.—Should the plough, for example, tend to go deeper into the earth, the line of draught is to be lowered by means of the bridle, so that it shall form a greater angle B G F; the effect of which will be to counteract the tendency which the plough has to go deeper. The same effect will be produced by shortening the traces by which the horses are attached to the draught and thus increasing the angle. In like manner, by means of the bridle, the point of draught can be shifted to the right or to the left. If the point of the share tends to turn to the left hand, into the firm ground, the line of draught is shifted more to the left, and if to the right hand, it is shifted more to the right. This adjusting of the plough's motion is easy, and is performed by the ploughman, until he feels that the plough continues to *swim fair*, to use his own technical language; that is, until he feels, which he does at once, that it continues to move horizontally forward, without any tendency to turn to the right or left, or to rise from the earth or to sink into it. A well constructed plough of this kind, therefore, needs no wheels or other devices, to steady its motion; the effect being produced by merely altering the direction of the line of draught.

Miscellaneous.

From the Genesee Farmer.

CULTURE OF THE RUTA BAGA.

The following is an account of the method I pursued in the cultivation of ruta baga. I sowed three-fourths of an acre, the most of which had been well manured the year preceding; soil, a deep sandy loam. The land was ploughed three times, and then thrown into low ridges, about 20 inches apart. These were smoothed down with a hoe, and a man followed with a sharpened stick to make a light drill in the top of the ridge. The seed was sown in these drills with a tin cup, which had two small holes punched in the bottom—in the top was fixed a tight wooden cover, to which was attached an upright handle two feet in length. The sower should walk at an even pace, shaking the cup gently. A boy followed with a light roller, which completed the work. Several rows were sown on the ridges as they were left by the plough, and no difference could be observed between them and the others. A rain, however, followed the sowing. Had it continued dry, I doubt whether these rows would have succeeded as well as the others. I used one pound of seed. This, I am aware, would be considered a great deal; but the cost of the seed is trifling in comparison with the value of the privilege of having a plant just where we want it. As soon as they were in the rough leaf, I thinned them out at from eight to twelve inches distance from each other.

1834.	*Expense of Cultivation.*	Dr.
4 mo. 26	—Ploughing, ⅔ of a day, 12s	$1 00
6 " 2	— do do "	1 00
6 " 30	— do ½ day, "	0 75
6 " 30	—Ridging, ¼ day, "	0 38
6 " 30	—½ day, sowing, three men and one boy, at 5s.	1 25
	Seed, 1 lb. 8s	1 00
7 " 22	—Weeding and thinning, 12 days, 5s	7 50
7 " 21	—Weeding, 2½ days, 5s	1 56
8 " 16	— do 1½ days, 5s	94
11 " 8	—Drawing from the ground, five days, 5s	3 12
	Covering, one day, 5s.	62
	Interest on land at $50 per acre,	1 75
		$20 87
Cr.		
By 40 bushels,	sold at 2s.	$10 00
By 486 do.	certainly worth 1s.	60 75
526 bushels.		$70 75
	Nett gain,	$49 82

But in my opinion, when corn is worth 50 cents the bushel, turnips ought not to be estimated as low as 12½ cents. I have not, however, made experiments sufficiently decisive to show what the relative value is, but I have fattened three oxen upon them, and those who had opportunities of judging, acknowledged that animals could hardly thrive better than they did.

Errors in Cultivation.—I think, unless for house use, they should not be sown later than the 15th of 6th mo. The first weeding was put off much too long—labor more than doubled on that account. They should be sown 2½ or three feet apart, that the cultivator may be used. WM. R. SMITH.

Field Culture of Beans.—Beans may be cultivated in drills or in hills. They are a valuable crop; and with good care, are as profitable as a wheat crop. They leave the soil in good tilth. The China bean, with a red eye, is to be preferred. They ripen early, and are very productive. I cultivated beans the last year, in three different ways, viz. in hills, in drills, and sowed broadcast. I need not describe the first, which is a well-known process. I had an acre in drills, which was the best crop I ever saw. My management was this:—On the acre of light ground, where the clover had been frozen out the preceding winter, I spread eight loads of long manure, and immediately ploughed and harrowed the ground. Drills or furrows were then made with a light plough, at the distance of two and a half feet, and the beans thrown along the furrows about the 25th of May, by the hand, at the rate of at least a bushel on the acre. I then gauged a double mould-board plough, which was passed once between the rows, and was followed by a light one-horse roller, which flattened the ridges. The crop was twice cleaned of weeds, by the hoe, but not earthed. The product was more than forty-eight bushels, by actual measurement. The beans brought me one dollar the bushel last fall. The third experiment was likewise upon a piece of ground, where the clover had been killed. It was ploughed about the first of June, the seed sown like peas, upon the first furrow, and harrowed in. The drought kept them back, but about 65 rods of ground, on which the experiment was made, gave a product of twelve and a half bushels. The crop was too ripe when it was harvested, and as it was cut with a scythe, I estimated that about two and a half bushels were left upon the ground. No labor was bestowed upon them from the time they were sown till they were harvested.—*J. B. in Ag. Tracts.*

Durable Whitewash.—I am enabled to certify the efficacy of marine salt in fixing whitewash made of lime. In the year 1795, when I was director of the naval artillery at the port of Toulon, I was commissioned to ascertain the utility of a method proposed by the master painter of that port, M. Maquilan, for whitewashing the ships between decks, and likewise their holds, in a durable manner, by means of lime. Our report was in favor of this process, which consists in saturating water in which the lime is slaked with muriate of soda, (common salt.) The whitewash produced by it is very permanent, does not crack, nor come off upon one's hands or clothes. The experiment was made only on wood. It appears from M. St. Bernarde's account, that it succeeded equally well on walls.—*Annales des Arts et Manufactures.*

Canada Thistles.—I have practised mowing the thistles every month successively during the summer for three years. I have found this to be the most effectual method I have tried. Continual cutting will prevent the seeds from reaching maturity: and the same operation will in time destroy the plant from the root. The next season after I begun cutting them once a month, there was not more than half as many, they have so diminished that there is only now and then a scattering plant left, which by another season will be wholly exterminated. The spot which contained about one-fourth of an acre, now affords good pasture, which before was unproductive of any thing else but the detestable weed.—*Genesee Farmer.*

Young Men's Department.

Lecture on Self-Instruction, delivered before the Young Men's Association in Albany, by J. Buel. *(Concluded.)*

Self-instruction does not consist alone in reading, even good books. The mind must be disciplined to analyze what is said, and to select and treasure up what is best adapted to its wants and its improvement. It must be taught to separate the wheat from the chaff. The particular business in which we are employed in life, ought first to engage our attention, as administering immediately to our wants. When our personal concerns are provided for, we have high duties to perform to our friends and our country. We may be greatly aided in these private concerns, and public duties, by the example and advice of others, capable of instructing, which are to be found in books. These furnish us with the experience of every age and country. Nor are the physical powers to be overlooked, in our efforts to improve the mind. The body must be trained to temperance and exercise, if the mind, its consort, would attain to distinction and usefulness.—The mental powers can only be kept in a healthy tone, with the consent and co-operation of the body. Hence men who have displayed the greatest efforts of mind, have in every age courted exercise, in order to impart a healthful vigor to the body. I do not mean to quarrel with any one's habits, by the remark, that most of the men who have distinguished themselves by successful literary and philosophical research, have chosen the dawn of morning as the favorite time for study and contemplation. It is not a little singular, that most, and I believe all, of the brute creation, except beasts of prey, which subsist on the substance of others, obeying the power of instinct, retire to rest and repose with the sun, and rise with it to renew their daily employments; while man, endowed with reason, perverts the seeming designs of Providence, and ignobly wastes, in slumber, the choicest hours, which wise men have consecrated to study or to business.

Self-instruction is a means of improvement that lies within the reach of every individual in this favored nation. In this respect we enjoy high privileges, and sustain high responsibilities. In most of the Asiatic countries, the influence of *caste* has a paralysing effect upon the development of genius and culture of intellect. Every son is born to the business of his father. He cannot rise above it. The mass of population are virtually serfs to the privileged classes. Nor is the condition of the people of Europe much superior. The advantages of education, and the opportunities of self-instruction, to the laboring classes, are comparatively limited. They are not permitted to look up to the honors and distinctions of society. A restricted education best fits them for the menial condition which they occupy in the social scale. And even in Great Britain, whose inhabitants justly boast of more learning and more freedom than any other portion of the old world, the maxim, "*Let every one who is below, or under me, stay there,*" has unlimited sway among all classes, and tends very much to repress the march of intellect in the middle and lower portions of society. With us, the case is altogether different. The honors and distinctions of life are open to the competition of all. Wealth confers no civil distinctions; and if it did, such is its tendency to dissipate itself, under the peculiar structure of our government, and the free scope which it imparts to individual enterprise, that there is little danger of its becoming an heriditary evil—for it seldom descends further than the third generation. The changes which take place in property here, more than in any other country, operate as a stimulus, and add very much to the intrinsic value, of self-instruction. With us, moreover, the acquisition of knowledge becomes a duty. Where all share alike in the privileges and responsibilities of freemen, we ought all to strive to bring the same, or at least competent talents, to aid us in the performance of common duties. If some of the minor classes of our population possess an undue influence in our civil affairs, a fact which is too manifest, they have acquired it by the power which knowledge has conferred upon them; and the best way to remedy the evil, is to impart more knowledge, which is power, to the major classes. The preservation of our freedom, and the perpetuity of our union, emphatically depend upon the general diffusion of knowledge, and a fair participation, of all classes, sects and professions, according to individual merit, in the honors and distinctions of the social compact. We should all feel proud of our privileges, but feel prouder that we merit them, by an intelligent and faithful performance of our civil duties.

In regard to this audience, and this community, the appeal is almost mandatory. There is not, to my knowledge, a place in the world, where the opportunities of self-instruction in useful knowledge, to the entire population, are more numerous and advantageous than they are with us, or the chances of profiting by it more flattering. Our public schools are of the highest order.—Our libraries are respectable, and accessible to persons of the most humble means. Our Institute proffers to the aspirants to literary and scientific fame, important facilities for the gratification of their laudable ambition. Public lectures are frequent, and embrace all or most of the useful sciences. And this association of young men, whom I now have the honor to address, is perhaps nowhere surpassed in its numbers, respectability and means of information. It realizes the best wishes, and promises to accomplish the best hopes, of the philanthropist and patriot. Those who have been instrumental in rearing it, and who have contributed to its usefulness and permanancy, deserve the highest praise, and will at least be richly rewarded in the consciousness, that they have contributed to a great public good. With all these means of self-instruction, and the strong motives which prompt to their use, our young men will be highly culpable, if they do not distinguish themselves in intellectual improvement. Much has been been given, and much will be required.

If, then, as I have endeavored to show, self-instruction affords a prominent means of promoting individual and public happiness—and if these means are virtually within the reach of all;—if fortune is precarious, and friends are not to be depended on—how strong is the monition which these facts convey to those who are coming on the stage of action, to enter with spirit, upon the business of self-improvement,—to become the architects and conservators of their own fame;—and, disregarding the adventitious circumstances of birth and fortune, or making these subsidiary to higher objects, to seek those substantial acquirements, which, under the favor of Providence, cannot fail to secure the great blessings of life. Every young man should resolve at least, to become respectable in his business or calling—*by his personal efforts*. Not that he is always to reject the proffered aid of others, but as this aid is at best precarious, and may disappoint his hopes, that he should be able, under every emergency, to sustain himself by the resources of his mind, and the energies of his body.—He should assume a high standard for his honest hopes and expectations, and perseveringly strive, by all honorable means, to reach the goal of his ambition. Without this preliminary resolution, his energies are liable to be relaxed, or wasted upon trivial objects. It is a characteristic of the Yankees to *try* to do what they see others perform; and what they try to do, they generally succeed in doing. This Yankee notion is worthy of imitation, in whatever is commendable. Industry, and some degree of self-denial, must be employed in the outset; yet habit will not only render these less and less irksome, but will soon convert them into pleasures; while the rewards they bring will become stimulants to new exertions. Our habits are our companions: our attachments to them are apt to become strong, be they good or bad: and hence the great importance of selecting and adopting in early life, those only of which we shall not be ashamed in maturer years. Knowledge is like money at interest: the more we have, the greater the income it yields us.

Permit me, in closing these brief remarks, which have been ripened into convictions by the force of half a century's experience and observation—to repeat to the young gentlemen of this association, that their future fame and fortune are in a great measure under their own control. Past ages tender to you the benefits of their experience, and the counsels of their wisdom; and the present is everywhere replete with admonition and instruction.—Nurture the pride and independence which becomes you as freemen; and, while you claim the free exercise of your own, permit not yourselves to trespass upon the rights of others. There is no principle in our government, and there should be none recognized in our practice, which gives any other precedence than that which is due to merit. All share in the burthens, and all should alike participate, in proportion to their qualifications and virtues, in the distinctions and honors of society. Without this, our boasted equality is but a mockery—a bitter taunt. Decide upon the business which you intend to follow in life; make it the object of your special attention; determine to become master of it, and to excel in it if possible; and cultivate, with assiduity, in the hours which can be spared from that business, the faculties of the mind, which are ever the source of the purest and most exalted of human enjoyments. Then may you say, in the spirit of the poet,

> "Though 'tis not in mortals to command success,
> We'll do all we can—*deserve it.*"

THE CULTIVATOR—JUNE, 1835.

TO IMPROVE THE SOIL AND THE MIND.

THE TURNIP CULTURE,

Is unquestionably rapidly increasing among us. There will probably be quadruple the quantity grown this year, in the northern and western parts of the state, that was ever before produced in a season. We entertain this opinion from the unusual quantity of seed which has been sold at the seed shops. This augurs well: for we are satisfied from fifteen years' experience, that there are few crops that make more than this for the interest of the farmer. As but few persons among us have as yet had experience in the culture of this root, we subjoin some brief directions, founded upon our personal experience, in particular reference to the ruta baga crop.

The soil for turnips should be such as will grow good Indian corn. It should be rich and dry, and, with these qualifications, the more that sand preponderates the better. Clay is the worst, and wet soils do not answer much better.

Preparation.—Our general practice has been to manure well a piece of pasture, or a clover lay from which the hay has been just cut, the last of June, plough it handsomely and harrow it well. A clover lay is preferable, as old sod does not rot, especially in a dry season, as was the case last year, in time for the wants of the crop. It is the practice of many to lay the ground in ridges of two and a half or three feet, and to cover the manure in these with a plough. This plan cannot be readily adopted upon a sward, but upon grounds under previous tillage, and to correct a wet soil, or economise manure, it is often the preferable mode.

Sowing, &c.—The seed may be sown broad-cast or in drills. The latter is far the best mode, and the drill-barrow is an important aid in the process. The sooner the operations of manuring, ploughing, harrowing and sowing succeed each other the better, as seeds germinate soonest in fresh ploughed ground. If the drill-barrow is employed, a trace chain may be passed round the coulter, and the ends suffered to drag after it, which will cover the seeds sufficiently. Sometimes a small roller is attached to the barrow, to press the earth upon the seeds. We allow a pound of seed to the acre, though half this quantity, well distributed, is enough. The seed should be sown from the 20th June to the 5th July. If sown earlier, the turnip is apt to become hollow before harvesting, the water gets in and induces rot. We have never succeeded well in transplanting.

Culture.—We use a cultivator, that may be graduated to the space between the rows, drawn by a horse, as soon as the plants can be well distinguished. This is repeated in a few days, twice in a space, and the implement carried so close to the drills, as to leave only strips of from two to six inches, which are then thoroughly cleaned with a skim-hoe, and the plants thinned to eight and ten inches distance. The cultivator soon follows for a third time, and if necessary, the skim-hoe, when the crop is generally left till harvest; the great aim is to extirpate the weeds, to do this while they are small, and to pulverize the soil.

Harvesting is postponed as long as the season will permit. The roots are then pulled up, and laid on the ground, the tops of two rows towards each other. The pullers are followed by a man or boy with a bill-hook, who, with a light blow, cuts the tops as fast as three or four can pull. Three men will in this way harvest, of a good crop, 300 bushels in a day. Another, and we think a better mode, is, for the puller, with a bill-hook or heavy knife, in his right hand, to grasp and draw the turnip with his left, to strike off the tap-root as soon as it is raised a little above the ground, and then with another quick stroke at the crown, sever the top from the root. This is done with great expedition, by an expert hand. The tap-root is acrid, and loaded with earth, and not worth preserving. The tops are gathered into heaps and taken to the yard in carts, daily, for the stock, until they are consumed. An acre will give from five to ten loads of tops. The roots are buried in the field, if dry—the pits, two or two and a half feet broad, covered with straw and earth, and as cold weather approaches, with manure, to prevent frost. N. B.—With a crow-bar, make one or more holes on the crown of the pit, into which a wisp of straw may be inserted, so as to let off the rarified air, and prevent the roots from heating. By neglecting this precaution, a neighbor, last winter, lost some hundreds of bushels! We have seldom lost one per cent in the pits.

Use.—The tops serve for autumn. As soon as the mild weather of spring will justify, we break through the frost, and take the contents of a pit to our barn, and cover the roots with straw or hay. From thence they are fed to our stock, being first chopped up with a *snick*, (Dutch meat-chopper,) or spade. They are excellent for sheep, especially for ewes that have young, and hogs and horses eat them freely. Steamed, they are used in the north of England for horses as a substitute for grain. We have fattened sheep and bullocks upon them with profit. They constitute particularly from February to June, an excellent culinary vegetable for the table. A bullock will thrive fast upon two bushels a day, and will consume hardly any hay, and requires no drink.

Produce and cost.—Our average crop has been 600 bushels per acre, though others have raised much heavier products. The cost, in manure and labor, when they are secured for winter, has been from two to three cents per bushel.

N. B.—Cattle or sheep, fattened upon this root, should be kept from eating them for eight or ten days before they are slaughtered; otherwise the meat will have an unpleasant flavor.

The Implements used in the Turnip culture, which are figured below, are useful for various other purposes on the farm or in the garden. They are, (*fig.* 1,)

Fig. 1.

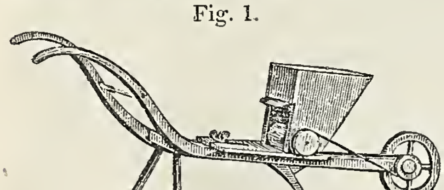


Fig. 2.

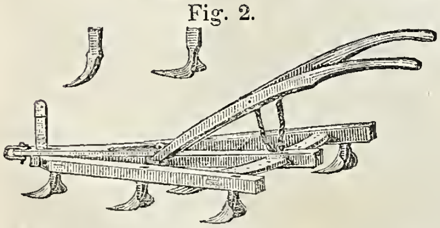
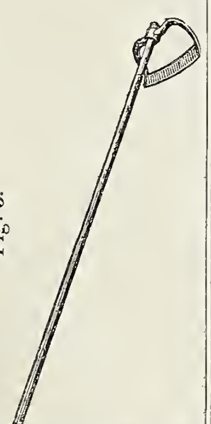


Fig. 3.



The Drill-Barrow, which is made in different forms, and is used in sowing various small seeds, as onions, radishes, lucern, beans, peas, &c. The machine is propelled like a wheel-barrow, and sows and covers the seed at the same operation. The cut represents the one we have in use. They are manufactured by Mr. Craig, of Galway, and sold at $8. A barrow somewhat differently modelled, has been invented in Lewis county, which has been highly commended for its value in planting corn. Price fifteen dollars.

The Cultivator, (*fig.* 2,) is the most useful implement we know of for dressing Indian corn, as well as ruta baga. By being passed frequently between the rows, the ground is kept free from weeds, and in a fine state of pulverization, while the manure and vegetable matter is left under cover, where it is most beneficial, and the roots of the plants preserved from injury. It should be passed twice at a dressing, and if the soil is stiff or grassy, it may be passed oftener, or repeated at short intervals. The teeth are of various forms, according to the purposes for which they are used. Some of these are figured in the cut. It is most convenient to have sets of different kinds, and the cost is trifling, that they may be shifted at pleasure. Our late excellent neighbor, Joseph Bullock, used effectually to extirpate the quack grass in his corn ground, by the frequent use of the cultivator, the teeth of which he had modelled for this purpose. They are manufactured by Mr. Craig, and, together with the drill-barrows spoken of, kept for sale by our enterprising friend, C. N. Bement, who is making some improvements on both these implements. The cultivator is often denominated horse-hoe, scuffler, scarifier, &c. It has sometimes a wheel attached forward, to regulate the depth.

The Turnip Hoe, (*fig.* 3.) is a very simple, but useful implement, particularly in the garden, where it greatly faciliates the weeding process. We have them of various lengths, from four to ten inches. They should be of cast-steel, and may be made of an old file or rasp: the blade should be thin, and not more than one and a half or two inches broad. They may be drawn the arm's length without being raised, and there is little danger of cutting the plants among which they are used.

WHEAT WORM.

During the current month, this enemy may be expected to appear again in our wheat-fields; and it may be expected to extend its ravages south and west into Columbia and Oneida. It is extremely desirable to collect information in regard to the habits of this insect, and the means, if any should be discovered, of averting the evils which it is likely to inflict upon the land. We would therefore respectfully request men of science as well as farmers, to note down the observations they may make, and to transmit to us the result for publication, particularly such as may tend to solve the following queries:—

1. When does the maggot make its first appearance, and what is the term of its continuance in that state?
2. What are the transformations, if any, which the insect undergoes, and at what intervals do these transformations take place?
3. Has steeping the seed in lime water or brine, according to the recommendation of Bauer, been found to be efficacious in lessening or averting the evil?
4. Has the sowing of quick lime upon the crop, when in blossom, or subsequently, or other topical application, been found to be beneficial? And,
5. What per cent injury has the wheat crop sustained in consequence of these insects?

After writing the above, we saw and conversed with Mr. Edward Haswell, a very intelligent and observing farmer of Bethlehem. He says that early sown wheat, and that growing on dry ground, was least, and some of it very little affected by the grain worm last year; that the worm made its appearance in great numbers at once, and not by degrees; that he sought for them almost daily, and that the first day he saw them, he found six to ten on a single grain; and that he saw no fly from which they could probably have proceeded. Mr. Haswell thinks lime has no efficacy in destroying them. He sowed it many successive mornings, when the wheat was in blossom; he covered the heads of grain with it and immersed them in lime water, and still found the worm in the heads thus experimented upon, wholly unaffected by it. The lime, however, had been some time on hand, and had become, undoubtedly, mild or effete. Mr. H. tried spirits of turpentine with as little effect. Mr. Haswell's observations rather favor the opinions of Bauer, as published in the first volume of the Cultivator, that the insect is propagated, like smut, *through the circulation of the sap*. He detailed several cases where seed from an unaffected crop, sown by the side of seed from an affected crop, had remained uninjured, or nearly so, while the crop from affected seed was nearly destroyed. He has found the worm in abundance, this spring, in the wheat of last year, when threshing it in his barn. From this it would seem that the worm is continually multiplying, as described by Bauer, or that it remains a long time as a maggot ere it changes to a chrysalis, and that, like some of the aphides, it produces several generations with once copulating.

SILK CULTURE.

To comply with the request of several correspondents, we insert, to-day, the directions, prepared by request of the State Agricultural Society, for sowing the seed, and rearing the plants of the White Mulberry. We cannot confidently recommend, until after further trial, in our northern climate, the culture on a large scale, of the morus multicaulis, though we think it probable that it affords a better material for silk than the common white variety. The French periodicals furnish another instance of failure to produce this species genuine from its own seed; while the Northampton papers are pertinacious in insisting that the seed will produce, and does produce, the like of its maternal parent. These contradictory opinions are easily reconciled, without imputing error to either side. The mulberry forms no exception to the sexual law which governs in the vegetable as well as in the animal kingdom, and which is made subservient to the interests of the gardener as well as breeder. Hybrid varieties of plants, the progeny of parents of different species, but of the same genus, are annually coming to our notice. The cabbage and turnip, when allowed to intermix their pollen, produce hybrids—so of the melon and squash. Now the Northampton seed came from India, where it is probable there was no other species of this genu- growing in the neighborhood, and the seed would of course be pure. In France and Italy, other species of the mulberry are common and extensively cultivated, and the blossom of the morus multicaulis undoubtedly became fecundated with the pollen of these, and the progeny became hybrid.

We have no doubt the silk culture will ultimately succeed, and constitute an important branch of our national industry, if it is not paralyzed by the blighting influence of associated capitalists. There is no business better suited to the economy of the farm, and to people in moderate circumstances than this. It enables the otherwise unproductive inmates, females and children, to turn their labor to good account. But we are afraid that large establishments, with corporate powers, will tend rather to retard than to encourage this branch of rural labor, except in their immediate neighborhoods, where it can be made subservient to their cupidity. There will, however, be failures in this as in every other business, in which men embark with more zeal than knowledge. We remember the subject produced no little excitement some half a century ago, in Connecticut, when that state gave a bounty for planting mulberry trees. We were then familiar with the management of the silk-worm, and assisted oft in gathering leaves for their food. The excitement and zeal soon died away, but is now renewed with far better prospects of success. The least we can advise every person to do, who wishes to succeed in the culture of silk, is to subscribe, without delay, for one of the monthly papers which are expressly devoted to this subject. Address F. G. Comstock, editor of the *Silk Culturist*, Hartford, Con.—enclose a dollar bill, and you will receive one or two copies.

LEGISLATIVE AID TO AGRICULTURE.

The indifference of our legislature to the interests of agriculture, or rather their pertinacity in denying to those who seek to promote these interests, any facility which may enable them to give more efficiency to their labors, is a matter of surprise to some. The State Agricultural Society made two respectful requests: one, that the legislature would offer a liberal premium for the discovery of an effectual preventive of the injury this part of the state is now suffering from the grain worm,—which, if it led to the desired discovery, would in all human probability, have saved millions to the state,—and if no discovery had ensued, would not have cost the state a cent. The other request was, to grant the common corporate powers to an association of gentlemen, who might be desirous of embarking capital—not to obtain usurious interest, —but for the purpose of advancing the best interests of the state, by the establishment of a school on a liberal scale for instruction in practical agriculture, in the arts, and in those branches of useful knowledge which are calculated to improve and embellish society. Not a cent was asked from the public treasury, nor was it, to our knowledge, contemplated to ask such aid at any time hereafter. This petition had attached to it the names of some of the best and most distinguished citizens of our state. Both of these applications failed—and failed too, we believe, in consequence either of the illiberal prejudice, or of the profound wisdom, of a committee of three, or of a single individual, and the perfect indifference to the subject of other honorable senators. The first mentioned application was not treated with common courtesy, if, as we are informed, it was not deemed worthy of being reported upon. It was presented in the senate, and referred to the committee on agriculture. The latter was presented in the assembly, where a bill passed with but three dissenting voices. In the senate it went to the committee on agriculture, who reported it, at the heel of the session, with numerous amendments changing altogether its character, and rendering it, if it had passed, unsuited to the ends contemplated by the petitioners.

We can make great allowance for honest prejudice—we can allow for, though we cannot commend, fastidious precaution—and we can appreciate the force of political feelings, which are too apt to claim the paramount homage of men now-a-days; we can do all this, without being able to discover any substantial reasons, worthy the dignity of grave senators, or compatible with their high public duties, for the marked hostility of the senatorial committee, to the propositions of the State Society; or the passive acquiescence of the senate in that hostile feeling.

AGRICULTURAL BOOKS.

We have been requested, by a correspondent of the *Genesee Farmer*, to furnish a list of agricultural books, suitable for a farmer's library. This we do cheerfully, remarking by the way, that the number of *American* books is very limited: and that in selecting those of foreign origin, we must take much chaff with the wheat. The elementary principles of husbandry are pretty general in their application while the practical operations of different countries must necessarily be variant, not only on account of difference in climate and soil, but in productions for the market, price of labor, habits of the people, &c. No European system of practice is therefore exactly adapted to our wants, though it may embrace much that is highly beneficial.

Independent of the memoirs that have been published by the agricultural societies in Pennsylvania and Massachusetts, and by the Society of Arts and Board of Agriculture in New-York, the *American* works on agriculture, that we have been acquainted with, are, to name them in the order in which they appeared: 1. Dean's New England Farmer; 2. Boardley's Husbandry; 3. Arator, a series of agricultural essays, by John Taylor, of Virginia; 4. A Treatise on Agriculture, by Gen. Armstrong: 5. The Farmer's Assistant, by John Nicholson; 6. Lorrain's Husbandry; 7. Essay on Calcareous Manures, by E. Ruffin; and 8. The Complete Farmer, by T. G. Fessenden. These are all worthy a place in a Farmer's Library, as well as the memoirs first named. Of Nos. 1 and 7, new revised editions have lately been published at Boston and Richmond. Of the others, copies are scarce, and the memoirs, we believe, cannot be purchased. No. 4 is a work of merit, comprising a great mass of interesting matter, detailed with great conciseness and perspicuity. No. 6 was written by an excellent practical farmer, who blended a great deal of useful reading and nice observation with an extensive practice. The writer was a self-taught philosopher, who scrutinized narrowly into cause and effect, and we believe was a very successful farmer. The essay on calcareous manures, is an invaluable treasure to all who can avail themselves of lime and marl, as sources of fertility. No. 8 is principally a judicious compilation from the agricultural papers of our country. A new edition is now in the press. There are several American publications which treat of the orchard and the garden, which it is unnecessary to enumerate, as they may be found in all our seed shops.

Of foreign publications upon husbandry, we should recommend the following, in the order we name them:—Low's Elements of Practical Agriculture; Lawrence on Cattle; Davy's Agricultural Chemistry; Sinclair's Code of Agriculture; and, (last, *only* on account of its expense,) Loudon's Encyclopedia of Agriculture. The Farmers' Series, published by the British Society for diffusing useful knowledge, affords an excellent compendium of British husbandry, though but partially adapted to our country.

But neither foreign nor American books ought to supersede the agricultural periodicals of the day. These abound in communications from our best farmers, and detail the improvements which are continually developing in rural labor. We venture to say, there is not a farmer in the Union, of common intelligence and enterprise, who is ambitious to improve his condition, and who takes an agricultural periodical, that is not more than remunerated for his subscription, by the useful information which he acquires from it. They are generally printed in a form to be easily preserved, and they ought to be preserved. We subjoin a list of such as are known to us, for the benefit of the readers of the Cultivator:—

Monthly.—Southern Agriculturist, at Charleston, S. C.; Farmers' Register, at Shell-Banks, Va.; New-York Farmer, N. York; Cultivator, Albany; Tennessee Farmer, Ten.; Fessenden's Practical Farmer, Boston; Rural Library, a monthly publication of 32 8vo. pages, New-York.

Weekly.—Genesee Farmer, at Rochester; New-York Farmer, at New-York; New-England Farmer, at Boston; Maine Farmer Winthrop, Me.; Yankee Farmer, Cornish, Me.; Ohio Farmer, Columbus, Ohio; Southern Planter, Columbus, Georgia.

Devoted to Horticulture particularly.—The American Gardeners' Magazine, by Hovey & Co., and Horticultural Register, by G. E. Barret, both monthly 8vos., published at Boston.

Devoted to Silk Culture.—The Silk Culturist, at Hartford, Con.

To Orchards and the Vine.—Coxe on fruit trees; Thatcher's Orchardist; Prince's Pomological Manual; Kenrick's New-American Orchardist, and Prince, Adlum, Lombat and Rafinesque on the Vine.

The Quarterly Journal of Agriculture and New-York Farmer are from the same press, as are the New-England Farmer and Practical Farmer. The Rural Library is a republication of American works on husbandry and gardening.

We can neither give the price of all the books we have enumerated, nor refer to the bookstores at which they can be had. The periodicals may be obtained, by addressing the editors of the respective works.

Directions for sowing the seeds and rearing the plants of the White Mulberry Tree, prepared in pursuance of a resolution of the New-York Agricultural Society.

1. Prepare a good piece of garden soil, by digging and pulverizing it; lay it out into beds of three or four feet broad, and rake it off smooth. Do this early in May. Sow from the 12th May to the 1st June.

2. With a hoe, stick, or other instrument, proceed to make shallow drills across the bed thus prepared, from twelve to eighteen inches apart, and scatter the seed in the drills as thick as you would onion or parsnip seed; then cover half an inch with fine mould, and press it moderately down with a hoe; or, when the first drill is sown and covered, place upon it a narrow strip of board, and stand upon this board to sow the second drill, upon which, when sown, place the board in like manner, and sow the third drill, and proceed thus until the whole is completed. The pressure of the earth upon the seeds is to bring it in close contact with them, that they may be kept moist, and germinate readily. If the weather be dry, or the soil very light, an occasional watering at evening will be beneficial.

3. The only further care required the first season, will be to keep the ground free from weeds, and the soil moderately loose.

4. Strong plants of one year's growth, may be transplanted in April into nursery rows; or, the whole may be left to grow a second summer in the seed bed; the ground, as before, being kept free from weeds and occasionally stirred.

5. After two summers' growth, all the strong and healthy plants should be placed in nursery rows, which may be done thus: the ground being prepared, as for a crop, draw a line and proceed to open a trench, of sufficient breadth and depth to admit the roots freely, leaving the side next the line straight and perpendicular. Having assorted the plants, and cut off the bruised and shortened the tap roots, a man proceeds to place them in the trench, in their proper position, the heel of the plant towards the line, and at the distance of a foot apart; while another man with a spade, or the planter with a gardener's trowel, throws in earth to hold them in their place. The trench is then to be filled, the plants set upright, and the earth trod about them. The other rows are planted in like manner, three feet apart—the ground to be kept clean during the season.

6. After standing two years in nursery, the plants will have acquired a sufficient size to plant out in the ground where they are to stand; and if intended to be grown in hedge, or as bushes, they may be taken earlier, even at two years old, from the seed bed. For hedges, plant the same as for nursery rows, at eighteen inches, the ground having been previously prepared by an ameliorating crop, as potatoes. The same precautions are necessary with mulberry as with other fruit trees, intended as standards, as to distance and planting. A broad and deep hole, partially filled with good surface mould, will always repay for extra labor. When intended to be cultivated as bushes, they may be planted thick, and left untrimmed, so as to occupy the entire ground. The mulberry is generally grown in the latter way in India and some parts of Italy. It facilitates the gathering of the leaves, and affords an earlier product.

The mulberry grows well on almost any soil, and particularly in one which is stony. Upon poor, dry soils, it affords the best material for silk. An ounce of seed will give some thousand plants, and require a bed four feet broad, and forty to fifty feet long. *Albany, March* 15, 1832. J. BUEL, *Cor. Sec'y.*

Gama Grass has been a topic of commendation in our journals for some years without our having participated in its praise; not because we did not think it an acquisition to farmers, but because we apprehended it would not do for *northern* farmers—that it would not withstand our winters. The seed is enveloped in a thick capsule, which it is difficult to separate from it, and which is ordinarily planted with it: it has been found extremely difficult to germinate, for which a high temperature, like that of June, is requisite, and it is yet in time for those who have the seed to sow it. Through the politeness of our esteemed friend, Dr. Beekman, we have received a package of the seed, some of which we have now growing in a hot-bed, and a small parcel yet remains in our office for distribution. Our readers shall be advised of the result of our experiment with it. In the mean time, we subjoin Dr. Beekman's directions for managing the seed and plants.

"*Gama Grass Seed.*—Sow in drills, 18 inches apart, about a half pint tumbler full to forty feet in length; cover about two inches; in a month it will come up like oats; when about six inches high and two suckers appear, one on each side, then transplant, about three feet by two feet. The second year, in Georgia, the first cutting may be made in May, and once every month to the first of October, say six cuttings; each cutting the blades will be three feet or upwards; each forms a large bunch, and may be annually divided into from ten to forty plants. The cuttings will probably be reduced to four, northerly, in place of six. Good land is of course required for such vegetation.

"Copy of the directions. From your friend,

"J. P. BEEKMAN."

PRACTICAL HINTS TO CORN GROWERS.

William Clark, Jr. of Northampton, to whom the public are already indebted for some nicely conducted experiments in growing this crop, has published in the New-England Farmer, the result of a series of new experiments, to determine the most advantageous distance of planting, &c. We subjoin the result:—

"The following table will show the order in which the rows were planted, and perhaps will exhibit the method pursued and the result, better than can be done by description; and also afford opportunity to detect any error that may have been admitted in the estimates.

Number.	Distance.	Ground to each hill.	Hills per acre.	Hills in row.	Stalks per hill.	Produce of row.	Produce of hill.	Shelled corn per acre.
1	2 ft. 6 in.	6 ft. 3 in.	6970	80	3	47 lbs. 9 oz	6¾ dms.	54 b. 44 p.
2	do	do	do	80	4	49 9	12¾	56 67
3	do	do	do	80	5	52½ 10¼		60 74
4	Intermediate or dividing row.							
5	2 ft. 9 in.	7 ft. 6¾ in.	5760	72	3	48½ 10	12½	51 56
6	do	do	do	72	4	53 11	12½	56 41
7	do	do	do	72	5	57 12	3½	58 48
8	Intermediate.							
9	3 feet.	9 feet.	4840	66	3	48 11	10½	46 70
10	do	do	do	66	4	54½ 13	3½	53 20
11	do	do	do	66	5	56 13	9¼	54 56
12	Intermediate.							
13	3 ft. 3 in.	10 ft. 6¾ in	4124	60	3	43 11	7½	39 31
14	do	do	do	60	4	48½ 12	15	44 34
15	do	do	do	60	5	55 14	10 2-3	50 30
16	Intermediate.							
17	3 ft. 6 in.	12 ft. 3 in.	3556	57	3	46 12	14½	35 18
18	do	do	do	57	4	55 15	7	45 56
19	do	do	do	57	5	56 15	11	46 43

"It will be seen in every case, that the hills of three stalks, produced less than th se of four, and those of four less than those of five. In this view it may be considered as five experiments, all giving the same result, notwithstanding some of the hills occupied but about half the quantity of ground usually given them in our field culture. The average of five rows, one from each parcel, is as follows, viz:

3 stalks in a hill, 46 bushels, 14 lbs. per acre.
4 stalks in a hill, 52 bushels, 42 lbs. per acre.
5 stalks in a hill, 54 bushels; 20 lbs. per acre.

"The difference of average between three and five stalks is eight bushels six pounds per acre.

"It will be seen also, in every instance but one, or eleven times in twelve, diminishing the distance between the hills increased the product of the ground. The average of each parcel is as follows, viz:

3 feet 6 inches between hills	gave	44 bushels 14 lbs. per acre.
3 feet 3 inches,	do	44 bushels 57 lbs. per acre.
3 feet,	do	51 bushels 49 lbs. per acre.
2 feet 9 inches,	do	55 bushels 45 lbs. per acre.
2 feet 6 inches,	do	57 bushels 36 lbs. per acre.

"The difference of product between the average of hills at two feet six inches, and that of hills at three feet six inches, is thirteen bushels twenty-two pounds per acre."

J. H. J. in the Maine Farmer, corroborates our repeated remarks and experience, *that unfermented manures are best for Indian corn.* Having manured a field part with fermented, and part with unfermented manure, the corn planted upon the former, had a surprising advantage, in the outset, over the latter. "The difference was so great, that you might tell where the fermented manure was put as far as you could see the field, as the stalks grew about twice as large. But, lo! *at harvest*, the ears were hardly worth gathering, whilst that part on which the green manure was put, was a fair crop of corn." We would ask the advocates for fermented manures, if this *fair crop of corn*, grown upon unfermented manure, did not derive all its superiority from the food which that manure gave off in the process of fermentation; and if so, whether the fermented manure had not lost much of its fertilizing properties by fermenting, *before it was applied to the crop?* The gases which unavoidably escape from fermenting manure, and which are lost to the farm if the manure ferments above ground, are as much the food of plants, as the black carbonaceous matter which remains after the dung has rotted; and the benign mechanical effects upon the soil of the former, are thrice as beneficial as those of the latter.

The Peach.—A correspondent at Bradford, near Newburyport, Mass. somewhat north of our latitude, says:—"I have been thus far very successful in rearing the peach tree, and in the amount and perfectness of the fruit, which I attribute, among other things to three causes. First, I set them upon rather dry and sandy land, but thoroughly manured from year to year. Secondly, I train them in the form of bushes rather than trees. Thirdly, take pains to have the crown of the tree well protected both winter and summer; and, if I may be permitted to add another, after having fixed upon the number of reasons, not suffering too much fruit to be reserved on the trees in any one year."

The Winter has been less hurtful to fruit trees in this neighborhood than was expected. Most of our peach trees are shooting forth their foliage, though their blossom buds have been destroyed here, as we believe they have generally been in the northern and northwestern states. Although, as we learn, the plum, and even the apple trees, have been seriously injured south of us, we hear no complaints of injury here. Hardy grape-vines, left upon the trellace, have been injured in their fruit buds, and in some instances they have been killed down to the ground. We owe our exemption from greater injury to the snow which formed a good covering to the ground at the time of the severe cold weather. Our practice is, and we recommend it as a wise precaution to others in our latitude, to take our Isabella and Catawba grapes from the trellace when we prune them in the fall, and either lay them close on the surface, or cover them slightly with earth. The magnolias, catalpa, paper mulberry, alianthus, Chinese arbor vitæ, evergreen thorn, and other exotics, have suffered more severely than ever before known. Plums will give but a light crop of fruit, but the apple and pear promise abudantly.

C. L. W., who dates at Canaan, asks, either jeeringly or in earnest, for "the best and most expeditious method of preparing saw-dust for manure?" We really doubt whether it can be *profitably* prepared by any artificial process. In reply to our correspondent's next query, whether breeding in-and-in, or cross-breeding, is best in the rearing of domestic animals, we have no hesitation in saying, that the latter is decidedly preferable. We thank C. L. W. for his hint in regard to the ladies, and we will endeavor to profit by it.

Asparagus.—I do not like the asparagus which I meet with on the tables of city hotels. It is white, to be sure, but it is tough, ligneous and often bitter, and the most part of it not edible. This arises from an error in the cultivator, countenanced and encouraged by the buyer. It is owing to the asparagus bed being covered with a layer of earth or sand, that the grass may become blanched. The blanched part is what I dislike. If this dressing of earth is omitted, and the crowns suffered to remain near the surface, within the genial influence of the warm air, the growth is more rapid, and the grass all perfectly tender, edible and rich.

Query.—"Is it best to take out the manure in the spring, and put on our corn or potato crops, or to take it out in the fall for our wheat crops?"—*C. S. Candee, Glenville.*

Answer.—It is best to take the manure from the yards in the spring, for the corn and potato crops, to spread it equally, and plough it under while moist. The corn may be cut early in September, and wheat sown on the ground by the 25th of same month. The manure will still be nearly or quite as beneficial to the wheat as if it lies during the summer to rot in the yard. [See remarks on Mr. Kinzer's communication of, &c.]

Cisterns.—A correspondent at Bridgetown, N. J., (E. Holmes,) asks, "What kind of mortar should be used in constructing cisterns that will not leak?" We have had two built with brick and common lime mortar, the lime fresh burnt, and then well plastered on the inside with mortar made with water lime. They have remained tight hitherto. The most approved mode is to take for three part of lime, one part of terras, ochre, ground iron ore, or smithy slack (the dust of a blacksmith's shop,)—and blend them well with the sand in mortar.

The Italian Rye Grass is found, on trial, to do well in Ireland and Scotland. It has afforded two good cuttings the season it was sown, the growth having been 4 feet 8 inches, and 4 feet 6 inches—and cut the 31st of July and last of September. The herbage was healthy and green till December.

CORRESPONDENCE.

Spring Lawn, Pequea, Lan. Co. Pa. 1835.

Dear Sir—Your distinguished reputation, acquired by a well directed zeal and observation, as a scientific agriculturist, affords me not only an apology for thus addressing you, but a sufficient guarantee, that the information which I so much desire, will be readily communicated.

Having understood that you have improved a farm near Albany from a very low, to a very high state of cultivation, I shall feel myself much indebted to you for a description of the original component parts of the soil of said farm, i. e. clay, gravel, sand, &c.; whether upland or lowland, if any swampy land, how drained, &c. Did you apply fossil manures? if so, in what manner, and in what season of the year? If you applied stable manure principally, please name your seasons for applying the same, as also, the state of the manure; whether recent or fermented. I am informed you are in possession of a productive species of corn, which matures sufficiently early in the season, to put the corn land down to wheat in autumn after harvesting the corn crop—a very great desideratum in this vicinity. Will you be kind enough to transmit me some grains of said corn by mail without delay? If a few sound grains should arrive in the present planting season, the favor shall be thankfully acknowledged. From what I can learn by your writings, and that of your cotemporaries in the East, concerning, manures, I find Sir Humphrey Davy's opinion uniformly adopted, i. e. that the most valuable nutriment for plants, viz. carbon, ammonia, &c. waste and evaporate from manure heaps, when left over year to ferment. I have heretofore committed myself in the same opinion, but the impression that Davy's theory is merely ideal, and practical experience having with me, set inquiry on tiptoe, as it were, I investigated this interesting subject for a few years past with the closest scrutiny and observation. I have deduced the following conclusions, which I cannot submit to a more competent judge than yourself.

I have applied stable manure repeatedly, in its recent state, generally ploughing it under, as it is troublesome when put on the surface, and requires a longer time to ferment. I have done what perhaps few have taken the pains to do; I have divided my manure heap in the spring with extreme precision—and after first surveying and dividing a field of very uniform soil throughout, I hauled the half of my manure heap in its recent state upon the half of said field, and ploughed it under in the spring; in September following, I put the remaining half of fermented manure on the remaining half of the field, and put the whole field down to wheat: I will just add that the part manured in the spring was sown with barley, and the other with oats; we consider oats the greater exhauster—the soil a heavy clay, upon which recent manure in all cases is most profitably applied. I will not omit the result, which was perceptibly in favor of that part of the field on which the fermented manure was applied, not only in the wheat crop, but with the grass since. I regret that my space will not allow me to narrate other experiments, equally conclusive, with fossil manures. According to the theory which I have deduced from experiments fairly tested, the vital spirit in stable manure, or all the vegetable nourishment it contains (excepting water) will not waste or evaporate. I compare a manure heap, in this point of view, to a vessel of ardent spirits exposed to the air; the quantity will diminish, but in the end there will be nothing lost but water. The water will evaporate from manure, but I contend the alkaline salt of the manure will not assume a gaseous or aeriform state. I cannot, as yet, be persuaded to dispose of fossil manures on any different principle. I say, after they are dissolved, they form a ley, which mingles with the soil, forming vegetable aliment, and adopting the theory, that the roots are the mouths of the plants, the sun, atmosphere and winds imparting in their turn, vigor, health and exercise to vegetation; it being obvious to the lax observer, that the winds exercise plants. I now, sir, come to the point—will you do the agriculturists in this quarter, (whose esteem you have deservedly gained) the enduring favor to publish this letter in the Albany Cultivator, with your answers to the queries herein contained? The public generally will greet your reply and remarks on a subject so important.

I am sir, with much esteem, yours, &c.

WM. PENN KINZER.

REMARKS ON THE ABOVE.

My farm lies on what is termed a pine barren, being an alluvial or diluvial formation, principally of silicious sand, once covered with a heavy growth of white and yellow pine, of late years intermixed with shrub oaks. The surface is somewhat undulating, with some swamps, and abounding in springs, mostly perennial. The soil contains but a small portion of calcareous earth, and but very little clay, though it is partially underlaid with clay and clay marl, that is, blue clay, containing 20 to 30 per cent of lime. The products of this farm, when first brought under cultivation eighteen years ago, were certainly not very flattering; but by draining, manuring, and alternating my crops I think it is now as productive, in net profit, as the alluvial bottoms on the Hudson, or any where else. It is not a wheat soil; but is well adapted to Indian corn, barley, rye, turnips, clover and the other grasses. I have used no fossil manures but gypsum, and that principally on my corn, potato and clover crops. Of animal and vegetable manures, I have used many kinds unknown to and unprized by many of our farmers. Crushed bones, horn shavings from the comb-makers, fleshings, oil and hair from the furriers, and the piths of cattle's horns, after the outside has been taken off for combs, are among the animal substances which I have employed, always with success, and which my contiguity to the city has enabled me to procure in large quantities, and often at a nominal price. I began with some of these rather as a matter of experiment, and the result has induced me to continue to use them. I draw manure from the city in the winter, and this, with the contents of my yards, is always applied in the spring, in an unfermented, or partially fermented state *and always to a hoed crop*, as corn, potatoes and beans, *which mature their product after the manure in the soil has undergone fermentation there*. The manure which accumulates before mid-summer is appropriated to the ruta baga crop. To induce healthy vegetation, and to enable me to work my land early in the spring, and with facility, I have constructed a great length of under drains, and I am satisfied the expense bears but a small ratio to the benefits which have already resulted from them. By these means, cold cranberry marshes have been transformed into fine tillable and clover land. I have also used, as a fertilizing material, large quantities of swamp earth, either spread upon the uplands, or first made into a compost with recent stable manure.

As to the corn which I cultivate, the favorable opinion I have expressed of it remains unaltered. I usually plant it between the 15th and 20th May, and harvest it, that is, cut it up, in the first half of September. In 1828 it was cut the last week in August, and deposited in the cribs before the 10th Sept. I treat it as I would a good horse—*feed it well*. I have sent some grains to Mr. K. For my mode of culture, I beg leave to refer him to the first vol. of the Cultivator.

We highly commend Mr. Kinzer's experiments with manure. It is by repeated experiments, and close observation, that the farmer is best enabled to apply general principles to his particular practice: and it is in canvassing each others opinions with freedom and decorum, that we often detect and escape error, and elicit truth. Although we attach full credit to Mr. K's statement we cannot nevertheless subscribe to his conclusions, which are so contrary to the convictions forced upon us by reason and practice. Every particle of vegetable and animal manure is capable of being converted into a liquid or gaseous state. These particles (including water, or its elements, hydrogen and oxygen) have formed necessary constituents of plants, and they are all necessary in the organization and structure of other plants. If fermentation takes place in the farm yard, decomposition ensues, and a portion of these particles, suited and prepared for the wants of the growing plants, escape into the atmosphere, and are lost. Another portion commingle with the water of the dung heap, and in fact are converted into water, and are washed away by the rains. But if the fermentation takes place in the sod, both the gases and the liquids are imbibed by the soil, and afterwards absorbed by the mouths of plants.

But there was an error in Mr. K's experiment, which we apprehend has led him to draw unsound conclusions. It was in applying his recent manure to the wrong crop—a crop which matured its seeds when the manure was in its most active state of fermentation—a circumstance which was calculated to produce a luxuriant growth of straw, but a diminutive crop of grain. Had he applied the unfermented manure to his corn or potato crop, he may rest assured. that these would have experienced great benefit, and yielded an increased product, from the application. But as we read the text, Mr. K. is silent as to the product of the barley crop. And besides, barley may exhaust the soil of the specific food of wheat more than oats, although the latter, in the main, may be the more exhausting for other crops than wheat. To have enabled us to draw just conclusions, both pieces should have been sown with barley or both with oats. Mr. K. has chosen a bad illustration of his theory in regard to alkaline salts, in the vessel of ardent spirits. Spirits are more volatile than water, and when combined in the still, are driven off before it, by the application of heat, in the form of steam or gas. And if the salts of the dung heap do not evaporate, they are certainly liable to be dissolved, and carried off by the rains. The application of Mr. K's principle to fossil manures, is undoubtedly correct. These do not ferment, nor evaporate in the form of gas; but they dissolve and sink, and hence should be applied on the surface of the soil, or near it.

We hope Mr. K. will persist in his experiments, and we invite him to transmit to us the results.—*Conductor*.

THE CORN CROP.

Sir—I have long been of opinion that the farmers of this country were not aware of the loss they sustained, by reason of the careless manner in which Indian corn is usually cultivated;—or, rather, that they were not advised of the immense increase of crop they might receive, by a more careful cultivation of the most benecial grain we cultivate.

I last spring planted several hills of corn of different sorts, in my garden, with a view of ascertaining the relative productiveness of each kind. But the ground was not suitable, and the drought was so severe that I was disappointed in the result, so far, as actual productiveness was in question. But still I was resolved to use the best data in my power, to demonstrate the relative productiveness of each short, by dissecting several plants.

And here I would observe, that all plants that bear their blossoms and fruit on the extremities of the stalk or branches, have the germs of all their parts and capacities for fructification formed in them from the time they come up out of the ground, although the parts may be so minute as not be detected. And this is particularly the case with Indian corn. For so soon as the stalk comes fairly out of the ground, by a powerful microscope, we may discover, on dissecting the plant, its entire capacity to bear fruit. But I have not predicated my investigation on microscopic observations, but on the dissection of the manure plant, taken up with roots.

The first subject, was a stalk of what I call Natick corn, and is so called in some parts of New-England, where it was cultivated by the Indians, before the landing of the Pilgrims. This is an early blue and white or blue and yellow corn, and will grow on as poor soil as any other sort I have seen, as it is perfectly acclimated to this climate.

At the 1st and 2d joints, there were the germs of suckers. These, if the ground had been rich enough, would have produced blossoms to fructify the late ears, and would also have produced hermaphrodite ears with the blossoms.

At the third leaf or joint, there was the germ of an ear, on their tops. At the 4th, 5th and 6th joints, there were perfect ears; then followed five barren joints, with leaves between the fruit bearing joints and the male blossom on the top. This variety of corn has eleven leaves and joints on the main stalk; the 1st and 2d to produce suckers to render later ears fruitful; the 3d, 4th, 5th and 6th bearing fruit, and the 7th, 8th, 9th, 10th and 11th are by nature intended to support and nourish the male blossom on the top. These ears were of eight rows, each row containing 37 grains; from which it will be seen, that this variety is capable of producing four perfect ears on each stalk, or twelve ears on each hill, which, if planted in rows three feet apart each way, would afford 4,840 hills to the acre, and when perfectly cultivated, would produce 120 bushels of corn to the acre. This crop might be reckoned on with much certainty, under good cultivation, from this variety being so well acclimated.

2d experiment—Was a stalk of the common sweet garden corn. This also had the germs of suckers and hermaphrodite ears on the two first joints. At the 3d and 4th joints, were the germs of ears. At the 5th joint, the germ of an ear on a long spike, which, grown to perfection, would have had 320 grains, and on each side of this were the germs of another ear. The 6th and 7th joints had perfect ears, the highest of which was the best; then followed four barren joints and leaves, supporting the male blossom. On each side of the ear, at the 6th joint, there were also the germs of ears.

From the above analysis, it will be seen that this stalk of corn had the germs of nine ears on the main stalk, which, allowing three stalks to the hill, if they could all be brought to perfection, would, give the enormous quantity of 270 bushels to the acre.

But this corn is undoubtedly deteriorated, by planting seed from inferior ears, as it is exclusively planted as a garden article, for boiling green; under which circumstance, the best and earliest ears are taken off for use, and the small that come last are planted.

Of this corn, I would observe, that I am persuaded, that if it was fully acclimated and carefully improved, by selecting the best ears for seed, might be made a great crop of corn. I have propagated several sorts of it, some earlier and some later; and although my land is unfit for experiments, I shall, the ensuing season, try them all.

3d experiment.—This was a single stalk of eight rowed yellow corn, probably like that which is usually planted in Dutchess county, that came up in the yard, and although the ground was rich, yet it was much exposed to the great drought of last summer, as it stood in sand, under the refraction from the house, and an high fence, and in the neighborhood of several trees. It however grew well in the early part of the season, until nearly the time of blossoming, when the effects of the drought became evident.

On dissecting this plant, in the fall, I found the first joint had sent out two strong suckers, each of which had the germs of two ears on the two lower joints, with hermaphrodite ears on the tops, and the germs of perfect ears at the 2d and 3d joints, with hermaphrodite ears on the tops. On the 4th, 5th, 6th and 7th joints, there were the germs of perfect ears, none of which came to perfection, except the 7th. Above this, were four barren leaves, for the support of the male blossom.

From all these facts, I conclude, that this stalk of corn was capable of producing ten good ears of corn, of 45 grains in the row, by which the hill of three stalks would have produced 10,800 grains of corn, and an acre equally prolific, would have produced 300 bushels. But this corn, like most of the corn planted by our farmers, was not probably fully acclimated.

I have several other sorts of corn, but as these are sufficient to prove that corn is not so cultivated as to develop its utmost capacity to reward the labor and care of the agriculturist, I shall not particularly decribe others.

Indian corn is a tropical plant; but a beneficent Providence has made it capable of being acclimated in every region between the forty-fifth degrees of latitude. But its stature diminishes as it recedes from the tropics.

To expect the greatest possible crop in any region, the seed must be taken from plants fully acclimated, for it will not bear transplanting more than 100 miles, either from the north or south, without prejudice to the crop. And I am well persuaded, that the longer it is planted on the same farm or vicinity, the better will be the crop; provided that due care is taken to select the best ears for seed. And that after long planting in this way, all the ears and grains will be alike, and the stalks will have the same number of joints, leaves and ears.

The farm on which Gen. Van Wyck now resides, in Dutchess county, formerly belonging to Major Hoffman, whose farming was only remarkable for producing the most beautiful crops of corn, for a long series of time, say more than forty years. He died before the astonishing improvements had taken place, from the use of plaster, that has in later years distinguished that county. And as there was nothing remarkable in the farming of Major Hoffman, except a superstitious attachment to his peculiar seed corn, which was a white, eight rowed variety; the secret of its excellence consisted entirely in his never changing his seed during a long life, by which his corn became all perfectly acclimated, as well as respects the stature of the stalk as the ears, which were all equal, and the grains alike; and the whole acccommodated to the soil and climate in which it was grown.

Much is said of the best means of raising crops of corn, but the story is a short one. The best preparation for corn, is a good sward, and clover is the best. On this, at least forty loads of barn manure should be spread, before ploughing, to the acre. It then should be turned up with a deep, fine furrow, and so harrowed as not to disturb the furrow. It should then be marked out with straight lines, so as to form rows three feet apart each way, and from five to seven grains of seed placed in each hill. When the corn is well up, plaster it, and run a furrow between each row, and after the plant has acquired three leaves, let a careful person go through, row by row, and pull out the superfluous stalks, extracting the most feeble; then go through it again with the plough, twice between each row, with the back of the plough to the plants, and at last, when the corn is about knee high, plough again, turning the furrow to the corn; and after the plough, in all these dressings, a person should follow with a hoe, to eradicate any weed, and right up any stalks that may be thrown down, but not to earth up the plants; that should never be done. At the last ploughing, at least a bushel of plaster should be sown broad cast over the whole.

I am not certain which will produce the greatest crop in ordinary field cultivation, where the rows are three feet apart, whether two or three stalks in the hill will produce the best crop—but am inclined to believe that three stalks is the best number to be left.

Some persons, without understanding the natural history of the plant, at the last dressing pull off the suckers, which is ruin to the crop, as they are absolutely necessary, not only to filling out the ends of most of the first ears, but to filling out of the late ears in in any degree.

The time in which the male blossom on the main stalk remains in vigor is not more than six days, when the season is good. But if the weather is very hot and dry, or is stormy, it is not so long. And this length is only enough to fructify the earliest ears, in which the female blossom comes out first from the germ of the lowest grains, and present themselves in circles at the ends of the corolla or husks, and as they come out, are impregnated, and thus they are every day and hour presenting new circles of female blossoms, until the whole are thus impregnated. But if the heat is so excessive as to kill the male blossom before the whole of the female blossom has come out of the corolla or husk, then, if there are no suckers to supply the deficiency of pollen, there will be a portion of the upper end of the ear that will be barren of grain. To supply this deficiency of pollen, Providence, in organizing the corn-plant, has ordered that the three lower joints should produce suckers that should come up in succession, to supply a continual source of the fructifying principle to the whole succession of ears that may come out for the space of at least three weeks, after that on the main stalk has been exhausted. And on this succession of male blossoms the greatness of the crop depends. And the land should be so rich as to force out at least two suckers on every stalk, or no very great crop should be expected. But if the land is so rich as to produce these, then, instead of having the usual crop of about 35 bushels to the acre, the careful farmer may, with confidence, expect from 80 to 120 bushels with very little extraordinary expense, and his land well prepared for other crops.

You will please to indulge me further to observe, on the culture of corn, that to manure poor land in the hill, is bad cultivation, although, it is true, that by this mode, the early growth of the corn is promoted; but the moment the roots of the plants extend beyond the manure, the growth of the crop is checked, at the most critical season, when the suckers and ears are setting, by which it often happens that the stalk still runs up, and the male blossom comes out and is spent before the female blossom appears at all.—

But if the shovel full of manure that had been put in each hill, had been incorporated with the soil, the early growth of the crop would not have been so rapid, but then the growth would have been equal in all parts of the plant, and a crop would have been received in proportion to the goodness of the soil, and preparation and attendance given to it. AGRICOLA.

REMARKS OF THE CONDUCTOR.

The preceding remarks appear to us to be just and valuable, with one or two exceptions; and we mention these principally that the farmer may settle the points of difference between us and our correspondent, by actual experiment. We object to the use of the plough at all in cultivating the corn crop, and would substitute the harrow and cultivator. Agricola dwells with just emphasis upon the value of the clover sod, and of *spreading* the manure, no doubt on account of the food they afford to the plants. By the free use of the plough, which he recommends, it seems to us, that the measure of fertility would be greatly reduced, by exposing the vegetable matter of the sod and manure to the wasting influence of the sun and winds, and the roots of the plants injuriously restricted in their natural range for food; for they must be cut by the plough, and confined to the narrow strip which that implement leaves undisturbed, at least till after the dressing operations are completed.—Our opinion is, that the sod and manure should be left covered with the earth, where the wants of the crop require food, and where the roots of the corn will certainly find it, if they are not curtailed by the plough. The objects of after culture are pulverization, to admit into the soil the genial influence of heat, air and moisture, and the destruction of weeds. These objects may be amply effected by the harrow and cultivator, without wasting the food destined for the crop, or bruizing and cutting the roots of the grain.

In regard to the use of gypsum, we think it benefits the corn crop, by affording to it a portion of its specific food, and that it enters into the organization of the plant in the same way that other food does, namely, through the spongeoles of the roots. If this opinion is correct, then the method practised and recommended by John Taylor and Judge Peters, of sowing it broad-cast, before the last ploughing for the crop, is preferable, (and it saves labor,) to plaistering twice on the hill. A few experiments, to test the relative advantage of the two modes, would tend to settle this question, and would be of public benefit.

CANADA THISTLES.

Mr. Editor—Coming into this town when young, and settling on a wild lot of land, I observed little patches of Canada thistles springing up here and there, on the land, as soon as cleared of the timber, and knowing their natural tendency to increase, and stand their ground where the soil is favorable, I concluded (with the ordinary manner of tillage,) that the time was not far distant, when this fine, fertile wheat section of country, would, by them, be spoiled for wheat. I therefore took to trying various experiments, to find out an easy and simple method of destroying this obnoxious weed, (such an one as the people would universally be induced to follow,) and have found by several years experience, that to begin with the beginning of the summer season, in the last quarter of the moon, and with the plough, or some other instrument, cut the root of each and every plant, below the surface of the ground, as much as three or four inches, or where so situated as to be most convenient, to take hold of them close to the surface, and pull them out by the roots, will answer. And follow this plan every four weeks, (or every last week of the moon,) until into September, will effectually destroy them; so that they will not grow any more on that ground until they are again seeded. To those farmers wishing to summer-fallow this summer, where there are Canada thistles, I would recommend to plough the ground between the 20th and the 27th of May, and follow the above directions, every four weeks, or every last week of the moon, until into September, cutting up all the ground each and every time where there is thistle roots, (for you will not kill those you do not cut off,) and then sow it. I would not recommend to plough too deep in wet weather, for fear the roots turned over might grow.

I think that they will not only find this formidable enemy destroyed, but will find their crop of grain on the thistle ground enough better to pay them for their extra trouble, from the ordinary manner of tillage.

I have here recommended five times ploughing, but I have destroyed them with four, when the last quarter of the moon happened in the first of June.

I think the above method will destroy any plant living. Set your boys to pulling up your milk weeds on the times above specified, one summer, and you will clear your ground of those obnoxious weeds, notwithstanding their natural tendency to stand their ground.

I think the regularity of the cuttings, together with the growth of the season and the influence of the moon, is what does the work. Many will say, the influence of the moon is nothing; but I think the attraction of that orb on the fluids of the earth, has great influence on the growth of vegetation.

Those agriculturists of our country possessing lands infested with obnoxious weeds, and willing to cause two blades of grass to grow where there now does but one, will, by trying the above experiment, confer a favor on a true, notwithstanding an illiterate, friend of his country. AARON TUFTS.

South Le Roy, Genesee County, N. Y. April 17, 1835.

REMARKS OF THE CONDUCTOR.

It is a settled principle in physiology, that leaves are as necessary to vegetables, as lungs are to animals; and that without the healthful exercise of these organs, both the vegetable and the animal will become diseased, and ultimately die. They are essential to fit the food as wholesome aliment.—Leaves are as necessary to the roots of plants as roots are to the leaves; roots make leaves, and leaves make roots; they are mutually dependent on each other; and like the Siamese twins, one cannot long exist without the other.—The repeated and complete defoliation of a plant, therefore, must soon become fatal to its roots. Hence it has been found, that although very tenacious of life. Canada thistles can be destroyed, and have been destroyed, by preventing the growth of their leaves, either by ploughing, hoeing, mowing, or smothering them, so that they have not time to elaborate and prepare food for their roots.

UNDER-DRAINS—WHEAT—CLOVER.

Sing-Sing, April 18, 1835.

Dear Sir—As you are writing considerable for the instruction of farmers, in the way of making drains and filling them up, I am induced to give you the way which the farmers of the low lands of Scotland practise, and which I have adopted, in filling drains with stones, and it is this:—I select such stones as are thin and flat, and set them on the bottom of the drain, on their thinnest edge, or on one corner, and close to the side thereof; then against the stones first set up, I set other stones, with their sharpest ends down; and against them others in like manner, until the bottom of the drain is covered with them, something in the way of the annexed representation, in which it will be perceived, that the water will have a free passage between the points of the stones, which are on the bottom of the drain. The advantages of this mode of filling a drain are simply these, (the sides of a drain being sloping, as I think they always ought to be:) the stones are put in, in such a manner that the pressure which comes on them is thrown to the sides of the drain, and thereby saves them from settling and choking up the passages for water, and consequently prolongs its duration, and it is soon done. Where flat stones cannot be had, any stones may be made use of, provided they are of a wedge-like shape. As the upright stones will not be all of a length, the first which are laid on them should be large, and if possible flat, and that will make another large opening for the free passage of water, if the bottom is insufficient, or gets filled up. I think the bottom of a drain should be narrow, and a little the lowest in the middle, in order to concentrate the force of the water into one direct channel, the better to keep it free and clear. For instance, a ditch three feet wide at top, and three feet deep, should not be more than one foot wide at bottom.

I have a piece of wheat which was sown about the middle of last September, on a dry soil, of which I should think nearly two-thirds is dead, with the roots fair in the ground, the cause of the death of which I could not account for, until I read Mr. Hickock's communication, read before the State Agricultural Society, which came in the April number of the Cultivator, the substance of which was, that the saccharine matter designed for the support of the plant is more likely to be destroyed when grain is sowed early, than when it is sowed late. I have another piece which was sown the 4th of October, on wet heavy land, which has survived the winter admirably well, it being difficult to find a spear that has died. I have yet another piece, which was sowed October 20th, of which I suppose the one-third part or one-half is dead. On all the above pieces, wheat was sown at the rate of two bushels per acre, so there is enough left yet.

Last spring I sowed my clover seed, on the same land, at two different times, about five pounds to the acre each time. The first time I sowed near the last of March; the second time the tenth of

April. Soon after I sowed the first time, we had a warm rain, and the seed sprouted on the top of the ground any where; soon after we had a severe frost, and I observed that the sprouts of all those seeds which were shot forth on the top of the ground, were killed, whilst those which shot into the ground, were not injured. I further noticed, that such seeds or plants as had burst the shell and unfolded the first two leaves, were killed, whilst those which were still covered with the shell of the seed survived. In fact nearly all the plants of the first sowing were killed, but of that which I sowed the tenth of April, a large proportion lived. I gathered up several seeds of the first sowing, which had sprouted, but still retained their shell, the sprouts whereof had been killed by the frost, and planted them, thinking they might sprout the second time, but not one of them did. It is urged in favor of early sowing, that if the seed is not sowed whilst the ground is freezing and thawing and full of cracks, that the seed will not get in the earth, so as to shoot its roots therein and live, but my opinion is, that if farmers were to sow their clover seed from the 8th to the 15th of April, and harrow and roll, or if the ground is heavy, merely roll it in, they would secure to themselves that great disideratum, a good crop of clover. I further think that a great many of the seeds which fall into the cracks, sink too low down ever to reach the top, and that would suggest the propriety of rolling the ground to press in the seeds that do not fall in the cracks, and thus perhaps secure the life of almost the only plants that can eventually come to perfection. If the ground is harrowed and rolled, I think the seed should be sowed after the harrow, that the cracks may first be filled up; if a plant, after it shows its first leaves, gets covered up, (as I think a great part of those which germinate in the crevices do,) it is done forever.

I want you, if you please, to inform me, through the Cultivator, why the skin of young pigs cracks open, if they eat green clover, and whether you know of any preventive; and also whether it will cause their skin to crack if it is mown and given them in a wilted state.

If you think any of the above is worth publishing, you are at liberty to do it. With respect, I am your friend,

J. Buel. JESSE RYDER.

Remark.—We confess ourselves unable to answer, satisfactorily, the queries in relation to pigs.—*Cond.*

Mr. Buel—I have read with great interest, the back numbers of the Cultivator, but particularly those communications and selections, found under the head of Young Men's Department. Issuing to the most secluded parts of the country, these papers convey important intelligence to a class of young men who have hitherto derived little benefit from the study and experience of others; but who, if I mistake not, will be found ready to appreciate, as soon as perceived, the facilities presented to them.

There are few, who do not at times seriously make the inquiry—what shall most conduce to their standing in society?—by what means can they become most useful to their country?—what pursuit shall secure to them the greatest amount of happiness? This feeling results from a laudable ambition implanted by nature for the best of purposes, and is called into action by contrasting the present condition with some nobler one which is worthy of aspiration. If cherished, it might be expanded into deeds and characters of the highest order. But how often is it stifled at its birth for the want of that fostering care which the situation of its possessor precludes; how much oftener is it improperly directed, and thereby becomes pernicious to the community and a source of individual misfortune.

The residents of our cities, and the wealthy of *other* professions in the country, for the most part, early make their children conversant with history and the biography of distinguished persons. Every effort to improve the mind to which such reading may incite them is encouraged by the assistance of books and competent instructors. But with the young farmer the case is quite different. He is seldom acquainted with more than the names and actions of such as are esteemed benefactors. Of the stations they once occupied, the impediments they have overcome, or the circumstances to which they are indebted for their elevation, he is generally ignorant. His knowledge thus circumscribed to the neighborhood wherein he resides, from such a contracted sphere must his plans of life be drawn. That some possess and exercise a degree of superiority over their fellows, is early perceived—and frequently he can attribute it to no other reason than a greater amount of property. To the accumulation of wealth then, as the primary object of his existence, are his energies directed; and to this erroneous conclusion we have seen happiness sacrificed, the ties of kindred severed, and the foundation of a character laid quite different from any one contemplated by the young man at first setting out.

Legislators and political writers have delighted to dwell on the importance of this class of citizens, in a national point of view.—They have ascribed to them the duty of maintaining and transmitting unimpaired to posterity the liberties which we so justly prize, and in all cases of public danger they are acknowledged to be the only certain resource. It must be apparent that their services will be increased or diminished in the ratio that knowledge and virtue are diffused, and as intelligence advances or recedes will the duration of our form of government be determined. Many of our most eminent statesmen who, self-instructed, rose to the stations they adorned, have striven to make this impression popular. It is the subject of every appeal to our patriotism, and every address to our youth inculcates it. At this time there is avowedly no denial of the necessity for increasing the means of general instruction; but this opinion, though so unanimous, is feebly seconded by practical application. It would seem that the persuasion of its necessity is rather acquiesced in than felt, and while opposition is unpopular, few look upon it as their particular interest to support further.

Many farmers entertain the idea that an acquaintance with books tends to render their sons less qualified for the discharge of their domestic duties; that it makes them discontented with their condition, and giving rise to a feeling of self-importance to which they were before strangers, they look upon labor as a sort of degradation. That besides producing grief and dissatisfaction in their families, it frequently induces a young man to quit his paternal home, to seek among strangers and amidst numberless temptations, a precarious subsistence by his wits—of which poverty and disgrace is the usual consequence. If such a termination could in truth be traced directly to the agency of knowledge, it were far better to remain ignorant of the contents of a book, and to banish one as the bane of domestic happiness; but while the influence of such an example goes to the prejudice of learning, it may more properly be ascribed to other causes. Farmers in general, are apt to regard study as totally unnecessary to the success of their operations, and any inclination for it is considered as an indication of uselessness for their profession. They are allowed little opportunity of making any application of their reading to their business, because any innovation on established practices are received with incredulity. The reputation of idleness, of all others the most to be dreaded in the country, is to a young man so disposed, soon attached, and he is regarded as a person who would gladly avail himself of any pretext to avoid honest labor. Influential men make it a matter of congratulation that their sons are *not lazy enough for scholars.* While, then, such is the feeling on this subject, while knowledge and agriculture are deemed incompatible, and a pursuit of the one is held an abandonment of the other, is it to be wondered that many are driven from a field they were intended by nature to adorn, to swell the ranks, already too full, of other professions.

Though this is a great cause of detriment, it is not the only one. A principal evil lies in the inducement which is commonly held out to incite to mental exertion. "Knowledge is power." It is recommended as the means of exalting one above another—as a ladder by which to mount to office and distinction—the philosopher's stone which is to become a mine of wealth to its possessor. Sought under such circumstances, what a spirit of rivalship and acrimonious feeling is it the foundation of—to what purposes of unhallowed ambition will they strive to pervert it—how much disappointment and despair is it calculated to produce. In no such light should it be presented to the young farmer. His attention should not be solicited by any appeal to his passions, or the promise of making it accessary to personal aggrandizement. It should be exhibited as of itself repaying every effort made for its acquisition—as tending to minister to his comforts, and extend the sphere of his enjoyment, acquainting him with sources of pleasure hitherto unknown: not for the purpose of diverting his mind from his occupation, nor enticing him from a station where both his own happiness and the national prosperity require he should remain.

These impressions are given by one little qualified for the task of writing on a subject of so much importance, and whose principal apology is in belonging to the class who are most immediately interested in such considerations. To this is joined the hope, that it may be the means of eliciting from some of your readers, with whose thoughts and feelings it is familiarly identified, such views and suggestions as may promote the end designed. When the means of intelligence can be commanded and desired by the producing classes, and agriculture and knowledge become synonymous, all will be realized that philanthropy and patriotism have contemplated. Traits of character, both of virtue and talent, will arise from the obscurest recesses of the country, from quarters little expected and now unavailable. Schemes of uncertain speculation will cease to attract so many of our most promising youth, and scientific agriculture regain the rank to which its bearing on the happiness of mankind entitles it. S. W. G.

Huntington, L. I. May 2d, 1835.

CATEPILLARS.

Mr. Buel—In the Cultivator for June last, I noticed an article on destroying the caterpiller, signed by Mr. Bridges, in which he speaks of killing the worms and destroying the eggs, by the same operation. If it would not be thought too trifling, I would correct an error which he has evidently fallen into, in supposing that he not only killed the worms, *but* destroyed the eggs. The fact is, that the eggs are never to be found in the nest or web that contains the worms. They are deposited in a sort of glutinous envelope, around some of the small or outer branches of the trees, in the summer or autumn of the preceding year, (as I suppose,) and I have but little doubt but that it is done in the latter part of autumn by the insect, when in the winged state, and not by a worm. Probably all of these eggs are hatched during the time the buds are expanding into leaves, and the great error is that the work of destruction is not commenced soon enough, by those who would preserve their trees from injury. This should be done as soon as the worms can be detected by means of their web. Yesterday, on a small tree of mine, by means of their web, I detected a company of these caterpillars, which, three days before, were (probably) in the egg. The house which contained the eggs, from which they had emerged, I found near the end of the same branch on which they had commenced their web. Let those who would preserve their trees despatch the worms on their first appearance.

Query.—Does the caterpiller undergo a transformation, by which it assumes wings? JOHN I. WILSON.

Port Byron, April 17, 1835.

Remark.—When the leaf-bud is bursting, a colony of caterpillers may be covered with three fingers, and easily destroyed; and even now, they will be found concentrated on a small spot in the morning, and may then readily be destroyed by a brush, or squib, affixed to a pole. The caterpiller *does* undergo a transformation.—*Cond.*

QUERIES.

Mr. Buel—Allow a subscriber to make a few brief inquiries.

Is it not an error (if one, venerable for its age, I confess,) to suppose that vegetable matter must be reduced to "food for plants," by the process of fermentation? Is it not true that by the lowest degree of heat at which fermentation can be produced the most valuable part of vegetable matter, consisting of the various gases, are driven off, and that there is as much difference between vegetables before and after the application of heat, as there is between bread "with the gin in it," and bread made of flour from which the alcohol has been distilled?

Are not the various vegetable substances from which manure is generally made, hay, straw, &c. &c. capable of being sufficiently decomposed for the purpose intended, by being intermixed with dung or rotten vegetable matter, and kept in a heap quite moist and sheltered from the sun—and by such process would the substances to be produced lose their properties as is above supposed in the case of fermentation?

Have we in this country any thing answering precisely to the *peat* of the old world?

ANSWERS.

1. Fermentation denotes "that change in the principles of organic bodies, which begins to take place spontaneously, *as soon as their vital functions have ceased*, and by them are at length reduced to their first principles." Vegetables as well as animals are organic bodies. Fermentation has been distinguished into three stages: the vinous or spirituous, the acid or acetous, and the putrid. The disengagement of gaseous matters from dead vegetables is therefore a sure indication that fermentation has commenced. It can only be prevented or retarded, by the absence of heat, moisture or the oxygen of the atmosphere. Thus seeds may be buried deep, beyond the reach of the atmosphere, or excluded from moisture, and the egg may be rendered impervious to atmospheric influence, for years, without losing their vitality, or their power to germinate or hatch; and until vitality has become extinct, neither the seed nor the egg will give off gas, or food for plants.—Ammonia is given off only in putrid, or the highest stage of fermentation, and is supposed to result from a union of the hydrogen and nitrogen of the decomposing matter. From these considerations we are induced to think that the old received opinion is a correct one, that vegetable matter must undergo fermentation before it can become the food of plants.

2. "Peat, or turf, is a congeries of vegetable matters, in which the remains of organization are more or less visible; consisting of trunks of trees, of leaves, fruits, stringy fibres, and the remains of aquatic mosses." Peat is found in various parts of our country, though the remains of aquatic mosses are less abundant, perhaps here than in Europe. The term we think is correctly applied when the vegetable matter is capable, by being cut and dried, of being converted into fuel, though the quality of American peat may differ somewhat from that which is found in northern Europe. Peat is found near Philadelphia: it has been long used at Poughkeepsie; and we have seen much of it undergoing the drying process in the state of Massachusetts. It is usually denominated *turf* with us, as it is in Ireland.

Tillage Husbandry.

There are few farmers, if any, who, in our opinion, manage their corn crop more judiciously than Mr. Chandler. The variety of corn he cultivates is the same we have cultivated and recommended for 12 or 14 years. His method of ploughing immediately before planting—of using the harrow, roller and cultivator—of not earthing the hills, and of steeping the seed in a solution of nitre—are also the methods we have pursued. Yet there are points in which we differ. Mr. C. sows turnip seeds at his last dressing.—We are perfectly satisfied of the utility of this practice, and intend to adopt it. He speaks of the plough in dressing corn; we do not use it. We think its use prejudicial, in breaking the roots, and in limiting their range for nutriment. He says nothing of harvesting the crop. We harvest ours early in September, which will give the turnip crop an opportunity of coming to something. He plants at 3½ feet by 18 inches—we at 2½ by 3. He leaves six or eight and we four stalks in a hill. But the material point of difference is in manuring; he *harrows* in his manure, or puts it in the hills; we *plough* it in; he uses compost, i. e. rotted dung mixed with earth or other matters—we rotted stable dung.

If dung is long, or unfermented, its first fertilizing properties *ascend*, in the form of gas, and it should hence be buried at the bottom of the furrow, where the roots ultimately seek for it. But if it is short manure, which has principally lost its volatile properties, its fertilizing properties will *sink*, and hence it is proper to apply it near the surface. As to dunging in the hill or spreading broadcast, although Mr. Chandler's experiments seem to favor the former mode, we are nevertheless inclined to think, both from theory and practice, that further experiments will induce him to adopt a contrary opinion, especially if he uses, as we do, unfermented manure for his corn crop. We are not pertinacious in our opinions, and are sensible of our imperfections.

From the New-England Farmer.

INDIAN CORN.

Sir—Having been often requested both by scientific and practical farmers, to publish my method of growing Indian corn, I take the liberty to offer to the public, through your useful Journal, the *New-England Farmer*, a few practical hints to young corn-growers. The reader will readily perceive, that I am more used to handling the plough and hoe than the pen, consequently he will excuse me, if I should now and then make a *baulk* with the latter. In this, I shall give the result of my experience, in raising corn on green sward, so called.

I plough as late, or as near to planting in the spring as possible, so as to turn under as much growth of green grass as I possibly can, which will immediately ferment, and help to decompose the old fog and sward, which makes the best of food for the latter growth of the corn. I usually plough one day, and plant the next, in the following manner: I commence on the further side or longest way of the field; after ploughing one day or so, I cart on to the furrows, and drop in heaps, at the rate of about twenty ox cart loads of good compost manure to the acre: thirty-five bushels I call a load: dropped into six heaps the distance of the cart and oxen apart, each way, from centre to centre, will about do it. After dropping two rows of heaps, I spread the manure as even as possible, then harrow it over twice with a light harrow, then roll with a heavy roller, which I consider very important, as the harrow partially moves the manure with the soil, the roller levels the surface, and presses the manure into the soil, which prevents in a great measure its wasting, either by evaporation or the wind. I then furrow very shallow, calculating my rows three feet and a half from centre to centre: as sward land should always be worked lengthwise of the furrow, it is not necessary to furrow but one way, as all harrowing, ploughing, and hoeing the crop, should be done lengthwise, so as not to disturb the sod. If I have a plenty of manure, I then drop into the furrow in the hills, about eighteen inches a part, a small quantity of manure. In dropping the corn (a very nice operation) after levelling the manure with my foot, I strew from six to eight kernels lengthwise of the hill, in nearly a straight line, making the hill about ten inches long. The advantage of having the corn in a line is, you can pass with the plough or cultivator, (the latter I consider much the best) near the corn, without disturbing it, which I consider very important. At the first dressing, I pass twice in a row with the cultivator, taking care to shave close to the corn each time, then follow with the hoe, and chop around the corn, for the purpose of killing the weeds, and loosening the sod; taking care not to draw any earth up. At the second and third dressing, I pass with the cultivator or plough within about eight inches of the corn, and chop with the hoe as before, earthing up a very little, say about one inch each time, taking care to thin out the weakest plants, leaving from four to six in each hill. Immediately after the last dressing I sow about one pound of turnip seed to the acre. I will state some of the advantages of planting at the time of plouging. You make clean work, (as the old saying is among farmers) by beginning on the further side of the field, all the carting of manure and passing, will be on the grass, which is easier and better, than passing over ploughed land. Likewise at that season of the year, cattle are generally weaker than at any other time, therefore, ploughing one day, and planting the next, relieves them very much. Also by planting immediately after ploughing, the corn will get the start of the weeds, particularly, if it has been soaked twenty-four hours in a weak solution of nitre, and then mixed with ashes, so as to separate freely before planting.

I plant the early twelve rowed kind, which I name the Phinney corn, having first obtained the seed from E. Phinney, Esq. a first rate farmer in the town of Lexington, which I consider the best I ever planted, although I presume I have planted twenty different kinds, that I have received from different parts of the country. The ears are long, the kernels well set, and the cob better filled out than any other kind I ever saw. Take two ears of equal lengths, one a twelve, the other eight rowed, the twelve rowed ear will contain nearly a third more shelled corn than the eight. The stalks are very small and short, particularly the tops; consequently the ground is not so much shaded, which is a great advantage to the turnip crop.

The practice of spreading the manure on the sod, before ploughing. I do not approve of. I give my reasons: in 1828 or 9, I planted a field of about four acres, in the way and manner I have described, except a strip or band about two rods wide through the middle of the field, on which I spread the same kind and quantity of manure before ploughing, that I did on the other; and the after management was the same as the rest of the field. You could see the difference in the corn, in every stage of its growth. Come to harvesting, the ears were not so large nor so well filled out. The next spring I sowed the field down to grass without disturbing the sod: the seed took well, and I had a fine crop for several years after. For two or three years after, the grass was smaller on the strip where the manure was ploughed in, after which you could not perceive much difference in the crop. The experiment led me to observe more particularly the difference between spreading manure on or near the surface, or burying it deep. I am aware that it is said by some, and some very good practical farmers too, that you cannot bury animal manure too deep: that the gases will alway rise to the surface, which I will admit they do in some measure; but the juices, the most important part, which way do they go? up or down? I say down: and a good ways down, in some soils. For instance, where a large heap of manure lies over winter in the field, after moving the same in the spring, if you take it up, and then manage the spot the same as other parts of the field, without ploughing or putting on any manure, you will have a large crop. On the other hand, if you plough the spot deep, after moving the heap of manure, the crop will be small, comparatively speaking, unless you manure the same as you do other parts of the field.

Now, Mr. Editor, if any of your subscribers will try my method of raising Indian corn, with a good kind of seed, on a tolerable good soil, and manage the whole process skilfully, in a good husbandlike manner, and the season should be as favorable as the last was, if he don't raise from 75 to 100 bushels of corn to the acre, and 200 bushels of turnips, besides pumpkins and beans if he plants them, I will tell him how to make compost and manage his field next season, so that he can cut his two tons of hay to the acre, for three or four years to come; which will more than pay him for the trouble of reading this and trying the experiment.

DANIEL CHANDLER.

B——, March 16th, 1835.

N. B. If you plant fallow ground, either spread the manure on the furrows, or harrow it in, or put the corn under the dung.

D. C.

Household Affairs.

To make Yankee Bread.—Take two measures of Indian and one of Rye meal, mix with milk or water, to the consistency of stiff hasty pudding, and add yeast—bake in iron pans or iron kettles four or five hours. Eat with fresh butter or other food. and if while warm the better. Yankee bread is very good or very bad, according to the manner in which it is made. We commend it to dyspeptics. The Indian meal should be either bolted or sifted.

Rhubarb Pies.—Gather a bundle of the leaf-stocks, *quantum sufficit*—cut off the leaf and peel the stock of the thin epidermis—cut in quarter inch pieces, and lay them into the crust—cover well with sugar, and add nutmeg, orange-peel and spice to taste. The flavor is equal, and many deem it preferable, to gooseberries. The pie-plant is perennial, herbaceous and very hardy. A dozen plants will afford a family a constant supply.

Spruce Beer.—Take three gallons of water, of blood warmth, three half pints of molasses, a table spoonful of essence of spruce, and the like quantity of ginger—mix well together with a gill of yeast; let stand over night, and bottle in the morning. It will be in good condition to drink in twenty-four hours. It is a palatable, wholesome beverage.

I was at old Fort-Hunter, on the Susquehannah, above Harrisburgh, in 1828. The highly respectable owner of this beautiful situation, Col. M'Allister, a gentleman of science and refined observation, treated my fellow-travellers and myself with great courtesy, and showed us some household conveniences worthy of imitation, and among others, his Milk-house, Smoke-house and Clothes-line. I thought much of these, and have in part profited by my observation. That the readers of the Cultivator may profit also by these improvements, I will briefly detail them in part.

The Milk-house was built in the north-east side of a slope, near the well and not far from the mansion. It was composed of stout stone walls, and the roof, which rose 6 or 8 feet above the surface of the ground, appeared to be covered with earth or tile, and was deeply shrouded with the scarlet trumpet creeper, (*Bignonia radicans*,) then in splendid bloom. The interior of the house, principally under ground, was fitted up with cisterns, in which water stood nearly to the tops of the pans of milk, which were arranged in them. The house was entered by a flight of steps on the south, and there was a window on the north, which could be opened or darkened at pleasure. to give ventilation. For want of a natural spring, which many Pennsylvanians consider almost indispensable in a milk house, the water was conducted in a pipe from the well-pump, and after filling the cisterns to a certain height, passed off at the opposite side. The object was to obtain a cool temperature, in the heat of summer, which greatly facilitates the seperation of the cream from the milk, and this object was amply effected, with the labor of working occasionally at the well-pump.

The Smoke-house was a wooden octagon building, perhaps 16 feet in diameter, perfectly tight, except the door-way. The peculiarities of this building were, it was set a foot or more above the ground, and was perfectly dry, and bacon, hams, &c. were kept hanging around its walls all summer, without becoming damp or mouldy, or being injured by flies; and, in the second place, no fire was admitted into the building, the smoke being conveyed into it through a tube from the outside, where it was generated in a stove.

The Clothes-line we saw had been six years in use, without sensible injury, though it had remained all this time in the open air. It had always been wound up, upon a small windlass, as soon as the clothes had been taken from it, where it was protected from the rain by a roof. Several posts, with notches near their tops, were placed in a range upon the grass plat, upon which the line could be drawn and fastened in two minutes, and from which it could be loosened and wound up in as short a time. It is but a small affair, but such small affairs make a large aggregate in ordinary life. "Take care of the cents, and the dollars will take care of themselves."

Miscellaneous.

PLEASURES AND PROFITS OE AGRICULTURE.

The importance of agriculture to all the substantial interests of mankind is so fully recognized, that it may be deemed unnecessary to expatiate on the attention to which it is entitled, or to insist on the superior advantages which those nations must ever enjoy by whom it is the most skilfully practised. Some writers, indeed, without regarding the intimate connexion that subsists between every branch of human industry, have assigned to agriculture a superiority over every other art; but while claiming for it, to the fullest extent, pre-eminence over every mechanical trade, in all those considerations which mostly influence the choice of a profession, it would be inconsistent with that liberal spirit which forms so distinguished a feature in the character of the times, not to admit, that it has no real title to precedence before the manufactures of the country; the object of both is to promote the general weal, and it is unjust to ascribe any peculiar degree of dignity to either. Custom, however, which often arbitrarily decides in opposition to reason, has decreed that individuals, even of elevated rank, may engage in the cultivation of the soil, without descending from their station—a distinction which has not alone tended to raise it in the public estimation, but has also procured for it the more solid advantage of inducing many persons to embark in it, whose education and intelligence have suggested the idea, and whose fortune has furnished the means of making experiments upon a scale which could only rarely have been attempted by the mere farmer; and which, although they have not been adopted to the extent that might be wished, have greatly contributed to the flourishing condition of the land, and the consequent prosperity of the country. Nationally, therefore, it is rather matter of congratulation, than of jealousy, that such a distinction has been made in favor of an art in the successful prosecution of which the welfare of the community is so deeply involved; and, individually, it is, indeed, fortunate for many, that, without any diminution of personal consequence, the independent may find an agreeable occupation, and the less opulent a source of additional income, in dedicating some portion of their leisure to the pursuits of agriculture.

Although other avocations may offer greater prizes in the lottery of life, yet, if we compare the advantages of rural industry with those of any other of the common occupations to which men devote themselves, we shall find that he who is engaged in agriculture has no reason to be dissatisfied with the lot which fortune has assigned him. Its superiority, in point of salubrity, over every sedentary employment, is too apparent to require illustration, and it affords more of those common enjoyments which constitute much of the elements of happiness, than any other state of equal mediocrity. The farmyard, the orchard, and the dairy, supply, almost without expense, abundant means for those gratifications usually termed 'the comforts of life,' besides many luxuries that are beyond the reach of people of humble fortune. Few persons, indeed, are insensible to the difference of mere animal existence, as enjoyed by the farmer who passes his days in the healthful labors of the field, and that of the mechanic or the shopkeeper, who wear away their lives at the loom or the counter; but it is not in that alone that the advantage consists.

Of all the feelings which we cherish, none is dearer to us than consciousness of independence; and this, no man who earns his bread by the favor of the public, can be said to enjoy in an equal degree with the farmer. Traders, as well as those termed professional men, are rivals, jealous of each other's success, and, let that be what it may, they still owe a deference to the world that is often galling to their spirit. But the farmer fears no competition. Individually, he has nothing to apprehend from the success of his neighbor; he solicits no preference; and he owes no thanks for the purchase of his wares. His business, though subject to more casualties than almost any other, is yet so divided among many risks, that he is rarely exposed to the hazard of total failure; the same weather which injures one crop, often improves another, and the very difficulty of a critical season opens a field for exertion by which he is frequently a gainer.* Possessing on his land all the means of life, he is under no corroding anxiety regarding his daily subsistence; he is removed from those collisions of interest and those struggles for precedence which rouse the worst passions of our kind; and his constant observation of the beneficent dispensations of nature for the care of all her creatures, can hardly fail to impress him with a deep sense of that religion of the heart, which consists in the conviction of, and reliance upon, the care of an all-ruling and all-bountiful Providence.

Nothing tends more to enlarge the mind, and to extend the sphere of our rational pleasures, than the contemplation of the economy of nature; and to those whom fortune has placed above considerations of pecuniary advantage, but who set a due value on intellectual enjoyment, the study of agriculture offers an inexhaustible fund of amusement, as well as instruction. The same objects, seen under different aspects, present an infinite variety of feature, and the most slender stock of appropriate knowledge, if aided by habits of observation and research, may be eminently useful in ascertaining facts hitherto unknown or unrecorded, and in thus illustrating a science which, however sedulously it has been explored, still opens a wide field for inquiry; while, even if not fortunate in the attainment of any material benefit, the mere occupation of the mind in tracing the origin and progress of any novel improvement, will be found productive of the purest gratification. It has been well observed by Sir Humphrey Davy, that the frequent failure of experiments, conducted after the most refined theoretic views, is far from proving the inutility of such trials; one happy result, which can generally improve the method of cultivation, is worth the labor of a whole life, and an unsuccessful experiment, well observed, must establish some truth, or tend to remove some prejudice.

The principles of gardening and of agriculture (confining the latter to tillage only, instead of the more extensive sense in which it is commonly understood) are nearly similar; both are directed to the cultivation of vegetable productions, and the only material distinction is, that the former embraces a large range, extending indeed, through the aid of artificial heat, to the whole vegetable creation, and demanding more minute and scientific arrangement, with closer attention—while the latter is conducted on a broader scale, and is necessarily limited to those plants which flourish in the open air.

Through these arts, many herbs that were for ages regarded as weeds, and others that were exotic, are now cultivated among the most valued, as well as the most common of our esculent vegetables; while several of those now grown in the fields were, at no very distant period, either little known, or considered as garden delicacies, and exclusive confined to the tables of the rich. There is still extant an ancient manual of cookery, entitled, '*The Forme of Cury*,' supposed to have been compiled about the year 1390, by the master cooks of King Richard II., in which, although elaborate directions are given for the preparation of '*cubaches*,' no mention is made of any other vegetables, except peas and beans, onions, leeks, and rapes; which latter were probably a species of turnip. Hume, indeed, tells us, that, 'it was not until the end of the reign of Henry VIII. that any sallads, turnips, or other edible roots, were produced in England; the little of these vegetable that was used being imported from Holland and Flanders, so that Queen

* "In twenty-four years' experience, upon a considerable scale, I always made the most money in difficult seasons."—*Pitt's Survey of Leicestershire*, page 53.

Catherine, when she wanted a sallad, was obliged to despatch a messenger thither on purpose.' Still later, we learn from an entry, dated in 1595, in the household book of the Cliffords, kept at Skipton Castle, in Yorkshire, that eleven shillings (a large sum in those days) were paid '*for vi cabishes and some caret-roots, bought at Hull.*'—a seaport at the distance of full eighty miles: from which we may presume that they were imported, and purchased for some very particular occasion. In the commencement of the seventeenth century, one of the commonest of our present esculents, the potato, was regarded as so great a rarity, that it was only served in small quantities, and at the price of two shillings the pound, at the Queen's table: it was for a long time treated as a fruit, baked in pies with spices and wine, or eaten with sugar: and nearly two hundred years elapsed, from its first introduction into this country, before it was cultivated as a field crop.

Since that time, through the progress of botanical science, and the efforts made for the improvement of horticulture, many productions of the south have been naturalized in this country, and the introduction of the hot-house has made us familiar with the rarest exotics. Still, various foreign vegetables remain strangers to our culture, though adapted to our climate, and even some, which are indigenous to our soil, have not yet been brought into use, or are only slowly obtaining attention. It is not, indeed, to foreign nations alone that we are to look for new species of plants. Those which we already possess becomes so improved by cultivation, that new varieties of the same race are constantly produced, until at length, by continued meloration, the parent stock is either lost, or neglected, and a new generation is created. Thus it has been supposed that not one of the numerous kinds and varieties of fruit, now found in our gardens and orchards, are what they were in their aboriginal state, and several appear to be absolutely new formations, the offspring of accident, or skill, rather than the spontaneous productions of nature. We are even ignorant of the native country, and existence in a wild state, of some of the most important of our plants; but we know that improved flowers and fruits are the necessary production of improved culture, and that the offspring, in a greater or less degree, inherits the character of its parent; the austere crab of our woods has been converted into the golden pippin, and the numerous varieties of the plumb can boast no other parent than our native sloe. Thus also, notwithstanding the attention bestowed by the ancients on the products of their gardens, and the probability that they were acquainted with a great proportion of the vegetables still in use, yet botanists find it difficult to reconcile the generic qualities of many plants, as they are described by the Greek and Roman authors, with the properties of those of the same species with which we are acquainted; we may, therefore, confidently infer, that an ample and unexplored field for future discovery lies before us, in which nature does not seem to have placed any limits to the success of our labors, if properly applied.

If the faculty of increasing the stores which nature has already provided for his support, raises man above the brute, that of adding new productions to those in existence raises him above his fellow, and few subjects of contemplation can be more gratifying, or more elevating, to a reflective mind, than this power, as it were, of creation, granted to his intelligence and industry. Nor is it necessary to its enjoyment that we should be either botanists or natural philosophers; or that we should devote more than occasional leisure to the pursuit. So boundless, indeed, is the scope which it affords for experiment, that it is in the power of any one, possessed of the smallest garden, and the least acquaintance with horticulture, so to improve the qualities of its products, as to add something to the common stock of botanical riches, while enjoying a very delightful recreation. While the farmer, who will take the pains to mark the progress of his crops, and to select from them the most productive ears of corn, and the finest roots and grasses, for seed, may, by perseverance in such a plan, not only acquire wealth for himself, but confer an inestimable benefit on his country.

But it is not to the patriotism of the farmer that we appeal. That is a motive called into operation only on great occasions; it governs none of the common actions of life, and has no influence over ordinary minds: neither is it necessary to our purpose. Self interest alone is a sufficient inducement to most men to exert themselves in their peculiar walk, and, if properly directed, it accomplishes the object of society as well as if they were swayed by higher principles of conduct. We, therefore, only mean to call attention to the fact, that, when pursued with skill and assiduity, husbandry offers one of the surest sources, not merely of independence, but of fortune: in proof of which assertion, numberless instances could be adduced of men now living in affluence, acquired solely by farming, as well as of others who have left large property to their heirs.

Among the latter, Bakewell stands foremost—not so much for the fortune which he realized, as for the important results of his experiments, as a breeder, both to the public, and to his numerous followers; inasmuch as the improvements which he effected in live-stock, or to which his example has led the way, have contributed largely to the increase of animal food, and opened a branch of farming as novel as it has proved lucrative. Efforts had, indeed, been made before his time, to improve the different breeds; but they were comparatively feeble and ill-judged, until his penetration discovered the defects of the former system. He observed, that the moderate-sized, compact, small-boned animals were generally in the best condition: he, therefore, endeavored to improve these desirable points, and to remove what he deemed blemishes: until, by slow degrees, but with great judgment and perseverance, he produced those varieties, of both cattle and sheep, which have since been distinctively termed, from his place of residence, the '*Dishley breeds.*' Such was his success, that, in one season, he received twelve hundred guineas for the hire of three rams, and two thousand for the use of seven; and, during several successive years, he never obtained less than three thousand for his entire letting. The spirit of emulation thus excited, and since so widely spread, gave rise to a singular division of labor among the sheep-breeders, who, until then, had usually been contented with the rams bred in their own flocks; but, from that period, it became a speculation to breed rams for the purpose of hiring them out. Some of these have been let so high as five hundred pound for the season: one, the property of Mr. Buckley, was hired, in 1811, at a thousand; and, as the system has been extended from the Leicester to all the other favorite stocks, many of the '*Tup-masters,*' as they are called, have profited largely by the innovation. Equally extraordinary prices have been given for cattle of superior quality; and it will be remembered, that a Durham bull—*Comet*—belonging to Mr. Charles Colling, of Ketton, was actually sold, by public auction, for a thousand guineas.

Of Bakewell's immediate disciples, the Messrs. Culley, of Northumberland, were the most distinguished. They were among the foremost promoters of all agricultural experiments: and their superior intelligence, unremitting industry, and judicious application of the capital they gradually acquired, enabled them—from small original means—to leave their respective families each in the enjoyment of landed property to the amount of nearly four thousand pounds per annum, besides having largely contributed to the welfare of the surrounding country.

To these examples must be added, that of one, less known perhaps, but not less worthy of imitation. The late Mr. Dawson, of Frogden, in Roxburghshire, was the son of a farmer in moderate circumstances. He was born in 17?4; and afer having assisted his father during some years, and having also obtained an insight into the English mode of farming, in Yorkshire and Essex, he took the lands of Frogden, and there commenced the plan of growing alternate crops of grain and grasses, or roots, and particularly of turnips, which he cultivated according to Tull's method. He was also the first to introduce the Norfolk mode of ploughing, with two horses abreast, into that part of the country; and, by perseverance in the prosecution of these improvements, he lived, not only materially to advance the husbandry of the neighboring district, but also to purchase a considerable estate, and to leave a numerous family in very great affluence. He is described by his biographer, as having been "exceedingly regular in his habits, and most correct and systematic in all his agricultural operations. His plans were the result of an enlightened and sober calculation, and were persisted in, spite of every difficulty and discouragement, till they were reduced to practice. Every one who knows the obstacles that are thrown in the way of all innovations, in agriculture, by the sneers and prejudice of obstinacy and ignorance, and not unfrequently by the evil offices of jealousy and malevolence, must be aware, that none but men of very strong minds, and of unceasing activity, are able to surmount them: but such a man was Mr. Dawson." Yet this, however praiseworthy, is only the character by which every man of business should be distinguished: it displays none of that high talent which is the gift of nature, and may, deter, if not defy imitation; nor any of those great acquirements which are only to be attained by deep study and laborious research. Mr. Dawson's success was the simple result of the discernment with which he had adopted the improvements of others, combined with the application of good sense, observation, and persevering assiduity, to an object which requires no extraordinary ability; and it surely is in the power of every man of plain understanding, and equal determination in the same pursuit, to follow in his footsteps, if not to attain equal eminence. He must, however, divest himself of prejudice, nor reject improvements merely because they are innovations on the practice of his grandfather. Not that a farmer should try every new experiment that is proposed, far less adopt any novel plan without due consideration. But if, after having weighed its advantages and disadvantages, with its applicability to the soil and means at his command, the former should appear to predominate—then let him afford it a fair trial; and let him recollect, that if a short cut to fortune sometimes lead a man astray, yet no one ever arrived at distinction by slavishly following the beaten track.

It is, indeed, deeply to be lamented, that such distinguished examples have not been more generally followed. Notwithstanding the acknowledged stride which agriculture has made in this country within the last half century, yet no science has been slower in its progress towards perfection; and even admitting numberless existing instances of intelligence and spirited management among farmers of the higher class, it is still an undeniable fact, that the great mass are men of a very opposite description. Brought up without sufficient education to enable them to comprehend the first principles of their art, acquiring it mechanically, as a mere trade, and either too dull or too indolent to seek information from books, they reject every proposed improvement as the visionary schemes of mere theorists, and even neglect them after their value has been proved by experience. Thus they invariably pursue the same routine they have learned in their youth, and adhere, with the obstinacy of satisfied ignorance, to obsolete customs, as detrimental to their own interest as to that of their landlords and of the public; and thus it is, that the average produce of many parts of the kingdom is below, that of other districts of not greater natural fertility, and that the husbandry of the South, though more favored by climate, is generally inferior to that of the North.

It is too true, that this jealousy of written information has been in a great measure justified by many crude publications of inexperienced persons, and that the sneers of practical men at what they contemptuously call "*Book farming*," are not wholly groundless. Much injury has been done to the cause of agriculture by sanguine speculations, which have only led to expense and disappointments; but all works on agriculture are not of that character; nor should it be forgotten, that theory is the parent of practical knowledge, and that the very systems which farmers themselves adopt, were originally founded upon those theories which they so much affect to despise. Neither can it be denied, that systems grounded upon theory alone, unsupported by experiment, are properly viewed, with distrust; for the most plausible reasoning upon the operations of nature, without accompanying proof deduced from facts, may lead to a wrong conclusion, and it is often difficult to separate that which is really useful from that which is merely visionary. The art of husbandry depends so much upon patient observation and the test of repeated trial, and is influenced by so many casualties beyond our control, that it would be rash to adopt any general rules as invariably applicable to the endless varieties of season, soil, and incidental circumstances. Prudence, therefore, dictates the necessity of caution; but ignorance is opposed to every change, from the mere want of judgment to discriminate between that which is purely speculative, and that which rests upon a more solid foundation.—*Introduction to British Husbandry.*

CULTURE OF THE CUCUMBER.

I will state a fact relative to the planting of cucumbers which came under my observation, and which is worthy of being known. I shall at least give a further trial myself of its reality; though I cannot conceive there is a doubt remaining on the subject. Last spring, a friend of mine and myself were planting cucumbers at the same time. I was planting mine, as is usual, in gardens, by mixing a small portion of stable manure with the earth, and raising the hill an inch or two above the surface of the ground. Observing it, he jocosely remarked, "Let me show you how to raise cucumbers!" Never having much luck in raising them, I cheerfully agreed to his proposition. He commenced by making holes in the earth, at the distance intended for the hills, that would hold about a peck—he then filled them with dry leached ashes, covering the ashes with a very small quantity of earth. The seeds were then planted on a level with the surface of the ground. I was willing to see the experiment tried, but had no expectation of any thing but a loss of seed, labor and soil. But imagine my astonishment, (notwithstanding a drier season never was known, and almost a universal failure of garden vegetables,) when I beheld vines remarkably thrifty, and as fine a crop of cucumbers as any one need wish to raise, and continued to bear for a very long time, unusually so in fact. I will not philosophize or moralize on this subject, but say to all, try it—and instead of throwing your ashes in a useless heap to stumble over, near your door, put them to a proper use and reap your "rich reward."—*Ohio Farmer.*

SCHOOL DISTRICT LIBRARIES.

An Act relating to Public Instruction.

§ 1. The taxable inhabitants of each school district in the state, shall have power when lawfully assembled at any district meeting, to lay a tax on the district, not exceeding twenty dollars for the first year, for the purchase of a district library; consisting of such books, as they shall in their district meetings direct; and such further sum as they may deem necessary for the purchase of a book case. The intention to propose such a tax shall be stated in the notice required to be given for such meeting.

§ 2. The taxable inhabitants of each school district shall also have power when so assembled in any subsequent year, to lay a tax not exceeding ten dollars in any one year for the purpose of making additions to the district library.

§ 3. The clerk of the district, or such other person as the taxable inhabitants may, at their annual meeting, designate and appoint, by a majority of votes, shall be the librarian of the district, and shall have the care and custody of the library, under such regulations as the inhabitants may adopt for his government.

§ 4. The taxes authorized by this act to be raised, shall be assessed and collected in the same manner as a tax for building a school-house.

Demand for Cocoons.—Judging from appearances, the demand for cocoons and reeled silk, the coming season, will exceed the supply in a thousand fold. The silk manufactories in Dedham Mansfield and this city, are depending principally upon the new crop for the raw material. The last year's crop is already exhausted, and we understand that scarcely a bale of foreign silk can be found in the commercial cities. Those, therefore, who raise a crop this season may depend on its being sought for by the manufacturers and at a very liberal price. We should not be surprised if they commanded $4 a bushel. Such persons, therefore, as have foliage, will do well to make cocoons, if they are not prepared for reeling. —*Silk Culturist.*

Young Men's Department.

On the Pleasures and Enjoyments connected with the Pursuits of Science. (Continued from page 160, vol. 1.)

It is true, indeed, that the study of some of the subjects above mentioned, particularly the first principles of mathematics, may, in the onset, be attended with some difficulties, and to some minds may wear a dry and uninteresting aspect. But as the mind proceeds onward in its progress, and acquires clear conceptions of what at first appeared difficult or obscure—every difficulty it is enabled to surmount gives a new relish to the subject of investigation, and additional vigor to the intellect, to enable it to vanquish the difficulties which still remain,—till at length it feels a pleasure and an interest in the pursuit, which no difficulties, nor even the lapse of time, can ever effectually destroy. "Let any man," says Lord Brougham, "pass an evening in vacant idleness, or even in reading some silly tale, and compare the state of his mind when he goes to sleep or gets up next morning, with its state some other day when he has passed a few hours in going through the proofs, by facts and reasoning, of some of the great doctrines in Natural Science, learning truths wholly new to him, and satisfying himself by careful examination of the grounds on which known truths rest, so as to be not only acquainted with the doctrines themselves, but able to show why he believes them, and to prove before others that they are true: he will find as great a difference as can exist in the same being,—the difference between looking back upon time unprofitably wasted, and the time spent in self-improvement; he will feel himself in the one case listless and dissatisfied, in the other comfortable and happy; in the one case, if he do not appear to himself humbled, at least he will not have earned any claim to his own respect; in the other case, he will enjoy a proud consciousness of having by his own exertions become a wiser, and therefore a more exalted creature."

The subjects to which I have now adverted may be considered, not merely in reference to the gratification they afford to the understanding, but likewise in reference to *the beneficial influence they would produce on the heart, and on social and domestic enjoyment.*

All the truths relative to the Creator's operations in the universe, when properly contemplated, are calculated to produce a powerful and interesting impression upon the affections. Is a person gratified at beholding *symmetry* and *beauty* as desplayed in the works of art,—what a high degree of delightful emotion must be felt in surveying the nice and beautiful arrangements of Infinite Wisdom, in the variety of forms, the nice proportions, the exquisite delicacy of texture, and the diversified hues which adorn the vegetable kingdom,—in the colors of the morning and evening clouds of a summer sky, the plumage of birds, the admirable workmanship on the bodies of insects, the fine polish of sea-shells, the variegated wavings and colorings of jaspers, topazes and emeralds, and particularly in those specimens of Divine mechanism in insects, plants, and flowers, which the unassisted eye cannot discern, and which the microscope alone can unfold to view! Has he a taste for the *sublime?* How nobly is he gratified by an enlightened view of the nocturnal heavens, where suns unnumbered shine, and mighty worlds run their solemn rounds! Such contemplations have a natural tendency, in combination with Christian principles and motives, to *raise the affections* to that Almighty Being who is the uncreated source of all that is sublime and beautiful in creation,—to enkindle the fire of *devotion*,—to excite *adoration* of his infinite excellencies, and to produce *profound humility* in his presence. Such studies likewise tend to preserve the mind in calmness and *serenity* under the moral dispensations of Him whose wisdom is displayed in all his arrangements, and whose "tender mercies are over all his works,"—and to inspire it with *hope* and confidence in relation to the future scenes of eternity, from a consideration of his power, benevolence, and intelligence, as displayed throughout the universe, and of the inexhaustible sources of felicity he has it in his power to distribute among numerous orders of beings throughout an immortal existence. Contemplating the numerous displays of Divine munificence around us—the diversified orders of delighted existence that people the air, the waters, and the earth, the nice adaptation of their organs and faculties to their different situations and modes of life, the ample provision made for their wants and enjoyments, and the boundless dimensions of the Divine empire, where similar instances of beneficence are displayed—the heart is disposed to rest with confidence on Him who made it, convinced that his Almighty power qualifies him to make us happy by a variety of means of which we have no adequate conception, and that his faithfulness and benevolence dispose him to withhold no real good "from them that walk uprightly."

Such studies would likewise tend *to heighten the delights of social enjoyment.* There is nothing more grating to the man of intelligence than the foolish and trifling conversation which prevails in the various intercourses of social life, even among the middling and the higher circles of society, and in convivial associations. The ribaldry and obscenity, the folly and nonsense, and the laughter of fools which too frequently distinguish such associations, are a disgrace to our civilized condition, and to our moral and intellectual nature. Without supposing that it will ever be expedient to lay aside cheerfulness and rational mirth, the lively smile, or even the loud laugh, it is surely conceivable, that a more rational and improving turn might be given to general conversation than what is frequently exemplified in our social intercourses. And what can we suppose better calculated to accomplish this end than the occasional introduction of topics connected with science and general knowledge, when all, or the greater part, are qualified to take a share in the general conversation? It would tend to stimulate the mental faculties, to suggest useful hints, to diffuse useful information, to improve science and art, to excite the ignorant to increase in knowledge, to present interesting objects of contemplation, to enliven the spirits, and thus to afford a source of rational enjoyment. It would also have a tendency to prevent those shameful excesses, noisy tumults, and scenes of *intemperance* which so frequently terminate our festive entertainments. For want of qualifications for such conversation, cards, dice, childish questions and amusements, gossiping chit-chat, and tales of scandal are generally resorted to, in order to consume the hours allotted to social enjoyment. And how melancholy the reflection, that rational beings, capable of investigating the laws and phenomena of the universe, and of prosecuting the most exalted range of thought, and who are destined to exist in other worlds, throughout an endless duration—should be impelled to resort to such degrading expedients, to while away the social hours!

Domestic enjoyment might likewise be heightened and improved by the studies to which we have adverted. For want of qualifications for rational conversation, a spirit of listlessness and indifference frequently insinuates itself into the intercourses of families, and between married individuals, which sometimes degenerates into fretfulness and impatience, and even into jars, contentions, and violent altercations; in which case there can never exist any high degree of affection or domestic enjoyment. It is surely not unreasonable to suppose, that were the minds of persons in the married state possessed of a certain portion of knowledge, and endowed with a relish for rational investigations—not only would such disagreeable effects be prevented, but a variety of positive enjoyments would be introduced. Substantial knowledge, which leads to the proper exercise of the mental powers, has a tendency to meliorate the temper, and to prevent those ebullitions of passion, which are the results of vulgarity and ignorance. By invigorating the mind, it prevents it from sinking into peevishness and inanity. It affords subjects for interesting conversation, and augments affection by the reciprocal interchanges of sentiment and feeling, and the mutual communication of instruction and entertainment. And in cases where malignant passions are ready to burst forth, rational arguments will have a more powerful influence in arresting their progress, in cultivated minds, than in those individuals in whose constitution animal feeling predominates, and reason has lost its ascendency. As an enlightened mind is generally the seat of noble and liberal sentiments—in those cases where the parties belong to different religious sectaries, there is more probability of harmony and mutual forbearance being displayed, when persons take an enlarged view of the scenes of creation, and the revelation of the Creator, than can be expected in the case of those whose faculties are immersed in the mists of superstition and ignorance.

How delightful an enjoyment is it, after the bustle of business and the labors of the day are over,—when a married couple can sit down at each corner of the fire, and, with mutual relish and interest, read a volume of history or of popular philosophy, and talk of the moral government of God, the arrangements of his providence, and the wonders of the universe! Such interesting conversations and exercises beget a mutual esteem, enliven the affections, and produce a friendship lasting as our existence, and which no untoward incidents can ever effectually impair. A Christian pastor, in giving an account of the last illness of his beloved partner, in a late periodical work, when alluding to a book she had read along with him about two months before her disease, says, "I shall never forget the pleasure with which she studied the illustrations of the Divine perfections in that interesting book. Rising from the contemplation of the variety, beauty, immensity and order of the creation, she exulted in the assurance of having the Creator for her father, anticipated with great joy the vision of him in the next world, and calculated with unhesitating confidence on the sufficiency of his boundless nature to engage her most intense interest, and to render her unspeakably happy forever."

In short, the possession of a large store of intellectual wealth would fortify the soul in the prospect of every evil to which humanity is subjected, and would afford consolation and solace when fortune is diminished, and the greater portion of external comforts is withdrawn. Under the frowns of adversity, those worldly losses and calamities which drive unthinking men to desperation and despair would be borne with a becoming magnanimity; the mind having within itself the chief resources of its happiness, and becoming almost independent of the world around it. For to the individual whose happiness chiefly depends on intellectual pleasures, retirement from general society and the bustle of the world is often the state of his highest enjoyment.

Thus I have endeavored briefly to illustrate the enjoyments which a general diffusion of knowledge would produce—from a consideration of the limited conceptions of the untutored mind, contrasted with the ample and diversified range of view presented to the enlightened understanding—from the delightful tendency of scientific pursuits, in enabling us to trace, from a single principle, an immense variety of effects, and surprising and unexpected resemblances, where we least expected to find them—from the grand and sublime objects it presents before us—from the *variety* of novel and interesting scenes which the different departments of physical science unfold—from the exercise of tracing the steps by which scientific discoveries have been made—and from the influence of such studies on the affections and on social and domestic enjoyment.

For want of the knowledge to which I have alluded, it happens that few persons who have been engaged in commercial or agricultural pursuits feel much enjoyment, when, in the decline of life, they retire from the active labors in which they had been previously engaged. Retirement and respite from the cares of business afford them little gratification, and they feel a vacuity within which nothing around them or within the range of their conceptions can fill up. Being destitute of a taste for intellectual pursuits, and devoid of that *substratum* of thought which is the ground-work of mental activity and of rational contemplation, they enjoy nothing of that mental liberty and expansion of soul which the retreats of solitude afford to the contemplative mind; and, when not engaged in festive associations, are apt to sink into a species of listlessness and *ennui.*

They stalk about from one place to another without any definite object in view—look at every thing around with a kind of unconscious gaze—are glad to indulge in trifling talk and gossip with every one they meet—and, feeling how little enjoyment they derive from their own reflections, not unfrequently slide into habits of sensuality and intemperance.

From what we have stated on this topic, it evidently appears that the pursuits of science are fitted to yield a positive gratification to every rational mind. It presents to view processes, combinations, metamorphoses, motions, and objects of various descriptions calculated to arrest the attention and to astonish the mind, far more than all the romances and tales of wonder that were ever invented by the human imagination.—When the pleasure arising from such studies are rendered accessible to all, human happiness will be nearly on a level, and the different ranks of mankind will enjoy it nearly in an equal degree. As true enjoyment depends chiefly on the state of the mind, and the train of thought that passes through it, it follows, that when a man prosecutes a rational train of thought, and finds a pleasure in the contemplation of intellectual objects, his happiness is less dependent on mere sensitive enjoyments, and a smaller portion of external comforts will be productive of enjoyment than in the case of those whose chief pleasure consists in sensual gratifications. When intellectual pursuits, therefore, shall occupy the chief attention of mankind, we may indulge the hope, that those restless and insatiable desires which avarice and ambition never cease to create, will seldom torment the soul, and that a noble generosity of mind in relation to riches will distinguish persons of every rank, and be the means of producing enjoyment wherever its influence extends.—*Dick.*

WHY SHOULD'NT A FARMER KNOW A THING OR TWO?

Why should not a farmer know more than other folks? They certainly ought to, for they have in this country more to do than others. They have to make more use of the powers or laws of nature than other folks;—they have to use the elements for tools—they are indeed practical chemists, (whether they are aware of it or not,) for they have to make use of the various substances which Nature gave them—they have to combine, separate, modify and change both simples and compounds. Their farm is at one and the same time a laboratory and a workshop, and in proportion as they operate in such a way as to afford the several elements of which the substances are composed, and upon which they are operating, to disunite or combine, will be their success. They depend upon the vegetable world for subsistence—their labor is among and upon the plants of the earth—why should they not know the proper name and nature of every tree and herb and plant? They have to contend with insects and animals—why should they not know the habits, and the natures of these as well or better than any other class of people? They have to work upon the earth—they have to put it in a condition to bear a good crop—they have to change the state of it and adapt it to the various purposes and crops—why should they not know more and better respecting the ingredients of their soil—the various mineral or fossil substances which they may find either upon their own or others' farms? They have to "discern the face of the sky," and watch the changes of the atmosphere, and regulate their movements in accordance to the changes of the weather, temperature, &c. Why should they not know as much or more of the composition of the air or atmosphere, and the science of meteorology than any other people? They must use tools or implements of labor. They must take advantage of the principles of mechanics and the application of mathematics to practical life. Is there any good reason why they should not know as much or more than others, respecting the science of mechanics or natural philosophy? In this country they have to contribute largely to the support and formation of the government, and upon them depends the election of rulers and law makers—why should they not understand the fundamental principles of national law—political science and political economy? They have to administer to the sickness of animals under their charge—heal wounds and restore health—why should they not perfectly understand comparative anatomy, at least, and also, physiology and the symptoms and treatment of diseases, as well as any others? Indeed so wide is the field of his labors, so numerous the objects with which he is connected, so various the operations which he has to perform, that we verily think that a farmer ought to be the most learned man upon earth. But can a man conquer or make himself perfectly familiar with every science and every thing? By no means—yet nevertheless he should have his mind so well stored with the general principles of all the sciences, that he can be guided by them when it becomes necessary to be more particular, and to know, when he employs a man devoted particularly to any one branch, whether he is competent to the task, and will discharge his duty to him with fidelity and precision.—*Maine Farmer.*

"The constant habit of enjoying good things is hurtful."—*Pub. Lec.* Nothing is more prejudicial to the health or constitution than a too great indulgence in luxuries. Use but do not abuse the good things of the world.

"The love of money increases with our wealth, and he who possesses the least in general wishes the least for it."—*Juvenal.*

THE CULTIVATOR—JULY, 1835.

TO IMPROVE THE SOIL AND THE MIND.

LOOK AHEAD!

Our northern farmers should be admonished, by the scarcity of cattle fodder, coarse grain and vegetables during the last spring, and by the inauspicious prospects of the season, to adopt extra means to provide for the coming winter. In this neighborhood, we may anticipate great loss in our wheat crop from the grain worm. In the south, particularly in Virginia, it is already ascertained that this crop will prove greatly deficient. Our Indian corn has been planted late, on account of the backwardness of the season; and the uncommon devastations of the grub and wire-worms have rendered it necessary to plant much of it a second time. Our meadows are unpromising, and the worms are doing much injury in them also. On the whole, we have reason to apprehend a scarcity, though even this apprehension, should it become general, will tend to economy and better management. The season will still admit of expedients to mitigate or to avert the anticipated evil. Some of these we will venture to enumerate, viz:

1. *Millet* may yet be sown, by those who can procure the seed. It may be sown broad-cast, at the rate of four to six quarts an acre, and harrowed in, on any tolerable soil; and though it may not mature its seed, if cut and cured will serve as an excellent winter fodder, and will yield at the rate of one or two tons the acre, according to the richness of the soil. It is cut and cured like hay.

2. *Turnips.*—These may be sown all this month, as a separate crop, or among Indian corn, at the last dressing. In open planting, and where the corn has partially failed, a considerable crop may be expected, and more particularly if the corn is cut and stooked, as our practice has uniformly been, as soon as the grain becomes glazed. The yellow Aberdeen keep best. The crop may be secured in pits, as directed for ruta baga, taking the precaution, *by all means,* of limiting the breadth of the pits to 2½ or 3 feet, and of giving vent holes for the rarified air to escape at the crown of the pile. They should be deposited in as dry a condition as possible.

3. *Corn stalks and husks.*—The ordinary value of these may be trebled or quadrupled as cattle fodder, by the mode we have often recommended in the Cultivator, particularly if they are cut small and steamed.

4. *Potatoes, pumpkins and apples.*—By husbanding these, and not permitting them to be wasted through carelessness, and by COOKING them for swine, a great saving of coarse grain may be made. Let it be remembered, that the value of these, for hog feed, is at least doubled by the process of cooking, intimately mixing them, and suffering the mass to become sour before it is fed out.

5. *Cut provender.*—We have the testimony of some of the most eminent horse and cattle managers in Great Britain and in the United States, founded on numerous and nicely managed experiments, that by cutting the straw and hay for our domestic animals, *a saving of more than fifty per cent* may be effected. The ordinary ration for a horse, is 28 lbs. of hay for 24 hours. It is found, that by cutting and mixing it with their grain, 8 to 12 lbs. will do as well as 28, fed in the ordinary way. But one fact is to be borne in mind—the feed must be given in mangers and not in racks. One-third to one-half of our hay is wasted, from the difficulty of masticating the long stocks, and from our slovenly mode of feeding it either on the ground, where much is trodden under foot and spoilt, or in illy constructed racks.

6. *Buckwheat,* though not a common crop with good farmers, may be a profitable one in 1835. It may be sown during the coming fortnight in the north. A new kind, denominated *Indian Wheat,* the seed of which is small, is represented to be superior in quality, and more productive, than the common kind.

BUDDING.

The effect of propagating choice fruit, about a farmer's premises is, figuratively, to grow the rose where only grew the thorn, and literally, to provide for one's family and friends, some of the choicest luxuries of life; and these luxuries far surpass those of a like kind which are purchased with money, because upon one's own trees, they may be permitted to attain their highest perfection, and because they are rendered more endearing by the personal care and labor which we bestow on their culture.

We now proceed, agreeable to our promise in the 2d No. of the Cultivator, to describe the mode of propagation by budding. This mode has several advantages over grafting. It is more readily performed, with fewer implements, less preparation, and with greater success; it does not injure the stock if unsuccessful, and the operation may be twice or thrice repeated the same year, as the season for its performance is protracted, for some one or other of the varieties, for some three months. Although July and August constitute the ordinary season for budding, the plum and the cherry may often be budded in the latter part of June, and the peach, apricot and nectarine as late as the middle of September. Youth may readily acquire the art, by a little practice, under the directions we are about to give; and we know a young lady who is an adept in it, and who practises it annually as a pleasant recreation, as well as a useful labor. We have often been treated with delicious peaches produced from the buds which she had inserted.

The first consideration is to provide stalks, if this provision has not already been made. Seeds may be collected the coming season, in almost every family. Those of stone fruit may be mixed with earth, or deposited in a hole in the garden, and in the autumn buried superficially in the earth, to expose them to the expanding influence of the frost; and in the spring those of the peach and plum that have not burst the shell should be cracked, and the whole sown in a well prepared seed bed. The cherries may be sown immediately after they are taken from the fruit, and the apple, pear and quince either in autumn or spring. All the kinds will generally grow the first season. If transplanted in June, and well treated, the peach will do to bud in September following, and the others in two and three years, if put into nursery rows, three feet apart, and a foot distant in the rows, and well taken care of. The same rule applies to plants as to animals: the better condition they are kept in while young, the more profitable they will become at maturity. Thus two or three roods of ground will suffice a farmer for a nursery of choice fruit, from which he may replenish his orchard and his garden at pleasure, and readily appropriate to his use every new variety which comes under his observation. No one will regret the trifling labor and attention which he has bestowed upon a little plantation of this kind, after he has began to realize the fruits of it. Ornamental shrubs and trees, to embellish the grounds about his buildings, may be added without cost, and with trifling labor.

A bud is an organized plant in embryo, with roots, branches and foliage, and like a seed, possesses individual vitality, capable of development and the reproduction of its species. The process of budding is the transferring this embryo plant from its parent tree to another tree, which must at least be of the same genus, if not of the same species. The apricot and nectarine may be, and generally are, budded upon the peach; the plum and the peach are budded on each other, and the pear and apple may be worked on the wild crab and hawthorn—and the former is put on the quince to produce dwarf trees. To render the transfer or budding successful, three things are requisite: 1. That the bud be in a proper condition to transfer; 2, that the stalk be in condition to receive and nourish it; and 3, that the transfer be skilfully made. The bud ought to be matured, i. e. of full growth, and yet not so hard and firm as to cause injury in separating it from its parent. The stock must peel freely, as this is necessary for the insertion of the bud, and indicates the presence of what is termed the cambium, which is the soft partially formed woody matter which underlays the bark, which will ripen into indurated wood—is the source of nourishment to the bud, and the bond of union between it and the stock. The operator must use precaution that he injures neither the bud, the bark nor the cambium, as these all exercise important offices in effecting the union; and he must withal take care to apply his ligatures properly. It will be seen from these remarks, that both the stock and the graft should be in a state of active growth, and the more vigorous the better, when the budding process is performed. It is also preferable to bud when the weather is cloudy, but not wet. Twigs for budding may be preserved for many days with care. They should be immediately divested of their leaves, but not wholly of their leaf-stocks or petioles, to prevent the exhaustion of moisture, and may then be wrapped in fresh grass, wet cloths, or with their butt ends preserved in moisture.

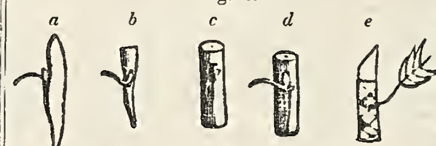
Fig. 1.

The only implement necessary is a budding knife, (fig. 1,) and the only preparation some bass matting, or the inner bark of the basswood or linden.

Prof. Thouin enumerates twenty species or varieties of grafting, most of which are only practised by amateurs and professional gardeners. We shall describe only the common mode, which is in general practice in nurseries. We take it from the Encyclopedia of Gardening.

"*Shield-budding*, or T budding, is thus performed:—Fix on a smooth part of the side of the stock, rather from than towards the sun, and of a height depending, as in grafting, on whether dwarf, half, or whole standard-trees are desired; then, with the budding-knife, make a horizontal cut across the rind, quite through to the firm wood; from the middle of this transverse cut, make a slit downward, perpendicularly, an inch or more long, going also quite through to the wood. This done, proceed with all expedition to take off a bud; holding the cutting, or scion, in one hand, with the thickest end outward, and with the knife in the other hand, enter it about half an inch or more below a bud, cutting nearly half way into the wood of the shoot, continuing it with one clear slanting cut, about half an inch or more above the bud, so deep as to take a part of the wood along with it, the whole about an inch and a half long; (*a* fig. 2) then directly with the thumb and finger, or point of the knife, slip off the woody part remaining to the bud; which done, observe whether the eye or germ of the bud remain perfect; if not, and a little hole appears in that part, it is improper, or as gardeners express it, the bud has lost its root, and another must be prepared. This done, placing the back part of the bud or shield between your lips, expeditiously with the flat haft of the knife separate the bark of the stock on each side of the perpendicular cut, clear to the wood, (*c*) for the admission of the bud, which directly slip down, close between the wood and bark, to the bottom of the slit, (*d*.) The next operation is to cut off the top part of the shield (*b*) even with the horizontal first made cut, in order to let it completely into its place, and to join exactly the upper edge of the shield with the transverse cut, that the descending sap may immediately enter the back of the shield, and protrude granulated matter between it and the wood, so as to effect a living union. The parts are now to be immediately bound round with a ligament of fresh bass, (*e*) previously soaked in water, to render it pliable and tough, beginning a little below the bottom of the perpendicular slit, proceeding upward closely round every part, except just round the eye of the bud, and continue it a little above the horizontal cut, not too tight, but just sufficient to keep the whole close, and exclude the air, sun and wet.

Fig. 2.



"*Future Treatment.*—In a fortnight at farthest after budding, such as have adhered may be known by their fresh appearance at the eye; and in three weeks all those which have succeeded well will be firmly united with the stock, and the parts being somewhat swelled in some species, the bandage must be loosened, and a week or two afterwards finally removed. The shield and bud now swell in common with the other parts of the stock, and nothing more requires to be done till spring, when, just before the rising of the sap, they are to be headed down close to the bud, by an oblique cut, terminating about an eighth or quarter of an inch above the shield. In some cases, however, as in grafting, a few inches of the stalk is left for the first season, and the young shoot tied to it for protection from the winds."

CALCAREOUS MANURES.

We have been reading with much interest, and we believe profit, "*Ruffin's Essay on Calcareous Manures,*" a copy of the second edition of which has been politely forwarded to us by the author. It is a pamphlet of 116 closely printed 8vo. pages—is sold by J. W. Campbell, Petersburgh, and Gideon B. Smith, Baltimore, booksellers, at 75 cents the copy, and by the author, at Shellbanks, Va. at a reduced price by the quantity.

Mr. Ruffin is a gentleman of chemical knowledge, a practical farmer, and editor of the Farmers' Register, a work replete with valuable information in rural affairs. He seems to be peculiarly fitted, by location, talents and persevering investigation, for the work he has furnished us; and we think he has succeeded in pointing out the defects which exist in a portion of our soils, and in suggesting the sure means of correcting them. We do not hesitate to say, that the pamphlet will prove a valuable acquisition to any farmer, who has a spark of ambition to better his practice, and we hope the author will meet the ample reward, in the sale of the work, which he justly merits, for his patient labors to improve the condition of our husbandry.

The work is divided into three parts, viz. 1, Theory; 2, Practice, and 3, Appendix. The second part details the author's experiments with calcareous manures upon his farm, and the results, for nearly twenty years. These go to sustain, we think pretty fully, the theory laid down in the first part. The lands upon which the experiments were made, are somewhat of the character of those which extend from the east end of Long-Island to Florida, upon the tide waters of the Atlantic; and, with the exception that they probably contain more clay, appear to be similar to what are denominated the Albany barrens, Kinderhook plains, and to a large portion of Saratoga county. The natural growth is pines, oaks and whortleberry bushes, and, when cleared, common sorrel; the soil is destitute of stones, and the earthy matters are, apparently a deposite from overflowing waters, at a remote period of time. The experiments were made with shell marl, containing 25 to 27 per cent carbonate of lime, mixed with sand.

We will remark here, that as the calcareous earth is the benefitting property of the marl, other calcareous earths may be substituted; and on sands, clay marls it is believed, if convenient, may be more profitably applied than shell marl, which latter does not often occur in the interior. Mr. R. gives the following classification of manures, *a* designating its strongest or most valuable agency, *b* the next strongest and so on.

"Substances which form manures, are either

"*Alimentary*, or serving as food for plants—as feathers, hair, woollen rags, pounded bones,(*b*) all putrescent animal and vegetable substances, as dung, stable and farmyard manures,(*a*) straw,(*a*) green crops ploughed in.(*a*)

"*Solvent* of alimentary manures,—as quick-lime,(*a*) potash and soap ley?(*a*) ashes not drawn?(*a*) paring and burning the surface of the soil.(*a*)

"*Mordants*—serving to fix other manures in soils,—as calcareous earth, including lime become mild by age,(*a*) chalk (*a*) limestone gravel,(*a*) wood ashes.(*b*) fossil shells,(*a*) marl (or calcareous clay),(*a*) old mortar.

"*Neutralizing* acids,—as all calcareous manures,(*b*) quicklime,(*b*) potash and soap ley,(*b*) wood ashes (*c*)

"*Mechanical*, or improving by altering the texture of soil—as all calcareous manures.(*c*) marl,(*b*) clay, sand, fermenting vegetable manures,(*b*) green manures.(*b*) unfermented litter.(*b*)

"*Stimulating*,—as nitre? common salt?

"*Specific*, or furnishing ingredients necessary for particular plants—as sulphate of lime, or gypsum, (for clover,) phosphate of lime, (for wheat,) in bones.(*a*) and drawn ashes.(*a*) salt?"

"*Calcareous earth*, or *carbonate of lime*," says Mr. R. "is *lime* combined with *carbonic acid*, and may be converted into pure or quick-lime by heat—and quick-lime, by exposure to the air, soon returns to its former state of calcareous earth. It forms limestone, marble, chalk and shells, with very small admixtures of other substances. Thus the term *calcareous earth* will not be used here to include either *lime*, in its pure state, or any of the numerous combinations which lime forms with the various acids, except that one *(carbonate of lime)* which is beyond comparison the most abundant throughout the world, and most important as an ingredient of soils. Pure lime attracts all acids so powerfully, that it is never presented by nature except in combination with some one of them, and generally with the carbonic acid. When this compound is thrown into any stronger acid, as muriatic, nitric, or even strong vinegar,—the lime being more powerfully attracted, unites with, and is dissolved by the stronger acid, and lets go the carbonic, which escapes with effervescence in the form of air. In this manner the carbonate of lime, or calcareous earth, may not only be easily distinguished by silicious, and aluminous earth; but also from all other combinations of lime." p. 9.

We mark another extract from p. 10, with the view of impressing upon the mind of the reader, the very important truths which it conveys, and which are seldom duly appreciated by the ordinary farmer.

"All earths, when as pure as they are ever furnished by nature, are enterely barren, as might be inferred from a description of their qualities [described in p. 9]: nor would any addition of putrescent manures enable either of the earths to support healthy vegetable life.

"The mixture of the three earths in due proportions, will correct the defects of all, and with a sufficiency of animal or vegetable matter, putrescent, and soluble in water, a *soil* is formed in which plants can extend their roots freely, yet be firmly supported, and derive all the needful supplies of air, water and warmth, without being hurt by too much of either. Such is the natural surface of almost all the habitable world: and though the qualities and value of soils are as variable as the proportions of their ingredients are innumerable, yet they are mostly so constituted, that no one earthy ingredient is so abundant, but that the texture of the soil is mechanically suited to some one valuable crop,—as some plants require a degree of closeness, and others of openness in the soil, which would cause other plants to decline or perish."

After describing the soil, the general characteristics of which we have mentioned, and the state of agriculture in the tide water district of Virginia, Mr. R. proceeds, in chap. 3, to describe the different capacities of soils for receiving improvement, in which he lays down the following propositions:

"Proposition 1. Soils naturally poor, and such soils reduced to poverty by cultivation, are essentially different in their powers of retaining putrescent manures; and under like circumstances, the fitness of any soil to be enriched by any manures, is in proportion to what was its natural fertility.

"2. The natural sterility of the soil of lower Virginia, (and of like soils elsewhere,) is caused by such soils being destitute of calcareous earth, and their being injured by the presence and effects of vegetable acid.

"3. The fertilizing effects of calcareous earth are chiefly produced by its power of neutralizing acids, and of combining putrescent manures with soils, between which there would otherwise be but little chemical attraction.*

"4. Poor and acid soils cannot be improved durably, or profitably, by putrescent manures, without previously making them calcareous, and thereby correcting the defect in their constitution.

"5. Calcareous manures will give to our worst soils a power of retaining putrescent manures equal to that of the best—and will cause more productiveness—and yield more profit than any other improvement practised in lower Virginia."

The defect in many of the pine lands in the interior, is not only the want of calcareous, but of argillaceous matter—clay: they lack the adhesive quality, which calcareous earth in a measure, but not sufficiently, supplies. The blue and the other clay marls, which are found, in many districts, to underlay the soil, offer, therefore, the most efficient means of improving our sands. We have occasionally, though not systematically, applied the blue clay, containing 25 to 30 per cent carbonate of lime, on literally blowing sand hills, at the rate of 3 to 4 hundred bushels, or 20 cart loads, to the acre, and the results fully sustained the high opinions of Mr. R. of the benefits imparted to these soils by calcareous applications. The soil has become more adhesive, sorrel has disappeared, and there is no longer the former marked difference in the products of the hill and the swale. We have often expressed the opinion, produced by these results, that a load of blue clay has been of more permanent benefit to some of our land than a load of putrescent manure. And in passing over the sandy plains which skirt the rich bottoms on the Connecticut river, we have thought that our blue clay was the material wanted to impart to them adhesiveness and fertility, with the aid, however, of putrescent manures which, after all, afford the only alimentary nourishment to plants.

Calcareous earth is an essential ingredient in all good soils, though much less of it is required than of sand or clay, and may therefore be artificially supplied at comparative small expense. From 20 to 40 cart-loads per acre of clay marl would double, if not quadruple, the value of our light sands. We hope soon to be able to detail some interesting experiments upon marling, by a gentleman of high standing.

In discussing the second proposition, Mr. Ruffin details the results of nineteen chemical examinations of soils, taken from different localities, all from situations which, from their proximity to calcareous rock, were supposed most likely to present highly calcareous soils. In only four of these experiments did he find any finely divided calcareous earth, and in these but in very small proportions. These experiments show the error of an opinion generally entertained, that the soil in limestone formations always abound in carbonate of lime. Where the limestone is hard, and in its natural beds, the debris, or pulverized portion, is often so minute as to form hardly a perceptible constituent. This fact explains the utility of the practice which prevails in Pennsylvania, as communicated to us by Dr. Darlington, of applying lime on lime-stone lands. The benefits of the application seem to be twofold: In the form of quick lime it operates as a solvent, and renders soluble the vegetable matter in the soil; and in that of a carbonate, or mild lime, it improves the soil mechanically, and increases its capacity for combining with, and preventing the waste of, putrescent manures. Mr. Ruffin also examined specimens of soils from the western and southern prairies, from localities abounding in shell marl, or soft and decomposing limestone. These gave an abundant proportion of carbonate of lime, and in some instances it existed in excess, so as to render the soils sterile.

In acid and neutral soils, Mr. Ruffin supposes that carbonate of lime may have originally existed, and that it may have been de-

* "When any substance is mentioned as *combining* with one or more other substances, as different manures with each other, or with soil, I mean that a union is formed by chemical attraction, and not by simple mixture. *Mixtures* are made by mechanical means, and may be separated in like manner; but *combinations* are chemical, and require some stronger chemical attraction to take away either of the bodies so united.

"When two substances combine, they both lose their previous peculiar qualities, or *neutralize* them for each other, and form a third substance different from both. Thus, if certain known proportions of muriatic acid, and pure or caustic soda, be brought together, their strong attraction will cause them to combine immediately. The strong corrosive acid quality of the one, and the equally peculiar alkaline taste and powers of the other, will neutralize or entirely destroy each other, and the compound formed is—common salt—the qualities of which are strongly marked, but totally different from those of either of its component parts."

composed, and the lime taken up, by the gradual formation of vegetable acid, until the lime and the acid neutralized and blanched each other, leaving no considerable excess of either. There are several of the vegetable acids, and among them the oxalic, which abound in sorrel, that have a stronger affinity for acids than carbonic acid, and when coming in contact with carbonate of lime, would of course decompose it and unite with the base. These acids, Mr. R. contends, are poisonous to cultivated crops. The burning of newly cleared lands is so essential to the first crop, that no good return is expected unless there has been "*a good burn,*" and spots of a new fallow which escape the fire are comparatively barren, until the soil has been broken up and ameliorated by atmospheric or other influence. The fire does not add to the vegetable matter in the soil; it diminishes it; but it produces some chemical change beneficial to the crop, either by the solvent quality of the ashes, which it produces, or by neutralizing some noxious property in the soil.

In discussing the 3d and 4th propositions, our author shows, that "silicious earths can have no power, chemical or mechanical, either to attract enriching manures, or to preserve them when actually placed in contact;" and that they "give out freely all they have received, not only to a growing crop, but to the sun, air and water, so as soon to lose the whole;" that "aluminous earth, by its closeness, mechanically excludes those agents of decomposition, heat, air and moisture, which sand so freely admits;" and that therefore although clay lands retain manure longer, they only retain it mechanically. The means by which calcareous earths act as improving manures, are, "*completely preserving putrescent manures from waste,* and yielding them freely for use;" —"their *power of neutralizing acids,*" and of "*altering the texture and absorbency of soils.*"

We will close our notice of this valuable work, for the present, with another extract, explaining the author's views of the operation of manures in the soil, which strongly inculcate the propriety of applying dung in its unfermented, or partially fermented state, of ploughing it in, and of cropping the ground with hoed plants, which come to maturity in autumn. We propose, however, unless admonished that we are trespassing upon the publisher's rights, to copy some of Mr. Ruffin's experiments with marl, to show to the readers of the Cultivator the positive and important benefits which have resulted from marling, and to serve as a guide in some measure to their practice.

"Except the very small proportions of earthy, saline and metallic matters that may be in animal and vegetable manures, the whole balance of their bulk (and the whole of whatever can feed plants,) is composed of different elements, which are known only in the form of *gases*—into which they must be finally resolved, after going through all the various stages of fermentation and decomposition. So far from sinking in the earth, these final results could not be possibly confined there, but must escape into the atmosphere as soon as they take a gaseous form, unless immediately taken up by the organs of growing plants. It is probable that but a small portion of any dressing of manure remains long enough in the soil to make this final change—and that nearly all is used by growing plants, during previous changes, or carried off by air and water. During the progress of the many changes caused by fermentation and decompostion, every soluble product may certainly sink as low as the rains penetrate: but it cannot descend lower than the water, and that, together with the soluble manure, will be again drawn up by the roots of plants. One exception, however, seems probable. Should the soil need draining, to take off water passing beneath the surface, the soluble manure might be carried off by those springs: and this supposed result receives strong confirmation from the complete loss of fertility which is often observed in spots over a foundation that is springy in wet seasons, but which have been kept under tillage, without being drained. We are as yet but little informed as to the particular changes made, and the various new substances successively formed, and then decomposed, during the whole duration of putrescent manures to the soil—and no field for discovery would better reward the investigations of the agricultural chemist. For want of this knowledge, we proceed at random in using manures, instead of being enabled to conform to any rule founded on scientific principles: nor can we hope so to manage manures with regard to their fermentation, the time and manner of application, mixing with other substances, &c. as *to enable the crops to seize every enriching result as soon as it is produced, and to postpone as long as possible the final results of decomposition*—which ought to be the ends sought in every application of putrescent manure."

We cannot close this brief notice, without asking the intelligent reader to reflect on the incalculable advantage of scientific husbandry, when combined with practical operations. Mr. Ruffin, we suspect, is self-taught in chemical science; and yet within his limited sphere of operations, he is teaching invaluable truths, mostly before unknown or unappreciated, to his countrymen, which ere long may, in all probability, lead to the addition of annual millions to the value of our agricultural products. If such benefits can result from the limited exertions of a single individual, who is able to devote to the subject but a portion of his time, what benefits might the community not expect from the united exertions of twenty such men, specially directed to the subject, in all the departments of husbandry—in a school of Scientific and Practical Agricultural—under the liberal patronage of the state, or of associated wealth?

HARVEST DRINKS.

Every man of practical experience, at least, knows that midsummer laborers in the harvest and hay-fields, must swallow a goodly quantity of liquids in the course of the day, to supply the exhaustion occasioned by copious prespiration. Ardent spirits are now proscribed by common consent and common usage: they inflame the blood, increase thirst, rouse and foster the worst passions, and are too often the cause of fixed habits of intemperance. To discover a good substitute is a desideratum. Pure water, in large quantities is rather debilitating, and withal often hurtful. Any considerable portion of molasses, either with water or small beer, is also too relaxing, without something additional to counteract this tendency. Our common practice for two seasons was to mix one part sound cider with three of water, and to add molasses, and sometimes ginger, to suit the palate. But last season, the cider being scarce, accident led to the adoption of a new harvest beverage, which we venture to say is surpassed by no other for the grateful and healthful influence upon the strength and spirits of the harvest laborer. A Scotchman, not liking our Yankee drinks begged a little oat-meal, that he might just make a wee bit o' Scotch drink. He was indulged; and by degrees, our Yankees, Irish and English, for we happened to have all these about us, became so partial to the Scotch drink, that it was adopted as the field drink by general acclamation. It is cooling, strengthening, and allays thirst—it is truly *victuals and drink.* A respectable Scotch farmer, residing in Montgomery, assured us, that during 18 months, while employed as a shepherd among the hills of Scotland, he took not a particle of other subsistence, than oatmeal and water, and almost entirely without any preparation—and that he never enjoyed 18 months more perfect health in his life.

Here then is an excellent substitute for ardent spirits, in the labors of the harvest, which may be accessible to all, and at trifling expense—promotive of health, strength and kind feelings. Oat meal is becoming an article of commerce; it is useful, in many ways, in the economy of a family, and may be readily kept by every farmer.

To make this *Scotch Drink,* denominated *Crowdy,* put a teacup full of oat-meal into two gallons of water, and stir well before drinking.

TICKS ON LAMBS.

When sheep have been shorn, the ticks, with which they are apt to abound, seek shelter in the fleeces of the lambs, or are destroyed by the shorn sheep. They are often so numerous upon the lambs as not only greatly to annoy them, but seriously to injure their health and their growth. The following effectual method to destroy them, has been detailed to us by Judge Bostwick, of Delaware co. whose statement may be implicitly relied on.

Finding his lambs, in former years very much injured by ticks, he procured 4 pounds of tobacco, boiled it in water,—put the strained liquor into a half-hogshead tub, diluted it with water till he found on trial that it had just sufficient strength to kill the ticks in a minute or two, placed an empty kettle by the side of the tub, and when cold, proceeded to apply it to the lambs, in the manner following: One man took the lamb by his fore legs and head, and plunged it into the liquid, leaving only his head out—he next raised it and held it over the empty kettle, when a second man pressed out of the fleece all the liquid which would flow into the kettle. This completed the operation. The liquor was then turned from the kettle into the tub, and the operation repeated upon the rest of the young flock. In shearing the present year the Judge discovered but two ticks upon his entire flock.

DISEASES OF THE POTATO.

In Great Britain the potato has been subject to a disease for years called the *curl;* but as it has never appeared in our country, we refrain from noticing its character, or the modes which have been suggested for its cure. More recently, and particularly the last season, great loss to the potato crop was experienced there from the seed rotting in the ground; and many speculations as to the cause, and the means of prevention, have been published in their agricultural periodicals. We have reason to believe that we have more or less the same cause of complaint. Our late planting last year of this crop, proved wretchedly defective, in consequence of four-fifths of the seed not growing, while those planted early throve as usual. The seed had been all cut early in May, but that planted late appeared to be defective, and the sets partially decayed. Among the many causes assigned for this evil, one in the "Irish Farmers' Journal," by Mr. Hinckley, appears to us to be the most rational, and his mode for prevention the most efficient. He says it is caused by animalcula, which swarm in the cut seed, and which ultimately destroy its germinating power; and that steeping the seed in salt and water destroys them. Of 34 acres under potatoes in 1832, a complete failure of the crop ensued, from this cause. This led to various experiments, all of which failed of being beneficial save that of soaking the seed in brine. In the seed which he had not immersed in brine, he could distinctly see, with the aid of a powerful microscope, many small white particles like eggs; and those cuts which he had immersed, presented no such appearance. This discovery impelled him to follow up the examination attentively; and every day for a short period, he continued to watch the appearance of the matter. The result was, that those white globular particles were animalcula, for in a few days they became quite visible to the naked eye in the form of maggots. The cuts that had been steeped never showed the slightest appearance of any such thing, and they retained their solidity and firmness when the other cuts were completely decayed and rotted.

An interesting experiment, *to preserve potatoes through the summer*, without destroying their vegetating principle, is published in the Edinburgh Quarterly Journal of Agriculture for March. M. De Lancy, in March, 1803, buried some potatoes of the preceding year's crop in his court yard, in a hole two and a half feet deep, under the protection of a south wall, where the sun shone but a short time in the day. On the 24th Jan. 1804, nearly eleven months afterwards, on examining them, he found, to his astonishment, that, two or three excepted which were perforated by the ground worm, though firm, they were all perfectly sound, without having in the least vegetated in any respect, fit for the purpose of planting and the use of the table, as he boiled some, and found them similar in taste and flavor to new potatoes.

This experiment, in connexion with others which we have seen noticed, goes to show, that it is the temperature, and not the season, which induces the sprouting of potatoes. The practical improvement which the facts suggest, is to exclude the potatoes which we wish to preserve for summer use from atmospheric influence and a warm temperature, in vaults, deep trenches or cool cellars. All vegetables keep best in a temperature a little above the freezing point. The potato, in particular, soon loses the fineness of its flavor, and becomes sodden, if stored in a warm cellar and exposed to the influence of the atmosphere. A farmer of Schoharie has been accustomed to bring fine Spitzenburgh apples to market on the 4th of July; and the method he adopts to preserve them to so unusually a late period, is simply, we are told, to keep them, after they are gathered, in a temperature as little above 32° as possible.

ECONOMY OF FODDER.

The editor of the Maine Farmer has an appropriate and excellent article on this subject. Quoting the adage that "experience is the best schoolmaster," he thinks the late scarcity of cattle food ought to admonish the farmer to prevent a repetition of the evil, 1, by economising their hay and straw by *cutting it* before they feed it to their stock; 2, by cultivating root crops more extensively; and 3, by not selling off their course grain until they know they will not want it themselves.

It has been demonstrated by repeated experiments, that a great saving of hay is effected by cutting it in the straw or hay cutter before it is fed out. It prevents waste—the whole being eaten and digested, and with less labor by the animal, when thus cut. In very many of the horse establishments in Great Britain, and even in our country, the custom of cutting feed has been adopted with great advantage. The ordinary ration of hay for a horse is 28 lbs.; and it has been found, that when cut and mixed with the daily provender, that from 8 to 12 lbs. of cut hay will answer as well as 28 lbs. uncut. Here then, with a little extra labor, which every farmer can bestow in winter, without loss, at least 50 per cent of a farmer's hay may be saved in seasons of scarcity; and this item, during the recent scarcity, would have amounted to no inconsiderable sum.

One word, at this time, upon our perhaps hackneyed topic of root culture, may exhibit its advantages in a favorable light. Our stock was fed with ruta baga daily till about the 24th May, when our store became exhausted; and we were consequently enabled to sell much hay, which but for these roots they would have required, and to obtain for it a high price. Now we consider 2 bushels of ruta baga better than a ration, or 28 lbs. hay, for any domestic animal; and by this estimate, the thousand bushels of roots, which we estimate to have fed out, has enabled us to sell seven tons of hay, which at $15 per ton, not deemed high during the spring, would bring the value of our roots to $105. Again—say the average product of hay is two tons the acre, and of ruta baga 600 bushels. By the estimate we have made of the ration, the acre of hay would keep an ox 143 days, and the acre of ruta baga 500 days. The hay ground would afford after feed or rouen; the ruta baga early feed till 25th June, or a cutting of clover hay. The difference in labor on the two crops would be in a measure equalized by the value of the turnip tops. With proper soil and implements, and after a little experience, the cost of ruta baga need not average, to the cultivator, over two to three cents the bushel. It is proper that we should express our doubt, whether this root will succeed well south of our state; the failure of Mr. Cox, of Burlington, N. J. and others, in their culture, has induced these doubts. In the north, however, this plant is at home, and will not fail to requite well for the labor bestowed in its culture.

A new machine for cleaning hemp is announced in the Edinburgh Quarterly Journal of Agriculture, which promises to supersede all others, and, if what is reported of it be correct, to render the hemp crop far more profitable than it has been hitherto. The machine is composed of two metal plates, supported by springs to modulate the compressure, and the hemp in passing through these plates undergoes a friction, and after passing through several rollers, is wholly divested of its glutinous matter, and is of a soft delicate fibre, which may, after being hackled, be spun and applied to the same purposes as the finest flax. The apprehension is, that strength must be sacrificed in obtaining fineness of fibre.

The young States of Ohio and Indiana, are setting a noble example to their elder sisters, in making legislative provision for the establishment of County Agricultural Societies. In the latter, a State Board of Agriculture is established, which we perceive by the papers of that state is actively engaged in the organization of county societies.

A correspondent at Goshen, sends us the following directions for making superior Indian *Johnny-cakes*, with a request that they may have a place in the Cultivator.

"Take one quart of milk, three eggs, one tea-spoonful salaratis, one tea-cup of wheat flour, and Indian meal sufficient to make a batter of the consistence of pan-cakes. Bake quick, in pans previously buttered, and eat warm with butter or milk. The addition of wheat flour will be found to be a great improvement in the art of making these cakes. Those who have not got eggs will find that it will do very well without.

Siberian Lyme-grass.—It is announced in the last Edinburgh Quarterly Journal of Agriculture, that this grass, recently introduced, promises to become a valuable acquisition to the farmer. It is a broad leaved, seemingly coarse grass, will grow in light soils, gives a very abundant product, and is eaten with avidity by all animals.

Animalized carbon, is the term applied to a new manure now employed in France and Denmark, and for the manufacture of which, a Frenchman has obtained a patent. It is sold at 35*s.* ($7.77) per ton. A Dane has sold 250 tons in Scotland.

The evils attendant on sloth are only to be conquered by attention to business.—*Seneca.* Without employment, the mind becomes relaxed and inert.

CORRESPONDENCE.

Wallingford, June 10, 1835.

Mr. EDITOR—A correspondent in your paper for June, inquires "*whether we have in this country any thing answering to the* PEAT *of the old world?*" to which you made a brief reply; but supposing that further particulars might not be without interest to many of your readers, I send you the following, to be disposed of as you deem best.

"*Peat,*" says Bakewell, (Geology, p. 329, 1st Am. Ed.) "though often classed with alluvial soils, *is evidently a vegetable production.*" "It accumulates," says Prof. Hitchcock, (Geol. Rep. Mass. p. 118,) "in the bottom of ponds, lakes, estuaries, &c. In this mud, various aquatic plants take root, and by their decay swell the deposite already made. At length the pulpy mass reaches the surface, when the sphagneous and other masses take root in it, along with various other plants, and by their gradual decomposition the pond or lake in the course of ages, becomes converted into a swamp or marsh." Thus are the materials furnished for a bed of peat.

The changes produced upon this accumulation of matter, in its transformation, are most clearly described by Dr. McCulloch, in his history of the Western Isles of Scotland. "The process," he says, "by which these vegetables are converted into peat, is most clearly seen in the *sphagnum*, (peat moss.) As the lower extremity of the plant dies, the upper sends forth fresh roots like most of the mosses, the individual thus becoming in a manner immortal, and supplying a perpetual fund of decomposing vegetable matter. The growth of peat keeps pace with the vegetable from which it is formed. When the living plant is still in contact with peat, the roots of the rushes, and ligneous vegetables, are found vascillating between life and death, in a spongy, half decomposed state. Lower down; the pulverized carbonaceous matter is seen mixed with similar fibres, still resisting decomposition. These gradually disappear, and at length, a finely powdered substance alone is found, the process being completed by the destruction of all the organized bodies." *(Dr. McC. p. 130, Bake. 33.)*

Such is a brief account of the origin, growth and nature of peat beds, and is applicable to all countries, though a predominance of any given species of plants, may vary its external aspect or affect its quality. "The best kinds, *(Jameson's Mineralogy, Shetland Isles,)* burn with a clear bright flame, leaving light colored ashes; but the more indifferent kinds in burning often emit a disagreeable smell, and leave a heavy red colored kind of ashes."

It is frequently kiln-dried, or rather charred, the mode of doing which, may be found at length in the Encyclopedia Americana—article *Fuel.*

In England, many of "the peat moors have disappeared before the genius of agricultural improvement," but in Scotland they are abundant at the present day, and the description of them by Prof. Jameson, is an accurate description of all peat moors. In some situations, peat increases with astonishing rapidity, overruning land depastured within the memory of man.

It abounds in Connecticut and Massachusetts, and I doubt not, in all the New-England States.

Peat, also possesses the power of preserving animal matter from putrefaction to a surprising degree. Fleshy parts of the Mastodon have been found in peat. *(Bake. p. 332.)*

In the *Philosophical Transactions* for 1734, Dr. Balgery gives an account of two human bodies preserved entire in peat for fifty-nine years.

I am, dear sir, respectfully yours, A. B. CHAPIN.

Knox, June 10, 1835.

J. BUEL—Dear Sir—I communicate to you my method of increasing the quantity of manure from the hog-pen. If you think an insertion in the Cultivator may be the means of aiding some farmer to profit by the practice, it is at your disposal.

I make a yard adjoining the hog-pen, equal to ten or twelve feet square for each hog, in which I deposite a layer, at least a foot thick, of black swamp earth, such as may be easily obtained in a dry time by almost every farmer. The hogs having a way to pass, deposite all their manure in the yard, which leaves the pen clean and healthy, a decided advantage in fattening hogs. If the yard becomes very muddy, I throw in litter. After the hogs are killed, I deposite another layer of the like earth, previously heaped, of about half the thickness of the former, and put up my store pigs to winter, which I think is far better than to suffer them to run at large. In the spring, I have a fine rich yard of manure, which I verily believe, when judiciously applied, pays more than a hundred per cent on all the expense. Yours respectfully, AMOS CRARY.

Tillage Husbandry.

EXTRACTS FROM LORAIN'S HUSBANDRY.

The texture of any soil is most advantageously altered by the roots and tops of the grasses, properly applied and ordered.

Grass lays, when properly applied and cultivated, are very productive, and enrich the soil far beyond what is generally supposed, or can in fact be accomplished by the usual practice. They also alter the texture of it so much, that it is capable of growing valuable crops, which were before opposed to its natural texture, and which could never have been profitably grown on it, until this alteration has been effected.

The judicious application of this vegetation, will often supersede the necessity of riding and under-draining.

If nature and reason had been sufficiently consulted in the practice of husbandry, it would have been generally known, that ploughing a considerable mass of vegetation under a sandy soil, will as effectually prevent an injurious evaporation of moisture from it, as the application of any other substance commonly used for that purpose, until the vegetation is decomposed.

The fertility of rich, sandy soils also determines, that an injurious evaporation of moisture from them, is greatly retarded, even by the enriching matter arising from the decomposition of the vegetable substances while it continues in the grounds. Hence it is, that we hear but little complaint of the sandy texture of soils, until these substances, and the fertilizing matter arising from the decomposition of them, have been considerably exhausted by an injudicious husbandry. On the contrary, we find that the renters of land generally prefer sandy soils, while they continue rich; the cultivation of such grounds is far less laborious than those of a firmer texture, and may be progressing, when continued rains have put a stop to the plough in soils that are more retentive of moisture.

It is also worthy of remark, that the nutriment arising from the vegetation ploughed under the soil, will greatly promote the vigor of the plants: also, that the close shade formed by this increased vegetation, is well calculated to defend the soil from the injurious influence of the sun and air; whereas the mixture of clay, &c. with a sandy soil, merely alters the texture of it.

Many gentlemen of distinguished talents fondly imagine, that alterations made by combining the different earths properly, will effect a more productive, as well as lasting improvement, than can be made in any other way; it will be found, however, that no combination of the simple earths, without the aid of animal or vegetable matter, can create a soil calculated for the efficient growth of plants: also, that after the animal and vegetable matter contained in this improved soil, has been exhausted, it, as well as the unimproved ground, will be unproductive. Plants cannot prosper in any soil, unless a sufficiency of nutriment has been provided for them. Still it is readily granted, that a happy mixture of the different earths greatly favors vegetation; but this cannot be obtained, where nature has not formed it, without great labor and expense. No fact is more obvious in our recent settlements, than that every soil well stored with animal and vegetable matter is productive, until these substances have been too much exhausted: also, that after this evil has been effected, the fertility of the exhausted soil is restored, so soon as a sufficiency of animal and vegetable matter has been incorporated with it. Why then should we encounter the enormous labor and expense of altering the texture of our grounds, by mixing other earths with them, when we can grow luxuriant crops, and gradually improve all the different soils, without having recourse to this Herculean task?

How ridges should be formed and cultivated in retentive soils.

The texture of stiff, retentive, clay soil, may be also as readily altered by grass lays; for (as has been before observed,) every furrow slice forms an under drain, more especially if a good crop of grass be turned under the sod. The vegetation thus applied, more effectually cuts off the communication between the cold clay underneath and furrow slice above: also furnishes a wider opening between the two to run off the moisture. This will frequently render ridging up useless, where it could not be dispensed with in the usual mode of cultivation; and often save the expensive practice, of draining in still moister soils: provided the grounds be formed into ridges of a suitable width, and the clearing out furrows be properly regulated and cleaned out. But this is not all, for the innumerable roots of the grasses divide the soil minutely. The fermentation of them expands and opens it, and their gradual decay not only greatly enriches it, but also furnishes an inconceivable number of hollows or cavities throughout its whole extent. These openings being equal to the length, thickness, and number of the roots of the grasses and weeds, they are well calculated to admit the ready progress of the roots of the growing plants through every part of the soil. This, together with the powerfully expanding force of fermentation, and the nutritive matter obtained by decomposition, forms a light, open, artificial bed, well prepared for the growth of plants. When the soil is thus ordered, they do grow luxuriantly, and produce abundantly: provided the succeeding cultivation be calculated to secure these very obvious advantages.

After the grounds have been prepared as above described, and the seed planted at a depth suitable to the economy of the plants, a level and superficial cultivation should follow, even when the soil is retentive of moisture. In case, however, of two much moisture for a level preparation of the lay, the sod should be properly ridged up at first. To prevent the middle of the ridge from being injuriously high, the two first furrows ought barely to meet each other in the centre of it.* As ridges are calculated to produce artificial droughts, the least possible declivity is best, especially as the under drains formed by the forrow slices, together with the clearing out furrows, will be found sufficient to run off the superfluous moisture. After the ridges have been formed, the roller should be used to sink those parts of the furrow slices that, by lying hollow, are raised above the rest. When this has been done, the seams between the furrow slices ought to be well closed with the tined harrow. If the sod be very compact, (which generally happens in retentive lays,) a much better preparation for planting is obtained, by running the hoe harrow once or twice through the soil, before the tined harrow is used The seams between the furrow slices will also be much better closed by this practice, as more loose earth will be obtained.

Care should be taken to keep the cleaning out furrows open during the cultivation of the crop This may be done by the plough going up and down them, in the same tract, unless the excess of moisture render it necessary to preserve their original width. As the inequality in the surface will often prevent the moisture from running from one end to the other of the furrow slices, it should, in that case, meet with no obstacle that would prevent its escape at the sides of the ridges, into the cleaning out furrows.†

In the cultivation for the small grain that follows the fallow crop, care should be taken to order the course of the hoe and tined harrows, in that way best calculated to reduce the ridges as near to the form of flat beds, as can be done by the harrow going lengthwise of the furrows: as when I shall hereafter describe the proper cultivation for wheat sown in the fall, it will clearly appear, that if the cleaning out or water furrows are not wider apart than half a perch, this crop will not suffer, when sown on flat beds; even if the soil is not only retentive of moisture, but also spouty or springy to a considerable degree. It is evident, that the rotundity of ridges is very injurious, unless the spring and summer happen to be unusually dripping; and quite as obvious that the sun cannot act equally on every part of them.

I am well aware, that ridges of not half this width have been used and recommended by enlightened cultivators. It, however, should be recollected that these gentlemen pursued a cultivation calculated uselessly to waste the animal and vegetable matter contained in the soil. The latter, before it sinks deep into decay, has a tendency to keep the soil open, by separating its parts, even when it is only mixed through it; but this is far better effected by forming under drains with the furrow slices, well stored with vegetation.

If the grounds be not laid down in grass, to be continued for two or more years, after one crop of grain is sown on them, red clover should be sown with the small grain that followed the fallow crop. This should be mowed but once the ensuing year, and the second crop turned under wheat, sown in the fall. In forming the flat beds for this crop, in grounds which have been ridged up, the ploughing ought to commence at the former cleaning out furrows. In this case, the water furrows will be formed in the middle of the former ridges or beds. Care should, however, be taken to put the two first furrows very closely together, or the beds will be lowest in the middle, which would be very injurious to the crop. The water furrows for this crop should also be well regulated, and properly cleaned out. As the ploughing for every succeeding round of crops will commence at the water furrows formed for the last cultivated crop, every fallow crop after the first may be grown on beds perfectly flat, or with a little rotundity, if this should be considered best.

The under drains formed by the furrow slices will not continue open, *long* after the cultivated crop sown on the clover lay is removed. Neither should they, for the cleaning out furrows will be found sufficient to carry off the superfluous moisture from these grasses; as they require much more of it than cultivated crops. Hence it is that dripping climates are considered the best for grass, and that crops of small grain, when sown in the fall, do not generally succeed well in such climates, unless proper provision be made to run off the excess of moisture.

Here I wish the reader to observe, that the level cultivation means nothing more or less, than that, after the crops have been planted, all ridging, hilling, or moulding up should cease.

The injury done by hilling, ridging, and moulding up plants is explained. as are also the advantages derived from a level and very superficial cultivation.

Hilling, ridging, and moulding up plants, must have originated in barbarism, or but a few removes from it; like the practice of planting fruit trees as though they were fence posts. The latter practice, however, has been abandoned by enlightened cultivators, and the former will share the same fate, when nature and reason are harmonized in the practice of husbandry. Hilling, ridging, and moulding up plants have been the too general practice of the world from time immemorial. It is, however, as much opposed to reason and observation, as it is to the economy of nature, and these ought to govern all our agricultural pursuits.

When the grounds have been properly prepared for planting, no possible good can arise from this inconsiderate practice; except when applied to celery, or other plants, which habit has rendered more palatable when blanched. The evils arising from it, however, are many and great: it compels the plants to form new sets of roots, so often as they happen to be ridged or hilled up. This is done at the expense of those already formed, as the roots of plants cease to perform their proper functions when buried too deep within the soil: thus the efforts of nature are diverted by the folly of man, to useless and very injurious purposes, instead of being applied to the growth and maturity of the crop.

If the soil be too thin and weak, or the habits of the plants too delicate to form repeated sets of roots readily, vegetation languishes still more, and the injury is greater. Hilling and ridging up plants, form furrows or gutters, exactly calculated to carry off the rains, and produce artificial droughts; yet so infatuating are long established practices, that the very obvious effects produced by them pass unregarded. Even sandy soils, which part with moisture too freely, under the best system of management that can be devised, are generally cultivated in this way. This very inconsiderate practice turns up the grass roots and dung, (if the latter has been applied,) and exposes them to the very injurious effects of the sun, wind, and rain: consequently scatters much of the nutriment in the air, which should be secured for the crops and improvement of the soil. Still we are told, that this is the proper way to "subdue the sod." This is not all, for the openings made by ridging up the plants, may be justly considered as main drains, communicating with innumerable avenues running in every direction through the ground, from which the moisture and confined air escape; and with them, the nutriment contained in the enriching matter buried in the soil. This checks fermentation and decomposition, and with them the exciting and nutritive principles arising therefrom. In fact, hilling and ridging up plants may be justly considered, as in direct opposition to nature and reason, and of consequence to good husbandry. Still it has remained in general practice, except where the intervals between the plants have been so limited, that man with all his ingenuity, could not devise means to effect the ruinous purpose, as in narrow drilled wheat, or turnips sown broad-cast, &c.

The level cultivation which has been recommended should be only sufficiently deep to extirpate weeds. The less the open, mellow, artificial bed prepared for the growth of the plants is disturbed, the better it is calculated to promote vegetation: also, to secure the riches contained in it for the following crops and the improvement of the soil. The skim, with a proper rake attached to the hinder part of it, will effect this purpose in very narrow intervals, and the hoe harrow, with the tined harrow following it, in wider, with much less labor than the common plough, except where stones, and stumps with superficial roots abound. There the shovel plough, (with a share but little more pointed than one-half of a circle,) should be introduced, until a better tool has been invented for this purpose.

The common plough cuts off, laps over, and mangles the roots of the plants in ridging them up. Although the soil is not diminished by this inconsiderate practice, the roots of the plants are confined in heaped up ridges. This compels them to take such unnatural directions that their prosperity is greatly abridged, particularly in narrow intervals, and in these the injury is most observable.

When this instrument is used for ploughing from and to plants, the roots on the sides of them next to the intervals are cut off. The gentlemen who recommended this practice must have seen its injurious effects by the paler complexion and very slow growth of the plants, until they recovered from the very manifest injury done to them by this truly barbarous operation.

If they had recommended the tops to be cut off at the same time, uniformity would have been better preserved, with the additional advantage that might be derived from a new set of tops as well as roots. The subject is really too ludicrous to be treated seriously. Still, gentlemen of great talents have recommended this practice: however, nature, reason, and practice united, clearly determine that the less plants are injured in the cultivation, the better: provided the cultivation be equally good; and it may be far better. Repeated ploughing and harrowing pulverize the soil, and leave it quite open and mellow. It, however, too soon, becomes compact, in consequence of the loss of the animal and vegetable matter exposed to useless waste by this injudicious practice, unless the soil be so rich as not to be materially affected by this very inconsiderate waste. Whereas, the fermentation of the animal and vegetable matter, when closely confined under the soil, will keep it continually open and mellow, for the ready admission of the roots of the plants.

We are told that cutting the roots increases the number of them, and that this multiplication of the roots greatly promotes the growth and prosperity of the plants. No question but that more branches will spring out from the stubs, after the roots have been cut off. It should, however, be recollected, that nature has formed the roots exactly to suit the economy of the plants, and that no possible good, but much evil, must arise from the ill judged attempts of man to improve the formation of them:

* See Low's directions for the best method.

† After very heavy rains, the plants standing in hollow parts of the field are sometimes very much injured, unless slight drains are formed by the hand hoe across the ridge where the water remains stagnant.

especially by mutilating them irregularly, as is done by the plough. The injury done by this practice is readily seen by the procrastination of the growth of the plants, until these new sets of roots are formed.

I have carefully pruned, and too often ruggedly mutilated annual plants, by various injudicious systems of cultivation; but evil, instead of good, invariably followed, except when I removed the suckers growing near to the roots of their parent stem, and believe that even this operation should be very carefully performed, and while the suckers are very young.

Still, I do not question that the gentlemen who recommended ploughing from and to plants, grew good crops in that way. It should still, however. be remembered that talents, capital, and industry, have often done this, when a highly interesting part of the management has been excessively bad.

The usual mode of cultivation is not well calculated to subdue weeds. The seeds are as often turned down beyond the power of vegetation, as they are turned up. They are also buried underneath the heaped up ridges, and when the grounds are cultivated for the small grain, they are spread abroad. As this favors the vegetation of them, they often greatly injure the crops. These facts are best seen when the grounds have been manured for a fallow crop, with dung made by cattle fed on clover hay. In that case, the seeds buried under the ridges often produce as luxuriant crops of this grass as if they had been sown. This does not happen when a level cultivation has been properly executed. It turns up none of the seeds that are buried beyond the power of vegetation. They of course remain torpid, and as those near the surface vegetate, they are destroyed.

I have before observed, nothing but fire, or some cause that acts in the same powerful way, will destroy the vegetative powers of plants, as soon, or so effectually, as a well directed fermentation. Numerous instances of the powerful effects produced by this simple operation of nature, might be advanced. I have already mentioned some of them; but as it may lead the farmer to recollect others, and prevent the injury caused by them, I will briefly observe, that if a long spell of rainy weather takes place after grass has been mowed, and the swaths be not turned in due time, both the tops and the roots of the grasses covered by them are sadly injured, and sometimes effectually killed, by the fermentation occasioned by this covering alone. It also but too often happens, that both small grain and grass plants are greatly injured, or destroyed, by the still much lighter covering of the leaves blown on them from adjacent woods; when a boy or a girl with a rake, timely used, could have prevented the injury.

Now, if fermentation alone be capable of doing this, when but partially favored, certainly vastly more is to be expected from this powerful agent, when its whole force is brought into full effect. No question but this is done when plants are turned upside down, and the vegetation arising from them regularly cut off a little within the surface of the soil by the hoe harrow, also overturned and effectually mangled by the tined harrow following it. The wounds inflicted on them, together with the close covering of earth above them, greatly promote fermentation, and of course hasten their destruction.

The reason why this powerful agent has not been brought into general use. seems to be simply this; farmers have not seen, when the tops and roots of the grasses, or other enriching manure are buried under the soil, and a proper cultivation pursued. that fermentation more effectually expands, divides, and keeps the grounds open and mellow than can be effected with the plough. We might, however, have long since seen the impropriety of the usual mode of cultivation, merely by walking through these parts of our woods which still remained well set with timber, and other native vegetation. There we might observe that our feet sunk freely into a soil, which nature had kept covered with leaves, and so effectually cultivated through the medium of this simple covering by fermentation alone, that the grounds were kept more open and mellow than our best cultivated fields: also, that the depth of this open texture was in due proportion to the animal and vegetable matter contained in the soil underneath the covering of leaves. We might likewise have seen that nature did not cut, rend, or mangle either the tops or the roots of the plants, and by this means debilitate, and procrastinate the growth of them, nor form hills or mounds around, nor furrows or ditches between them, to run off the moisture necessary to their growth.

There can be no difficulty in altering the present mode of cultivation. so as to save the farm yard manure, also that arising from the roots of the grasses; and at the same time, preserve the roots of the plants from injury by a level cultivation, when fallow crops are grown, or grass or clover lays alone. As peas and beans are frequently sown broad cast, and good crops of them are obtained in that way, they will certainly yield much larger crops, when kept free from weeds by a level cultivation.

Starch.—To make starch from wheat, the grain is steeped in cold water until it becomes soft and yields a milky juice by pressure; it is then put into sacks of linen and pressed in a vat filled with cold water; the pressure should be continued as long as any milky juice exudes; the fluid gradually becomes clear, and a white powder subsides which is starch.

Elements of Practical Agriculture,

By David Low, Professor of Agriculture, &c.

SIMPLE OPERATIONS OF TILLAGE.—PLOUGHING.

In ploughing, it has been seen, a slice of earth is to be cut from the left-hand side, and to be turned over to the right-hand side. In this operation, the left-hand or near side horse walks on the ground not yet ploughed, the right-hand or off side horse walks in the furrow last made, and the workman follows holding the handles of the plough. By means of these handles he guides the plough, and he directs the animals of draught by the voice and the reins. When he is to turn the plough at the end of a ridge, or when it encounters an obstacle, as a large stone, he presses down the handles, so that the heel of the plough becomes a fulcrum and the share is raised out of the ground.

In ploughing, the instrument ought to be held vertical. If it is inclined to the left-hand side, the same work is performed in appearance, though not in reality; a portion of the ground below not being tilled at all, but left thus:—

Fig. 1.

The plough is of the most perfect form, when its various parts are so adjusted that they shall not oppose each other's motion: but it is very difficult to form a plough that is perfect in the form and combination of its parts. Even in those of the best construction, there is frequently found to be a tendency to rise out of the ground or to turn to one side, generally the right-hand or open side. The tendency to rise out of the ground can be corrected by giving an inclination downwards to the point of the share; and the tendency to turn to the open or right-hand side, can be corrected by turning the point of the share slightly to the left hand side. By these means. however, the labor of draught is increased, and care must therefore be taken that this tempering of the irons, as it is frequently called, be not in any case carried further than is necessary to correct the defects of the instrument. All that is necessary beyond this is effected by changing the position of the line of draught by means of the bridle on the beam.

With regard to the depth to be ploughed, this, we shall see in the sequel, depends upon the kind of crop to be cultivated; and other circumstances. It has been shown that a furrow-slice of ten inches in width requires a depth of seven inches: that is, a depth of about two-thirds of the width, in order that it may lie at an angle of 45°. But although it is necessary to proceed upon this principle in forming a plough, we cannot regulate the depth to the width in this manner in practice. It is not necessary that the depth should be to the width in the proportion of two to three, or that the sod should lie precisely at the angle of 45°. In the field all that can be arrived at is a kind of approximation to the true proportions. When the sods are considerably too wide in proportion to their depth, the ploughman will be admonished of this by their lying too flat, and too slightly overlapping each other. When their depth is considerably too great in proportion to their width, they will stand too upright, and be apt to fall back again into the furrow.

The medium depth of good ploughing may be held to be seven inches. When circumstances, as the kind of crop and the nature of the soil, do not require deep ploughing, the depth may be less: but it will be considerably more in those cases to be afterwards adverted to, where deep ploughing is from any cause expedient.

In the moist climate of this country, and indeed in most others of Europe, it is necessary to form the ground into what are termed ridges, so as to admit of the water which falls upon the surface finding a ready egress. And even in lands so dry that little injury will result from stagnating water, such ridges are generally formed on account of their convenience in the different works of tillage.

The first operation in the forming of ridges is *striking the furrows.*

Let it be supposed that a field has been laid level by previous ploughings, and that the marks of former ridges being obliterated. the lines of the new ones are to be laid out. The usual breadth of ridges is from 15 to 18 feet, and sometimes more. We may assume in the following descriptions 15 feet to be the width of the ridges.

Let a steady ploughman be furnished with three or more poles of wood, shod with iron, eight or nine feet in length, and divided into feet and half feet. The first operation is to mark off at two sides of the field what is termed a head-land. This is merely, a ridge formed parellel to the side of the field, on which the horses are to turn, to afford sufficient space for which, these ridges may be 18 feet wide. The lines of them are marked off before the other ridges, in order that the ploughman may know, on arriving at the end of the ridge, when to turn his horses. After the rest of the field is ploughed, the headlands themselves are ploughed and formed into ridges.

In the following diagram, representing a field, let EF, GH, represent the lines of the head-lands, drawn parallel to AB and CD, the sides or boundaries of the field, and at the distance from each of these sides of 18 feet. These lines the ploughman marks out, by running a straight furrow with his plough parallel to the two sides.

Let him now, beginning at the side of the field, AD, parellel to which it is intended to run the ridges, measure off with his pole E*a*, 7½ feet. At the point *a* let him place one of his poles. This is the point at which he is to *enter* his plough. But, leaving his horses in the mean time, let him walk on to a convenient distance, as to I, and there, in like manner measuring off I*b*, 7½ feet, let him set up his second pole at *b*, and then, at the further end of the field, on the line of the head-land, at *c*, let him place his third pole. He has now three poles placed in a line; but if, from the length of the field or inequalities of the surface, more than three poles are necessary, more must be used, as there must be so many poles in sight as that the ploughman may be enabled to direct his plough by means of them in a straight line. He now returns to his plough and enters it at the first pole at *a*, keeping the other two poles in a line, so that he may be enabled to plough directly towards them. Having entered his plough at *a*, he stops his horses and measures off 15 feet to *d*, where he plants the pole. He then returns to his plough, which is standing at *a*, and drives his horses, keeping the two poles before him as a guide, to the second pole *b*. Having done this, and leaving his plough standing at *b*, he measures off from *b* to *e*, 15 feet, and there he plants his pole. He then returns to his plough, and proceeds forward, making his furrow in a straight line to the last pole *c*, where in like manner, he stops his horses, and, measuring off 15 feet, he plants his pole at *f*.

In this manner he has placed his poles in a straight line, at the distance of 15 feet from their last position, and parallel, as before, to the line of fence. He now turns his horses sharp about, and returns by the furrow which he has just drawn *cba*. By this second ploughing he throws the earth out in an opposite direction, so that he has formed a completely open furrow. In returning, he takes care to correct any inequality or crookedness that may have taken place through the unsteady motion of the horses in his fi st track.

The poles being now placed in a line, *def*, he brings his plough to *d*, enters it, and stops it there. He measures off 15 ft. with his pole from *d* to *g*, and fixes his pole at g; and then he proceeds with his plough to *e*, and *f*, repeating the same operation with his poles as before, and returning by the track of his last-made furrow from *f* to *d*. In this manner he proceeds throughout the whole field forming parallel open furrows, at the distance from each other of 15 feet. These furrows are to form the *centres* of the future ridges.

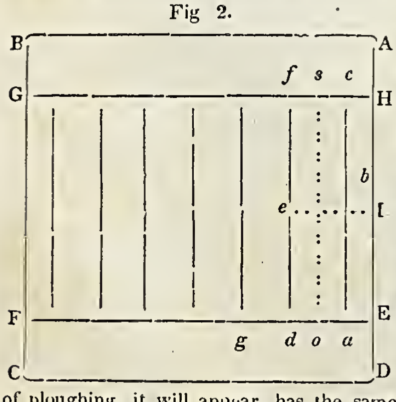
The field is now prepared for being ploughed into ridges, and the manner of doing so is this:—

The ploughman, beginning at the left-hand side of the open furrow, ploughs his first furrow-slice towards it. He then, returning by the opposite side performs the same operation, causing the two first furrow-slices to rest upon each other.

Thus, in forming his first ridge, he begins at the side of *a*, and ploughing in the direction from *a* to *c*, he turns his first furrow-slice into the open furrow *ac*. When he arrives at *c*, he turns his plough right about, and returning from *c* to *a*, he lays his second furrow-slice upon the first one, as at C, figure 3.

In this manner he continues always turning to the right-hand side, and laying his furrow-slices towards the centre of the ridge, until he has reached the boundary of the ridge EH, on the one side, and the line *os*, halfway between *ca* and *df* on the other. He has thus formed a ridge, of which *ca* is the crown or centre, and HE and *os* the termination. By proceeding in this manner throughout the field, the whole is formed into ridges, of which the first marked furrows are the centres.

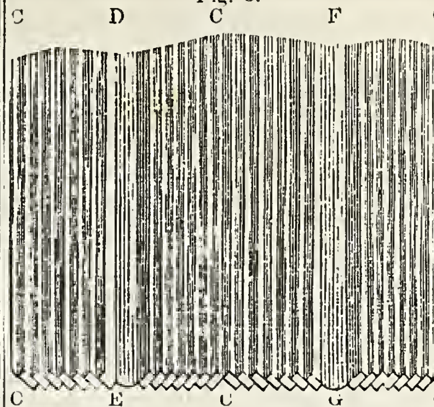
Fig 2.



It has been said that the ploughman continues turning his horses to the right, and that thus, after having proceeded from *a* to *c*, he returns from *c* to *a*, and so on, always ploughing round *ac* as a central line. When, however, he has proceeded from *a* to *c*, he may turn his horses left about and return from *f* to *d* and so on, always laying his furrow-slices towards *ac* and *fd* respectively. In this manner he will have ploughed the half of two adjoining ridges, and terminated at the space *os*, half way between them. This method of ploughing, it will appear, has the same effect as turning the horses right about, and is the most frequent and convenient in practice.

In the following figure, in which CC, CC, CC, are the centres of the ridges, the manner in which the successive furrow-slices have been laid upon each other is shown.

Fig. 3.



By this laying of the earth towards the centres, the ridges acquire a certain curvature. By ploughing the earth away from the intervals DE, FG, the ground is hollowed at these parts, which now form the *open furrows*. It is by these open furrows that the water which falls upon the surface finds a passage.

A certain, though not a great, degree of curvature, is given to the ridge by this ploughing. It is frequently, however, necessary to give it a yet greater degree of curvature and elevation. This is done by ploughing the whole ridge a second time, and in a similar manner.

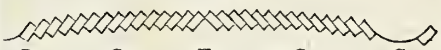
The plough is first driven along the centre of the ridge from C to C, forming an open furrow. Successive furrow-slices are then laid towards this furrow, in the same manner as in the previous ploughing. This is done with the successive furrow-slices, until the plough reaches the open furrows, DE, FG. In this manner the whole ridge is ploughed, and an increased elevation and curvature given to it. The operation is termed *gathering*.

In performing the operation of gathering, it is important that the ridge be formed with a uniform curvature, so that it shall not have what is technically termed a shoulder, or hollow part on each side of the crown. It is to prevent this defect that the open track is made along the crown before the first two slices are laid together; by which means the ploughman is better enabled to lay them upon each other in such a manner that they shall not overlap and form a protuberance at the crown of the ridge. A transverse section of the ridges, when gathered will appear thus:

Fig. 4.

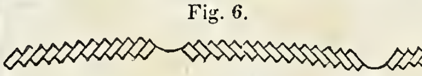
A ridge, however, being already formed, it may be wished to plough it again, and yet to preserve it at the same curvature and elevation. In this case, the plough is to enter at the open furrow, and to lay the successive furrow slices towards it, until the two adjoining ridges are ploughed. By this means all the slices of the same ridge lie in the same direction, and the curvature and elevation of the whole remain as before. This operation is termed *casting*, and the manner in which the furrow-slices rest upon each other, will appear in the following figure:

Fig. 5.



In the operation of casting, two methods may be pursued. The two first furrow-slices, as those at E, &c. may be laid resting upon each other, as in the figure above, in which case the two ridges will be formed as it were into one large ridge; or else the open furrow at E may be preserved by keeping the two first furrow-slices at a little distance from each other, and preserving the space between them, thus:

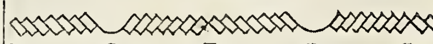
Fig. 6.



When land is ploughed in this manner, the ground is taken from one side of each two adjoining ridges at G, and laid towards the other E, that is, it is gathered towards one side and gathered from the other. In this manner the ground at the open furrows G, from which we gather, becomes more bare of earth than the open furrow E, towards which we gather. This is an imperfection unavoidable in casting a ridge. When, therefore, we wish to cast a ridge twice in succession, we reverse the former mode of ploughing; we gather towards the open furrow G, and from the open furrow E, and thus the ridge is restored to its former state.

Another method of ploughing is *cleaving*. In this case, the plough commences at the open furrow, lays the first slice towards it, and then returning by the other side of the open furrow, lays the second slice upon the first, as in the following figure. When it has reached the centre, it stops

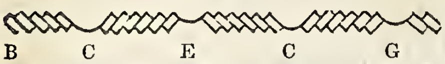
Fig. 7.



and begins with another pair of ridges, and ploughs the half of each pair together in the same manner. In this way the open furrows of the ridges become the centres, and the former centres become the open furrows. The operation of cleaving is of constant occurrence in the summer fallow and other cleaning processes of tillage. When we wish to level a ridge, we cleave it.

There are two variations to be noted in the practice of cleaving. Either the two first slices are laid close together, in which case the open furrows of the former ridges become the centres, and the former centres the open furrows, in the manner shown in the last figure; or a certain distance is kept between the two first slices, and so the open furrow is preserved. In this case, each ridge is split into two ridges, and the number of open furrows is doubled, thus:

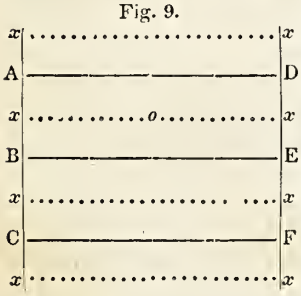
Fig. 8.



The next method of ploughing, is *cross-ploughing*. This, as the name denotes is ploughing in a direction crossing that of the former ridges and furrows.

In cross-ploughing, the workmen place themselves at equal distances from each other, as thirty or forty yards, at the side of the field at which they are to begin to plough. Each then runs a straight furrow across the field, as from A to D, from B to E, from C to F. Each then returns as from D to A, from E to B, from F to C, laying always the successive furrow-slices towards the right hand, until each man arrives at the termination of his allotted space *xx*, *xx*, *xx*, *xx*. There has been thus formed by each workman one great ridge, but so extended that it may be said to be without curvature. The ploughmen, we perceive, turn from left to right around the first furrows AD, BE, CF. But they may also turn from right to left. Thus in going from B to E, the ploughman lays his first furrow-slice to the right hand. When he arrives at E, he may turn his horses left about, and proceed to D, and returning from D to A, lay his first furrow-slice to the right hand towards DA. Turning left about then at A, he proceeds in the direction BE, and so on, always turning left about until he has arrived at the middle space *o*, when the whole space between AD and BE will have been ploughed.

Fig. 9.



Sometimes, for convenience and the saving of distance, he may plough in the first place round the central line BE, by turning from left to right and then plough the remainder of the interval by turning from right to left.

These are matters of detail somewhat difficult perhaps to be described clearly, but so simple in themselves that they need only be seen in the field to be thoroughly understood.

The first operation, we have seen, is striking the furrows previous to forming the ridges. This is done by laying off, by means of furrows, first the lines of the head-lands, and then the parallel lines corresponding to the future centres of the ridges to be formed.

The next operation is forming the ridges. This is done by beginning at the centre, and ploughing towards it till each ridge is formed.

When ridges are formed they may be subsequently ploughed in different ways.

First. They may be gathered; in which case, beginning at the crown, the ridge is ploughed, and an increased elevation given to it.

Second. They may be cast; in which case two ridges are ploughed together, and either formed into one large ridge, or, by keeping the open furrows clear, retained in two ridges.

Third. They may be cloven; in which case, beginning at the open furrows, the half of each adjoining ridge is laid together. The first two furrow-slices may either be laid close together, or the open furrow may be kept clear between them. In the first case, each ridge will have been so cloven as that the open furrow shall have become the crown, and the crown the open furrow. In the second case, each ridge will have been cloven into two, and the number of ridges and open furrows doubled.

In the original laying out of the ridges, the lines have been described as running straight through the field; but it is frequently expedient, on account of the inequalities of the surface or other cause, to change the direction of the ridges at some part of the field, so as to facilitate the discharge of the water.

The application to this case of the principle of striking the furrows is easy. The ploughman makes a furrow where the change of direction is to take place, straight or curved as circumstances may require. The one set of ridges terminate at this part, and the other are laid off from it in the new direction to be given. The ploughman, by means of his poles, as before, strikes his first set of furrows terminating them at the furrow where the change of direction is to take place. From this furrow he strikes his second set of furrows, in the direction in which they are to run. The part where the opposite sets of furrows meet may be made an open furrow or a raised up ridge or head-land, as circumstances may require.

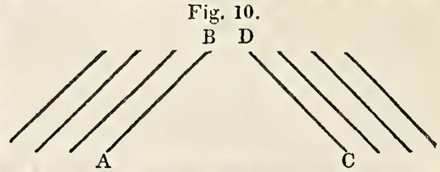
The direction of ridges must generally be regulated by the sloping of the fields, and the lying of ditches and fences, so that they may promote the main purpose for which they are formed, the carrying off of surface water. But, other circumstances being alike, they should be made to lie as much as possible north and south, and as rarely as possible east and west; for, in the latter case, when the ridges are much elevated, the north side has a somewhat less favorable exposure than the south side.

Sometimes ridges are altogether dispensed with, either when the land is very dry, or when it is wished to keep it in grass and give it the aspect of a park or lawn. In this case, the ploughs may either follow each other round the entire field, and terminate at the centre, or they may plough in large divisions, as in the case of cross-ploughing.

In ploughing very steep land, it is frequently laid in ridges diagonally across the slope, for the purpose of rendering the labor more easy, and of lessening the danger of torrents carrying away the surface.

The precaution to be observed in this case, is to make the ridges slope upwards from the right hand, as from A to B in the following figure, and not to the left hand, as from C to D. For in the first case, when the laboring cattle are ascending the steep, the plough is throwing the furrow-slice down hill; whereas, in the other case, when the cattle are ascending, they are raising the furrow-slice up hill, by which their labor is greatly increased.

Fig. 10.



Besides the open furrows of the ridges, which act as channels for carrying off the water, it is necessary, where there are hollow places where water may stagnate, to form open furrows or channels. This is done by drawing a furrow with the plough in the direction most convenient for the purpose. A workman then follow with the spade or shovel, and carefully opens all intersections with other furrows, so that there may be a free communication between them.

Sometimes it is necessary that the furrow made by the plough be further deepened by the spade, so as to form a channel sufficiently large; and wherever head-lands intercept the run of water, channels must be cut through them to the ditch or outlet, so that none may stagnate upon the ground. Attention to these details in practice is essential in all cases of tillage; and it manifests a want of skill and industrious habits in a farmer to suffer his lands to be injured by the stagnating upon it of surface water.

Miscellaneous.

PLEASURES AND PROFITS OF AGRICULTURE.

(Continued from page 61.)

The prejudices of farmers against all innovation upon their established habits are as old as agriculture itself. In the dark ages of superstition, a man who by any improved method contrived to grow larger crops than his fellows, was supposed to use supernatural means; and if he escaped prosecution as a wizzard, was at least shrewdly suspected of dealings with a power whom his more pious neighbors carefully avoided. On the introduction of hops into this country, the city of London petitioned against their use, lest they should injure the beer; and with equal wisdom the Kentish farmers, whose land was overrun with coppice, and who are now so largely benefitted by their cultivation, objected to their growth "because they occasioned a spoile of wood for poles." New implements have been opposed upon much the same principle as the objection made about a century ago in Scotland, and so humorously as well as truly related by Sir Walter Scott, to the use of the winnowing machine;* and at this hour, the farmers in a large midland county assigns as a reason for making the hinder wheels of their waggons preposterously larger than the fore, 'that it places the body on a level in going up hill;' never reflecting, that it will have to come down again, or to move upon even ground.

Among numberless instances of a similar nature, it is told, that the late Duke of Bedford,—who, in his well-known zeal for the promotion of every agricultural improvement, took great pains to introduce the Norfolk manner of ploughing, with two horses abreast,—observing, while riding in the neighborhood of Woburn, one of his tenants at work, on that sandy soil, in the old-fashioned mode, with four at length, his Grace dismounted, yoked two of the horses together, and held the plough himself, explaining at the same time the advantages of the new method; but his disappointment may be imagined, when the man, instead of being at all convinced by his reasoning, replied, 'that such a plan might answer with his Grace,

* "Your leddyship and the steward hae been pleased to propose, that my son Cuddie suld work in the barn wi' a new fangled machine for dighting tho corn frae the chaff, thus impiously thwarting the will of Divine Providence, by raising wind for your leddyship's ain particular use by human airt, instead of soliciting it by prayer, or waiting patiently for whatever dispensation of wind Providence was pleased to send upon the sheeling-hill.—*Tales of my Landlord, Old Mortality*, chap. vii. It was introduced in the year 1710, from Holland, by Fletcher of Saltoun, and its use was publicly denounced from the pulpit, as impious.

but was *too expensive* for him!' To which it may be added, that, notwithstanding the obvious economy and handiness of this mode of ploughing all light soils, and that, on such land, it has been adopted on every gentleman's farm throughout the kingdom, yet, with this example before the farmers' eyes, it has not yet entirely superseded the ancient cumbersome and expensive team.

Even in the settled and customary management of a farm, unforeseen difficulties occur that baffle experience, and in some cases, the merely practical farmer, who relies solely upon that, will be at a loss for expedients which an acquaintance with the practice of others might enable him to supply. There is, in this respect, assuredly much to learn, and no great difficulty in the task. For the rising generation, a more enlarged system of education is obviously the surest means, but the farmer who has not had that advantage, may easily acquire a practical knowledge of the various modes of culture and of rearing stock pursued in other districts, by occasionally visiting them after seed time, and adopting Bakewell's advice—'*to see what others are doing*.' He will thus be enabled to compare, in the most effectual manner, their different fashions with his own; and it is in this manner, that the intelligent farmers of the North—of Northumberland and of Norfolk, have surpassed their bretheren in active enterprise and improved husbandry.

There is an old and an often-repeated adage, that—

'He who by the plough would thrive,
Himself must either hold, or drive:'

and this, which has become a prevalent opinion, has deterred many a man who has sought relief from the cares of trade in the retirement of the country from availing himself of the the profit, as well as the amusement, which he might have derived from farming. It is unquestionably true, that the man who, from early habit, is capable of holding the plough, must have great advantage in the practical knowledge of that most important operation, over him who has not himself stood between the stilts, and it is earnestly to be recommended, that every youth who is destined to a farming life should personally assist in all the labors of the field, as the surest means of enabling him to direct them hereafter with effect; but nothing can be more erroneous than the supposition that the continuance of the toil is necessary to success. Formerly, indeed, when husbandry was confined to one dull round of drudgery, and when farms were generally so small, that the profit depended as much upon the personal labor as the capacity of the tenant, it might be true: but since the introduction of the present improved modes of cultivation, the more systematic attention to live stock, and the enlarged size of farms; since in fact, agriculture has become a science, rather than a mere mechanic art, the time of a man who occupies sufficient land to employ only a few laborers, would be ill bestowed on manual toil. The axiom is not, indeed always applied in its literal sense; but then it is construed to mean, that no man can hope to become a good farmer, who has not been bred to the business. Undoubtedly personal experience is necessary· but it may be acquired at much less expense of time and money than is commonly imagined, by any man who will sedulously devote his powers of reflection to the principles, and his atteotion to the details of farming operations, with a firm resolution neithen to relax in his exertions, nor to suffer himself to be daunted by disappointment in the commencement of his career. Such a man will be sure to succeed; and, as encouragement to perseverance, he may bear in mind, that many of the most eminent agriculturists, and those who have introduced the most important improvements in rural economy, were not originally farmers.

Both the late Arthur Young, and Marshall, whose writings have contributed so much to the diffusion of agricultural knowledge, were brought up to commerce; and it was not until the latter had attained to a mature period of life, that he turned his attentioo to the plough. He then, with little other previous preparation than what he had acquired from reading, entered upon a farm within ten miles of London, of three hundred acres of mixed soil, and which had been greatly mismanaged. This, for one so unpractised, was an arduous undertaking; yet within three months he discharged his bailiff, and became his own manager. The consequence, as might be expected, was, that he at first committed some blunders; but at the end of three years, he published his '*Minutes of Agriculture*,' containing the memoranda of his operations from 1774 to 1777, which although not free from error, yet show, that he had even then attained to a greater proficiency than most of his cotemporaries: but, to use his own language, '*attendance and attention will make any man a farmer*.'

The notion that farming is unprofitable to any other than 'regular-bred farmers,' has been strengthened by numerous examples of persons who embarked in it during the late war, without any previous experience, or any other incentive than an expectation, encouraged by the high prices of the day and the exaggerated representations of some agricultural writers, that it would prove an advantageous speculation. Impressed with that idea, they gave exorbitant rents for land: their stock was purchased at ao equally extravagant rate; and wheo the markets declined, they incurred enormous loss. The publication on the agricultural state of the kingdom in 1816, drawn up from the replies to a circular letter on the subject by the Board of Agriculture, teems with accounts of farms thrown up in every county; and, in many cases, the stock and crops were sold at less than half their original cost,

To these instances are to be added those, constantly recurring, of men in easy circumstances, who, without any knowledge of either the theory or practice of husbandry, engage in it merely for amusement, and not condescending to stoop to the details, are exposed to numberless impositions of their tradesmen and servants. They pay higher wages, and obtain lower prices, than their neighbors; they grow large crops, but at an expense that the sale will not repay; and, retiring at length in disgust, they declare farming to be 'a losing concern;' but without acknowledging that it only became so through their own improvidence.

That such failures, however, do not always occur, we have the evidence of a very competent judge, who, alluding to persons who, having been in other lines of business, yet, having a strong inclination for rural occupation, had betaken themselves to farming as a profession, says,—'this class forms the most intelligent and accurate of husbandmen. Like converts in religion, they have more zeal, give more application, in short, have fewer prejudices to surmount, and more enthusiasm for their new profession, than those who have been brought up in it from their infancy. They are, however, at the first outset, more liable to error or mistake, from the want of practice; but their indefatigable attention makes more than amends for their ignorance of the minutiæ of the art; and as they have been at some pains to acquire a knowledge in the theory of agriculture, and hence established their ideas on rational principles, they most commonly in the end make a distinguished appearance, as their labors, if judiciously performed, though often in a new and experimental channel, seldom fail of being crowned with success.'

Thus, in every country, the condition of the people is seen to depend upon the degree of skilful labor which it can command: but the plough is the prime mover of all, for until a sufficiency of food be produced for the common consumption, no one cao be spared from the cultivation of the land; and it is obvious, that in proportion to the perfection of that cultivation will be the amount of subsistence obtained, and the number of spare hands left for other purposes. The means of support in other branches of industry being thus secured, the demand for the produce of the land increases along with the produce of that labor; more hands are then required for its cultivation, and these again require more manufactures. Thus industry and wealth keep pace with agriculture, and, each stimulating the other, contribute to the national prosperity. That such is the effect of agriculture on the welfare of the community, is proved by the history of its progressive improvement, and of the consequent change in the mode of living.—*Introduction to British Husbandry.*

Young Men's Department.

Beneficial Effects of Knowledge on Moral Principle and Conduct.

Knowledge is valuable chiefly in proportion as it is practical and useful. It dispels the darkness which naturally broods over the human understanding, and dissipates a thousand superstitious notions and idle terrors by which it has been frequently held in cruel bondage It invigorates and expands the intellectual faculties, and directs them to their proper objects. It elevates the mind in the scale of rational existence, by enlarging its views and refining its pleasures. It gratifies the desire of the soul for perpetual activity, and renders its activities subservient to the embellishmeot of life and the improvement of society. It unveils the beauties and sublimities of nature, with which the heavens and the earth are adorned, and sets before us the "Book of God," in which we may trace the lineaments of his character and the ways of his providence. It aggrandizes our ideas of the omnipotence of Diety, and unfolds to us the riches of his beneficence, and the depth of his wisdom and intelligence. And, in the exercise of our powers on such objects, we experience a thousand delightful emotions and enjoyments to which the unenlightened multitude are entire strangers. All such activities and enjoyments may be reckoned among the practical advantages of knowledge.

But there is no application of knowledge more interesting and important than its practical bearings on moral principle and action. If it were not calculated to produce a beneficial effect oo the state of morals and the intercourses of general society, the utility of its general diffusion might, with some show of reason, be called in question. But there cannot be the slightest doubt, that an increase of knowledge would be productive of an increase of moral order and an improvement in moral conduct. For truth, *in thought and sentiment*, leads to truth *in action*. The man who is in the habit of investigating truth, and who rejoices in it when ascertained, cannot be indifferent to its application to conduct. There must be truth in his actions; they must be the expression, the proof, and the effect of his sentiments aod affections, in order that he may approve of them, and be satisfied that they are *virtuous*, or accordant with the relations which subsist amoog moral agents. There must likewise be a truth or harmony between his actions, so that none of them be incoherent with the rest. They must all be performed on the same principles, with the same designs, and by the same rule. To a man who perceives truth and loves it, every incongruity and every want of consistency between sentiment and action, produces a disagreeable and painful sensation; and, consequently, he who clearly perceives the rule of right, and acts in direct opposition to it, does violence to his nature, and must be subjected to feelings and remorses of conscience far more painful than those of the man whose mind is shrouded in ignorance. It is true, indeed, that proficiency in knowledge and in the practice of true morality, do not always proceed with equal pace. But it is nevertheless true, that every action that is truly virtuous is founded on knowledge, and is the result of scrutiny and choice directed by truth; otherwise what is termed virtue would be only the effect of necessity, of constraint, or of mechanical habits. We need not, therefore, fear that the dominion of virtue* will be contracted, or her influence diminished, by an enlargement of the kingdom of light and knowledge. They are inseparably connected, their empire is one and the same, and the *true* votaries of the one will also be the true votaries of the other. And, therefore, every one that sincerely loves mankind, and desires their moral improvement, will diffuse light around him as extensively as he can, without the least fear of its ultimate consequences; since he knows for certain, that in all cases whatever wisdom excels folly, and light is better than darkness. The following observations will perhaps tend more particularly to confirm and elucidate these positions:

1. *Ignorance is one principal cause* of the want of virtue, and *of the immoralities which abounds in the world.* Were we to take a survey of the moral state of the world, as delineated in the history of nations, or as depicted by modern voyagers and travellers, we should find abundant illustration of the truth of this remark. We should find, in almost every instance, that ignorance of the character of the true God, and false conceptions of the nature of the worship and service he requires, have led, not only to the most obscene practices and immoral abominations, but to the perpetration of the most horrid cruelties. We have only to turn our eyes to Hindostan, to Tartary, Dahomy, Benin, Ashantee, and other petty states in Africa: to New-Zealand, the Marquesas, the Sandwich Islands, and to the Society Isles in the Southern Pacific, prior to their late moral transformation, in order to be convinced of this melancholy truth. The destruction of new-born infants,—the burning of living women upon the dead bodies of their husbands,—the drowning of aged parents,—the offering of human victims in sacrifice,—the torturing to death of prisoners taken in battle—the murder of infants, and the obscene abominations of the societies of *Arreoy* in *Otaheite* and other islands, and the dreadful effects of ambition, treachery, and revenge which so frequently accompany such practices, are only a few specimens of the consequences of ignorance combined with human depravity. It is likewise to ignorance chiefly that the vices of the ancient pagan world are to be attributed. To this cause the apostle of the gentiles ascribes the immoralities of the heathen nations. "The gentiles," says Paul, "having the understanding darkened through the ignorance that is in them, have given themselves over unto lasciviousness, to work all manner of uncleanness with greediness." Ephes. iv. 18, 19. And, in another part of his writings, he declares, "Because they did not like to retain God in their knowledge, they were given up to a reprobate mind," or a mind *void of judgment;* and the consequence was, "they were filled with all unrighteousness, fornication, wickedness, coveteousness, maliciousness, envy, murder, deceit, and malignity;" they were "backbiters, haters of God, proud, boasters, inventors of evil things, disobedient to parents, without understanding, without natural affection, implacable, and unmerciful." Rom. i. 28-31. And if we turn our eyes to the state of society around us, we shall find that the same cause has produced the same effects. Among what class do we find sobriety, temperance, recitude of conduct, honesty, active beneficence, and abstinence from the grosser vices most frequently to prevail? Is it among ignorant and grovelling minds? Is it not among the wise and intelligent, those who have been properly instructed in their duty, and in the principles of moral action? And who are those that are found most frequently engaged in fighting, brawling, and debauchery, in the commission of theft and other petty crimes, and in rioting in low houses of dissipation? Are they not, for the most part, the rude, the ignorant, and untutored,—those whose instruction has been neglected by their parents or guardians, or whose wayward tempers have led them to turn a deaf ear to the reproofs of wisdom? From all the investigations which of late have been made into the state of immorality and crime, it is found, that gross ignorance, and its necessary concomitant, grovelling affections, are the general characteristics of those who are engaged in criminal pursuits, and most deeply sunk in vicious indulgence. Now, if it be a fact that ignorance is one principal source of immorality and crime, it appears a natural and necessary inference, that the general diffusion of keowledge would tend to counteract its influence and operations. For when we remove the *cause* of any evil, we, of course, prevent the *effects*; and not only so, but at the same time bring into operation all those virtues which knowledge has a tendency to produce.

2. Knowledge is requisite for ascertaining the true principles of moral action, and the duties we ought to perform. Numerous are the treatises which have been written, and various the opinions which have been entertained, both in ancient and modern times, respecting the foundation of virtue and the rules of human conduct. And were we to investigate the different theories which have been formed on this subject, to weigh the arguments which have been brought forward in support of each hypothesis, and to balance the various conflicting opinions which different philosophers have maintained, a considerable portion of human life would be wasted before we arrived at any satisfactory conclusions. But if we take the system of revelation for our guide in the science of morals, we shall be enabled to arrive, by a short process at the most important and satisfactory results. We shall find, that, after all the theories which have been proposed, and the systems which have been reared by ethical philosophers, the Supreme Lawgiver has comprised the essence of true morality under two commands, or fundamental principles, "Thou shalt love the Lord thy God with all thy heart," and "Thou shalt love thy neighbor as thyself." On these two commandments rests the whole duty of man.

Now, although the leading ideas contained in these commands are simple and obvious to every one who considers them attentively, yet it requires certain habits of reflection and a considerable portion of knowledge to be enabled to trace these laws or principles to all their legitimate consequences, and to follow them in all their ramifications, and in their bearings on human conduct, and on the actions of all moral intelligences. For it can easily be shown, that these laws are so comprehensive as to reach every possible moral action, to prevent every moral evil, and to secure the happiness of every moral agent,—that all the duties inculcated in the Bible, which we owe to God, to our fellow-creatures, and to ourselves, are comprehended in them, and are only so many ramifications of these general and fundamental principles,—that they are equally adapted to men on earth and to angels in heaven; that their control extends to the inhabitants of all worlds; that they form the basis of the order and happiness of the whole intelligent system; and that their authority and influence will extend, not only through all the revolutions of time, but through all the ages of eternity. Here, then, we have a subject calculated to exercise the highest powers of intelligence; and the more we investigate it the more shall we admire the comprehensive nature of that "law which is exceeding broad," and the more shall we be disposed to comply with its divine requisitions. But unless we be, in some measure, acquainted with the first principles of moral action, and their numerous bearings upon life and conduct, we cannot expect to make rapid advances in the path of virtue, or to reach the sublimer heights of moral improvement.

3. Knowledge, combined with habits of thinking, would lead to inquiries into the *reasons* of those moral laws which the Creator has promulgated, and the *foundations* on which they rest. It is an opinion which very generally prevails, even among the more respectable portion of mankind, that the moral laws given forth to men are the *mere dictates of Sovereignty*, and depend solely on the *will* of the Deity, and consequently, that they might be modified, or even entirely superseded, were it the pleasure of the Supreme Legislature to alter them or to suspend their authority. But this is a most absurd and dangerous position. It would take away from the *inherent excellence* of virtue, and would represent the Divine Being as acting on principles similar to those of an Eastern despot. If such a position were true, it would follow, that all the immoralities, cruelties, oppressions, wars, and butcheries, that have taken place in the world, are equally excellent and amiable as truth, justice, virtue, and benevolence, and that the character of infernal fiends is just as lovely and praiseworthy as that of angels and archangels, *provided that Deity willed that such a change should take place.* Were such a change possible, it would not only overturn all the notions we are accustomed to entertain respecting the moral attributes of God, but might ultimately destroy our hopes of future enjoyment, and endanger the happiness of the whole moral universe. But there is an inherent excellence in moral virtue, and the Deity has willed it to exist, because it is essential to the happiness and order of the intelligent system. It might be shown, that not only the two fundamental principles of religion and morality stated above, but all the moral precepts which flow from them, are founded on the nature of God, and on the relations which subsist among intelligent agents, and that, were they reversed, or their influence suspended, misery would reign uncontrolled through the universe, and in the course of ages the whole moral and intelligent system would be annihilated.*

Now, if men were accustomed to investigate the foundations of morality, and the reasons of those moral precepts which are laid before them as the rule of their conduct, they would perceive a most powerful motive to universal obedience. They would plainly see, that all the laws of God are calculated to secure the happiness of every moral agent who yields obedience to them,—that it is their *interest* to yield a voluntary submission to these laws,—and that *misery*, both here and hereafter, is the certain and *necessary* consequence of their violation. It is a common feel-

* By *virtue*, in this place, and wherever the term occurs, I understand, conduct regulated by the law of God, including both the external action and the *principle* whence it flows; in other words, Christian morality or, that *holiness* which the Scripture enjoins.

* For a full illustration of these positions, and a variety of topics connected with them, the author begs to refer his readers to a work which he lately published, entitled "The Philosophy of Religion, or an Illustration of the Moral Laws of the Universe."

ing with a considerable portion of mankind, though seldom expressed in words, that the laws of heaven are too strict and unbending,—that they interfere with what they consider their pleasures and enjoyments, and that if one or more of them could be a little modified or relaxed, they would have no objections to attempt a compliance with the rest. But such feelings and sentiments are altogether preposterous and absurd. It would be inconsistent, not only with the rectitude, but with the *benevolence*, of The Deity, to set aside or to relax a single requisition of that law which is "*perfect*," and which, as it now stands, is calculated to promote the happiness of all worlds. Were he to do so, and to permit moral agents to act accordingly, it would be nothing less than to shut up the path of happiness, and to open the flood-gates of misery upon the intelligent universe. Hence we are told by Him who came to fulfil the law, that sooner may "heaven and earth pass away," or the whole frame of nature be dissolved, than that "one jot or one tittle can pass from this law." For, as it is founded on the nature of God, and on the relations which subsist between Him and created beings, it must be absolutely perfect, and of eternal obligation; and, consequently, nothing could be taken from it without destroying its perfection, nor any thing added to it without supposing that it was originally imperfect. Were the bulk of mankind, therefore, capable of entering into the spirit of such investigations, and qualified to perceive the true foundations of moral actions; were they, for example, clearly to perceive that *truth* is the bond of society, and the foundation of all delightful intercourse among intelligent beings in every world, and that, were the law which enjoins it to be reversed, and rational creatures to act accordingly, all confidence would be completely destroyed,—the inhabitants of all worlds thrown into a state of universal anarchy, and creation transformed into a chaos,—such views and sentiments could not fail of producing a powerful and beneficial influence on the state of morals, and a profound reverence and respect for that law "which is holy, just, and good."

4. Knowledge, in combination with habits of reflection, *would lead to self-examination and self-inspection.* The indolent and untutored mind shuns all exertions of its intellectual faculties, and all serious reflection on what passes within it, or has a relation to moral character and conduct. It is incapable of investigating its own powers, of determining the manner in which they should operate, or of ascertaining the secret springs of its actions. Yet, without a habit of reflection and self-examination, we cannot attain a knowledge of ourselves, and, without self-knowledge, we cannot apply aright our powers and capacities, correct our failings and defects, or advance to higher degrees of improvement in knowledge and virtue. In order to ascertain our state, our character, and our duty, such inquiries as the following must frequently and seriously be the subject of consideration. What rank do I hold in the scale of being, and what place do I occupy in the empire of God? Am I merely a sensitive creature, or am I also endowed with moral and intellectual powers? In what relation do I stand to my fellow-creatures, and what duties do I owe them? What is my ultimate destination? Is it merely to pass a few years in eating and drinking, in motion and rest, like the lower animals, or am I designed for another and higher sphere of existence? In what relation do I stand to my Creator, and what homage, submission, and obedience ought I to yield to him? What are the talents and capacities with which I am endowed, and how shall I apply them to the purposes for which they were given me? What are the weaknesses and deficiencies to which I am subject, and how are they to be remedied? What are the vices and follies to which I am inclined, and by what means may they be counteracted? What are the temptations to which I am exposed, and how shall they be withstood? What are the secret springs of my actions, and by what laws and motives are they regulated? What are the tempers and dispositions which I most frequently indulge, and are they accordant with the rules of rectitude and virtue? What are the prejudices I am apt to entertain, and by what means may they be subdued? What are the affections and appetites in which I indulge, and are they regulated by the dictates of reason and the law of God? What are my great and governing views in life? Are they correspondent to the will of my Creator, and to the eternal destination that awaits me? Wherein do I place my highest happiness? In the pleasures of sense, or in the pleasures of intellect and religion,—in the creature or in the Creator? How have I hitherto employed my moral powers and capacities? How do I stand affected towards my brethren of mankind? Do I hate, or envy, or despise any of them? Do I grudge them prosperity, wish them evil, or purposely injure and affront them? Or do I love them as brethren of the same family, do them all the good in my power, acknowledge their excellences, and rejoice in their happiness and prosperity?

Such inquiries and self examinations, when seriously conducted, would necessarily lead to the most beneficial moral results. In leading us to a knowledge of our errors and defects, they would teach us the excellence of *humility*, the reasonableness of this virtue, and the foundation on which it rests, and of course, the folly of pride, and of all those haughty and supercilious tempers which are productive of so much mischief and unhappiness, both in the higher and the lower spheres of life. Pride is uniformly the offspring of self-ignorance. For, if a man will but turn his eyes within, and thoroughly scrutinize himself, so as to perceive his errors and follies, and the germs of vice which lodge in his heart, as well as the low rank he holds in the scale of creation, he would see enough to teach him humbleness of mind, and to render a proud disposition odious and detestable, and inconsistant with the relations in which he stands to his Creator, to his fellow-creatures, and to the universe at large. Such mental investigations would also lead to self-possession under affronts and injuries, and amid the hurry and disorder of the passions,—to charity, candor, meekness and moderation, in regard to the sentiments and conduct of others, to the exercise of self-denial, to decorum and consistency of character, to a wise and steady conduct in life, and to an intelligent performance of the offices of piety and the duties of religion. But how can we ever expect that an ignorant, uncultivated mind, unaccustomed to a regular train of rational thought, can enter, with spirit and intelligence, on the process of self-examination? It requires a certain portion, at least, of information, and a habit of reflection, before a man can be qualified to engage in such an exercise; and these qualifications can only be attained by the exercise which the mind receives in the acquisition of general knowledge. If, then, it be admitted, that self-ignorance is the original spring of all the follies and incongruities we behold in the characters of men, and the cause of all that vanity, censoriousness, malignancy, and vice which abound in the world; and if self-knowledge would tend to counteract such immoral dispositions, we must endeavor to communicate a certain portion of knowledge to mankind, to fit them for the exercise of self-examination and self-inspection, before we can expect that the moral world will be renovated, and "all iniquity, as ashamed, hide its head, and stop its mouth."

5. Knowledge, by expanding the mind, will enable it to take a clear and comprehensive view of the motives, bearings, tendencies, and consequences of moral actions. A man possessed of a truly enlightened mind must have his moral sense, or conscience, much more sensible and tender, and more judiciously directed, than that of a person whose understanding is beclouded with ignorance. When he has to choose between good and evil, or between good and better, or between any two actions he has to perform, he is enabled to bring before his mind many more arguments, and much higher and nobler arguments and motives, to determine the choice he ought to make. When he is about to perform any particular action, his mental eye is enabled to pierce into the remote consequences which may result from it. He can, in some measure, trace its bearings, not only on his friends and neighbors, and the community to which he belongs, but also on surrounding nations, on the world at large, on future generations, and even on the scenes of a future eternity. For an action, whether good or bad, performed by an individual in a certain station in society, may have a powerful moral influence on tribes and nations far beyond the sphere in which it was performed, and on millions who may people the world in the future ages of time. We know that actions, both of a virtuous and vicious nature, performed several thousands of years ago, and in distant places of the world, have had an influence upon the men of the present generation, which will redound either to the honor or the disgrace of the actors, "in that day when God shall judge the world in righteousness, and reward every man according to his works." We also know, that there are certain actions which to some minds may appear either trivial or indifferent, and to other minds beneficial, which nevertheless involve a principal which, if traced to its remoter consequences, would lead to the destruction of the intelligent creation. Now, it is the man of knowledge and of moral perception alone who can recognize such actions and principles, and trace them to all their natural and legitimate results. He alone can apply, with judgment and accuracy, the general laws of moral action to every particular circumstance, connect the present with the future, and clearly discern the mere semblance of truth and moral rectitude from the reality.

In short, the knowledge of divine Revelation, and a serious study of its doctrines and precepts, must accompany every other species of information, if we wish to behold mankind reformed and moralized. It is in the sacred oracles alone that the will of God, the natural character of man, the remedy of moral evil, the rules of moral conduct, and the means of moral improvement, are clearly and fully unfolded. And the man who either rejects the revelations of Heaven, or refuses to study and investigate the truths and moral requisitions they contain, can never expect to rise to the sublime heights of virtue, and to the moral dignity of his nature. But, were the study of the Scriptures uniformly conjoined with the study of every other branch of useful knowledge, we should ere long, behold a wonderful transformation upon the face of the moral world. Pride, selfishnesss, malice, envy, ambition, and revenge would gradually be undermined. The spirit of warfare and contention would be subdued; rioting, drunkenness and debauchery would be held in abhorrence by all ranks; kindness and affection would unite the whole brotherhood of mankind; peace, harmony, and subordination would be displayed in every department of social life; "our judges would be just, and our exactors righteous; wars would be turned into peace to the ends of the earth, and righteousness and praise spring forth before all the nations," Were moral principle thus diffused among the different classes of society, it could not fail of producing a beneficial influence on the progress of the arts and sciences, and on every thing that might tend to meliorate the condition of our fellow-creatures, and to promote the general improvement of mankind. For, in endeavoring to promote such objects, we meet with as great a difficulty in the *moral* as in the intellectual condition of mankind. The principles of *selfishness*, pride, ambition, and envy, and similar dispositions, create obstacles in the way of scientific and philanthropic improvements, tenfold greater than any which arise from pecuniary resources or physical impediments. But were such principles undermined, and a spirit of good-will and affection pervading the mass of society, the machinery of the moral world would move onward with smoothness and harmony; and mankind, acting in unison, and every one cheerfully contributing to the good of the whole, would accomplish objects, and beneficial transformations on the physical and moral condition of society, far superior to any thing that has hitherto been realized.

To what has been now stated, with regard to the influence of knowledge on moral conduct, it may, perhaps, be objected, that many instances occur of men of genius and learning indulging in dissolute and immoral habits, and that the higher classes of society, who have received a better education than the lower, are nearly as immoral in their conduct. In replying to such an objection we have to consider, in the first place, *what is the nature of the education such persons have received.* Most of the higher class have received a grammer-school education, and, perhaps, attended a few sessions at an academy or a university. There cannot, however, be reckoned above one in ten who pursues his studies with avidity, and enters into the spirit of the instructions communicated at such seminaries; as it is well known to every one acquainted with the general practice of such students in colleges and academies, that a goodly number of them, spend their time as much in folly and dissipation, as in serious study. But, although they had acquired a competent acquaintance with the different branches to which their attention was directed, what is the amount of their acquisitions? A knowledge of the Greek and Latin Classics, and of pagan mythology, in the acquisition of which five years are generally spent at the grammar-school, and two at the university—and the elements of logic, ethics, and mathematical philosophy. But such departments of knowledge, *in the way in which they have been generally taught*, have no necessary connexion with religion and moral conduct. On the contrary, by keeping the principles of Christianity carefully out of view, and even insinuating objections against them, some professors of these sciences have promoted the cause of infidelity, and consequently impeded the progress of genuine morality. What aid can be expected to morality from a mere grammar-school education, when the acquisition of words and phrases, and the absurd notions and impure practices connected with Roman and Grecian idolatry, form the prominent objects of attention, and when, as too frequently happens, no instructions in Christianity are communicated, and not even the forms of religion attended to in many of those seminaries? The mere acquisition of languages is not the acquisition of useful knowledge: they are, at best, but the *means* of knowledge; and although we would not discourage any one, who has it in his power, from prosecuting such studies, yet it is from other and more important branches of study that we expect assistance in the cause of moral improvement.

With regard to men of learning and genius, we have likewise to inquire into the nature and tendency of their literary pursuits, before we can ascertain that they are calculated to prevent the influence of immoral propensities and passions. Persons are designated men of learning, who have made proficiency in the knowledge of the Greek, Latin, French, German and other languages—who are skilled in mythology, antiquities, criticism and metaphysics, or who are profound students in geometry, algebra, fluxions, and other branches of the mathematics. But it is easy to perceive, that a man may be a profound linguist, grammarian, politician or antiquarian, and yet not distinguished for virtuous conduct; for such departments of learning have no direct bearing upon moral principle or conduct. On the contrary, *when prosecuted exclusively, to the neglect of the more substantial parts of knowledge, and under the influence of certain opinions and prejudices*, they have a tendency to withdraw the attention from the great objects of religion, and consequently from the most powerful motives which excite to moral action. We have likewise to inquire whether such persons have made the Christian revelation one great object of their study and attention, and whether they are frequently employed in serious contemplations of the perfections of the Creator, as displayed in the economy of the universe If such studies be altogether overlooked, we need not wonder that such characters should frequently slide into the paths of infidelity and dissipation; since they neglect an attention to those departments of knowledge which alone can guide them in the paths of rectitude. We may as soon expect to gather "grapes from thorns, or figs from thistles," as to expect pure morality from those, however high they may stand in literary acquirements, who either neglect or oppose the great truths of religion. We do not mean, however, to insinuate, that the subjects alluded to above are either trivial or unworthy of being prosecuted. On the contrary, we are persuaded, that there is not a subject which has ever come under human investigation, when prosecuted with proper views, and in connexion with other parts of knowledge, but may be rendered subservient, in some way or another, both to the intellectual and the moral improvement of man. But when we speak of diffusing useful knowledge among the mass of mankind, we do not so much allude to the capacity of being able to translate from one language into another, of knowing the sentiments of the ancient Greeks and Romans, and the character and squabbles of their gods and goddesses, or to the faculty of distinguishing ancient coins, fragments of vases, or pieces of armour—as to the facts of history, science and revelation, particularly in their bearing upon the religious views and the moral conduct of mankind. And if the attention of the great body of the people were directed to such subjects, from proper principles and motives, and were they exhibited to their view in a lucid and interesting manner, there cannot be the smallest doubt, that the interests of virtue and of pure and undefiled religion would be thereby promoted to an extent far beyond what has ever yet been realized.—*Dick*

THE CULTIVATOR—AUG. 1835.

TO IMPROVE THE SOIL AND THE MIND.

EFFECTS OF THE WINTER.

The cold of last winter is known to have been unprecedently severe. It was not, however, until recently that we were enabled fully to appreciate the injury which it had caused to trees and plants, in open situations, which usually withstand our winters. The following memoranda of its effects upon trees and plants in our grounds, may not be without interest to some of our readers.

The peach, and Isabella and Catawba grapes, exposed to the weather, were either destroyed or materially injured. The pear, plum, cherry, (particularly the duke cherries) were not materially injured, though some were killed. The spice bush (laurus benzoin) an indigenous shrub, the alianthus glandulosa (tree of heaven) common catalpa (C. syringifolia,) the paper mulberry, (broussonetia papyriferia) the Chinese mulberry (morus multicaulis) and the English hawthorn (cratægus oxyacanthus) were generally killed to the ground, or to the surface of the snow. The weeping and curled leaved willows (salix babylonica and S. crispa) were seriously injured, the latter particularly. Eight or ten feet of the tops of three thrifty black walnuts (juglans nigra) and the entire branches of a Madeira nut (juglans regia) of 12 years growth in our garden, were destroyed; and Michigan and Ayreshire roses, and some other climbing varieties, in an exposed situation, as also the scarlet monthly honeysuckle (caprifolium sempervirens) were mostly killed to the ground.

SILK COMPANIES.

The doubts which we expressed in a former number, as to the ultimate utility of companies for producing silk, have been animadverted upon by some of our cotemporaries. Our opinion was perhaps expressed without due consideration, and may have been founded in misconception of their tendency. Yet we confess we have seen nothing, in reply, to satisfy us of our error. The raising of the mulberry, and the feeding of the silk worm, is emphatically a business of the farm—of the cottage,—a simple labor, in which females and children, who do not essentially aid in supporting a family, may turn their services to profit. It admits of no division of labor—requires no costly machinery, and involves, comparatively, no expense. Every family, of the most limited means, can raise the mulberry, and produce cocoons, as well as a company of associated capitalists; and in this way, the business may give employment and bread to thousands who would never seek for either, and if they did might not obtain them, in the employ of a company. The great desideratum is to secure, to those in the middle and lower walks of life, in regard to property, the means of *helping themselves.* It is well known, that by the introduction of manufactories, concentrating great capital and influence, most of the household manufactures, in cotton, woollen and linen, which gave a wholesome and salutary employment to the female sex, have gone out of use. We want a substitute for the family, and *that* the silk business promised. It is also well known, or may be known, that the manufacturers of woollens have clubbed their wits and their capital, to lessen the profits of the American wool grower, by forcing great quantities of the foreign article into our market. In 1831 it proved rather an unfortunate speculation for them; but in the current year, their prospects are more flattering. They have made up a purse of some 70,000 dollars, and sent their agents abroad to purchase foreign wool, not exactly for their own use, but to speculate upon in the market. They have become mercantile speculators, to the prejudice of the wool growers, whose aid they invoked, and efficiently received, in the tariff conventions at Harrisburgh and New-York, to protect the *common* interests, as was asserted and believed, of the wool *grower* and wool *manufacturer*.

Give men power, whether in pecuniary or political affairs, and they are prone to abuse it—by making it subservient, *first*, to selfish views. They soon come to think, that what was given to them for the public good, they have a right to use for private gain;—and whenever this feeling becomes ascendant, it grows and strengthens with age, until it supplants, or smothers, some of the best emotions of the heart.

Silk Companies, like most other monied associations, are formed *to make money*—to make capital more productive, and with less personal risk, in a *corporate*, than it is likely to become in a *private* business And it generally happens, that some counterbalancing good is held out to the public, as a consideration for corporate privileges. But we confess we cannot discover any thing of this sort in the case under consideration. The business of raising the mulberry and producing silk cocoons, is as much a farm— a family business, as milking cows and making butter, or rearing and shearing sheep; and we should think that associated capital, and corporate powers, were about as necessary to the prosecution of one as the other. Now our fear is, that when corporate and private interests come in competition in the silk, as they are found to do in many other kinds of business, the weaker will fall before the stronger interest—that private enterprise will be paralyzed, or made subservient to corporate cupidity. In a business where all can compete, individually, upon equal grounds, we hold it to be wrong to destroy this equality, by giving to a part corporate privileges, to the manifest prejudice of the rest. All chartered companies are a sort of monopoly—aristocratic in their nature and tendency, and are only salutary, under a republican government, where the object to be attained is of manifest public utility, and beyond the reach of ordinary individual capital and enterprise. We do not object to companies for *manufacturing* silk, though we verily believe that no good is likely to grow out of associations for producing the raw material.

THE GOOSEBERRY,

Is among our choicest garden fruits, and is one of the earliest species which is fit for the table. But in many locations it is subject to mildew, which not only blights the fruit, but the anticipations of the cultivator. Mildew, according to Darwin, is a plant of the fungus kind, which vegetates without light, or change of air, in the same manner as the generality of mushrooms; and penetrates with its roots the vessels or plants to which it adheres. Wyllich says it is a topical disease only to be cured by a topical remedy. We have heard, and seen somewhat ourselves, of the effects of topical remedies, in which lime, salt or sulphur have constituted the preventive or cure of this disease, not only upon the gooseberry, but upon the grape, wheat, &c.

In the grape houses about Boston, and in our own grape house, sulphur is efficaciously employed, in its dry state, dusted upon the young fruit, to prevent mildew, or to check it where it has already appeared. Here neither winds or rain occur to wash or blow it off; and one or two applications suffice for the season. It may be applied out doors in a liquid form, by first mixing the sulphur with milk, with which it incorporates—and then diluting freely with water, sprinkle it upon the leaves and fruit with a white-wash or other brush.

A weak brine, or salt, scattered about the roots of the gooseberry and grape, in May, is said to operate as a preventive. Before we were aware of it, we perceived our gooseberry crop affected with mildew, when the fruit was about the size of peas. We immediately applied a weak brine; and three days afterwards, dusted the bushes with lime. The disease was checked, and the berries have continued to swell, and appear healthy. Whether the salt or lime was separately or jointly beneficial, we are unable to say; but the remedy seems to have proved effectual. In the application of either of these substances, care must be taken not to apply them in excess, lest they should destroy the plant as well as its parasyte. Salt is best applied to vegetation in a liquid form, as it is then more equally distributed. Lord Manners applied it with great success, in the proportion of one ounce of salt to a gallon of water. Two ounces to a gallon proved hurtful to vegetation, but the second year the herbage where it was applied was abundant. All the land on the coast is treated with sea water in China and Hindostan. The utility of salt, in preventing or destroying mildew, has been announced, by the Rev. E. Cartwright, of London, as a discovery of great importance to agriculture. He declares it to be an absolute remedy for the mildew in wheat. His directions are: take "salt one part, water eight; with this mixture let the diseased grain be sprinkled; in three or four days the mildew will vanish, leaving only a discoloration on the straw, where it had dried off. Two hogsheads of the mixture will suffice for an acre. The best mode of applying it is with a white-wash brush, having a tin collar made water tight, to prevent the mixture dripping down the operator's arm, and running to waste. The operator having a pail of the mixture in one hand, with the other dips the brush into it, and makes his regular casts, as when sowing broadcast; in this way he will readily go over ten acres a day."

T. A. Stoughtenburgh, Esq. of Johnstown, has an east and a west high tight fence to his garden. His gooseberries on the east fence, he informs us, which do not get the morning sun, have been uniformly free from mildew; while those on the west fence, the soil at both being similar, are covered and spoilt by mildew. This has happened for years. In the compact part of Albany, in the small enclosures, excluded by buildings from the morning sun, the gooseberry is seldom affected with mildew.

THE CURRANT,

Like the gooseberry, should be in every farmer's garden. The fruit of the red and white varieties are nutritive and pleasant, and afford, in many ways, nice dishes for the table. Like the gooseberry it is propagated by cuttings, and requires no great space or labor to make it profitable in the family and for the market.

Propagation. Take thrifty well ripened shoots of the preceding season's growth, and cut them 12 to 18 inches in length, and if it is desired to make them trees, or to grow them on a single stem, gouge out all the eyes with a sharp knife, except three or four upon the upper extremity, which are designed to form the branches. Cut the lower end square at a bud; it will sooner granulate, and throw out roots;—and when planted, insert two-thirds of the cutting in well dug ground. The cuttings are best when taken off in autumn, soon after the leaves fall. They may be put out then, or, what is better, kept till spring, in a cellar, or buried in the ground. Thus every man may procure cuttings in autumn or winter, to be planted in spring. They may be planted where they are to stand, or in a nursery bed, to be removed after one or two years. They may be planted in rows 10 feet apart, and 4 feet in the rows.

The Culture consists in digging the ground about the bushes in the spring, keeping down weeds, thinning the wood, and cutting in the long shoots.

The fruit may be used for culinary purposes while green; and, in its ripe state, is converted into wine, jelly, and is used extensively, in various ways, for the table, with other food, in which forms it is gently laxative, emollient, and sometimes anodyne. The jelly is grateful and cooling in fevers, and no less so as a conserve at table; and the wine affords an excellent summer drink, especially with the addition of water. Directions for making the jelly and wine will be found under the head of household affairs.

Sorts.—There are two varieties of both red and white, termed the common and Dutch kinds, the latter growing on lower bushes, and affording larger fruit, than the common kind. The Champagn is another kind, distinguished principally by its pale colour. Mr. Knight has produced a sweet kind, not yet introduced into our culture.

COMETS.

An elaborate and instructing article upon *the approaching comet*, has appeared in the Edinburgh Review, from which it would seem that two comets are expected to pass the earth's orbit the present year, which bear the names of the astronomers who first calculated the period of their return. The first is called *Encke's comet*, whose period round the sun is 1200 days. It appeared in 1825, 1829 and 1832, and its return is expected about this time. It is considered by our auther as a planet, revolving in our system between the orbits of Jupiter and Mercury.

The other is termed *Halley's comet.* Its revolution is computed at 75 years. It appeared in 1531, 1607, 1682, and 1758. It is expected to be visible in Europe in the latter part of August or beginning of September, "that is," to quote the writer, "rather more than two months before its arrival at that point where it will be nearest the sun. Its situation also will be favorable to the splendor of its appearance. It will most probably be distinguished by the naked eye, like a star of the first magnitude, but with a duller light than that of a planet, and surrounded with a pale nebolosity, which will slightly impair its splendor. On the night of the 3d of October, about midnight, it will appear in the east, at an elevation of about 30 degrees; and will be a little above a line joining the bright star, called Castor, with the star called α in the Great Bear. Between that hour and sunrise, it will ascend the firmament, and will cross the meridian near the zenith of London about sunrise. On the night of the 7th, the comet will approach the well known constellation of Ursa Major; and between that and the 11th it will pass directly through the seven conspicuous stars of that constellation, following the track we have here attempted to mark. In our latitude, this constellation, [known by the common names of the *pointers, wagon wheels*, &c.] never sets and consequently the comet may be looked for at any hour of the

night. But the time most favorable for its appearance will be on the 7th, before the commencement of the morning twilight; on the 9th, at any time in the absence of twilight, when it will pass during the night from the north-west to the north-east, its altitude not, however, exceeding thirty-five degrees; and on the 11th, after the close of the evening twilight, when it will be seen approaching the constellation of the Crown, in a direction a little north of west, and at an altitude of about thirty degrees.

"Towards the end of Nov. the comet will plunge among the rays of the sun, and disappear, and will not issue from them on the other side until the end of December. On its departure from the sun, it is doubtful whether it will be visible at all; but, under any circumstances, it cannot remain long apparent."

The orbit of Halley's comet is a very oblong oval, the nearest point of which to the sun is about half the earth's distance, or 50 millions of miles, and its extreme remote point 355,000,000 of miles. At its nearest point to the sun, the heat and light of that luminary will be four times the heat and light at the earth, and at the greatest distance they will be about twelve hundred times less. If the earth were transported to the more remote extremity of the comet's orbit, every liquid substance would become solid by congelation; and it is extremely probable that atmospheric air and other permanent gases might become liquids. If the earth was, on the other hand, transferred to the nearest extremity of the comet's orbit, all the liquids upon it would be converted into vapor, would form permanent gases, and would either by their mixture constitute atmospheric air, or would arrange themselves in a strata, one above the other, according to their specific gravities. All the less refractory solids would be fused, and would form in the cavities of the nucleus oceans of liquid metal. Such are the conjectures of philosophers.

Comets, in former times, were supposed to portend direful evils, as earthquakes, war, pestilence, famine, &c. Science has dispelled such fears, and it has been demonstrated from the past, that comets have not hitherto produced any sensible influence on the earth. They are supposed to be mostly masses of vapor, totally divested of all concrete or solid matter: both Sir William and Sir John Herschell, as well as other astronomers, having, on account of their translucency, discovered stars and constellations through their heads or centres.

Laighton's Threshing Machine, is a recent invention, recommended by the inventor, for its utility, cheapness and simplicity; and from a cursory view of it, while in partial operation, we are rather disposed to endorse the recommendation. We are not however prepared to give a definite opinion, until we see it subjected to a more prolonged and satisfactory trial. The machine occupies about the space of a common wagon box, and the sweep by which it is propelled, and which is attached to it, works in a circle of 13 feet diameter. It is easily removed, and with a little attention not liable to get out of order, and may be readily repaired. It is driven by one horse power, requires two men to attend it, does not cut or break the straw, will thresh 70 to 75 bushel of grain per day, will do it well, and costs $75. The proprietor has not left us his address.

Liquid manure.—A correspondent in Loudon's Gardeners' Magazine speaking of the cultivation of the ground at Ghent, says, "Liquid manure may be here named, and very justly so, their *summum bonum;* as if applied when the corn is sprouty, or just before a rain, it has an effect which no other manure can have. It destroys insects, and throws a surprising degree of vigor into the crops. It is pumped [from the tanks under ground, into which it is conducted by drains from the stables, &c.] into a barrel-shaped water cart: and, when brought upon the land, the plug is taken out, and the liquid, flowing over a board something in the shape of a fan, as the cart proceeds, is dispersed on both sides, over a space, perhaps, of 4 or 5 feet. The cart has generally three wheels."

Scraping Apple Trees.—George Olmstead, of East-Hartford, publishes in the New-England Farmer, that he has experienced great benefit from scraping the ross from his apple and pear trees, with a hoe, in June or July. There is no mistake in this. The rough bark of those trees affords shelter to numerous insects, and a receptacle for their eggs, prejudcial to the tree or its fruit. A smooth clean skin is of as much value to the tree, as it is to the animal; its functions are important to the health and growth of both. The fault is, Mr. Olmstead does not go far enough: he should *clean,* as well as *smooth* the surface of his trees; and we do not think there is any thing better for this purpose, at least for the apple, than a strong ley of wood ashes or potash. We have had a dozen years experience of the benefits of this wash, though we have not in this time applied it more than twice to the same trees. It is applied to the bole, and as far as convenient to the larger branches, with a common shoe brush, affixed to the end of a stick a yard long, the loose bark, where there is such, being previously scraped off. It imparts to the bark a handsome, smooth, healthy appearance, destroys insects and their eggs, takes off the moss, and seems to be to the apple tree what salt is to the animal—a highly useful condiment. The objection to lime-wash is, that it stops up the pores of the bark, and by its caustic quality contracts the sap vessels, and gives to the exterior a dry and rigid appearance. The ley, on the contrary, removes every obstruction to a wholesome perspiration, and leaves the bark so soft and pliable that it may almost be indented with the thumb.

Fence Posts.—An excellent method of rendering these durable in the ground, is published in the American Eagle. It consists, 1, In peeling the posts, and in sawing and splitting them if too large; 2. In sticking them up, under cover, at least one entire summer; and 3. In coating with hot tar, about three feet of the butt ends, which are to be inserted in the ground—after which they are ready for use. We have no doubt the advantages of this mode of preparation will more than remunerate for labor and expense. Our reasons for this belief are briefly as follows: The sap of all non-resinous trees, will ferment in the presence of heat and moisture, and cause the decay of the wood. To prevent this natural consequence, the first object should be, when a tree is felled, to expel the sap from the pores of the wood. This is done by peeling, splitting, sawing or hewing, and exposing the wood to the drying influence of the sun, or at least of the air. The process is faciliated too by immersing the wood in water for a time, which liquifies the sap, and favors its expulsion. And when the moisture has been expelled, the next object is to keep it out, by paint, tar or charring. In the mode recommended above, the moisture *is* expelled by the peeling, sawing and summer-drying and its return is prevented by the coating of tar. The retention of the bark upon timber is particularly prejudicial, not only in preventing evaporation, but as affording shelter to various species of the borer, which under its cover, carry on their depredations upon the timber. We have seen pine logs nearly destroyed in a summer by worms, where the bark had been left on, while those which had been peeled remained uninjured. The best timber is obtained from trees which have stood a summer, or a year, after they have been girdled and peeled.

The bodily powers are impaired by the diseases of the mind.—*Ovid.* And we may add, *vice-versa.*

Alternating crops.—The present season has afforded a good opportunity of testing the utility of alternating tillage and grass crops: For, so far as our observation has extended, meadows of similar quality of soil, have been productive in an inverse ratio to their age, i. e. the longer they have been in grass, the lighter the product. In some instances the difference has been three to one in favor of the new stocked lands. The more than common difference apparent the present year we ascribe to the want of heavy rains, in the last autumn, winter and spring. The light rains penetrated more readily grounds which had recently been under the plough, and which were comparatively porous and pulverent, than they did those which were rendered in a manner impervious, and which had remained for years undisturbed by the plough. But if grass greatly deteriorates, grains do much more so, without heavy dressings of manure, and the alternation of roots. Tillage is admirably fitted to pulverize, clean and prepare the soil for grasses; and grass leys are equally beneficial to tillage crops, by the vegetable matter—the food—which they give to the soil. We always suspect, that the man who advertises his farm, as "suitably divided into plough, meadow, and pasture land," pursues the old platform system, and that he knows nothing of the immense advantages, particularly upon sands, gravels and loams, which result from a judicious system of alternate husbandry. We do not wonder that such a farmer, now-a-days, should be obliged to sell his farm. Pastures, as well as tillage and grass crops, are augmented in value by the alternating system. There are districts which form an exception to the rule; but generally, every acre of a farm, which is not a rock, may, by thorough drainage, be rendered capable of yielding grain, grass or pasture; and the interests of the cultivator would be promoted by subjecting them to this alternation.

Grafting in May and June, is recommended, in Loudon's Gardeners' Magazine, by Mr. Thom, as preferable to March and April. We remember that Mr. Corse, of Montreal, recommending to us a like course. He had succeeded with grafts that had lain for weeks in his room, and which were dry, shrivelled and apparently dead.

Dear Fruit. Loudon's Magazine for June, quotes the price of peaches in Covent Garden market, at £3 ($13.33) per dozen, about 111 cents each! cherries at £1 to £1 10*s.* per lb. and strawberries at 1*s.* to 1*s.* 6*d.* (22 to 33 cents) per ounce! These were of course forced fruits.

QUERIES AND ANSWERS.

"I have heard it asserted, that rye grown in an orchard will certainly destroy it. By publishing your opinion on the subject, you may perhaps give important information to others as well as myself.—*B——. Bucks Co., Pa.*

Answer—We have had no practical experience in this matter, nor have we seen the fact before stated. We should infer, that in sowing rye among apple trees, the grain, rather than the trees, would be most likely to suffer.

Our Bucks Co. correspondent adds, "I had an ox in the fall affected with a disease very much resembling the cholera in the human species. I gave him linseed oil and glauber salts through the day, but without any good effect. By evening he became so weak, and appeared to have so much pain, that he could no longer get up. I then gave him about half a pint of strongly camphorated whiskey, and left him for the night. The next morning he was well, with the exception of weakness, and soon recovered."

Bee-House—"I wish you would describe the inside fixture of your bee-house. Is there staging all round to support the comb? and is the box in which the bees are when put in finally left?"—*W. Cowan, Lower Chaunford, Pa.*

Answer—The staging in our garret bee-house is the breadth of the common hive. It should be somewhat broader. It may be upon one, two or three sides, according to the size of the apartment, but at least on the side next the wall, where the aperture is made for the passage of the bees through the wall. The hive is placed directly above this aperture, where a place is previously fitted for its reception, and it remains there permanently. The staging resembles the shelves of a dry goods store, 6 to 12 inches apart, with three or four laths substituted for the board shelves.

"I have a grape vine in my garden, which is a very fine *promiser*, but no *bearer*, owing, I presume, to its want of a mate to fructify its blossoms. It has been in this town many years, but never brought any fruit to maturity. I send you a branch with the blossoms and leaves. Be pleased to inform me how it may be rendered productive, or send me a *mate*."—*Jesse Gove, Rutland, Vt.*

We apprehend our old school-mate and his neighbors have been bestowing their labor upon a seedling vine, which will never afford them fruit, even with the assistance of a *mate*. Vines raised from seed often prove barren, for want of the pistil, the female organ of the flower, and we know of no process by which such can be rendered fertile. Our practice has been to throw them away. We advise Mr. G. to follow our example, and to raise from cuttings of vines known to be fertile. His specimens came to hand, but the blossoms were too much decayed to permit us to determine their character.

Hedges.—Reuben Wheeler, of Vergennes, Vt., recommends what he terms the white thorn as a superior plant for hedges. He directs that the haws, or seeds be gathered in the fall, buried in the ground, and suffered to remain there till the second spring, when they may be sown in drills—they will grow one foot the first season, and if properly managed will make a good fence in six years. As the white thorn (C. oxyacantha) is exotic, and we believe not yet introduced into Vermont, we presume Mr. Wheeler has allusion to some of the indigenous species, which are of more vigorous growth than the white thorn of Europe. In burying the haws, we have mixed two parts of earth with one of seed, laid them in a ridge upon the surface, in the garden, and covered with about three inches of mould. They were once overhauled during the summer, replaced and recovered. In the autumn following they were found to have germinated, and were *then* sown in drills.

Mr. Wheeler sends us also his mode of making pickles, which is, to take for each barrel 4 lbs. good salt, ½ lb. alum, 1 lb. salt petre, with water enough to cover the cucumbers when the barrel is filled. Wash the cucumbers when put in, and keep the barrel in a cool place. When wanted for use, take them from the pickle, and turn upon them scalding vinegar. They will be fit for the table in 24 hours, fresh and green.

Rhubarb, or Pie plant.—The seed of this plant having ripened, it may be sown immediately with advantage, on a bed of good earth. Sow in drills, cover the seeds ¼ of an inch, press the earth smarthly to them, thin the plants, and next spring they may be planted out, at a yard apart, and the stalks may be used the first season.

Mowing Machines.—Two implements have recently been invented, one we believe in Columbia and the other in Montgomery, for cutting grass by horse power. We have seen the latter; but as we did not witness its operation, we are not prepared to speak of its merits.

SAXONY SHEEP.

[It was not until to-day (July 29) that the article from which the following extract is made, met our eye. Our correspondent R. in our May No. in answering queries which we sent him, animadverted somewhat severely upon the Saxony breed of this animal. Mr. Grove, who is owner of a large flock of Saxons, selected by himself in Germany, an excellent sheep manager, and a gentleman whom we highly respect and esteem, thinking the communication of R. calculated to prejudice his interests, published a reply in the June No. of the New-York Farmer. We make from it the following extract, unsolicited, as an act of justice to Mr. Grove; and at the same time venture to express our belief, that our correspondent R. intended nothing personal in his communication to the prejudice of Mr. G. For ourselves, never having been engaged in the sheep business, and knowing very little of the relative merit of breeds, we are free to say, it did not occur to us that injury would accrue to the feelings or interests of any individual from the publication.]

THE EXTRACT.

"There is in Saxony a breed of sheep which were introduced and reared with great care by Augustus, Elector of Saxony and King of Poland, which, in commenoration of the introducer, have been called the Electoral breed. I was brought up in that country to rural husbandry, particularly to the care and management of sheep, and was perfectly acquainted with the purest and most celebrated flocks. From these I selected my sheep, and brought them to this country. They bore the fatigues of the voyage remarkably well, and arrived in safety. I sustained some little losses at first, from being a stranger to the peculiarities of the country, from having to hire my sheep kept, for want of suitable accommodations, and of such fodder as I wished. During the last eight years, and since I had a farm of my own, I have not lost over 1½ per cent: for the last year not more than 1 per cent. The last two winters I had no loss, and the last year I raised 101 lambs, from 100 ewes, one only of my ewes having twins. The sheep which R. speaks of do not shear more than 2¼ lbs. My flock, last year, of 200 ewes and lambs, averaged 2 lbs. 6½ ozs. If I had had a proportion of wethers, they would probably have averaged 3 lbs. My grown bucks sheared 4½ lbs. He says they (that is, the sheep he speaks of,) are poor nurses: my ewes are uncommonly good. All these facts can be abundantly proved from my sheep records, in which births and deaths, and every thing of importance, is recorded, and from credible witnesses. All these facts, in which there is no guessing, show conclusively that R's statements about the *pure breeds* of Saxon sheep did not allude to my sheep at all; and therefore I hope there will be no unkind feelings between us.

Respecting the "*miserable*" quality of the meat, if R. will procure the best sample of South Down mutton he can find, I will meet him at any place he shall name with a sample from my Saxons; both shall be cooked in the same manner; he shall select one or more of the most accomplished connoisseurs in good eating, and I will rest that point on their decision.

I have but one little statement more to add, and I will then leave the subject to the public. The prices current of wool in New-York, given in the Cultivatior for the last month (May) are for Saxony, 80 cents; for half-blood 53 cents, and for native, 33 cents. Now, allow my ewes to produce 2¾ lbs., (and they will rather overgo than fall short of it,) then at 80 cents the fleece will bring $2.40. Allow the South Down ewes to shear 4 lbs. and allow it to be equal to the half blood merino, and the amount will $2.12. Allow the Bakewell breed to produce 7 lbs., which is 1 lb. more than R. rates them; this at 33 cents will be $2-31. The three fleeces will stand thus:—Saxon, $2.40—South Downs, $2.12—Bakewell, $2.31.

With these remarks, I submit the subject.

HENRY D. GROVE."

Wool and Hair are known to possess highly fertilizing properties—they are in reality, like bone and horn, concentrated manure. Until recently, refuse flocks of either could not be obtained in any considerable quantity; but our manufactories now afford them to such an extent as to entitle them to the farmer's notice. We have employed hair, combined with oil, from a seal skin manufactory, in considerable quantity, and with the best effect. Woollen factories furnish considerable waste flocks, combined with grease and dirt. Mr. Jabez Burroughs, of Watervliet, has been experimenting with these, and informs us that they exceed all other manure, when applied in one-third the quantity that hog manure is applied.

For Budding, Geo. H. M'Carter, esq., of Newton, N. J. recommends to us the inner husk of Indian corn for ligatures, as superior to bass matting, and as a material within the reach of all. The hint is worth being remembered.

CORRESPONDENCE.

BEET SUGAR, &c.

Dexter, (Mich.) May 12, 1835.

J. Buel, Esq. Sir.—I recollect a few years since of seeing an account of sugar being made somewhat extensively, in some parts of France, from beets. As this part of the country is at some distance from the sea board, and also destitute of the sugar maple, which renders sweetening quite expensive, if you are acquainted with the kind of beet used, together with the process of manufacturing, you would oblige many of your subscribers by inserting the same in the Cultivator. Or, if you are acquainted with any other substitute, it would be equally acceptable.

Should it not be foreign to the object of your paper, will you please to give us a recipe for making "India Rubber Varnish," for rendering leather water-proof? And here, permit me without being suspected of flattery, to add my name to the list of encomiasts of your valuable paper. I think the two first numbers of the second volume are worth the price of the year's subscription; at least they are so to me. Yours respectfully,

WM. A. JONES.

REPLY.

Mr. Jones' inquiry may be important to the far west, for the reason's he has stated. We therefore subjoin a description of the process of making beet sugar, as given by Chaptal, who was at the same time an extensive manufacturer of the article and an eminent chemist, with some other facts connected with the subject. Our quotation is from Orfila's Practical Chemistry, page 129-30.

"The beets are sown at the end of March or in April, [last of April or first of May with us,] when frost is no longer to be apprehended; it seems nearly indifferent whether the seed of the red, yellow or white beets are taken. The earth most proper for their cultivation, is that which has depth, and at the same time is light and rich; that which comes from the clearing up of meadows, alluvial soil, dunged and long worked, are preferred for this purpose.—These grounds should be prepared by two or three very deep ploughings, and a sufficient quantity of manure. The beets are sown at random like wheat, and it is then harrowed; this mode has more advantages than that of sowing by the hand, the drill plough, on beds, or in the nursery. All the plants which grow near the beets, and whose vicinity is very hurtful to them, are pulled up by the hand or a weeding hook. The period of taking up this plant differs greatly, according to climate; in the environs of Paris, and even at 40 or 50 leagues from the capital, we should proceed to take them up in the beginning of October, whilst in the middle countries, this operation should take place much sooner; without attending to this, it happens that the sugar formed is decomposed by the process of vegetation, and is replaced by nitrate of potash.

"After stripping the beets of their leaves, they are placed in the open air, on a very dry soil, beyond the reach of inundation, and which is covered with some pebbles and straw; the beets are placed in beds, in the centre of which a hole is left to give exit to the vapor, and the beds are covered with straw. These precautions are indispensable, since, on the one hand, the beets freeze at 1° to 0° (32 to 34° Fah.) and on the other, they germinate at 8 or 9° (48° Fah.) especially if the air is moist. It would be more convenient to preserve them in barns and granaries; but it is almost impossible to find a situation of this kind, capable of holding all the beets we want. If, nevertheless, we choose to put them into magazines, we must, 1. leave them in the field some days to dry; 2. uncover them when the temperature is only a few degrees above zero, unless it rains; 3. separate the heaps, remove the frozen or putrified beets, and renew the beds, [piles.]

"*Extraction of the Sugar.*—We cut off the necks and small roots of the beets, and scrape the surface with knives. They are reduced to a pulp by means of cylindric graters, [similar, probably to our grater cider mill,] moved rapidly by hand, or by some contrivance. The pulp is pressed, at first, in small lever presses, and then by much more powerful ones; by this plan, we procure from 65 to 75 per cent of juice, which marks from five to ten on Baum's areometer. This juice contains, besides those substances found in the juice of the sugar cane, malic and acetic acids, and scarcely will it afford more than three or four per cent of sugar. It is received in a boiler called the clarifyer, which is heated when one-third or one-half filled. When the temperature is 65 or 66° (Cent.=150° Fah.) the fire is stifled. We then throw into the boiler about 48 grains of lime, slaked with warm water, for every quart of juice, and the liquor is then brought nearly to ebullition; it is taken from the fire and on its surface is soon perceived a layer, which is skimmed off. The liquid is then made to run out by means of a stop-cock fixed at the distance of a foot from the bottom of the boiler.

"The liquid is quickly boiled, and sulphuric acid diluted with 20 parts of water, is poured on in the proportion of 1-10 of the lime employed; it is stirred, and it is better the mixture should have a slight excess of lime than of acid. We mix with the liquor 3-100 of animal charcoal, perfectly fine; for instance, that which is produced in the preparation of Prussian blue. Immediately afterwards, we add half of the charcoal which has served in a former process, and the boiling is continued until the liquid marks 18 or 20° on the areometer; it is suffered to rest until the next day, when it is strained through a woollen cloth; it is then put into a round boiler, two feet in breadth and ten inches high; this is one-third filled, and it is again boiled. If the contents are burned, the fire is relaxed, and the liquor is stirred; if the bath foams much, a little butter is thrown in and the heat moderated. The boiling is ended, when, on taking a little of the syrup between the thumb and fore finger, and quickly separating them, a thread is formed, which breaks *dry*. At this period the fire is covered, and after some minutes the syrup is poured into *coolers*, and from thence into the cones"—after which it may be subjected to the processes of *refining* or *claying*, like West-India sugar.

The manufacture of beet sugar was prosecuted in France extensively during the late war; but on the return of peace, was in a measure abandoned. It has recently been revived, and is said to be rapidly increasing; and land for beet culture lets for a higher rent than any other production About 18,000,000 pounds, or 18.000 tons, are said to be produced annually, and the profits are so great, that it has been recommended to the French legislature to tax it for revenue.

According to the tables of Dubrunfaut, the average product in Flanders, in ten cases cited, was 23.751 killograms the hectare. The killogram is 2¼ lbs.; the hectare 2½ acres. He estimates the raw sugar at four per cent on the weight of the roots, the pulp to be worth 12 francs, (about $2.28,) per ton, for feeding stock, and the molasses worth something additional for distillation Dr. Achard obtained 6 lbs. 3 oz. raw sugar from a quintal of roots. Dubrunfaut estimates the cost of the sugar to the producer, at about five cents per pound; at the manufactory of M. Cresspell, the cost was six to seven cents per pound.

Chemistry has discovered a new material for sugar, in wheat, the great staple of the west. It was first announced by a Russian chemist, M. Kirchoff, that starch may be converted into sugar, by being boiled for some time, in very dilute sulphuric acid; and M. The. Saussure found that 100 parts of starch made 110 per cent of sugar, and he concluded that sugar is merely a compound of starch and water. According to M. Berzelius, starch and common sugar are thus composed, though other chemists make the component parts of sugar somewhat different.

	Starch.	Sugar.
Oxygen,	49.6	49.856
Carbon,	43.5	43.265
Hydrogen,	7.0	6.879

Hence, the abstraction of a little hydrogen and carbon, would convert starch into sugar.—*See Brewster's Encyclopedia.*

The butternut affords sugar. We have a sample before us. The maker informs that the butternut yields as much saccharine matter as the maple. Our sample is not well granulated, having been merely made as an experiment.

India Rubber, or caoutchouc, or gum elastic, may be dissolved in oil of turpentine or vitriolic ether, by the application of a gentle heat; and the directions for varnish prescribe equal parts, by weight, of caoutchouc, linseed oil and essence of turpentine.

FATTENING CATTLE—ELDER BUSHES.

Jesse Buel, Esq—Dear Sir—Having recently become a subscriber to, and recipient of the valuable publication which you conduct, permit me to comply with the invitation you have given, of making known some of the practical observations which have proved useful in my agricultural pursuits. I have for some years, if not profitably, industriously, been cultivating and improving a worn out farm. I have groped along without any guide, excepting such as the "mother of inventions" has suggested; but sir, I have succeeded, and the land which would hardly produce white beans, now produces first rate wheat and grass. The Cultivator is the only work on agriculture I have had the opportunity of taking, and from the remarks on various modes of practice I shall improve them. There are two subjects I can recommend as having been useful to me, and perhaps they have long been known and practised by you and others. If they have been recommended, I am ignorant of it, and to new readers of your valuable publication they may prove useful.

The first is the manner I treat my beef cattle, which I wish to fatten as cheap as possible. I begin in the fall by giving them the best pasture I have, to have them in good case for wintering; when fattening time commences, I put my steers by themselves in some clean field,* where water is convenient for them, having stacked some of my best hay in such parts of the field as needs manuring most, and as often as once a week or more, draw out and scatter to them straw, with brine scattered on it, a part of which they eat hastily and make beds of the remainder. My oxen and farrow cows, I keep at the barn yard apart, and feed them lightly once or twice a day, always reserving my best salted hay for spring foddering. When I wish to put them to grass, I take a sufficient number of troughs to the pasture field, if not convenient to let them to the barn yard, the oxen steers being put together, and once a day I feed all my cattle intended for beef, from two to four quarts of oats and corn ground fine, cob and all together, say one part of oats to two of corn in the ear ground together. By this mode, I gain three or four weeks on my neighbors, who neglect it, for it prevents the young grasses acting too powerfully as a physic, which without some preventive, I have observed will sometimes last for three weeks, and cattle would fall away. After the grasses have grown and become solid, I slacken the feed and salt them oftener, and by the first of June omit feeding altogether, but continue giving salt plentifully.† I have by these means generally turned off my beef cattle early, and at little expense.

The other subject I would recommend to my brethren of the plough, is the manner which has proved easiest and most successful, in destroying one of the worst pests that infests the most of our farms, the elder. They generally grow along fences and ditch-banks and such places, out of the reach of the plough. I have destroyed many large bunches, by whipping them down two or three times. If they are of more than one year's growth, I wait till they begin to blossom, when I take a pole, and beat them down, young and old, as close as possible to the ground, and repeat the operation in August, if they sprout much. If they are sprouts of one season's growth, I leave them till about the time the older ones blossom, and then beat them down; being tender and full of sap, they are easily beaten down, and the most of them perish by discharging from the wounds.* In some cases, I have had to go over them the second year, when they generally disappear. If there is any easier and better mode of subduing them, I should like to know it. Has the elder berry ever been converted into any valuable purpose? Sir, I have hastily and imperfectly made these remarks, and if there is any thing in them worthy of a place in your publication, you will be good enough to put it in such a form as you think proper, and publish so much (if any) as you may think proper. I profess to be nothing but a plain farmer, and one wishing to promote the best interests of our profession, and that will promote and perpetuate the best interests of our common country.

Respectfully yours, SIMEON M'COY.

Parpacoten, June 9th, 1835.

QUERIES—ILLINOIS PRAIRIES.

Princeton, Putnam co., Ill., March 20, 1835.

Jesse Buel—Sir—We have procured ten subscribers for the Cultivator; inclosed is a five dollar bank note, which I suppose, agreeably to the statements in your prospectus, will entitle me to an additional copy. Our settlement being new, and not very densely populated, the list of subscribers forwarded herewith, is as large as we could conveniently obtain at present. One very important item of instruction which we hope to obtain, consists in the art of making live fences. This is a country in which we must resort to hedging, in consequence of the scarcity of timber, and the utter lack of materials for stone fence. As to materials which have been recommended and used for hedging, we have the crab apple and the common thorn, (Cratægus crus-galli Ph.) or c. punctata, as Eaton has it, on the authority of Willdenow. Dr. Darlington says this species is extensively used in New-Castle co., Del., and when properly managed, makes a very sbstantial hedge. We have also the honey locust, (Gleditschia triacanthos;) but I find the size it attains in our soil and climate, is generally considered an insuperable objection to its being used for a hedge, though I have seen no one who has made a fair trial of it. We perceive you propose giving us a wood cut occasionally in the next volume; we hope you may be enabled to illustrate the manner of training hedges in that way. We should like also to see cuts of improved farming implements, particularly the revolving rake. I might fill out a sheet in enumerating the various matters in which we need instruction, but will trouble you with only one thing more, and that is the cultivation of grasses;—not merely of timothy and clover, but all the various kinds which are considered valuable in American husbandry. The time and manner of sowing—soils adapted to each kind—comparative value for hay or pasture—method of preparing such kinds of seed as do not readily vegetate, and where the seed may be obtained.

It may not be amiss to give you a brief description of our soil. The surface of most of our prairies is gently undulating. The slight elevations form the first kind of arable land. The depressions seem fitted by nature to collect and carry off, though very moderately, the surplus water; most of them having no channel for it

*We would suggest, that a yard is better than a field for winter feeding and littering stock, and a barn, shed or barrack better than a stack for securing hay. If cattle are fed from a stack in a grass field, the sole of the sod is broken, the ground badly poached, the manure virtually lost, and the fodder wasted. All these evils are avoided by feeding in a yard, particularly if the stock are fed in mangers, under cover. They may be tied while feeding on hay, and loosened in the day time, while feeding on the straw litter in the yard. The saving in manure and fodder, the great materials of fertility and profit, will far more than compensate for extra trouble and expense.—*Conductor.*

† We beg leave to repeat our recommendation, to give cattle access to salt daily, and we do it after having pursued the practice for a dozen years, with high satisfaction. Salt is of the same use to beasts as it is to man—it is a healthful condiment—a preventive, and often a cure for disease. Man finds it most congenial to these ends, and most grateful to the palate, when taken with his daily food—and it is no less so to dumb animals. When permitted free access to salt, farm stock never take it in excess, and consume but very little, if any more, in a season, than when given to them once or twice a week. We learn from a work now before us, that in Spain, they attribute the fineness of the wool to the quantities of salt given to sheep; that in England 1,000 sheep consume at the rate of one ton of salt annually. Our practice is, to have salt troughs under our cattle sheds, where they are secure from rain, and to have salt in them, accessible to the farm stock, at all times.—*Conductor.*

* A good method of destroying the pests of the farm, whether shrubs or herbaceous plants. The cause of success may be thus explained: When the plant is in blossom, it contains the greatest volume of unelaborated sap, and is in most immediate want of food to sustain its flowers and fruit. But before this sap can become food, it must be elaborated in the leaves, and if the leaves are at this time destroyed, this cannot take place, and the plant dies for want of sustenance. The leaves are at this time as essential to the plant as lungs are to the animal; and although the plant may survive defoliation the first summer, it can seldom withstand a second or a third.

to occupy. They are covered with coarse kinds of grass, mostly of the cyperoideae family, which grow very thick and tall. They are in some places quite narrow, in others their breadth extends to several rods, and they are not unlike, in a superficial view, the moist margins of some of the rivulets in the level parts of the state of New-York. They are here called sloughs, (our western people pronounce it as though it were spelled sleugh,) and are uniformly moist and miry, except in the severest droughts. Our soil is clayey, containing a very large proportion of vegetable matter, having an average depth say of eighteen inches,—its color is nearly black. By some it would perhaps be termed a vegetable mould, its earthy parts being aluminous. It rests upon a subsoil of clayey loam, of a yellowish color, or in other words a mixture of very fine clay and sand, colored probably by the presence of a very small portion of carbonate of iron. The difference between the elevations and the sloughs, consists principally in their being drier, possessing a smaller portion of decomposed vegetable matter, and having less depth of soil—the sloughs often being two or three feet deep. I am confident that by slight draining, perhaps by the aid of a single furrow, made near the middle, to carry off the water which settles in the hollows between the bunches of roots, (or to use a rustic technical, as good perhaps as any,) tussucks, they might be rendered first rate meadow lands, provided we could once get the right kinds of grass started in them. In this region of country, which is below the rapids of the Illinois river, the upland prairies are on an elevation of from fifty to eighty feet above the beds of the large streams, which elevation terminates in most cases by an abrupt bluff, descending into the bottom lands. Such is the character of the Illinois prairies. Some of them are more undulating than others, and such are generally preferred by the settlers. Those which approach nearest to a level, are frequently interspersed with small shallow basins, separate from the sloughs just mentioned; but as it respects herbage and soil, of a similar character. In short, our prairies preserve a great uniformity as to soil, and it is not lacking in fertility. The main point, therefore, seems to prevent its deterioration by good husbandry.

JOHN M. GAY.

REMARKS OF THE CONDUCTOR.

We are yet without much experience in the management of live fences, and public opinion is altogether unsettled as to the plants most suitable for them in our climate. Gen. Derby, of Salem, Mass. has succeeded in growing a good hedge of the buck-thorn; in Pennsylvania and Delaware there are good hedges of two species of native thorn, which Caleb Kirk denominates the cockspur and Virginia thorns, the first sometimes termed the New-Castle, and the latter Washington thorn. Farther south, the red cedar is highly recommended as a proper plant, especially by the late John Taylor; in the western part of this state, there is represented to be good hedges of English hawthorn, (Cratægus oxyacantha); and we are experimenting with the honey locust and elm, and hope to succeed, though the result is yet problematical. In Flanders the beach is extensively employed We have in this vicinity several species of the cratægus, which seem better suited to our climate, and we think for hedges, than the species of the south; indeed, we should always advise the use of plants that are indigenous, in preference to those which are exotic. We have a tolerable good hedge made from these, the plants having been taken from the woods and pastures, and the species promiscuously mixed. It is clipped in June, and is annually improving. We are more in want of experience in managing hedges, and of patience in waiting their growth, than in suitable plants for them. Many persons object to the making a trial for the reason that others offer for not planting fruit trees—*they may not live to enjoy their benefit.* We have no doubt the wild crab, and also the various species of our native thorn, will make good hedges, on soils congenial to their growth. We intend to give a cut ere long, to illustrate our method of training a honey locust hedge. We will also shortly give, in a tabular form, the results of Sinclair's observations and experiments in relation to the most approved grasses.

Our list of cultivated grasses is small. The clovers, lucern, timothy, herdsgrass, orchard and tall oat, constitute the grass catalogue of our most respectable seed shops. It is only by trial that we can determine the relative value and fitness of these for different soils and climates; and we would rather invite, on this head, the observations of experienced farmers, than promulgate our own crude notions. The clovers, timothy and herdsgrass seem in a manner indigenous in the eastern and northern states, and our opinion of the orchard and tall oat, is greatly in their favor as pastures grasses. It is highly probable that there will be found in the west indigenous grasses, which, under culture, will prove valuable to its husbandry. We have heretofore received the seeds of several wild grasses of the west, some of which are now growing with us; but we have as yet been unable to decide upon their value here, much less for the rich and peculiar soil of Illinois.

We design to continue our illustrations of implements, &c. but prefer selecting those which are common property, which every man may make or procure made. Cuts of patented machines, that are worthy of public patronage, will be cheerfully inserted, where the owner chooses to pay for the engraving.

CORN—APPLICATION OF LIME.

Mannington, Salem Co. 6 *mo.* 17, 1835.

Respected Friend—I did not intend thus long to have delayed acknowledging the receipt of thy acceptible letter, but in one way or other have been diverted from it. The corn reached me in due time, though a delay of some days must have attended it at the office in New-York. The grain is not so large as the kind we plant, but it will no doubt weigh heavier to the bushel, and is the most on the flint of any I have ever seen. I planted it in some new ground about the 25th of last mo.; it has been harrowed both ways and in a few days will be large enough to plough. Whether it will gradually or speedily assimilate with the corn of the neighborhood, I cannot tell, but knowing the tendency of every kind to mix when planted in rows contiguous, I reserved a small portion of it, and about ten days since, turned in some clover and planted it, where it will have no chance to do this. The ground was marked out 3 by 3, and I should think the soil in a good state for a crop. The farmers complain, many of them, of their corn not standing well; many fields near me have been injured by the grub and wire worm, and the birds too came in for a share: having tarred mine well, and rolled in plaster, it has scarcely received any injury, and the process of thinning will have to commence shortly. My wheat, especially that part of it which was sown after corn, is very promising, though I fear it is too large, for the rains which will be likely to ensue between this and harvest. From experiments I have made, I am more and more inclined to change my mode of farming, and give up the oats crop entirely. I think it an exhausting one to the soil, and from its tendency to lodge, where the season is favorable, is often a troublesome one. About 80 loads of upland and meadow hay, the straw from about 30 acres of wheat and oats, and the fodder from about half that quantity of corn, are mainly my resources for manure. This I intend to put on the corn ground, with about 40 bushels of lime to the acre, and to proceed in this way till the farm has had a coat of the latter. I feel however, at a loss to know how this should be applied, as a contrariety of views appear to be held out by different writers. From some of them you might infer that it made but little difference when lime was put on, so that you get it on some time in the year, and that the effect was complete when combined with manure; from others, that it should always precede manure when breaking up old lays for cultivation, &c.—that it is injurious, when mixed with any common dung, tending to render the extraction insoluble; that when laid upon the land during the same season, the dung should be ploughed down alone, and the lime afterwards harrowed in with the seed furrow. This last seems to be the point, but "British Husbandry" is appended to it, and though it detracts nothing from its merit, yet we are liable to be misled by foreign practices, which are not always adapted to our climate. I should *wish* to plough in my manure in the spring, and a short time before planting, lime and harrow it in, *provided* it would be *advisable* to do so. One of my neighbors told me he thought he was 200 dollars out of pocket from having limed his wheat ground last fall; he put on about 60 bushels to the acre, and I think, shortly after, put on his manure and turned all down together, harrowing his wheat in. He probably put on too much lime, but from what I have observed, should think it best not to lime the wheat ground at all—I mean just before you sow. It would seem to be best to have the lime well incorporated with the soil by the tillage of a previous crop, and for this corn is well adapted. This plan I pursued a year ago, but did not manure the corn ground, but reserved about half the usual quantity for the wheat, which was sown about the 22d of the 10th month, and is now equal perhaps to any in the county. I took the pen to say how much I felt obliged for the corn; this might have been done in a few words, and some apology is certainly due for thus encroaching on thy time; I have done it from a desire to obtain in a future number of thy "Cultivator" information on the subject alluded to. I read what I can get hold of on agricultural subjects, but books containing the desired information are not always to be found, and in the words of a great writer, "to search is not always to find."

Very respectfully thy friend,

WM. CARPENTER, Jr.

REMARKS.—We confess ourselves destitute of much practical knowledge in regard to the use of lime, and, as our correspondent observes, authorities are too contradictory to be fully relied on. Our limited experience has however taught, that it is worse than folly to apply it with barn-yard manures, either conjointly or separately, the same season. We gave a dressing of caustic lime and dung to a corn crop during our noviciate in farming. The corn grew well in the outset, but before the ears had formed, the prospect was blasted: its growth was checked and the product trifling. Caustic lime is a powerful solvent, and brings on a too rapid decomposition not only of dung, but, in light sandy soils, of most of the vegetable matters which it meets with there. Lime should be applied separately upon all soils, and sown upon an old tenacious sod, is often useful in expediting the rotting process Quick lime becomes effete, i e is converted into carbonate of lime, in a short time after it is applied to the soil; in which latter state its presence in soils not already abounding in it, is highly beneficial in the economy of putrescent manures; and these may be applied with increased advantage on land dressed the preceding year with quick lime.

COB MEAL.

Shrewsbury, N. J., 6th Mo., 27, 1835.

Jesse Buel,—Respected Friend—From the favorable observations of intelligent persons relating to the use of corn and cobs ground together as food for cattle, I have had a cast iron mill recently put up for the purpose of crushing them. Not having noticed any remarks on this subject in the Cultivator, I shall yet be glad to avail myself of thy experience and judgment as to the best mode of preparing and feeding such meal. I do not wish the pages of your useful paper occupied with that which is interesting only to myself or to a few of its readers—but if the use of the corn cob as food for cattle is of sufficient general interest to give an article upon it, I for one, shall be gratified to learn if it be better to grind them alone with the corn, or to mix oats in the hopper, should the meal be fed dry, or wet, separately, or mixed with, cut hay, cut straw, or cut stalks; at what times and in what quantities?

A pretty extensive feeder for the Philadelphia market once told me, that a bushel of meal made of corn and cobs was quite equal to a bushel of meal made of corn and oats, that his cattle throve as fast on the former, and that they never stalled (cloyed) on it.

I use the present opportunity to bespeak a sufficient quantity of thy "*Dutton*" seed corn to plant 12 acres the next season, say 2½ bushels shelled. With much respect, thy friend,

ROB: WHITE, Jr.

In confirmation of the great economy in *preparing* food for animals, one of the aldermen of New-York city told me, that at their public yard, (where the previous year they had fed out hay and oats whole) by the cutting of the hay and grinding the oats 8 bushels of oats and 15 cwt. of hay fed the same number of horses, doing the same work, the same length of time, and kept them in as good order, as 24 bushels of oats and 35 cwt. of hay had done when fed whole!! R. W. Jr.

REMARKS OF THE CONDUCTOR.

The cobs of corn undoubtedly contain much nutriment. P. Minor, of Virginia, [*see Am. Farmer, Vol* 1, *p.* 324] has given us the results of a nicely conducted experiment to ascertain the amount of this nutriment. He took ten bushels of corn and cob, weighing 367 lbs. and ten bushels of shelled corn, and subjected them to the process of distillation. The product of the corn and cob was 13 gallons of spirits and of the pure corn 18 gallons Estimating that the ten bushels of corn and cob would have given five bushels of shelled corn, which is the general proportion, there will be left, as the product of the five bushels of cobs, four gallons of spirit, or nearly half as much as was afforded by five bushels of corn. Mr. Minor remarks that the cob affords other nutritive matter than the saccharine, which is converted into alcohol, as mucilage and oils. We have besides abundant testimony, in the practice of eminent farmers, of the utility of feeding cob-meal to animals, always mixed we believe, with meal of the corn or oats. Cob-and-corn-meal is improved by scalding, still more, for hogs, by boiling, with potatoes, apples and pumpkins, and yet more by partial fermentation. All these preparations facilitate digestion. An animal high fed with raw grain, whether horse, hog or ox, voids much of its food in an undigested state, which is of course lost for all beneficial purposes. Grinding grain for animal food, therefore, is universally admitted to be economical, and cooking and partially fermenting it, it is no less true, further enhances its value for swine. Even the water in which it is cooked augments its nutritious properties, in consequence, probably, of some chemical change effected by the boiling operation. Fish subsist in pure water, as is strikingly illustrated in the management of the gold fish. The experiments of the Rev. H. Colman, in fattening swine, further warrant this operation. "At first," says this nice observer, "we employed half a bushel of Indian meal to make a kettle full of hasty pudding; but we soon found that a peck of meal, by taking up all the water it could be made to absorb, in a thorough boiling, would make the same kettle full (holding five pails) of sufficient consistency." In giving cob-meal to horses and neat cattle, that are fed with cut hay or straw, there is a double advantage, at least so it is stated by those who are well experienced, in feeding the grain and hay together. The grain, especially corn, is sometimes too heating to horses, and this tendency is counteracted by the stimulus of distensions. afforded by the hay and straw. Mixed feed of this sort may be fed thrice in 24 hours. It is eaten in so short a time as to afford much beneficial rest to the animal. We would call the reader's attention to the facts stated in Mr. White's postscript.

CIRCULAR.

Addressed to the Raisers, Inspectors and Consumers of Hops.

At a meeting of the Brewers of the state of New-York, convened in the city of New-York, 6th March, 1835, to take into consideration the causes of the present ruinous and improper practice of picking, curing, and inspection of hops, by which a very large proportion are rendered worse than useless, and others materially injured, a committee was appointed, and their chairman made the following report:

In presenting this communication, it is unnecessary to make any other remark to those interested, than to refer to the important facts that are here disclosed, to shew that prompt and efficient measures ought to be taken, to effect a radical change in the present system of picking and curing, as well as a corresponding change in the standard of inspection of hops.

We ask the patient indulgence of brewers, farmers, and inspectors, for the liberty we shall unavoidably be compelled to use, in pointing out the errors that have been fallen into. Your committee are aware of the great difference between persuading a man of the truth of any new proposition, with that of convincing him he is wrong, and satisfactorily inducing him to take the way of truth. We know we have one difficulty to contend with, to surmount which, we are apprised will require not only all our ingenuity, but also all the forbearance of those concerned. This difficulty is the ready sale of hops in our market, in the imperfect condition they are now produced. The farmer would naturally enough ask why all this clamor about lupulin, resin, early and late picking, while we can get 16c. per lb. and 2,000 lbs. per acre, (near $320 per acre,) per annum? This is all fair enough, and we will further admit, that some individual, who may ask this question, has himself produced hops worth the money, and as good an article as either this or any other country is capable of producing; but our complaint is that there are but very few of this fine quality, not one bale in ten. We think we speak advisedly, when we repeat, that out of the 8,500 bales, the produce of New-York and the eastern states, there may not be more than 8 or 900 bales in prime order. That we may be perfectly understood, we earnestly solicit a careful perusal of an analysis of hops by Dr. Ives, of New-York, and published in Silliman's Journal of Science, 2d volume. Since which, the attention of many of the first chemists and physicians, French, Scotch, and English, have carefully experimented on them, and the result has been nearly the same. In one *essential particular* they *all* agree, which is, that the only valuable properties are contained in the resinous globules, which Dr. Ives calls lupulin. These globules are not formed until a few days before the hop is ripe, and if picked either a few days too soon or too late, the hop is an injury instead of being of any service, as they possess neither preservative nor medicinal qualities. The experiments of Dr. Ives are so nearly correct, and as he merits the gratitude of his countrymen for his labor and skill in first bringing these matters before the public, we will copy a part of them, that they may be the more extensively known, and hope the valuable and important facts they disclose, may have their just influence in correcting the many errors that have obtained, in the picking, curing, and inspection of hops.

EXPERIMENTS:

"Two drachms of leaves of the blossom of the hop, from which all the lupulin or farina had been separated, were digested twelve hours in six ounces of boiling water. The infusion was bitter, and exceedingly unpleasant to the taste; it possessed none of the aromatic flavor and peculiar bitter of the lupulin. When filtered and evaporated, it yielded five grains of nauseous extract.

"The same leaves were again digested in six ounces of proof spirits; after twelve hours, the infusion was filtrated, and, by evaporation, yielded five grains of extract similar to the last. The same leaves were digested twenty-four hours in alcohol: the infusions manifested none of the sensible properties of the hop; it gave, by evaporation, four grains of extract. The taste of none of the extractive matter obtained from the leaves, was sufficiently characteristic of the hop, to designate that it was obtained from that article.

"From this and other similar experiments, leading to the same results, I think it is conclusively proved, that the virtue of the hop resides exclusively in the lupulin; that the leaves contain a nauseous extractive matter, which is imparted to water and to alcohol, and which, instead of adding to the bitter and aromatic flavor of the lupulin, partially neutralizes or destroys it.

"The obvious inference from these results have, as I conceive, been demonstrated,—that the lupulin alone, contains the bitter principle and the aromatic flavor of the hop, which are essential to the excellence and preservation of malt liquor."

These dicoveries of Dr. Ives, immediately brought the attention of M. M Payen, and Mr. Chevallier, two of the most eminent chemists of France, to this subject. The learned compiler of the Materia Medica, Brewster's Endinburgh Encyclopedia, Doctor John Bostock, M. D., F. R. S., Dr. Paris, an able, profound medical writer, all agree that the lupulin is the only valuable part of the hop; and Dr. Paris particularly mentions the hop, as the most valuable ingredient in ale, its stomachic qualities powerfully aiding digestion, "and particularly useful to the lower classes, enabling them to digest their innutritive food;" he says "Dr. Franklin was wrong in condemning ale," and deprecates "the disappearance of small beer from the tables of the rich, as there was nothing to replace the tonic of the hop."

From the above authorities, there is one certain fact established which proves, conclusively, that the leaves forming the pod of the hop, contains nothing of value for the purpose of brewing; an acrid, nauseous bitter, the only properties they possess.

In looking back to the qualities of hops the market for the last fifteen years have furnished, our opinion is, that the standard has gradually deteriorated; many are now branded firsts, which have been picked before the resin had began to form in them, and a very large proportion of those branded firsts, are picked before the hops are ripe, and the resin or lupulin but partially appearing, being only sap, as soon as dry it is dissipated, and very shortly after, not even the smell of the aroma is perceptible.

This principle error of picking hops before they have arrived at maturity, is followed by another, as far as it goes, equally pernicious; using brimstone to give them the appearance of maturity,—hence our markets are furnished with first rate hop pods or leaves, without any lupulin, possessing only the nauseous, acrid bitter, of unripe vegetation, and charged with sulphuric acid, the most deleterious matter to a vinous fermentation.

Various circumstances have combined to bring about this lamentable state of things. The inspector is not the principal in fault for branding as firsts, those which are *refuse* from early picking and brimstone. This error no doubt had its origin with mistaken men conducting the brewing business, and ignorant of either the culture, curing or their essential properties. These men wanted hops that would impart no color to their liquor, and advised the inspectors, that hops when ripe, were refuse, because when ripe, the leaves forming the head of the hop, accquired a brown or yellow tinge, slightly coloring the ale; consequently the inspectors have branded those hops *firsts*, which are gathered *green*, before the lupulin is formed in them, and from this ill advised source, brimstone has been introduced and applied to both early and late picked hops; to the early, to take away the green, and to the late, to take away the brown color, and bleach them all to the imaginary pale ale standard. By this pernicious course the rinds, if we may so term them, are substituted for the fruit, and for the wholesome aromatic resin, we are presented with an acrid, unhealthy bitter.

Another cause may explain why our markets are yearly retrograding, which is, the early demand for shipping, or a scarcity among the brewers; hence often enormous prices are paid for trash, not worth the cartage for manure. This early demand makes numbers eager to avail themselves of the chance of advanced prices, and the first sales, while they run no risk of the inspectors condemning them, from early picking. The farmers also find their interests served in early picking, as it gives a much longer time for harvest, enabling them with but trifling help, and less kiln room, to secure their crop; and can we blame them, while brewers and inspectors second their wishes?

We have no personal feeling, nor intend attaching censure to any individual; but insist that our present standard of inspection is an imposition; it does not indicate the maturity or intrinsic value of the hops. To be a competent judge of hops, requires experience, and a nice discrimination; it is impossible for any man to decide, correctly, unless he is capable of distinguishing every peculiar odour that hops may have; his sense of smell must be acute; it is not enough that the hops are dry, that they look well on the outside, that they have not been heated, smoked, stewed, brimstoned, or burnt; they must have the strong, pungent, aromatic smell of the hop when ripe, and just plucked from the stem; they must have the small globules of resin or lupulin, like gems surrounding the cove of the pod, and covering the bottom of the calyxes or leaves; without this lupulin, they are refuse. All which is respectfully submitted. L. FIDLER, *Chairman.*

Resolved, That this report meets the approbation of the trade.

R. BOYD, *President.*

M. VASSAR, *Secretary.*

The above report was transmitted to the brewers of Pennsylvania, and the following gentlemen were appointed a committee, who concurred with the brewers of the state of New-York, in the adoption of the above report. *Philadelphia, June* 18, 1835.

GEO. PEPPER,	ABBOTT, NEWLIN & Co.
FRED'K GAUL & SONS,	FRANCIS & W. J. PEROT,
SAM'L N. GRAY,	M. L. DAWSON,
HUTCINSON & STUMP,	THOS. C. LUDERS.

[We have received for publication, the circular of the Pennsylvania brewers, which we deem it unnecessary to insert, as the opinions it expresses accord with those in the preceding circular.]

REMARKS OF THE CONDUCTOR.—We cheerfully give insertion to the above communication, as containing matter worthy the notice of farmers, particularly of the hop grower. And we beg leave to suggest to the worthy fraternity of brewers, as the most ready and efficient means of improving the hop culture, the propriety of offering liberal premiums for the hest samples of hops that shall be exhibited at the Albany October Fair. This is a great hop market, and the crop will then be mostly ready for sale. It will be the means of congregating together the growers, buyers and inspectors; of instructing all in the criteria which indicate the first quality; of demonstrating the relative value of good and bad parcels, and of curing their crops. Let a judicious committee be appointed, to decide on the relative merits of the parcels shown; to point out defects, explain the causes of them, and to report facts, with directions for managing the curing process. All parties would be benefitted by the arrangement here recommended.

QUERIES.

JESSE BUEL,—Sir—The Oneida Agricultural Society has not yet been organized, but the subject is under consideration, and we wish to submit to you the following inquiries, viz:

1st. Are the enterprising farmers of Oneida County either directly or indirectly interested in the formation of such a Society?

2d. If so, upon what plan should it be organized?

3d. Should premiums be awarded or not?

4th. What is the organization of the State Society, who are its officers, and who are its members,—what has it already done, and what does it intend to accomplish—in short what is its whole history?

5th. In what counties have Societies been formed, upon what plan, and who are their officers?

6th. How should a young and inexperienced farmer proceed to bring about the formation of an agricultural society in this county, and will you not assist him with your pen at least?

The Utica papers are respectfully requested to insert the above inquiries, and Judge Buel's reply to them.

Vernon, June 21, 1835. ONEIDA.

ANSWERS.

1. Not only the *enterprising* farmers, but the entire population of a county, are interested in the formation of agricultural societies. Agriculture constitutes the main source of our wealth and social comforts: and the general prosperity of any community is increased or retarded as this flourishes or languishes. In our young days, we remember to have heard the fertili y of Oneida highly and we believe justly extolled; but in our frequent rambles through it of late years, we have been impressed with a belief, that most of her farmers adhere too closely to the practices of the primitive settlers,—forgetting, apparently, that the system employed to subdue the forest will not always serve to perpetuate the productiveness of the soil. While some of our counties, say Dutchess and Orange for instance, have, within thirty years, doubled or trebled their agricultural products, by an improved mode of farming, Oneida has remained nearly stationary in her husbandry. Wheat is no longer her staple product; and the economical management of manures, alternation of crops, and a judicious system of draining, three great sources of improvment and profit, have seemed either not to have been properly appreciated there, or if appreciated, not to have been duly practised. The object of agricultural, like other associations, is to concentrate the energies of many for a common benefit;—to introduce the improvements which are constantly making in this as well as in other branches of industry, and thereby to increase the profits of agricultural labor, and the comforts and moral health of society. For these reasons, we are free to express an unqualified opinion, that the formation of an agricultural society in Oneida would be beneficial to every class of its population.

2. The more simple, to answer useful purposes, the better the organization. The constitution and by-laws of existing societies afford good models.

3. Premiums confer honorary distinction as well as pecuniary reward; and these constitute strong inducements to industry and useful exertion. Where they are bestowed, as they should he, for discoveries and improvements which are calculated to henefit a community, their public utility cannot be doubted. The premiums of the agricultural society of Scotland have been a principal means of the unprecedented improvements in her husbandry. And the premiums bestowed by Napoleon did more to improve the arts, in France, than had been effected for a century previous: they called forth the energies

of the human mind, the great lever which aids, abridges and supersedes human labor.

4. The *organization* of the State Society is very similar to that of a county society; the names of its *officers* will be found in No. 1 of the present Vol. of the Cultivator; its *members* amount to one hundred or more, belonging to different parts of the state—they are required to pay an entrance fee of one dollar, and an annual contribution of two dollars, and are entitled to the publications of the society. These contributions, with about an equal amount from the avails of the Cultivator, constitute the funds of the society, and are sufficient to defray its ordinary expenses. Its benefits have not been equal to the wishes of its members, or their hopes of the future. It has however done much to diffuse useful information, particularly through the Cultivator, which is exclusively devoted to the interests of the farmer—15,000 copies of which are printed monthly. It gave, probably, the first efficient impulse to the silk culture among us, by the gratuitous distribution of mulberry seed in all the counties of the state, and by calling the public attention to this branch of rural labor. It has endeavored to induce the organization of county societies;—and to direct legislative attention to agriculture, as the primary interest, the great business of the state, and as especially entitled to the fostering care of the public functionaries. Persuaded that the prosperity and happiness of a people depend not so much upon the learning and wealth of a few, as upon the intelligence, domestic virtues and independence of the many,—it has petitioned for a participation in the public bounty, for the establishment of schools for instructing young farmers in the higher branches of learning,—of imbuing their minds with those principles of science which have a controlling influence in every branch of human labor, and of instructing them, thoroughly, in the practical operations of the farm. But as the society had neither political influence, nor personal considerations, the tenders which seem to possess the greatest intrinsic value, to offer in exchange for what they deemed common justice, the prayer of their petitions was unheeded, and almost unnoticed. They then applied for common corporate privileges, seldom denied to any applicants, to enable an association to establish a school of theoretical and practical agriculture. This also failed; or we should probably, ere this, have seen the stock taken up, and preparations making to put the plan into efficient operation. But though the society has been crossed by disappointment, and depressed by apathy, it has neither abated its wishes to do good, nor its hopes of ultimate success. When its motives are better understood, and the advantages, which may result from its labors better appreciated, the expectation is indulged, that a more liberal policy towards the society and its plans, will be manifested both by the legislature and the community at large, and that its labors will result in much good, in the political, moral, and pecuniary improvement our state.

5. Agricultural societies are believed to exist, or have recently been organized, in the counties of Jefferson, Monroe, Onondaga, Oswego, Rensselær, Columbia, Albany, New-York, Essex and Clinton. And it may not be irrelevant to add, that in Massachusetts, Ohio and Indiana there are numerous societies, sustained in part by legislative patronage, and that in most of the other states societies are multiplying, with encouraging prospects of public usefulness. We are not in possession, at present, of the plans of organization, or of the names of the officers, of the county societies of our state, though we doubt not both may be readily obtained, by consulting the agricultural journals, or by applying to the post masters of the county towns in which they have been organized.

6. We advise, in reply, to the last query, that the "young farmer" should draw up a caption for an association, obtain to it the signatures, and enlist in the project the feelings and the services, of a dozen or twenty, or more, kindred-spirits; adopt a constitution and by-laws; and under a consciousness that he is not only doing a certain good to himself, but benefitting his neighbors, let him and them resolve not to remit their reasonable exertions till they have accomplished their object. Though there may be many members, few managers are most efficient in organizing and sustaining a society. Where the responsibility rests upon all, none are willing voluntarily to assume it. Should this recommendation be followed, "Oneida" may count freely upon the aid of our pen.

THE FOOT ROT.

The following remedy for the *foot rot* in sheep, I believe has not before been published; it is considered an effectual remedy against that troublesome complaint, and has hitherto been sold for $5 per receipt. I have used it this present season to remove the complaint in a flock, which last year had it so severe, that I lost many of them, and on which I exhausted every remedy, ever heard or read of, without effect. Two applications has entirely removed the complaint.

3 qts. alcohol, 1 pt. spts. turpentine, 1 pt. strong vinegar, 1 lb. blue vitriol, 1 lb. copperas, 1½ lbs. verdigris, 1 lb. alum, 1 lb. salt petre, pounded fine; mix in a close bottle, shake every day, and let stand for six or eight days before using. Also, mix 2 lbs. honey with 2 qts. tar, and after paring the hoof diseased, apply the compound, then put on the tar and honey. S.

TICKS ON LAMBS.

J. Buel, Esq.—Sir—In your last number, I noticed a method of destroying the ticks on lambs. I have for several years adopted the same means, only I have added a small quantity of corrosive sublimate, which is still more effectual; and also in connection with the tobacco, a preventive against the scab. But I have pursued a different method in applying the compound from that of Judge Bostwick, which is to boil a sufficient quantity of tobacco in a potash kettle, adding when hot the corrosive sublimate, say 1 lb. to 300 sheep. Put out the fire, and when sufficiently cool, I erect a platform on one side of the kettle, so constructed, that after plunging the sheep and placing it on the platform, the liquid will all run back into the kettle, I then press it out of the wool. I have been in the habit of applying the wash to all my sheep, young and old, as it will destroy the nits, and the sheep made healthier and the quality and quantity of wool perceptibly increased. Three men in this manner, one to catch and the others to plunge the sheep, can wash 500 in a day. S.

Nelson N. Y., July 21.

ON AGRICULTURAL IMPROVEMENT.

Plainfield, Mass. June, 1835.

Among the many objects upon which great improvements are made at the present day, it is cheering to consider that agriculture is also receiving much attention. True it is, that this is a subject which has been too much neglected. We have followed our predecessors. As our fathers and grand fathers did, so have we done. We have long followed them in their steps, without ever supposing that their ways could be altered for the better. And it is astonishing to consider that while enterprise is the great characteristic of the Yankees, they have remained so long satisfied with travelling in the steps of their forefathers. But so it is, at least so it has been in this part of the country. But while some yet continue in the practice of their forefathers, others have left their tracks, and are now beginning to make experiments for themselves. The method of cultivating the soil that has been practised in this vicinity, that was handed down to us by generations that have gone before us, and which some of our farmers yet continue to practise, is the following: In the first place, a man to be called a farmer, must have a large farm. This is divided into lots for mowing and pasturing. The pastures are left to take care of themselves, and since they were cleared, have seldom or never been disturbed by the plough. Of course they now produce but very little, and that not of the best quality.

But this is good husbandry, compared with the practice of many of our farmers, with their mowing lots. With one class of our farmers, it has been the practice to till far too much land, and that quantity of manure that ought to be put on one acre, is put on three. After planting several seasons, it is sown with some kind of grain, without manure, till the soil becomes exhausted to such a degree, that it hardly compensates the laborer for his toil. It is then thought to be in a good condition to put to grass.

This is one instance of the mismanagement of farmers in this region, and the natural consequence is, that land has greatly decreased in value. Many farms have been worn out to such a degree, that the owners have been under the necessity of removing to the more fertile lands of Ohio. But though most of the farmers have for a long time practised this method of their forefathers, though their minds for a long time have been prejudiced against every thing contrary to what their predecessors taught them, yet it is pleasing and cheering to witness, notwithstanding many continue to practise the old methods, that some are laying them aside, and beginning to act with unbiased and unprejudiced minds. It is truly gratifying to witness the improvements that are made at the present day in agriculture, and though we do not expect to plant and hoe, or raise our crops by steam or water power, yet we believe improvements in agriculture have but just commenced. It is gratifying also to consider how much is written at this day on this subject; how many periodicals are published and distributed in our land, when but a few years ago such a publication could scarcely be found. And it is cheering to see, that such publications are now read by many with unprejudiced minds. The time has been, when if a person read a periodical on this subject, and was influenced by it to deviate in the least from the customs and practices of his forefathers, he would be despised and ridiculed. I have seen the man, who, when told by his more enlightened brother farmer, his method of raising corn, would sneer at him for getting his opinions from the newspapers.

But how strange it is, that the farmer has remained so long deluded; how strange that they have remained so long blind and deaf to the writings of those who have examined the subject, and whose object in writing has been to benefit them.

The divine must spend years in studying the bible, and in examining commentaries upon it, before he is qualified for the duties of his office. The lawyer must spend years in study, before he is capable of pleading at the bar. The physician must spend years in studying and examining the writings of others, on the treatment of diseases, before he is qualified for attending to the sick. But many a farmer supposes he can be taught nothing with respect to cultivating the soil. He has already the art to perfection; and he would almost as soon think of putting a rattle snake into his bosom, as to read on this subject. But the times are fast changing; books and periodicals on this subject are now read by many without prejudice. Those that cultivate the soil, are now rising from the degradation in which they have so long remained. Formerly it was thought that farmers were wholly unfit for any thing except to till the soil, and they were considered the offscouring and the dregs of mankind. But at the present day, the farmer is fast rising to respectability and he now fills places in society, for which he was formerly thought wholly unfit. Formerly it was thought, if he could read, write, and say the multiplication table, it was all that was necessary for him to know. Not a year ago, a young man applied to his father for permission to attend a select school, then kept in the town in which they resided. Ah, said his father, I would not have you attend that school for a thousand dollars. The reason was because he thought learning worse than useless for the farmer.

But these dark ages with respect to agriculture are rapidly flitting by us; and the sun that has been so long hid in clouds and darkness, is now breaking forth in its meridian splendor, dispelling the fogs and mists in which our land has so long been enveloped.

J. A. B.

TO DESTROY THE CANADA THISTLE.

Cut them off near the ground, when they are full in the blow or a little past. This process I have tried for three years, and find that it entirely eradicates them from the fields by once mowing. I have noticed several modes of destroying this noxious weed in the Cultivator, but find none attended with so small expense as mine, which has induced me to send you the above.

SOLOMON W. JEWETT.

Weybridge, Vt. July 23, 1835.

Remark.—In confirmation of the above, we can state, that in 1834, we unexpectedly found a quarter of an acre of rank thistles in a piece of grass ground recently laid down. They were in full bloom when the grass was mown. The present year, the number was apparently diminished five-sixths and what remained were stunted dwarf plants. The thistle spreads most in ploughed ground and in highways, where they are rooted among by the hogs.—*Conductor.*

TO DESTROY ANT-HILLS.

The Pismire [ants] are becoming quite a detriment on some of our valuable lands, especially meadows, by the raising of mounds and destroying of crops. They, similar to the honey-bee, when too numerous in one family, emigrate to new grounds and are thus constantly multiplying their habitations. They may be destroyed by taking out of the centre of the mound, a block the width and depth of a spade, just as winter sets in, or before the ground freezes.

Weybridge, July 23, 1835. S. W. JEWETT.

WIRE WORM.

Schenectady, 18*th June*, 1835.

Sir—In many parts of this county, the wire worm and grub have injured the corn, oats and barley, growing on land that had previously been in grass. Does ploughing grass land in the fall kill the worm? I am inclined to think it does not, because a meadow on our Mohawk flats, containing four acres, was ploughed last fall and planted this spring with corn previously soaked in a solution of copperas. The corn planted on three of the acres was also smeared with tar. The worms have been much more destructive among the corn that was tarred, than that which was not. This was probably owing to their being more numerous in that part of the field. A few days since, in reading one of the late numbers of that valuable English periodical, the Farmers' Series of Useful Knowledge, I found that in England they destroy the worms in grass lands in the following manner:—Knowing that the worms come above ground in the night, they at that time spread quick lime in a state of powder, over the grass, which is evenly done by throwing it with a shovel high in the air from the rear of the cart, which is driven across the field. The worms crawling about at that time are covered with lime, which soon kills them.

Respectfully yours, C. H. T.

Remarks.—The wire worm, we think, does not come to the surface at night—it remains fixed in the corn upon which it preys. It is the alkaline property of the lime, carried down by water, which destroys them if any thing. Tar is no preventative, nor fall ploughing, nor any application that we know of. Salt, at the rate of two or three bushels to the acre, is said to be efficacious. The grub or cut-worm comes to the surface at night.—*Conductor.*

THE MADDER CROP.

Hon. J. Buel—Sir—As I consider the madder crop to be one of importance, as well to the grower of the article as to the country at large, I deem it proper to send you a few lines, giving some details of the most improved method of cultivating and preparing the article for use; which, if you deem them worthy a place in the Cultivator, you are at liberty to insert.

The land best adapted to this crop is a retentive, strong loam soil, moist, but so situated that the water may pass off in the wet saasons of the year. The plant accommodates itself to almost any soil; for I last fall harvested a piece that yielded at the rate of five thousand pounds to the acre, (in hills) which was in a dry loamy soil, suitable for the wheat or corn crop.

The method of planting has been formerly in hills, from four to six feet apart. The hills yielded from two to three pounds of ground madder each, on good land.

Madder growers have lately made great improvements in the mode of planting. The drill method was introduced two or three years since, and is now the only way practised by those who raise madder in any considerable quantities. The first drills that were planted, were set in single rows, about six feet apart and eighteen inches from plant to plant. These were found to be too near together, both for the good of the crop and the convenience of tending it. It is now ascertained that the best method of planting madder, is in beds six feet wide, with four rows of plants to a bed, leaving a space between the beds nine feet wide unoccupied; or it may be planted with rows of corn or potatoes the first season. This space is useful for various purposes, as passing with a team to carry manure, should it be considered necessary during the first and second seasons. The manure should be cropped between the beds, and mixed with a plough before it is used in beds.

Particular care should be taken at the time of planting, that the ground be not too dry. It should be covered with clear, moist dirt, about two or two and a half inches deep. Soon as it has come up, it should be carefully hoed and cleared from weeds. When it is six or eight inches high, the tops should be covered up nearly to the ends; and covered again soon as they are six or eight inches high as before. In the fall, before the frost kills the tops, they should be covered entirely up. It is then left to lie till the next spring. It should be managed in the same manner during the second as the first season; but requires only two dressings before covering up in the fall. During the third season it should be dressed once certainly, and twice if practicable; and by this time the tops may be expected to cover the ground nearly from one bed to the other. During the fourth season, it requires no attention till the time for digging, which may be any time in the months of September or October. At digging time, the tops should be cut off with a scythe, and rolled out of the way; then with a plough, cut a deep furrow on each side of the bed; afterwards take dungforks and shake the dirt from the roots. They may then be picked up. Proceed in this manner till the whole bed is dug, washed clean, and dried in a hop kiln. A stove is preferable to charcoal for drying. Fifty bushels of roots may be dried in a kiln 12 feet square. They should be turned while in the kiln, at least once in six hours, until they are thoroughly dried, which takes from 36 to 40 hours. When taken out of the kiln, they should be taken immediately to the mill for grinding. Madder has formerly been ground in grist mills, but a much more convenient and economical way, is to grind in cast iron mills, constructed expressly for grinding madder.—They also answer a valuable purpose, for grinding coarse grain for provender, in sections of country where grist mills are not near by. They may be propelled by horse power, (one horse being sufficient,) or by water power if it is convenient. One of these mills will grind 800 or 1,000 pounds a day with one horse. Improved mills of this kind can be obtained by applying to me, at West-Winfield, Herkimer county, or Lester Curtis, Nelson, Madison county. Orders for mills will be promptly attended to: price $20.

The following bill exhibits nearly the cost of cultivating an acre of madder, including the expense of digging, drying and grinding.

Seed per acre, ...	$32 00	Product, if well cultivated, 5,000 lbs. at 20c. per lb...	$1,000 00
Interest of land 4 years, at $40,..	11 20	Deduct cost, ...	111 70
Ploughing and harrowing twice, .	2 50		
Planting, ...	2 00	Nett profit,......	$888 30
Dressing first year,..	8 00		
do second year, ...	7 00		
do third year, ...	3 00		
Digging, ...	21 00		
Drying, 25c. per cwt.	12 50		
Grinding, 25c. per cwt...........	12 50		
Total cost,.....	$111 70		

A good crop of madder looks small the first season, but those interested need not be discouraged. I have now planted nine acres, and shall be ready at the season for digging to supply seed to a considerable amount. Those who wish for seed, had better obtain it in the fall. Quantity per acre, as I plant, 8 bushels.

Price of seed: under 6 bushels, $4 per bushel; over 6 and under 12 bushels, $3.50; over 12 bushels, $3.

Respectfully yours, HERBERT WOODBERRY.

West-Winfield, N. Y. July 20th, 1835.

Elements of Practical Agriculture,

By David Low, Professor of Agriculture, &c.

THE HARROW.

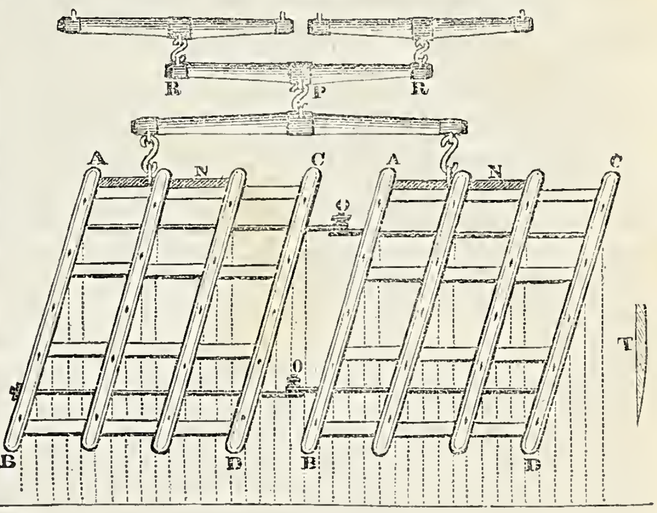
This instrument succeeds to the plough in the order of description, and the uses to which it is applicable. It consists of a frame of wood or iron, in which a certain number of teeth are fixed, which are pressed into the ground by their own weight and that of the frame. The instrument is intended to pulverize the ground which has been acted upon by the plough, to disengage from it the roots and other substances which it may contain, and to cover the seeds of corn and other cultivated plants.

The harrow is greatly more simple in its form than the plough. It is even an imperfect machine in any form of which we can construct it; yet it is of great utility in tillage, and should receive all those mechanical improvements of which its nature will admit.

The harrow performing its operation by means of a certain number of teeth moved forward in the ground, and pressed downwards by their own weight and that of the frame in which they are fixed, the first questions that occur in investigating the principles of its construction are, the form that should be disposed in the surmounting frame. Were it the purpose, in harrowing, solely to drag up the roots of plants and other substances from the ground, the best form, perhaps, that could be given to the teeth would be that of a thin wedge, tapering to the point, like the coulter of a plough, and, like it, inclining forward. But although this construction might be the best calculated for tearing up roots and other substances beneath the surface, it would not be so well fitted for covering the seeds and for breaking and pulverizing the ground, as when a broader surface was presented to the earth, and a greater movement given to its particles. The wedge for this purpose should be broad rather than thin. In order, therefore, to adapt the form of the teeth to this purpose—to the strength necessary to be given to them, and to the lateral or shaking motion to which they are subjected in passing over rough ground, as well as to their forward motion—it is conceived that the best form of them will be when their horizontal section is a square, whose diagonal is moved forward in the line of the harrow's motion; while they should gradually taper to a point, the forepart being kept straight, as in T, fig. 1.

With regard to the distribution of the teeth in the frame of the harrow, they should not be placed too closely together, for then they would be too much impeded by the obstacles opposed to them: Further, they should be so disposed with relation to each other, as that one part of the instrument shall not be more interrupted than another: Again, their number should not be too great, because then their power to penetrate into the ground will be diminished, unless the weight of the whole instrument, shall be increased in a corresponding degree: And lastly their length should not be greater than is necessary, because they will not on that account penetrate more deeply into the ground, unless the whole weight is also increased, and because this increase of length will give a greater power to the teeth, when encountered by obstacles, to split the frame in which they are fixed.

Fig. 1.



The harrows represented in Fig. 1,* of which the frame is of wood and the teeth of iron, are formed with a regard to these general principles. They are connected together in pairs by hinges. They consist each of four bars of wood, AB, CD, &c. which are joined together by an equal number of cross-bars of smaller dimensions, mortised through them. The larger bars may be 2½ inches in width or more, by 3 in depth, and the smaller 2¼ inches in width by 1 in depth. The larger bars are placed oblique to the smaller bars, and to the line of the harrow's motion, and the teeth are inserted into them them at equal distances from each other. This inclination is made to be such, that perpendiculars from each of the teeth falling upon a line LM, draw at right angles to the harrow's motion, shall divide the space between each bar into equal parts, so that the various teeth, when the instrument is moved forward, shall indent at equal distances the surface of the ground over which they pass.

The number of teeth in each harrow is 20, 5 being inserted in each of the larger bars. When two harrows, therefore, are employed together, the surface of the ground from L to M is indented by 40 teeth, impressing the ground at equal distances from each other, and covering the space of about nine feet. The teeth may project below the under surface of the frame seven or eight inches, their length somewhat increasing from the hindmost to the foremost rows, where the oblique position of the line of draught tends most to elevate the harrow. The teeth are often inserted into the frame with a little inclination forward; but this deviation from the perpendicular, if made at all, should be very slight, because it renders the harrow more apt to be impeded by the weeds or other substances collected in the angle between them and the frame. The teeth are fixed in the bars by boring holes with an auger of about three-fourths of an inch in diameter, and then driving them firmly through. The teeth, when thus driven into the bars, will be retained with sufficient firmness. The best of the common kinds of wood for the larger bars, as being the least liable to split, is elm, birch or ash, and for the cross-bars ash.

The iron rods which terminate in the hinges, O, O, may pass through the farmework to give it greater strength. These rods keep the harrows at the distance required, and the hinges admit of either harrow rising or falling according to the inequalities of the surface. When thus joined, the harrows are drawn by two horses guided by reins, the driver walking behind, so as to be pre-

* These harrows are constructed by Mr. Craig, of Galway, and sold at $15 the pair.

pared to lift up either harrow when choked by weeds, or otherwise interrupted.

The method of attaching the animals of draught will be explained by the apparatus of swing-trees, shown in the figure, by means of which each animal must exert an equal force in pulling. There are plates of iron, N, N, passing through the left-hand bars of each harrow. These plates have a few holes in them, so that the line of draught may be shifted to the right or left as may be required. The staple P upon the swing-tree RR, being the point to which the moving power of the harrow is attached, it is important to ascertain its proper position.

Were a perpendicular to be let fall from the staple P upon the line LM, the point of intersection would be in the middle of the entire breadth covered by the harrows, and an equal number of teeth would be on each side of the line of traction, and this would seem to indicate the position of the staple P. But the larger bars being placed oblique to the line of the harrow's motion, when any obstacle raised above the surface of the ground strikes one of these bars, it tends to press it to the right hand side. And as there are eight bars of this kind, and these of considerable length, it will appear that, in ground where there is any great unevenness of surface, there will be a constant succession of strokes, forming a strong lateral pressure on the left side of the several bars. But the staple P being nearly fixed in its position, while the harrows may be moved round, the effect of this lateral pressure is to turn the whole harrows on P as a pivot from left to right. In practice, accordingly, there is found to be a constant tendency in the harrows of this construction to swing around from left to right, and this often to so great a degree in very rough ground, as to place the larger bars parallel to the line of motion, thus causing all the teeth in the same bar to follow in the same track. Hence the point P ought not to be precisely in the middle of the space covered by the harrows, but placed somewhat to the left hand, in order that so great a number of teeth may be placed on the right side of the line of traction as to counteract the tendency of the harrows to turn from left to right. But further, the position of T is not fixed, but must vary with the roughness of the surface over which the harrows are dragged. Hence not only must the staple P be placed somewhat to the left hand, but there must be the power of moving it more or less towards the left hand, according to the roughness of the surface passed over. This is effected by the iron plates, with holes, of which mention has been made, and by means of which the driver can readily shift the line of draught more or less to the left hand, as may be required.

From Ruffin's Essay on Calcareous Manures.

OBSERVATIONS ON MARL AND LIME.

The theory of the constitution of fertile and barren soils, has now been regularly discussed; it remains to show its practical application, in the use of calcareous earth as a manure. If the opinions which have been maintained are unsound, the attempt to reduce them to practice will surely expose their futility; and if they pass through that trial, agreeing with, and confirmed by facts, their truth and value must stand unquestioned. The belief in the most important of these opinions, (the incapacity of poor soils for improvement, and its cause;) directed the commencement of my use of calcareous manures; and the manner of my practice has also been directed entirely by the views which have been exhibited. Yet in every respect the results of practice have sustained the theory of the action of calcareous manures—unless there be found an exception in the damage which has been caused by applying too heavy dressings to weak lands.

My use of calcareous earth as manure, has been almost entirely confined to that form of it which is so abundant in the neighborhood of our tide-waters—the beds of *fossil shells*, together with the earth with which they are found mixed. The shells are in various states—in some beds generally whole, and in others, reduced nearly to a coarse powder. The earth which fills their vacancies, and serves to make the whole a compact mass, in most cases is principally silicious sand, and contains no putrescent or valuable matter, other than the calcareous. The same effects might be expected from calcareous earth in any other form, whether chalk, limestone, gravel, wood-ashes or lime—though the two last have other qualities besides the calcareous. During the short time that lime can remain *quick* or *caustic*, after being applied as manure, it exerts, (as before stated,) a solvent power, sometimes beneficial and at others hurtful, which has no connexion with its subsequent and permanent action as calcareous earth.

These natural deposites of fossil shells are commonly, but very improperly, called *marl*. This misapplied term is particularly objectionable, because it induces erroneous views of this manure. Other earthy manures have long been used in England, under the name of marl, and numerous publications have described their general effects, and recommended their use. When the same name is given here to a different manure, many persons will consider both operations as similar, and perhaps may refer to English authorities for the purpose of testing the truth of my opinions, and the results of my practice. But no two operations called by the same name can well differ more. The process which it is my object to recommend, is simply the *application of calcareous earth in any form whatever, to soils wanting that ingredient*, and generally quite destitute of it; and the propriety of the application depends entirely on our knowing that the manure contains calcareous earth, and what proportion, and that the soil contains none. In England, the most scientific agriculturists apply the term *marl* correctly to a *calcareous clay*, of peculiar texture; but most authors as well as mere cultivators, have used it for any smooth soapy clay, which may, or may not have contained, so far as they knew, any proportion of calcareous matter. Indeed, in most cases, they seem unconscious of the presence, as well as of the importance of that ingredient, by not alluding to it when attempting most carefully to point out the characters by which marl may be known. Still less do they inquire into the deficiency of calcareous earth, in soils proposed to be marled—but apply any earths which either science or ignorance may have called marl, to any soils within a convenient distance—and rely upon the subsequent effects to direct whether the operation shall be continued or abandoned. Authors of the highest character, (as Sinclair and Young, for example,) when telling of the practical use, and valuable effects of marl, omit giving the strength of the manure, and generally even its nature—and in no instance have I found the ingredients of the soil stated, so that the reader might learn what kind of operation really was described, or be enabled to form a judgment of its propriety. From all this, it follows that though what is called *marling*, in England, may sometimes (though very rarely, I infer,) be the same chemical operation on the soil that I am recommending, yet it may also be, either applying clay to sand, or clay to chalk, or true marl to either of those soils—and the reader will generally be left to guess in every separate case, which of all these operations is meant by the term *marling*. For these reasons, the practical knowledge to be gathered from all this mass of written instruction on marling, will be far less abundant, than the inevitable errors and mistakes. The recommendations of marl by English authors, induced me very early to look to what was here called by the same name, as a means for improvement: but their descriptions of the manure convinced me that our marl was nothing like theirs, and thus actually deterred me from using it, until other views instructed me that its value did not depend on its having "a soapy feel," or on any mixture of clay whatever.

Nevertheless, much valuable information may be obtained from these same works, on calcareous manure, or on marl, (in the sense it is used among us) but under a different head, viz. *lime*. This manure is generally treated of with as little clearness or correctness, as is done with marl: but the reader at least cannot be mistaken in this, that the ultimate effect of every application of lime, must be to make the soil more calcareous—and to that cause solely are to be imputed all the long continued beneficial consequences, and great profits, which have been derived from liming. But excepting this one point, in which we cannot be misled by ignorance, or want of precision, the mass of writings on lime, as well as on calcareous manures in general, will need much sifting to yield instruction. The opinions published on the operation of lime, are so many, so various and contradictory, that it seems as if each author had hazarded a guess, and added it to a compilation of those of all who had preceded him. For a reader of these publications to be able to reject all that is erroneous in reasoning, and in statements of facts—or inapplicable on account of difference of soil or other circumstances—and thus obtain only what is true and valuable—it would be necessary for him first to understand the subject better than most of those whose opinions he was studying. It was not possible for them to be correct, when treating (as most do) of *lime*, as one kind of manure, and every different form of the *carbonate of lime*, as so many others. Only one distinction of this kind (as to operation and effects) should be made and never lost sight of—and that is one of substance, still more than of name. Pure or quicklime, and carbonate of lime, are manures entirely different in their powers and effects. But it should be remembered that the substance which was pure lime when just burned, often becomes carbonate of lime before it is used, (by absorbing carbonic acid from the atmosphere,)—still more frequently before a crop is planted—and probably always, before the first crop ripens. Thus, it should be borne in mind that the manure spoken of as lime, is often at first, and always at a later period, neither more nor less than calcareous earth: that lime which at different periods is two distinct kinds of manure, is considered in agricultural treatises as only one: and to calcareous earth are given as many different names, all considered to have different values and effects, as there are different forms and mixtures of the substances presented by nature.

But however incorrect and inconvenient the term *marl* may be, custom has too strongly fixed its application for any proposed change to be adopted. Therefore, I must submit to use the word *marl* to mean beds of fossil shells, notwithstanding my protest against the propriety of its being so applied.

The following experiments are reported, either on account of having been accurately made, and carefully observed, or as presenting such results as having been generally obtained on similar soils, from applications of fossil shells to nearly six hundred acres of Coggin's Point Farm. It has been my habit to make written memoranda of such things; and the material circumstances of these experiments were put in writing at the time they occurred, or not long after. Some of the experiments were, from their commencement, designed to be permanent, and their results to be measured as long as circumstances might permit. These were made with the utmost care. But generally when precise amounts are not stated, the experiments were less carefully made, and their results reported by guess. Every measurement stated, of land or of crop, was made in my presence. The average strength of the manure was ascertained by a sufficient number of analyses—and the quantity applied was known by measuring some of the loads, and having them dropped at certain distances. At the risk of being tedious, I shall state every circumstance supposed to affect the results of the experiments—and the manner of description, and of reference, necessary to use, will acquire a degree of attention that few readers may be disposed to give, to enable them to derive the full benefit of these details. But however disagreeable it may be to give to them the necessary attention, I will presume to say that these experiments deserve it. They will present practical proofs of what otherwise would be but uncertain theory—and give to this essay its principal claim to be considered useful and valuable.

When these operations were commenced, I knew of no other experiments having been made with fossil shells, except two, which had been tried long before, and were considered as proving the manure too worthless to be resorted to again. Inexperience, and the total want of any guide, caused my applications, for the first few years, to be frequently injudicious, particularly as to the quantities laid on. For this reason these experiments show what was actually done, and the effects thence derived, and not what better information would have directed, as the most profitable course.

The measurements of corn that will be reported were all made at the time and place of gathering. The measure used for all except very small quantities, was a barrel holding five bushels when filled level, and which being twice filled with ears of corn, well shaken to settle them, and heaped, was estimated to make five bushels of grain—and the products will be reported in *grain* according to this estimate. This mode of measurement will best serve for comparing results—but in most cases it is far from giving correctly the actual quantity of dry and sound grain, for the following reasons. The common large soft grained white corn was the kind cultivated, and which was always cut down for sowing wheat before the best matured was dry enough to grind, or even to put up in cribs; and when the ears from the poorest land were in a state to lose considerably more by shrinking. Yet for fear of some mistake occurring if measurements were delayed until the crop was gathered, these experiments were measured when the land was ploughed for wheat in October. The subsequent loss from shrinking would of course be greatest on the corn from the poorest and most backward land, as there, most defective and unripe ears would always be found. Besides, every ear, however imperfect or rotten, was included in the measurement. For these several reasons, the actual increase of product on the marl land, was always greater than will appear from the comparison of quantities measured: and from the statements of all such early measurements, there ought to be allowed a deduction, varying from ten per cent on the best and most forward corn, to thirty per cent on the latest and most defective. Having stated the grounds of this estimate, practical men can draw such conclusions as their experience may direct, from the dates and amounts of the actual measurements that will be reported. Some careful trials of the amount of shrinkage in particular experiments will be hereafter stated.

No grazing has been permitted on any land from which experiments will be reported, unless it is specially stated.—[*To be continued.*]

THE CULTIVATOR—SEPT. 1835.

TO IMPROVE THE SOIL AND THE MIND.

ON THE UTILITY AND BEST METHOD OF COOKING FOOD FOR DOMESTIC ANIMALS.

This subject has engaged the attention of practical men in Europe and in this country for many years, and it is a branch of rural economy at all times worthy the careful investigation of the farmer. The Highland Society of Scotland have, in a particular manner, directed the public attention to the comparative advantages of feeding farmstock with prepared or unprepared food, and have, by liberal premiums, induced numerous experiments to be accurately made, and elicited much valuable information. The conclusions which have been drawn from these and other experiments, seem to be,—

1. That a great saving, some say one-half or more, is effected by cutting the dry fodder for horses and neat cattle, and feeding it with their provender or grain, in two or three daily messes, in mangers. Not that the food is thereby enhanced in its inherent properties, but that given in this way it all tells—is all consumed, all digested, *all* converted into nutriment. There is comparatively none wasted, or voided, without having benefitted the animal. In the ordinary mode of feeding in racks, yards, and in open fields at stacks, it is well known that much *is* lost, from the difficulty of masticating uncut hay, straw and stalks, and from its being trodden under the feet of animals and spoilt. Much labor is besides saved to the animal, as cut food requires less mastication, and the animal enjoys a longer period of rest.

2. That grain and pulse, as cattle food, is enhanced in value by being ground or bruised before it is fed out, so much as to warrant the expense of sending it to mill, and the deduction of toll. Indian corn, oats, rye, and other grain, given to farm animals in a dry, unbroken state, it must have been observed by every one, particularly when the animal is high fed, are often voided in a half or wholly undigested state, and are virtually lost. This does not happen when the grain has been ground.

3. That although roots, as ruta baga, mangel wurzel and potatoes, are improved as fattening materials for neat cattle, by cooking, the advantages hardly counterbalance the extra expense of labor and fuel.

4. That for working horses, cooking the roots we have enumerated, and feeding them with cut hay and straw, is of manifest advantage; and that thus fed they supersede the necessity of grain.

5. That in fattening hogs, there is decided economy in grinding and cooking the food. The experiments upon this subject are many and conclusive. Some estimate the saving at one-half the quantity of food. Taking into account the various materials on a farm, which may thus be turned to account, we are satisfied that one-half the cost of making pork may in this way be saved.—Swine are voracious animals, and will eat more than their stomachs can digest, unless assisted by the cooking process. There are upon the farm may refuse matters, as pumpkins, squashes, small potatoes, early and defective apples and apple pomace, which are of little value, except as hog food, but which, if well husbanded, cooked and mixed with ground provender, contribute essentially to cheapen our pork. It has been questioned whether the articles we have enumerated are nutritive to pigs, when given in their raw state; while all admit, who have made the experiment, that they are highly so when cooked. Cooking undoubtedly adds to their nutritive properties, as it does to the nutritive properties of Indian meal.

Before we offer our views of the most economical mode of cooking food for hogs, and of the apparatus to be employed, we beg leave to submit the plan of a hog-pen or piggery, which, with some modifications, is the model of one we examined at the Shaker village in Niskayuna.

Fig. 1.

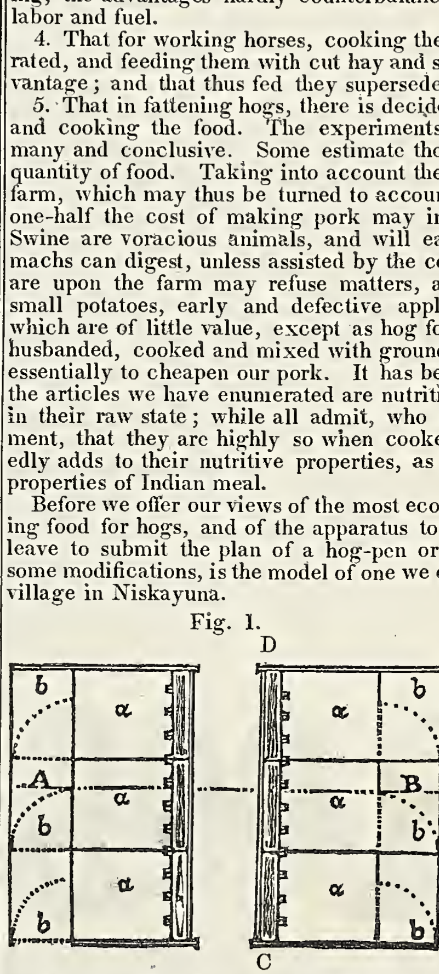


Fig. 1, exhibits a ground plain of the building, showing a gangway in the centre, with a range of pens on each side.—The breadth is 26 feet, and the length may be adapted to the convenience of the builder. The pens are six feet broad and ten feet deep, with a cross partition 4 feet from the rear, and a four feet door, which is used to close the passage between the front department (*a*) and the department *b*, or to extend the partition between the pens. The different uses of the doors are shown on the two sides in the cut. The pens are calculated for four hogs each, and the section here exhibited will therefore accommodate 24. When the pens require to be cleaned, the doors are shut into the cross partitions, as at A, so that the rear presents an uninterrupted passage, the hogs being confined in *a a;* and as soon as the pens are cleared, these doors are thrown back as at B. The troughs are embraced in the gangway.

Fig. 2.

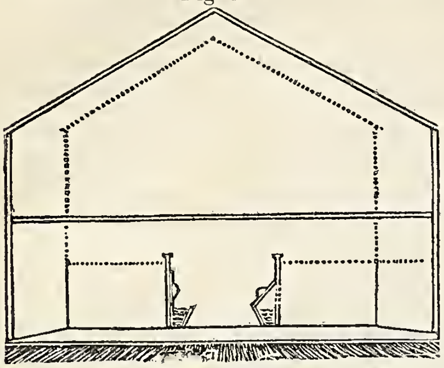


Fig. 3

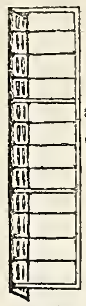


Fig 4

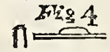


Fig. 2, shows a cross section along the dotted line A B. The partitions are three and a half feet high, the posts eleven feet, giving seven feet to the basement, and four to the upper story, below the roof. The position of the feeding troughs is here shown. They are provided with lids, hung with stout hinges above, and may be let down so as to exclude the hogs from the troughs while they are being cleaned or replenished with food, or raised up, at pleasure, as shown in this section. Each lid is provided with an iron bolt, *(fig.* 4.) which works in staples, and confines the lid in the position required. This section also shows the slope of the floor in *b b*, so constructed that the urine may drain off. The dotted lines represent the size of the building, when, instead of the apartments *b b*, it is wished to let the hogs run in an open yard. For small farmeries, a single range of pens and the gangway may suffice. The loft serves as a store room for hog-food, &c.

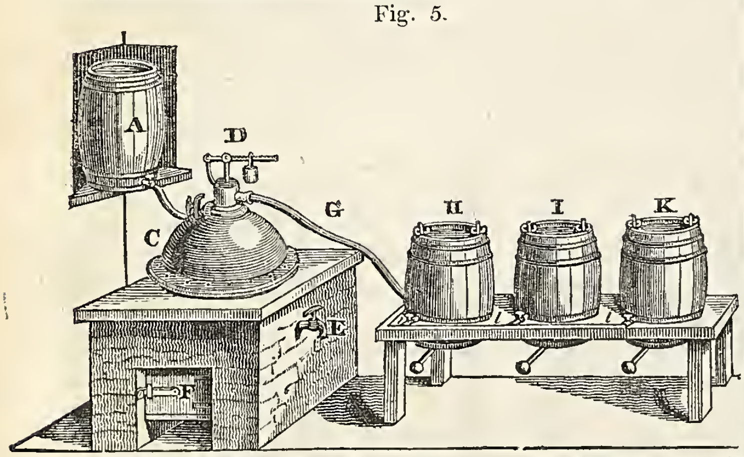
Fig 3, is a section along C D, showing the studs that prevent the interference of the hogs while eating.

The boiling or steaming room is in one end of the building, and communicates with the passage and the loft.

The peculiarities, or rather the advantages of this piggery, consist in the facility which is afforded of cleaning the pens and the troughs, and of depositing the food in the latter, without being incommoded by the hogs, and in preventing the hogs worrying each other.

We shall now exhibit the model of a steaming apparatus, calculated for a large establishment. We have shown the plan to an intelligent master in one of our furnaces, who estimates the cost of boiler, pipes and cocks, at $50.

Fig. 5.



"A is a barrel or other vessel for containing water and supplying it to the boiler C. D is a safety-valve. At the upper part of the boiler at C are placed two tubes, with stopcocks. One of these tubes terminates near the bottom of the boiler. Upon the stopcock being turned, water should always issue from this tube. When, therefore, steam issues from it, and not water, this indicates that the water is too much boiled away, and consequently that there is a deficiency of water in the boiler. The other tube terminates within the boiler, near the top. Upon the stopcock being turned, therefore, steam ought always to issue forth. But should water in the place of steam come out, then it will appear that the boiler is too full of water. In this manner the attendant, by turning either stopcock, ascertains whether there is a deficiency or excess of water in the boiler. The quantity of water could indeed be regulated by nicer means; but that described will be found sufficient in practice. F is the furnace, and E is a pipe with a stopcock communicating with the boiler.—When it is wished to obtain hot water, it is obtained by this pipe. A pipe G communicates with the barrels H, I, K, and conveys the steam to them; and in these is placed the food to be steamed. By means of the stopcocks *l, l, l*, the communication can be cut off with any of the barrels, so that the steam may be admitted to one barrel, or two barrels, or three, as may be wished.—The barrels in the figure are three, but the number may be extended. Each barrel has a moveable lid, which is kept down by screws, and a sliding board below, by which the food, when ready, is withdrawn. The barrels are raised on a frame, so that a wheel-barrow or vat may be placed below, and the food at once emptied into it.

"By means of an apparatus of this kind, roots and other parts of plants may be steamed in a convenient and economical manner."

The relative advantages of steaming and boiling, will very much depend, we suspect, on the extent of the establishment. We have tried both, though our steamer was imperfect, and have come to the conclusion, that when the number of hogs to be supplied does not exceed 15 or 20, boiling is preferable,—as with a good boiler, of the capacity of 30 gallons, from 12 to 16 barrels of food may be easily cooked in a day. But much depends on the judicious setting of the boiler, so that it may receive the whole advantage of the fire. For this purpose the brick work should be made to conform to the shape of the kettle, leaving a space of three or four inches between them, until it reaches nearly the top of the kettle, when a tier of brick set edgeways is projected for the flange of the boiler to rest upon; and the bottom of the fire flue should be above the bottom of the kettle, or about parallel with the commencement of the slope which rounds its bottom. By this means, the flame is thrown upon the sides and bottom, and in a manner that the whole boiler is collapsed with it on its passage to the smoke flue; and the brick work being heated constantly refracts back its heat upon the boiler. A tight cover should be laid over the cooking food, to prevent the free escape of the steam, by partially confining which, the cooking process is greatly facilitated.

There should be appended to the hog-house an open yard, for straw, litter, weeds, &c. which the hogs, during summer, will work into manure, and into which the dung is thrown from the pen.

Hogs are subject to various diseases, particularly if shut up in a close pen, during the time of fattening, which are often suddenly fatal. Prevention is here easier than cure; and many farmers prefer giving their hogs yard room, where they can root in the earth, which is deemed a preventive. Others give them occasionally rotten wood, charcoal, sulphur, antimony or madder, all which are considered as aperients, cleansers or alteratives, and consequently as conducing to health. Salt is all important, and should be habitually blended with their cooked food.

ON THE MANUFACTURE OF CIDER.

The quality of cider depends on several contingencies, among which may be reckoned,

1. The species of fruit employed;
2. The soil and aspect of the orchard;
3. Condition of the fruit;
4. The process of grinding;
5. Management of the vinous fermentation; and
6. The precautions which are taken to prevent the acetous fermentation.

We shall offer some brief remarks under each of these heads. And,

1. *The Fruit.* Apples differ not only in their flavor, colour, and time of ripening, but in the proportions of their constituent parts. The most material of these constituent parts are acid, sugar, astringency, vegetable extract and water. The properties of good dessert and cider apples are seldom found united, though they are not incompatible with each other. Table apples are esteemed on account of their bland and aromatic flavor, crisp and juicy pulp, and for the property of keeping long, or ripening late. The characteristics of a good cider apple are, a red skin; yellow and often tough and fibrous pulp, astringency, dryness, and ripeness at the cider making season. "When the rind and pulp are green, the cider will always be thin, weak and colourless; and when these are deeply tinged with yellow, it will, however manufactured, or in whatever soil it may have grown, almost always possess colour, with either strength or richness."—*(Knight.)* The apple, like the grape, must attain a state of perfection, or perfect maturity, before its juices develop all their excellence; and as many

of our best eating apples do not acquire this maturity until winter or spring, this affords a satisfactory reason why winter fruit is seldom or never good cider fruit. In a dry apple, the essential elements of cider are generally more concentrated, or are accompanied with a less proportion of water, than in a juicy one; of course the liquor of the former is stronger than that of the latter. Of our best cider apples, ten or twelve bushels of fruit are required for a barrel of juice; while of the ordinary juicy kinds, eight bushels generally suffice.

The only artificial criterion employed to ascertain the quality of an apple for cider, is the specific gravity of its *must* or unfermented juice;—or its weight compared with that of water. This, says Knight, indicates, with very considerable accuracy, the strength of the future cider. Its weight and consequent value, is supposed to be increased in the ratio of the increase of saccharine matter. In making wine of domestic fruit, say of the current or gooseberry for example, we use sugar till the unfermented liquor attains a certain specific gravity; or until the saccharine matter of the fruit and that artificially supplied, bears a certain proportion to the water. This ensures to the liquor, strength, or body, as the sugar is converted into spirit by the fermentive process.

The specific weight of the most of apples differs materially.—That of some varieties is lighter than distilled water, while the juice of others is materially heavier. Taking water at 1.000 as the standard, the Redstreak, Styre, and other of the old cider varieties, afforded a must of the specific gravity of 1.060 to 1.079, and some of the new varieties, produced by Knight, as the Downton, Foxley, Siberian Harvey, &c. of 1.080 to 1.091.

2. *Soil and aspect.*—The apple, like the grape, is known to take much of its character from the soil on which it grows. The best cider orchards in England, are on a stratum of red marl which stretches across the island. The soil of Herefordshire, highly reputed for its ciders, is an argillaceous, or clay marl. And Knight says, the strongest and most highly flavored cider which has been obtained from the apple, was produced from fruit growing on a shallow loam, on limestone basis. All the writers upon the subject seem to agree, that calcareous earth should form a component part of the soil of a cider orchard. It appears to have the effect of mitigating the harshness of rough and austere fruits, and of neutralizing the juices of those which are too acid. Coxe says, the soil which grows good wheat and clover, is best for a cider orchard. Our own observation would induce us also to prefer a dry and somewhat loose soil, in which the roots, destined to furnish food for the tree and fruit, may penetrate freely, and range extensively, in search of nutriment. The juices of plants and fruits are always more concentrated when growing on a dry than on a wet soil. Mint, or other aromatic herbs, is much stronger in the specific virtues of the plant, when grown on a dry soil, and greater in volume, when grown on a wet one. The maple yields the sweetest sap, though less in quantity, on a dry soil. Apples may grow large on a moist alluvion; but the fruit will neither be so abundant, nor so rich, as on a dry soil. The thriftiest trees produce the most wood buds; those less thrifty the most fruit buds. The best aspect for an orchard is one somewhat elevated or undulating, protected from prevailing cold winds—and facing the south, south-east or east. Ciders brought to the Albany market, from the hilly towns of Columbia and Saratoga, on the transition formation, possess the most spirit, best flavor, and resist longest the acetous fermentation.

3. *Condition of the fruit.*—Fruit should be used when it has attained its perfect state of maturity, and before it begins to decay, because it then yields the greatest proportion of saccharine matter. The most certain indication of ripeness, says Crocker, is the fragrance of the smell, and the spontaneous dropping from the trees. Each kind of the apple should be manufactured separately, or those kinds only mixed which ripen at one time, and which experience shall show, are not prejudicial to each other. Who would ever think of making a superior wine from an indiscriminate mixture of a dozen kinds of grapes? And yet we seem to expect good cider from an indiscriminate mixture of a dozen kinds of apples. It may be urged, that the evil is irremediable, because our orchards, containing these dozen varieties, have been furnished to our hands; and that neither the quantity nor quality of any one kind of fruit renders it an object to manufacture it separately. Is it not time then, to set about correcting the evil, by selecting only the best kinds for new plantations? A farmer should make cider to sell, and it is material to him whether he obtains two or ten dollars the barrel. Our manufactories, our towns and cities, and the demand for exportation, will always ensure a market and price for good ciders. Mr. Wynkoop, of Lancaster, Pa. has 400 trees of the Virginia crab, on less than five acres of ground; and when his orchard was twenty-two years old, he stated to the President of the Pennsylvania Agricultural Society, that it produced him every other year forty hogsheads of cider, of 112 gallons each; which he sold at Philadelphia at 2s. 6d. the gallon, or about $1,500 in the gross. And yet this apple is not a first rate cider apple. It is deficient in sugar, but abounds in astringency, rather a keeping than an enriching quality. What farmer can apply his land to better profit? Wines differ as much in their quality and price as ciders. Fruit, soil and skill make the difference in both; and upon the proper selection and exercise of those depend the quality of the liquor, and the consequent profits of the cultivator. Upon this branch of the subject, I will only add, that the apples should ripen upon the tree, be gathered when dry, in a cleanly manner, spread in an airy, covered situation if practicable, for a time, to induce an evaporation of aqueous matter, which will increase the strength and flavor of the liquor, and be separated from rotten fruit and every kind of filth before they are ground.

4. *Grinding, &c.*—The apples should be reduced by the mill, as nearly as possible to a uniform mass, in which the rind and seeds are scarcely discoverable; and the pomace should be exposed to the air from twelve to twenty-four hours, according to the temperature, before it is pressed. The juices of the rind of fruit, as may be instanced in the orange and lemon, are highly concentrated; and those of the rind of the apple have a material influence, with the aromatic bitter of the seeds, upon the flavor and strength of the liquor.

On partially macerating the pulp of an apple, and subjecting it to immediate pressure, the juice which escapes will be found to be thin, nearly colourless and devoid of flavor. If the maceration is perfect, so as to crush the seeds and break down the rind, the strength, colour and flavor of the must will be improved: and if the macerated pulp is exposed for a few hours to the atmosphere, and then subjected to pressure, these desirable properties in the liquor, will be found to be still further augmented. "By the chemical action of the roller," says Knight, "the various fluids which occupy the different vessels and cells of the fruit are mingled with the juices of the rinds and seeds, and with the macerated substance of the vessels and cells themselves. In such a mixture it seems probable that new elective attractions will be exerted and compounds formed, which did not exist previously to the fruit being placed under the roller; and hence the most correct analysis of the expressed juices will convey but a very imperfect degree of knowledge of the component parts of the different fluids, as they existed in their state of separation within the fruit. I have often extracted," he continues, "by means of a small hand-press, the juice of a single apple, without having previously bruised it to pieces; and I have always found the juice thus obtained, to be pale and thin, and extremely defective in richness, though the apple possessed great merit as a cider fruit. I have then returned the expressed juice to the pulp which I have exposed, during a few hours, to the air and light: and the juice has then become deeply tinged and very rich. In the former state it apparently contained but a very small portion of sugar; in the latter it certainly contained a great quantity; much of which I believe to have been generated subsequently to the juice having been subjected to the action of the press; though it may be difficult to explain satisfactorily the means by which it could have been produced." Knight ascertained by a subsequent experiment, that by exposing the reduced pulp to the operation of the atmosphere, for a few hours, the specific gravity of the juice increased from 1,064 to 1,073; and from the experiment being repeated in a closed vessel with atmospheric air, he ascertained the accession to be oxygen, which according to Lavoisier, constitutes 64 per cent of sugar. For fine cider, he recommends, that the fruit be ground and pressed imperfectly, and that the pulp be then exposed twenty-four hours to the air, being spread, and once or twice turned, to facilitate the absorption of oxygen, that it be then ground again and the expressed juice be added to it before repressing. In straining the must, too much care cannot be taken to exclude the pulp, as its presence is apt to render the fermentation too violent, and drive into the acetous stage. A hair seive, filled partly with straw, answers the purpose well. The mill which most effectually reduces the pulp is to be preferred. It has been remarked with much force, that cider mills should, like school-houses, be limited to one in a district. In this way, it would be an object with the owner, to render his implements complete, and to conduct the process with care and skill. And as the value of the cider depends so much upon its being well made, it is believed the owners of the fruit, as well as the purchasers of the cider, would be benefitted by such an arrangement.

5. *Vinous fermentation.*—This is commonly called *working*. It commences at the temperature of 59° Fah. and cannot be conducted in safety when the heat is over 75°, for a high temperature induces a too rapid fermentation, by which much of the spirit passes off with the disengaged carbonic acid gas, and the acetous or vinegar fermentation begins at 77°. This will show the importance of conducting the vinous fermentation under a proper temperature, which is from 50 to 70° of Fah. To show the chemical effect of the vinous fermentation it will be proper to repeat, that the unfermented juice, or *must*, of the apple, consists of saccharine matter or sugar, vegetable mucilage or extract; astringency or tannin; malic, and a small matter of gallic acid, the principle of flavor, tinging or colouring matter, and water. The sugar becomes the basis, or spirit, of the fermented liquor; the spirit, after vinous fermentation, and the tannin, or astringent matter, preserve it from the acetous fermentation, if the vegetable mucilage or yeast, is separated when it has performed its office. This vegetable mucilage acts upon the saccharine matter in a manner analagous to yeast upon the wort of the brewer—it causes fermentation, and converts sugar into spirits—by its giving off carbonic acid gas, and imbibing hydrogen—the liquor becomes clear, and part of the mucilage rises to the surface with the disengaged air, in the form of froth, and the residue is precipitated, with the heavier impurities, to the bottom, in the form of sediment or lees. This is the critical period. The liquor may now be drawn off clear. If left longer, the feculent matter, or froth, by parting with the gas which renders it buoyant, soon settles and mixes with the liquor, renders it turbid, and as soon as the temperature attains a proper height, causes a new fermentation. This will explain the reason why ciders become harsh and sour on the approach of warm weather in the spring. The elementary principles of sugar, ardent spirits and vinegar, it has been ascertained by the experiments of Lavoisier, are the same; and these substances only differ in the proportion of their component parts, and in the modes of their chemical union. Sugar consists of hydrogen, oxygen and carbon. An increased proportion of hydrogen enters into the composition of ardent spirits, and of oxygen into vinegar. The same agent, vegetable mucilage, which converts the sugar of the apple into spirits, will convert the spirits into vinegar, under a proper temperature, and aided by the oxygen of the atmosphere. The process of making vinegar is greatly accelerated by exposing cider or wine to the atmosphere, the oxygen of which it imbibes, and which is termed by chemists, the great acidifying principle. Here again we see the propriety of professional cider manufacturers, who might be provided with cellars where the temperature could be regulated, and who would carefully rack off the liquor at the completion of the vinous fermentation.

The vinous fermentation commences and terminates at different periods, according to the condition and quality of the fruit, and the state of the weather. The juice of unripe fruit, if the weather be warm, will begin to ferment in a few hours after it passes from the press; and seldom stops at the vinous stage. The juice of ripe fruit, when the temperature is lower does not begin to ferment under a week or fortnight, or longer, often continues slowly through the winter, and when made from some of the finer cider apples, is not completed under six or nine months. Indeed, in some cases the liquor does not become clear under a year, and the sugar is not wholly decomposed under two years: For the whole of the sugar is seldom decomposed during the first sensible fermentation. Knight considers cider at two years old as in the best state for bottling. For until the sugar is decomposed, fermentation insensibly goes on, and the strength of the liquor increases. The like insensible process goes on in wines, and when it is completed, the wines are said to be ripe, and are in their highest state of perfection. (*See McCulloch.*) Temperature being the same we think it may be assumed as a rule, that fermentation will be rapid and short, in an inverse ratio to the proportion which the saccharine matter bears to the mucilage and water; and that the vinous liquor will be rich, high flavored and durable, in proportion as the sugar and astringency preponderate in the must.

6. *Precautions to prevent acetous fermentation.*—These are, supposing the previous contingencies to have been favorable, a careful separation of the vinous liquor from the froth and lees,—a cool temperature,—racking and fining,—and artificial means to destroy the fermenting quality of the remaining mucilage.

We have already suggested the importance of drawing off the liquor from the scum and sediment—at the termination of the vinous fermentation. This period may be known by the cracking of the froth in an open cask, or, if in a close one, by the application of the nose or ear to the bung hole. If the fermentation has not ceased, a hissing will be apparent, and the gas given off will give a pungent sensation to the nose. If the liquor is not sufficiently clear, or indications appear of the acetous fermentation having commenced, the cider should be racked into clean strong casks, and fined with isinglass, eggs, or skimmed milk. This operation may be repeated if found necessary; but it should be performed in clear cold weather. After the first racking, the casks should be kept bunged close, and further rackings be avoided if possible, as every racking reduces its strength, and much of the spirit escapes with the cabonic acid gas which is evolved in the fermentive process. The oxygen of the atmosphere, besides, increases the vinegar fermentation. But if these methods fail, resort may be had to the means of impeding the natural operation of the mucilage, or vegetable leaven. This may be done by what is called *stumming*, that is burning a rag impregnated with sulphur, in the cask in which the liquor is to be decanted, after it has been partly filled, and rolling it so as to incorporate the liquid with the gas; or by putting a drachm or two of sulphate of potash into each cask, which will precipitate and render insoluble the remaining leaven. If the fruit is good, and properly ground, and the cider racked from the fermenting casks at a proper time, most or all of the subsequent operations will be superseded.

The vinous fermentation is here considered as embracing the whole process till the sugar is converted into spirit. This may be subdivided: the production of sugar being termed the *vinous*, and the conversion of sugar into spirit, the *spirituous* fermentation.

NEW AMERICAN ORCHARDIST.

The second edition of Kenrick's *New American Orchadist*, has been just issued from the Boston press, revised and considerably enlarged, by the author. The additional matter embraces a chapter *on climate*, one on *modern or landscape gardens*, one on *usefulness of fruits for food and health*, a *practical treatise on mulberry plantations and the culture of silk*, and a compendious notice of the whole class of *useful vegetables*. The letter press is neatly executed, in a 12mo. size, pp. 420—price $1.

Our county is comparatively yet in its infancy in horticultural improvement, and particularly in that branch of it which regards the selection and cultivation of choice fruits. Most of our people are not only ignorant of the relative value of good and bad fruits, but are perfectly indifferent what kinds they cultivate, and too many of them care not whether they cultivate any at all. We consider the free use of the finer cultivated varieties as among the higher and most innocent indulgences of the appetite; and as not only increasing our animal comforts, but as imparting health to the body, and benignity to the mind. We therefore hail with pleasure whatever has a tendency to diffuse a taste for these rural enjoyments, and to instruct us in the selection and culture of those fruits which Providence has bountifully provided for our use. Although we by no means consider the work before us as perfect, it is perhaps as perfect as the present state of pomological knowledge among us would permit us to expect, and is certainly a valuable guide and assistant in the management of the orchard and garden. The author is among our most promising young men. He possesses a discriminating mind, honest intentions and indefatigable industry; and promises, if his life and faculties are spared, to become eminently distinguished in this branch of rural improvement. He has been aided in this work by many of the most experienced pomologists of our country, and has profited much from the perusal of modern European works upon the subject on which he writes. We know of no American better qualified for the task than Mr. K.

The opinion is too prevalent, that fruits are prejudicial to the health. This may be true with certain qualifications. Fruits that are gathered before they are ripe, and before their finer qualities have become developed, and transported to market in masses, in hot weather, often attain an incipient state of putrefaction before they are consumed. Fruits in this condition, which are too frequently exposed for sale in our cities, are undoubtedly prejudicial to health; and it is this circumstance that has brought the whole family into bad odor with some. Yet nothing can be further from the truth, than the allegation, that the fruits of our gardens, when suffered to mature, and eaten fresh and in moderation, are hurtful to health. *None can truly appreciate the value of fruits, but those who cultivate them:* the care and toil bestowed in their culture give to them a zest which the buyer can never realize; and *ripe* fruits will seldom bear transportation.

Upon the *utility of fruits for food and the preservation of health,* we quote the following from page 21, &c.

"The fruits of various countries and climes, should be regarded as one of the most valuable gifts which Divine Providence has bestowed on man; and the cultivation of those of superior kind should on all accounts be promoted —not merely as a source of luxury, nor yet alone as a delicious, healthy and most nutritious article of food; but as connected in other respects with all that eminently concerns the family of man. 'The palate,' says the celebrated Mr Knight, 'which relishes fruit. is seldom pleased with strong fermented liquors; and as feeble causes, continually acting, ultimately produce extensive effects, the supplying the public with fruit at a cheap rate, would have a tendency to operate favorably, both on the physical and moral health of the people.'

"The belief is but too prevalent, that fruits produce diseases during the months of summer and autumn, and especially the dysentery. The belief is untrue—and the very reverse is certainly true; fruits being the true preventives of disease. I might amplify on this subject, but must be brief, and will only add as proofs, and from celebrated physicians, the following from the 'Annals d'Horticulture,' due to the researches of Gen. Dearborn and the New-England Farmer, where I found them inserted. It is from the writer of another country—a country celebrated for the cultivation of good fruit, and alike celebrated for the remarkable temperate habits of its people. 'One of the best aliments, and the best appropriated to the different ages of life, is that which fruits afford. They present to man a light nourishment, of easy digestion, and produce a chyle admirably adapted to the functions of the human body.' * * * *

"There are fruits which, when perfectly ripe, can be eaten even to excess without inconvenience—such as grapes, cherries and currants—the other kinds never occasion ill consequences, if they are eaten only to satisfy the demands of nature.

"Thoroughly ripe fruit, eaten with bread is the most innocent of aliments, and will even insure health and strength.

"In traversing the territories of Germany, there is to be seen, near each habitation, a vineyard or a garden of fruit trees. The villages are surrounded with them, and there are but few families who do not make use of fruits during summer, and preserve a certain quantity for winter. The surplus is sold in the cities. There are to be seen upon the Rhine, and other rivers of Germany, boats laden with dried apples, pears and plums.

"The following from the same writer, is from a passage to be found in '*Advice to people upon their health,*' by Tissot.

"There is a pernicious prejudice, with which all are too generally imbued: it is that fruits are injurious in the dysentery, and that they produce and increase it. There is not perhaps a more false prejudice.

"Bad fruits, and those which have been imperfectly ripened, in unfavorable seasons, may occasion cholics, and sometimes diarrhœa—but never epidemic dysentery. Ripe fruits of all kinds, especially in the summer, are the true preservatives against this malady. The greatest injury they can do, is in dissolving the humors, and particularly the bile, of which they are the true solvents, and occasion a diarrhœa. But even this diarrhœa is a protection against the dysentery.

"Whenever the dysentery has prevailed, I have eaten less animal food, and more fruit, and have never had the slightest attack. Several physicians have adopted the same regimen.

"I have seen eleven patients in the same house; nine were obedient to the directions given, and ate fruit; they recovered. The grandmother, and a child she was most partial to, died. She prescribed burnt wine, [*burnt brandy or high wine?*] oil, powerful aromatics, and forbade the use of fruits; it died.—She followed the same course, and met the like fate.

"This disease was destroying a Swiss regiment, which was stationed in garrison in the southern part of France. The colonel purchased the grapes of several acres of vines. The sick soldiers were either carried to the vineyard, or were supplied with grapes from it, if they were too feeble to be removed. They ate nothing else; not another died—nor were any more attacked with the complaint after they commenced eating grapes.

"A minister was attacked with the dysentery, and the medicines which were administered gave no relief; he saw by accident some red currants, and had a great desire to eat them; he ate three pounds between seven o'clock in the morning and nine in the evening; he was better during the day, and entirely cured the next."

RIDGING.

The object of ridging, in tillage husbandry, is either 1, to render the soil more warm and friable, by exposing a greater surface to the sun; or, 2, to render it more dry, by increasing the facilities for the surface water to pass freely off. The climates where ridging is most practised, are those which are cold and humid; the soils which are most benefitted are stiff clays, or those of a more porous quality, which repose upon a tenacious subsoil, and have a level, or but a gently inclined surface. Where the slope is sufficient to carry off the surplus water, or the subsoil porous enough to give it a free passage below the roots of plants, ridging in our climate, is rather prejudicial than otherwise; because it causes a waste of land, by multiplying water-furrows, and augments the injuries of a dry season. Ridging and under draining are designed for the same end, viz. to free the roots of cultivated plants from the habitual presence of water, always prejudicial to their health and product. In former times the first of these modes was generally resorted to; but in the improved system of husbandry under draining has obtained a decided preference. In some of the tenacious soils of Gloucestershire, England, where the surface is level, Marshal, tells us, that ridges have existed, time out of mind, so high, that two men standing in adjoining water furrows are unable to see each other across the intervening ridge. In Scotland, on the other hand, at the present day, parallel under-drains are often made, at the distance of 20 or 30 feet, in large tracts of moist or stiff lands, possessing a level surface, and ample remuneration is found for the outlay in the improvement which ensues. These drains are now principally made with draining tiles, which are laid about two feet from the surface, and in parallel lines of twenty feet are found to preserve in high tillable order the most cold and tenacious soils. We are having some draining tiles made for our use, and shall at a proper opportunity, apprize our readers of the expense and advantages of this mode of under draining.

"Stagnant water," says Loudon, "may be considered to be injurious to all the useful classes of plants, by obstructing perspiration and intro-susception, and thus diseasing their roots and submerged parts. Where the surface soil is properly constituted, and rests on a subsoil moderately porous, both will hold water by capillary attraction, and what is not so retained will sink into the interior strata by its gravity; but where the subsoil is retentive it will resist or not admit with sufficient rapidity, the percolation of water to the strata below, which, accumulating in the surface soil, till its proportion becomes excessive as a component part, not only carries off the extractive matter, [the food of plants,] but diseases the plants. Hence the origin of surface draining, that is laying lands in ridges or beds, or intersecting it with small open gutters."

It will be perceived, from the preceding view of the subject, that the propriety or impropriety of ridging will depend upon a variety of circumstances which are liable to vary in every district, and upon almost every farm. No general rule will apply. A practice that might be beneficial in a flat humid district of New-York, might be prejudicial in an undulating warm district in Pennsylvania or Virginia. Yet as there are a great many farms that are essentially benefitted by the practice, we will suggest some considerations that may be beneficial, at least to the novice in husbandry.

1. Ridges should be laid with the slope of the field, that the waters may pass off freely; and if hollows or hills intervene, cross drains should be cut, after the field is ridged, from the low places, to carry off the water, in the direction to which the surface inclines.

2. The breadth of the ridge must depend upon circumstances, and may vary from two to thirty feet. The flatter the surface, and the more tenacious the soil, the narrower should the ridges be laid. The manner of forming them of different breadths, and of different inclination of surface, will be found amply described and illustrated in the fifth No. of our present volume. It is well to remark, to those who admire and imitate British husbandry, that ridging is not so essential here as in Great Britain—from the circumstance of our climate being warmer and less humid. It is a common practice in Britain to drill turnips, particularly Swedes, upon ridges. Here we think they do best drilled upon a level surface, presupposing, however, that they are to be grown upon soils adapted to their culture, which are light and porous.

3. Head lands are indispensable to good work where a field is to be laid in ridges, and trenches should be made through these, at least upon the lower border of the field, to carry off the water from the middle furrows.

"The grains are God's *bounties;* the flowers his *smiles.*"

EARTHING PLANTS.

Our late quotation from Lorain, against earthing up, or hilling hoed crops, has called forth, it will be seen, the animadversion of a respectable correspondent, in to-day's Cultivator. The benefits sought for by ridging, are in some measure obtained by earthing plants, that is, the plants are less liable to be incommoded by water, and a geater surface is exposed to the ameliorating influence of the sun and atmosphere; but then it must be confessed, that serious injury is likely to ensue, from cutting and restricting the range of the roots, and the waste of manure, incident to the earthing process, particularly where the plough is employed, as it usually is. We have made this the subject of experiment and observation for some years, and the conclusion we have come to is, that upon our sandy soil, there is neither field nor garden crop, save potatoes, that is benefitted by being earthed up, if the ground has been properly prepared, and the surface is kept clean and open, by the cultivator, harrow or other implement;—and that even the potato crop should be only earthed up at the first dressing. Earthing plants, as Lorain observes, is not imitating nature, whose teachings constitute our best guide. The most plausible reason urged for this practice, except what we have intimated at the commencement of this paragraph, is, that it affords a bed of fine pulverized mould for the roots of plants to range in for their food; but if the ground is well prepared and drained, and the surface kept loose, this labor is seldom necessary. While on the other hand, the disadvantages of the practice are manifest. We will illustrate this in the corn crop. When this receives its last dressing, it is usually from three to five feet in height, and we assume it as a fact, of which we have had ocular demonstration, that the roots at this time, unless they have been already shortened by the plough or hoe, are of greater length than the tops—or in other words, that they occupy the whole ground. Now supposing the hills to be four feet apart, it gives to each hill four superficial feet of soil to thrive upon. If you run a plough twice between the rows, one way, you reduce this four square feet of pasture, at least until the roots can be elongated, to three feet, and if you plough your corn both ways, you reduce it to two, or one-half, and this too at a time when the grain stands most in need of an abundant supply of food. Nor is this all; nature has ordained, and she will in this be obeyed, that plants shall have surface roots, to imbibe the benign influence of the atmosphere, and when those which she provides are buried under a load of earth, she will provide new ones; and every earthing which we give to our corn and potatoes, causes a new growth of surface roots, at the expense of the crop. Besides droughts operate far more prejudicial to hilled crops than they do to those which are not hilled.

The potato, according to our understanding, has two sets of roots, which perform entirely different offices for the plant—the proper roots, which take the unelaborated food from the soil—and the stollens or fruit bearing roots, which receive the elaborated food, and convey it to the tubers. The first are protruded as soon as the seed germinates, the latter not till the plant has made most of its growth. The first strike down obliquely; the latter shoot horizontally, and repose near the surface. The object of earthing is to furnish a bed permeable to the stollens, and which will give readily to the pressure of the expanding tubers. The hill may be formed when the seed is deposited; but as the soil is apt to become compact, it is better to form it later, but before the stollens and tubers have formed; for if the plant is earthed after these have begun to form, a new set of stollens is thrown out near the surface, the tubers upon which seldom attain to full size. Hence a late earthed crop is likely to abound in small potatoes.

Calcareous Manures.—We invite the attention of the reader to Mr. Ruffin's experiments with shell marl, inserted in to-day's Cultivator. The extract details but a small portion of the experiments made by this enterprising gentleman, and which are narrated in his essay—a work which we cannot too warmly commend to the patronage of every farmer who can avail himself of the advantages of calcareous manures. And it may not be amiss here to repeat, that most if not all our sandy districts abound in clay marl, a material calculated to impart as much benefit to a sandy soil, as shell marl has been found to impart to the poor clays of maritime districts. And the expense—what is it compared to the advantages! Twenty to forty loads to the acre constitute a good dressing, the benefits of which will be as lasting as time. Clay marl should be carted on to the field in autumn, and deposited in small heaps, that it may be broken down and pulverized by the frosts of winter, before it is blended with the soil.

Transplanting Evergreens.—This may be done all the present month, taking care that the roots do not dry, and that the transplanted trees do not suffer from drought. Mulch the surface about the transplanted trees with coarse litter, and saturate this with water. The only danger, if the operation is well performed, is from evaporation, which is much less now than at midsummer. Evergreens must have a prompt and constant supply of moisture and food to sustain their foliage, when transplanted.

On the 8th of July last, during a bright sunshine, the thermometer at 80°, and between the hours of one and three P. M. we went to the commons, took up, brought home and planted in our court yard, six white pines, nine to twelve feet high, and feathered with limbs to the ground. They are all now living, Sept. 1, and promise to do well. A few tender branches, injured in the transportation, have alone died.

Gama Grass.—We have given this grass a fair trial, and have become satisfied that it cannot answer any valuable purpose in northern husbandry, and that it is not, as has been said, found growing naturally in Connecticut. We soaked the seeds in hot water, sowed them early in a hot bed; they germinated freely, and as soon as the season would warrant, the plants were removed into a bed of rich garden mould. Their growth has been diminutive, and affords no hope that this grass can amount to any thing as a forage crop.

William Murphy complains that he cannot make grass seeds take on a stiff brownish clay—proposes to apply 20 bushels of lime to the acre, and asks our opinion as to the expediency of the application. The lime should be quadrupled to produce a good effect, and even then its benefits cannot be insured. We suspect the stiff clay was not sufficiently pulverized, and that the grass seeds were sown in a dry time, and the roller not used—consequently that the seeds failed to vegetate for want of moisture, or from the earth not coming in close contact with them. We advise, that 20 loads of manure be substituted for the lime, that the ground be well pulverized, and rolled after the seed is harrowed in. A heavy bush drag may be substituted for the roller. It will pulverize the surface, and press the earth upon the seeds.

The Tomato.—Dr. Bennett, a medical professor in one of the western colleges, considers the tomato as an invaluable article of diet. He ascribes to it high medicinal properties, and declares,

"1st. That it is one of the most powerful deobstruents" [i. e. removing obstructions; having power to clear or open the natural ducts of the fluids and secretions of the body; resolving viciditiies; aperient,] of the materia medica; and that in all those affections of the lesser organs, where calomel is indicated, it is probably the most effective, and least harmful remedial agent known to the profession.

"2d. That a chemical extract will probably soon be obtained from it which will altogether supersede the use of calomel in the cure of diseases.

"3rd. That he has successfully treated serious diarrhœa with this article alone.

"4th. That when used as an article of diet it is almost a sovereign remedy for dyspepsia, or indigestion.

"5th. That persons removing from the east or north, to the west or south, should by all means make use of it as an aliment, as it would in that event save them from the danger attendant upon those violent billious attacks to which almost all unacclimated persons are liable.

"6th. That the citizens in general should make use of it, either raw, cooked or in the form of a catsup, with their daily food, as it is the most healthy article of the Materia Alimentary, &c. &c."

Without intending to endorse all the professor's conclusions, we know enough of the tomato, from experience, to recommend it as a grateful vegetable, and salutary to health, in the summer months. It is extensively used in the south and south-west, as an article of diet. It is easily cultivated, and readily prepared for the table in various forms, requiring merely a seasoning of salt and pepper. It belongs to the same family of plants as the egg plant, potato and deadly nightshade. To obtain it when most wanted, during the heats of summer, the plants should be started in a hot-bed, and afterwards planted out two or three feet apart, in a soil moderately rich, in which case the ripe fruit may be gathered early in July.

To make tomato sauce, the ordinary preparation for the table, peel the ripe fruit, place it in a sauce-pan, over the fire, without water or other liquid; in a few moments it will be cooked; season with salt and pepper to the taste, and serve up.

" *Teasels.*—This at present is one of the most profitable of crops. There is a crop to be gathered this fall on three or four acres of what was Mr. Cogswell's garden, said by competent judges to be worth $3,000. We are told that many Farmers in Hatfield, have gone into the cultivation of it. The scarcity of the article is the main cause of its present high price. A few years since it was so low as to be hardly worth raising, and the probability is that there will soon be an abundance to supply the market."—*Northampton paper.*

The Fuller's Teasel is a biennial plant, the crooked awns of the heads of which are used by clothiers, for raising the knap on woollen cloths. For this purpose, they are fixed round the periphery of a large broad wheel, against which the cloth is held, while the machine is turned. The seed may be sown in April or May, in drills 7 to 10 inches apart; the plants must be kept free from weeds and thinned to the distance of one foot apart. In the second year, the plants are earthed up; in July, the plants begin to flower, and in August, as soon as the blossoms decay, such heads must be cut off, and exposed daily to the sun, till they become completely dry, care being taken to protect them from the rain.

Hop Premiums.—The Brewers, we understand, have appointed three of their association, and they mean to invite the hop-growers to add two or three of their number, as a committee of examination, to award the silver cups which are to be given as premiums to the growers of the best parcels of hops. Every hop farmer should endeavor to be present at the examination, and to bring his crop with him, as it is expected purchasers will attend from New-York, Philadelphia, and other towns.

Cutting Corn.—We repeat our advice to the farmer, to cut his corn as soon as the grain become seared or glazed. The corn crop is late, and fodder is like to be in demand. If, as is to be apprehended, we have early autumnal frosts, before the corn is cut, or is ripe, not only serious injury will accrue to the grain, from the functions of the stalk being wholly destroyed by the frost, but the forage will be greatly impaired in quality. Cut as we recommend, the corn *will* mature on the stalk, and the stalks will receive no injury from the frost. Try it.

Turnips must not only be kept free from weeds, but if not already done, they must be thinned so as not to remain nearer than six to ten inches apart, according to the size they are expected to grow. They will not bottom if they are crowded, whatever be the condition of the soil, or the species or variety cultivated.

Skinless Oats.—We sowed two quarts of skinless oats, in drills, one foot apart. The crop has been gathered, threshed and measured. The product is 40 quarts, and the bushel weighs 41 lbs. Several circumstances prevented a better yield. The ground was too light, being a sand; the seed was sown late; the soil was too rich, as the grain lodged, and the portion which grew under two early apple trees was wholly trodden down.

The Grain Worm.—It has been remarked to us by several farmers, that early sown wheat was much less injured by the grain worm, than that which was sown late. This fact should induce early sowing, wherever it is practicable.

CORRESPONDENCE.

IMPROVED CHINA HOGS.

Mr. Buel,—Sir—This superior breed of swine, as I have observed in a former communication, was first introduced here by the late Christopher Dunn Esq. Some ten or twelve years since, when passing through Princeton or New-Brunswick, N. J. in the stage, his sagacious eye was attracted by a beautiful sow with her litter of pigs, running in the street. Delighted with their appearance, he was determined to possess some of them if possible. He accordingly applied to the driver of the stage to procure a pair of them for him. As an inducement, and to ensure success, he offered him the liberal price of twenty dollars, for a male and female, although only eight weeks old, on their delivery to a certain house in New-York. They were of course procured and delivered, and from these two have sprung my " *Improved China Hogs.*"

Their colour is various, some white, black and white spotted, and others blue and white. They are longer in body than the pure China breed. Upright or mouse-eared—small head and legs—broad on the back, round bodied, and hams well let down. Skin thin—flesh delicate and fine flavored.

They are easy keepers, and of course small consumers, quiet and peaceable in disposition, seldom roaming or committing depredations. Keep in good condition on grass only.

They are not remarkable for size, seldom attaining more than 200 to 250 pounds although instances have occured where they have been made to reach 350 ! Therefore they cannot, in their pure state, be called the " farmer's hog," but their great value is in crossing with the common hog of the country. A very good hog may be obtained by a cross with your *land shads,*—your long legged, long nosed, big boned, thin backed, slab-sided, hungry, ravenous, roaming tormentors, that will run squeaking about the yard with an ear of corn in their mouths.

To give you some idea in what estimation they are held by persons who have procured them of me, I have taken the liberty of making the following extracts from some of their letters.

" My Chinas, the true *Bement* breed, exceed all praise; you never saw their equals. I have a young boar in the pen, nine months old, that I will show against the United States, out of the boar and sow I had of you, both of which I still keep. Nothing can compare with them in this country, and I honestly assure you, I never saw their equals any where, for all needful qualities in the hog."

" Dear sir—I have the satisfaction of saying to you, that I got my little Berkshire and China home in good order, and doing finely, and are much admired by every person who sees them. Should I meet with success in rearing from this pair, I shall not be able to furnish any thing like the quantity spoken for."

In another letter a valuable correspondent says—" The hogs I had of you have done admirably, and I am getting a fine stock of them: but on the whole, I like the full bred improved China better than the cross, and I am getting into the pure blood. The young sows, of which I have three from the white (Hosack) boar you had, have had pigs from the old boar, but they are not true enough in blood, appearance and shape to suit me; whereas the mother, who is the true China, brings the pigs from the old boar, both in colour, shape, size and every thing, as if they were cast in the same mould,—and that is what I like,—uniformity of appearance, even in hogs, and this bear, let me tell you, has the admiration of all who have seen him, as the best and most perfect *hog* in the country. These hogs, 'tis true, are not large, they are indeed rather small; but they are the easiest kept of any according to their size, that I ever saw, and so far as I have yet seen, I prefer them, even to the Bedfords, or any I know. The Bedfords are good, but they are too heavy headed, long legged, and great eaters to suit me altogether. The quiet, peaceable dispositions of the Chinas, like that of the short horn cattle, is a great item, I assure you in a farmer's account."

I might fill a page with similar extracts, but I think it unnecessary, for I shall not be able to supply all my orders until next spring.

In the next No. I propose to furnish you with a portrait of one of the Berkshire breed, of which I am now in possession, imported by S. Hawes, in 1832. C. N. BEMENT.

Albany, September 1st, 1835.

CISTERNS.

Mr. Buel—In the June number of the Cultivator, was published a short article on the subject of cisterns, in reply, as declared, to a question of a correspondent. Your readers may perhaps be willing to take some farther hints upon the same subject, especially such as know the value of rain water, and would know the means of its perfect preservation. Although the method of building cisterns there suggested, will, in many instances, be entirely successful, I propose to offer a reason or two, founded not only upon theory, but some experience and observation, to show that cisterns thus built are liable to fail of answering the desired end: and also, to give the outline of a new plan of constructing them, now fairly tested, that is calculated to avoid the defects of many kinds of cisterns differently constructed, and to lessen the expense of construction.

To build a brick cistern to contain about 40 barrels, the walls of which shall be laid in common lime mortar, with an inside face or plastering of water lime, the expense in this neighborhood would be as follows. That it may be of the above mentioned capacity, it must be built about six feet deep and six feet square—or contain 216 cubic feet. To construct the walls of such a cistern, the thickness of which shall be the length of one brick, are requisite about 3,500 bricks at $4, | $14 00

brick, are requisite about 3,500 bricks at $4,	$14 00
20 bushels of lime, at 2s.	5 00
Two loads of sand and drawing at 3s.	75
1 barrel water lime for facing at 10s.	1 25
Mechanic for building 4 days, at 12s.	6 00
Tender for building 4 days, at 6s.	3 00
Materials for covering and curb to draw water	2 00
	$32 00

No calculation is here made for digging the pit, as this must vary with the soil and situation, and be nearly alike for all kinds of cisterns of the same capacity.

This is the cheapest way, perhaps, of making a brick cistern, the wall being the thinnest practicable; but it will be seen that cisterns having walls of double thickness, (which are frequently made, and are by some considered cheapest in the end,) would cost nearly double the above account, which expense is a great obstacle in the way of the general use of cisterns, in obtaining one of the greatest comforts, not to say luxuries of life, an abundance of pure rain water.

Objections to the utility of such a cistern are, that the common lime, unless the water lime facing be entirely impervious, will affect the water by creating *hardness*, as it is generally called, for a long time ; and moreover it is difficult to make a cement of that material that will hold water, especially when united with brick or any substance, that so readily conducts water.

And the bricks extending quite through the wall, as in the case of the thinnest wall, I do not believe it could be made to hold water by any means, without facing, there being so many crevices under the bricks occasioned by the settling of the mortar from underneath them when the wall is constructing ; then the dependence for holding water must be upon the water lime facing, and this is very uncertain, for a slight frost, and frequently a few months standing and use will cause such a facing to cleave off from any other substance that may be plastered or faced by it ; and this facing being necessarily so thin, it is often the case, that for one or another of these causes the cistern cannot be made to hold water. In the vicinity of this village there have been made many cisterns of stone and water lime in various methods, and this has been done for many years. But an improvement made by two respectable mechanics of this place, about two years since, has superseded every other plan attempted among us, and reduced the cost to a sum that any householder can afford, for the certainty of enjoying the common use of rain water. They have procured a patent for the improvement, but there is no secret in the operation of constructing their cisterns. A false curve is made of staves that fasten or link together in some way, and this is set up like a tub in tne pit, which is dug in a well-form, that is circular to the proper depth, and about one foot in diameter larger than the curve, and after placing the curve in the pit, the space between it and the bank or earth is filled with fragments of stones, cobbles, brick-bats, cinders or almost any hard material crumbled into pieces of four inches or less diameter ; a quantity of water lime is then mixed with sand in the usual proportions for making mortar, but of a consistency of grout or puddle, and the compound poured into the space. It runs through the whole to the bottom, and fills all the crevices and the entire vacuum left between the curve and the earth. When this becomes set, as they term the partial induration of the mortar, the curves is removed, and the wall while yet in a green or soft state, is faced or smoothed, and the bottom made with nearly the like materials. It is then covered and completed, and in a few days is fit to receive the water.

Now there is no quick lime used in the construction, which obviates one difficulty above mentioned, there is nothing to conduct the water through the wall to make it leak, no stone or other substance extending through it. It soon becomes hard as stone, and must endure, with proper care to guard against frost, (which will break rocks) as long as time. Cheapness and utility are great desiderata of this age of improvement. This cistern is certainly equal if not superior to any other ever made for holding and preserving the purity of rain water ; and one constructed six feet in diameter and the same depth, holding about 35 barrels, costs here 15 to $17. Besides, the builders warrant them to hold water; and all know who are acquainted with the nature of hydraulic cement, that when it once holds water for a short time, it is forever. Indeed out of 200 cisterns and reservoirs that have been built upon the "pattern curve" plan, as it is called, not one as I have heard has failed to hold water from the time of its completion hitherto.

The expense of this kind of cistern it must be perceived, is comparitively small, and that will of course vary according to the price of water lime where it is used—a cistern of the last named dimensions requiring about three barrels in all. They may be made with equal convenience of any shape or size, and the proportional expense is diminished in building large resorvoirs. I have a cistern built upon the old plan, with a thick stone wall, of about 35 barrels capacity, that cost $40. I have another built upon the "pattern curve" plan of the same capacity, and most perfectly finished, that cost about $15. They are both good cisterns, and I do not hesitate to use the water (when conducted into them clean) for family purposes, cooking, &c. And I think I could give some good reasons, why it is better for such uses than spring water of this limy region. But this may perhaps be done hereafter. Yours,

A FRIEND TO IMPROVEMENT.

Note.—To know how much a cylindrical or circular cistern of given dimensions will hold, multiply one-half the diameter into one-half the circumference, and that product into the depth, or the square of the diameter into the decimal 7,854—which will give the number of cubic or solid feet. By statute, one cubic foot of distilled water weighs 62½ lbs., and ten pounds make a gallon, so that multiplying the number of cubic feet by 62½ and dividing by 10 will give the gallons.

ON SEEDING.

Of all the practices constituting good husbandry, none are more replete with beneficial effect, and which better repay the outlay than that of seeding. It has become an established practice with good farmers to seed frequently with clover and timothy, a practice that should be adopted by all. It is high time that the practices and opinions of our ancestors—those which derogate from our best interests I mean—should give place to more modern and more rational views. That there has been great advancement in the science of agriculture will be conceded to by all; then why do we cling so strenuously to ancient practices when those of more modern date are infinitely superior.

I rejoice in the improvement that has been already made. Agriculture has become the theme of the day. The most enlightened of our citizens are embarking in its pursuits, which give assurances of its being ultimately established upon a basis concomitant with its merits. Then it behooves us to follow those practices most clearly demonstrated to be beneficial—and believing seeding to be one of these, I proceed briefly to detail its utility.

The practice of seeding is too much neglected by many of our farmers, a practice, which, could they be induced to adopt, I am confident in believing would not be relinquished. The natural grasses yield less of quantity and nutriment than either clover or timothy and some others of more recent introduction. Double the quantity of pasture may be obtained from a given piece of ground well seeded, than it would otherwise afford ; and for mowing there will be a still greater difference.

Independent of this, its fertilizing properties to the soil must be considered. A good sod preserves the soil from the too great influence of the sun, renders it porous, and consequently pervious to atmospheric nourishment; hence we observe that meadows newly laid down almost invariably bear the greatest burden.

Whereas grounds not seeded, by being too much exposed, soon become of so compact a nature as to render them in a degree impervious to either heat or moisture, without which they cannot be capable of the least productiveness.

Autumn we considered the most proper time for sowing timothy, and the spring for clover. We have generally made it a practice to sow our timothy immediately after the last harrowing in of the wheat, having a person to follow each harrow, which leaves not a particle of ground without seed, and never have perceived the wheat to have been injured in consequence.

The time for sowing clover must depend altogether on the season whether early or backward. We have oftener sown too early than too late, and I am inclined to believe that others have fallen into the same error.

In my opinion, it should not be sown until the ground begins to dry and become settled, when it will be observed there are enumerable small crevices produced by the contraction of the earth, which will receive the seeds, and which the first rains will close, thereby producing immediate vegetation. Respectfully submitted, by

GEO. WILLETS.

Skaneateles, Ond. co. 8th mo. 17th, 1835.

TICKS UPON SHEEP.

J. Buel, Esq.—Sir—In the July number of the Cultivator you gave some directions for removing ticks from lambs. To this method there are objections: there will always be some ticks on the sheep, which will there stay, or remove to the lambs after the first few showers of rain; and I have known it when the liquor was strong, to kill the lambs as well as the ticks; besides, the lambs must suffer a great deal before the bathing.

My object is not to find fault, but to give you the method I have followed for seventeen or eighteen years. Take, (say for 50 sheep) two pounds tobacco, damaged tobacco will do, or the stems or liquor pressed out at the tobaconists; soak in two gallons stale urine for four or five days, squeeze out and strain the liquor off, put into a pot over a moderate fire five quarts good tar, ten quarts damaged lard, butter, or clean soap grease, stir with a stick until well mixed or melted, then pour it into the tobacco liquor, mixing it thoroughly; have in reserve about thirty quarts old butter-milk or urine, which pour into the first mixture, and when about blood warm, take a sheep, lay it on its left side on a broad bench before you, the head towards you, make a shed, or opening of the wool about four inches from, and parallel with the back bone, the whole length of the animal, commencing at the head; then let a boy pour a little of the mixture on the skin all along this opening, beginning at the head; then turn the sheep a little more on the back, and make a second shed or opening four or five inches from, and parallel with the first, and pour on as before; repeating the shedding and opening until you come to the back bone on the other side, always smoothing up the wool and keeping the animal in that position that the liquor will run to the skin, and not out on the wool: when finished, let the animal stand up, and make a cross shed about the middle, when if properly done, you will find the liquor has run all over the skin. For dipping up and pouring I use a tin quart measure with a lip or spout like a pitcher, covered about half over, leaving an opening at the point of the lip large enough to admit a goose quill, to prevent its pouring too fast or spilling all over the wool. A quart on an average is enough for each sheep. The proper time for this operation is the first warm dry day from the middle of Feb. to the middle of March, allowing the ewes to lamb the 15th or 20th of April.

There are many reasons in favor of this mixture, and time of applying it. The ingredients used, improve the health of the animal, prevent and even cure the scurvy, improve the quality and increase the quantity of the wool, and when shearing time comes, you will find the skin smooth and clean, and not a single tick on sheep or lamb. Some may think it will injure the wool: it is not so; for manufacturers who have used it, say to the contrary, and it has of late years come much into use amongst the more intelligent sheep graziers in the west of Scotland.

I have been something lengthy in the direction of the mixture and the application of it, being more accustomed to handle the sheep-shears and the plough, than the pen; but I leave to your better judgment and practised pen, to give a shorter *version*, if you think it worth insertion in the Cultivator. A SUBSCRIBER.

Johnstown, Montgomery Co. Aug. 3, 1835.

RIDGING—POTATOES.

Hyde-Park, Aug. 3, 1835.

J. Buel—Dear Sir—In the perusal of your valuable agricultural publication, *The Cultivator*—Vol. 2, page 68, I noticed extracts from *Lorain's* Husbandry, explaining the injury done by ridging and moulding up plants, &c. and the great advantages derived from a very level and superficial cultivation. I beg you will not think it presumption in stating my views on this important subject. It appears from my limited knowledge of agriculture, this great agriculturist has given too great scope to his theory or practice, or is unacquainted with the great variety of situations and soils in Great Britain and America, which are now producing the most abundant crops of grain. &c. from the ridge system. In many parts of the county of Essex (Great Britain,) it would be impossible to produce a crop, by his level and superficial mode of cultivation, and the most abundant produce are obtained by the four furrow ridge system of cultivation. The extract states that ridging and moulding up plants is as much opposed to reason and observation, as it is to the economy of nature. I admit this to be the case with some plants, situations and soils, but to others, the ridging and moulding in a proper degree is necessary to the production of abundant crops. It also states the evils arising from it are many and great, as it compels the plants to form new sets of shoots, so often as they are ridged or moulded up, and that the roots cease to perform their functions when buried too deep. I beg the favor of your information as to the depth which will prevent the potato from performing their functions,—having been successful in the cultivation of potatoes, turnips, and cabbages, for the use of stock, all upon the ridge. From the scanty knowledge of soils I have acquired, I know of no uniform given depth; this must be guided by the agricultural skill and knowledge of soils, which is indispensable and must be the chief corner stone of the practical and scientific agriculturist. I attribute the success and abundant crops of potatoes and turnips, growed by E. Holbrook, Esq., to his ridging system, here represented to be the occason of so many and great evils. My agricultural views differing from so great an agriculturist induces me briefly to state our practice and motives for the ridge system, that we with thanks may receive through the medium of your publication from some able and practical cultivator, better information on the subject, and thereby benefit the *agriculturist*.

If we intend to grow a crop of potatoes, turnips, or cabbages, on old mowing ground, we carefully trench plough the land according to the properties of the soil, as soon as spring will admit: and when it has received a few slight frosts, it is harrowed down, and is now a level bed of mould. We then with a double breast plough furrow out the ridges two feet apart, and about three or four inches deep. The potatoes, cut and rolled in lime and plaster, we proceed to plant thus in the furrows, . · · · . the dots here marked being one foot apart, and showing one extra in the intermediate space between the ridges, being a gain of 50 per cent by this mode of cultivation, as no more ground is used than in the ordinary mode of ridging. A dung cart follows, and as soon as four furrows are planted, the man throws from his cart common barn yard manure upon the potatoes, which is adjusted by a boy evenly over them. As soon as a few rows are covered with manure, and before the sun has power to evaporate the moisture from the manure, a plough covers it up by ploughing two ridging furrows upon them. They remain thus two or three days, to settle down, when a roller is passed over them, and then a light harrow of a proper construction, which again brings the land to a level surface, and the sets will come up simultaneously. When out of the ground about four inches, the first producing root is formed with its extending feeding roots. We then with a small light one horse plough, mould them up about two or three inches, when they will again near the surface put forward (not by mutilation) another set of producing shoots with their extending fibres or feeding roots, which spread horizontally along the mould of the ridge, then turning perpendicular downward to receive the moisture and substance that passes from the manure which is in the centre of the ridge, and by its gradual decomposition leaves the soil loose and enables the potatoes freely to produce in quantity and size. We repeat this operation, say three or four times if possible, before the potato blossom appears. In each operation we are careful not to mutilate or disturb the feeding roots already moulded up: to prevent this, we use three different size ploughs until the operation is completed. In 1833, E. Holbrook, Esq., Hyde-Park, produced the extraordinary crop of upwards of 750 bushels of potatoes per acre—a pretty clear demonstration. If the ridging and moulding up certain plants, originated in barbarism, the enlightened cultivator, *Lorain*, has not or will not, advance us far in the march of improvement in the beautiful science of agriculture, with his level and very superficial cultivation, by totally excluding from the field the ridging and moulding science of agriculture.

Excuse my brevity on the subject, as time will not permit me more fully to detail, having the superintendence of the estate of E. Holbrook, Esq. to attend to. Yours, with great respect,

THOS. MIDFORD.

P. S. If this feeble attempt to explain my views on the subject, is worth your perusal or notice, it is at your service and use.

Mr. J. Buel—Sir—Observing in your interesting and highly valuable work some observations by T. A. Knight, Esq. as taken from the British Farmers' Magazine, and given in the 2d No. of Vol. 2, on the cultivation of the potato, I would just here remark, that with these observations, *so far as they went*, I was exceedingly well pleased. It was observed in a former No of the Cultivator, that the potato was long kept back by prejudice and ignorance. To some little extent is it so still; (witness the lucubrations of Cobbett,) but these are fast dispelling, and the community are indebted to every one, who will communicate useful knowledge on that or any other branch of what I would call the staple trade of mankind—agriculture. T. A. Knight justly remarks of the potato that "it has long been known that every variety cultivated gradually becomes debilitated and loses a large portion of its powers of producing;" but unfortunately stops there, and leaves the less erudite, though no less ardent lover of agricultural knowledge in the dark as to the proper means of producing these new varieties which ought to take the place of those that have served their day, and are unfit for use. I know that potatoes can be raised from the seed, and take it for granted that is the way that new varieties are intended to be produced; and if I am right in this supposition, would you or any of your worthy correspondents spare a few lines on the subject of raising potatoes from the seed? There must be many things connected with this which it is important to know, so as to produce the best result; as from what sort of parent the seeds are to be selected; the best way of preparing and preserving the seed; the cultivation thereof; and selection of such varieties as may be best expected to suit the purpose of the cultivator or consumer, both as to their probable value for quantity and quality. How long will it require to bring the potato from the seed to a state of maturity so as to be fit for market or stock? How long may it be expected to remain good without declining by age? What influence has changing the soil, i. e. changing the cultivation of them from one soil to another, upon the plant? Perhaps it may be thought by some that the article in question is too unimportant to merit much attention. I think otherwise; it does not indeed rank with wheat or corn, but it is important enough both in the feeding of cattle and for domestic use to demand all the attention that can reasonably be bestowed upon it.

Happening to have been once in the "old country," and looking around upon any thing that might profit or amuse, I was particularly taken up with the high state of agricultural improvement which prevails there, and among other things, with the *quality* of the potato. *There* it is *good* food; and I know of no reason why it may not be cultivated to as good purpose both as to quantity and quality, in this as in that country; and any information you can give on the best mode of producing new varieties, will, I am persuaded, be highly acceptable to many of your readers, and to none more than AN AGRICULTURIST.

Massachusetts, July, 1835.

P. S. I would like to have your or some of your correspondents' opinion on Mangel Wurzel.

BY THE CONDUCTOR.

There is nothing peculiar in raising the potato from seed, more than any other plant. The quality of the offspring will, like that of all animals and vegetables, partake of the character of its parents. Of course the seed should be selected from the best varieties, as we shall be then sure of breeding from *one* good stock. It may be separated from the pulp of the ball and dried, or the balls may be broken and dried, to be sown in the spring. They should be kept from frost and moisture. At the usual planting time prepare a bed of good mould, and sow the seeds thinly on it in drills 18 inches apart. Nurse the plants as you would a bed of onions; and in autumn take up and preserve the small tubers of each plant separate. Plant the second year at the distance of 18 inches or two feet each way, nurse as before: and you will be able to judge from the product, and their time of ripening, of their character and quality. Plant your selected kinds a third year, and the crop will be fit for market or stock. The superiority which our correspondent discovers in "old country" potatoes, is not wholly owing to new varieties, but to climate. In our country we think the potato deteriorates south of latitude 41, and perhaps the best potato zone may be comprised between latitudes 41 and 46 deg. north. The latitude of Britain is still farther north, though its climate is more temperate than ours. In our latitude, in ordinary seasons, the best potatoes are grown on grounds that are deemed cold, as reclaimed swamps, &c. The best potatoes are grown in Ireland, Lancashire, Eng. in Nova Scotia, Maine, &c. where the temperature is comparatively cool, and at the same time very humid. The duration of a variety, in perfection, is generally computed at from 14 to 20 years, though this period is sometimes prolonged by a change of soil or climate. The nutritious properties of the potato have been proved to vary from 14 to 28 per cent in different species. Those abounding most in nutriment are invariably the best not only for the table, but for farm stock; but they seldom if ever exceed a medium size, and are less productive than coarse kinds. Hence as buyers make little or no distinction, the grower finds it most profitable to raise the latter.

CONDITION OF HUSBANDRY IN THE VALLEY OF THE MOHAWK.

Palatine Bridge, 21*st Aug* 1835.

Dear Sir—Have you white Mulberry trees (Morus Alba) in your nursery? And at what price can I obtain say 100? What is the proper period for setting them out? [We have the white mulberry at $5 per hundred. They may be planted in the spring or summer.]

I have prepared a seed bed; and I propose while the young trees are growing, to set out a few, that I may, upon a small scale, learn the art of managing the worms.

I continue to receive and read the "Cultivator;" and I can assure you that the information I have derived from it, has been in the highest degree serviceable to me in my farming operations. Could this valuable periodical be generally diffused and read by the farmers in this region, I am well satisfied that it would contribute more than any one thing to make this one of the most flourishing agricultural districts in the state. There can be no better soil than that found in the valley of the Mohawk, and the adjacent country, on both sides of the river. But it is a fact, that the great majority of our farmers, so far from improving the advantages that nature has conferred upon them, and being in a thriving condition, are *retrograding*. They are so wedded to the "old system," that it is extremely difficult to make them believe that there is a *better one*. And although their lands are becoming less and less productive every succeeding year, they still believe themselves masters of their profession. Suggestions about *improved farming* are regarded with distrust; and he who attempts to teach doctrines at variance with their received opinions, must expect to meet with no very welcome reception; and should he have the moral courage to pronounce their opinions and practice altogether wrong, and in the end promising nothing but bankruptcy and ruin, he would be regarded as a deranged man. To these general remarks, there are some exceptions, and I am well satisfied that these exceptions would very soon compose the majority, if the "Cultivator" should be diffused and its suggestions adopted. Then the very individuals whose business, there can be no doubt, does not now pay them four per cent upon their capital, would find that their investments were producing a nett annual income of from ten to fourteen.

I think I am safe in saying, that the lands in my immediate neighborhood are worth at least twenty-five per cent less for agricultural purposes at this day, than they were ten years ago. Crop after crop, and that without much regard to rotation, has been taken from them till they have become exhausted; and the consequence is, that instead of abundant harvests, the husbandman's toil is usually rewarded with but a scanty increase —I mean a scanty increase, in comparison to what it should be, when the quantity of land and the amount of labor are taken into the account.—Many of our farmers, to be sure, raise large crops, but in most instances, where this is the case, it will be found, judging from what has been done under a proper system of management, that these same crops should have been taken from one-third of the quantity of land that actually produced them; and what the consequence must be in a few years more, if this ruinous system is continued, it is no difficult matter to determine. The same system, if it was universal, would bring ruin upon the nation. Whoever then shall, either by his pen or his practice, contribute any thing to exterminate the evil, will be justly entitled to the appellation of a public benefactor.

But I have spun out my epistle to a length I did not at all anticipate when I sat down to make inquiries about mulberry trees. You will however excuse me, as agriculture is a subject upon which we feel a common interest.

I think I shall ere long be able to send you a list of subscribers for the Cultivator. I have spoken to several individuals on the subject, and they have promised to take it. Respectfully yours,

JOHN FREY.

By the Conductor.—We are in doubt whether Mr. Frey intended his letter for publication; but it contains such just remarks in regard to the apathy of our farmers as to the benefits of modern improvements in husbandry, and the deteriorating effects upon our farms of the old system of management, that we feel justified in giving it publicity.

UNDER-DRAINING—CORN.

Greenwich, Ct. Aug. 21, 1835.

Sir—As a subscriber to the Cultivator, I am satisfied that it is calculated to advance the interest of the practical farmer.

I am willing to contribute my mite to help forward the improvement of the farmer's mind and soil. If you have a spare number for April, I should feel obliged if you would send me one, as none were received at the post-office in this place of that number.

I am satisfied that the mode of under draining recommended in the March number, is correct as respects springs. But there is another case somewhat different. I refer to the oozing near shelving rocks, after heavy rains. In this case it is important to place the drains in such a manner as to prepare the ground to receive the greatest quantity of water possible. This is done by making the drains as near level with the outlet as possible; and thus removing the standing water to a considerable depth, say four or five feet.

In Mr. Clark's table, showing the produce of corn at different distances, the kind of corn planted is not stated. This is a very important point in the culture of corn, as some kinds require near double the distance of others. The kind I have planted for 35 years, I think will yield most at about five feet distance between the hills each way, where the ground is very rich. On our common land, without manure, I wish to plant from three feet nine inches, to four feet each way. This kind is the large eight row dented-yellow. I suppose I have had 80 bushels of shelled corn from an acre without manure; but this is not common. We call from 40 upwards, a good crop. As I have never made any nice experiments and measurements, I do not pretend to precision.

But the particular point to which I would call the attention of my brother farmers, is the selection of seed corn. In the June number of the Cultivator, is an article headed, "The Corn Crop," stating a number of experiments and observations. An observation on the 2d experiment, is that to which I would turn the attention of all, that it may be fully tested. The observation to which I allude, supposes that the particular kind there mentioned, although the most prolific, had "deteriorated by planting from inferior ears."

Now I wish every farmer that takes the Cultivator, would go into his corn-field as soon as the corn is generally too hard to boil or when the forwardest ears begin to turn yellow, with two baskets, and select from the stalks that bear two ears each, putting the upper ear in one basket, and the lower one in the other, leaving the husk on till he brings the corn home, them strip up the husk and either tie them across a pole or braid them into a trace, as some term it, and next spring plant each separate; note exactly the produce of each, and give the result to the conductor of the Cultivator. I have tried it on a small scale some twenty-five years ago, and am satisfied for myself; but I have found that telling my experiments is not so good a way as to induce others to try; then they will know.

JAMES MEAD.

Enfield, Ct. Aug. 18, 1835.

Dear Sir—I have now growing on my lot 2 or 300 Quince bushes, some in a bearing state, when not injured by frosts, but mostly quite small. I have been looking for some information in the papers respecting trimming them, by some person who had made a sufficient trial to know whether best to trim or not. I find where I have thinned them at the bottom, the new sprouts come out two or three fold in number. I am yet a little short of sixty, but think, however, I am not too old to learn from your valuable paper, when it treats upon the small things in farming, such as I do.

Very respectfully, yours, GEER TERRY.

By the Conductor.—The Quince is sometimes trained on a single stem; but the better and more common way is to train two, three or four stocks from the same root. The shrub requires very little pruning, except the removal of dead wood, superfluous sprouts and branches that are likely to cross and interfere with each other. We advise to prune in July, to prevent the multiplication of sprouts. Dead wood may be removed at any season. We advise our correspondent to bud a part of his stocks with butter or melting pears, as dwarfs. It improves the quality of many kinds, and brings them early into a bearing state.

Sandisfield, Mass. June 28, 1835.

Mr. Buel,—Sir—The opinion seems well established, that the sheep worm or grub which occasions the annual loss of large numbers of fine sheep, is generated by the deposite of the eggs of a fly on or in the nostrils of the sheep during the hot months; but I have been led to doubt the fact—and hope some of the observing breeders and wool growers will ascertain the present season, if the eggs of the fly are, or are not deposited in a thin cavity *near the eye*. If my suspicions prove true, I trust the inventive skill of Yankees, or others, will not be long in devising a remedy as efficient, at least, *as tar on the nose*. Very respectfully, &c.

GEO. HULL.

Canaan Centre, Aug. 10*th*, 1835.

J. Buel, Esq.—Sir—I trouble you with this note to solicit information as to the best method of making and preserving cider; and as there are different ways of managing, I think the publication in the Cultivator, of some of the most approved modes, would be useful to many of your subscribers as well as to myself. Yours respectfully,

[For answer see p. 90.] DANIEL S. CURTIS.

"*Education*—A better safeguard for liberty than a standing army. If we retrench the wages of the school-master, we must raise the wages of the recruiting sergeant."—*Edward Everett's Toast.*

Miscellaneous.

From Low's Elements of Practical Agriculture.

SHEEP.—THE SOUTHDOWN.

The Southdown is a breed of fine-wolled sheep, now greatly esteemed, and extensively diffused on the light soils and chalky downs of England. They are without horns; their legs and faces are gray, and, like the sheep of the mountains, they are light in their fore-quarters. Their wool is fine and short, being from 2 to 3 inches in length, and weighing, on an average, about 2½ lbs the fleece. Their flesh is of excellent flavor; they are a hardy class of sheep, kindly feeders, and well suited to the species of pasture on which they are chiefly reared; they are about the size of the Cheviot sheep, the wethers, when fat, weighing about 18 lb. the quarter.

These sheep have been reared from time immemorial upon the chalky soils of Sussex; they have spread into other districts of light soils and downs, and also into some to which they are not adapted.

Much care has been bestowed on the cultivation of this breed, and it has accordingly been greatly improved; but attention having been mainly directed to the form and fattening properties of the animals, the quality of the wool has declined, though its quantity has increased.

MERINO.

In the class of fine-woolled sheep is the Merino or Spanish breed, now partially naturalized. They were originally natives of the northern provinces of Spain, and were introduced into this country in the year 1788. In the year of 1792 the rams were made to cross the Ryeland, the Southdown, and other fine-woolled breeds of England. His Majesty King George III. had introduced rams of the Merino breed from Spain, and cultivated it with care. In the year 1804, the sales which then began of his Majesty's stock attracted great attention to the breed; and, in the year 1811, a society was formed for the purpose of encouraging and extending it.

The result of the crosses with the native sheep has not in any degree fulfilled the expectations formed. The wool of the native sheep has indeed been improved in quality; but this has been accompanied by defects in the characters of the animals themselves not to be compensated by the increased value of the fleece. The sheep of the mixed breed have nearly all proved defected in their forms, slow feeders, and less hardy than the parent stock.

DISHLEY.

The improved Dishley breed is very generally termed the New Leicester, from having been formed by Mr. Bakewell of Dishley, in the county of Leicester. This gentleman was the son of a considerable farmer; and, about the year 1755, had begun to turn his attention to those improvements in the form of feeding animals, by which he came so distinguished. The precise steps which he followed in the forming of his breed of sheep are not known, as he chose to observe a species of mystery upon the subject. He is supposed to have derived his first sheep from Lincolnshire: but however this may be, it was by a steady breeding from the best-formed animals, until the properties aimed at had been acquired, that he gradually corrected the defects, and improved the form of the animals. He was well aware of the external characters which indicate a disposition to feed, and, by a steady course of selection continued during a lifetime, he obtained animals of superior feeding properties to any that had been before cultivated. By constantly breeding, too, from individuals of his own flock, and consequently near of blood to each other, he gave a permanence to the characters of his breed which it retains to the present hour. Mr. Bakewell adopted the practice of letting out his rams for the season, and this contributed to the general diffusion of his breed. Successors to Mr. Bakewell have continued the same system, and bestowed the utmost care in maintaining the purity of their flocks; and thus from the county of Leicester as a centre, this breed has been spread to every part of England, where the breeders have thought fit to receive it; and it has entirely changed the character of the greater part of the long-woolled breeds of this kingdom.

The sheep of the new Leicester breed are inferior in size to the other varieties which they have supplanted. The wool is but of moderate quality, & in weight it falls short of that of the larger breeds: it weighs from 7 to 8lb. and has a length of pile of from 5 to 7 inches. The value of the breed, therefore, does not consist in the size of the individuals, or the quality or abundance of their wool, but in early maturity, and aptitude to feed. In this latter property, the New Leicester has not been surpassed or equalled by any other breed of cultivated sheep.

IMPROVEMENT OF BREEDS.

The breed of sheep to be reared in any case must be selected according to the nature of the pastures, and the artificial means possessed of supplying food. If a mountain breed is selected for rearing on a low arable farm, then the advantage is lost which the farm possesses of producing a larger and finer class of animals. If, on the other hand, a lowland breed is carried to a mountain farm, an error of a different kind, but yet more hurtful, is committed; for a fine stock will be ruined if placed in circumstances where it cannot be maintained.

The breed, then, being selected which is the best suited to the circumstances in which it is to be placed, the province of the breeder is to breed from the best individuals.

Disposition to feed, and early maturity, are the properties most regarded in sheep to be reared for food. But the property of yielding good and abundant wool is not to be disregarded; and there is another property essential in the rearing of this class of animals, namely, hardiness and sound health of individuals.

In the case of the sheep as of the ox, refinement in breeding may be carried too far, and with more danger. By breeding from animals near of blood, the same means exist in the case of the sheep as of the ox, of giving that prematurity of age which produces fineness of the bones and a disposition to feed. But it is attended too with the same effect, of rendering the animals more delicate, and subject to diseases. It seems a violence done to nature, when carried too far, and the animals show the effects of it by becoming too fine in their skins, by ceasing to produce wool in sufficient quantity, by the females ceasing to yield milk, and by males becoming at length unable to continue their species.

Whenever, then, the sheep of any flock become too near of blood, the breeder should resort to the best animals of another family, but of the same breed, to continue his stock. This species of crossing is now easy, since there is scarce any of the cultivated breeds of which superior males may not be procured from other flocks. In the case of the new Leicester, so widely diffused and highly improved, no necessity can exist for breeding from animals too nearly allied.

FORM.

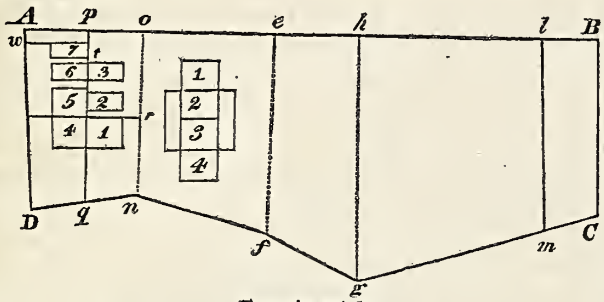
In the sheep, as in other animals, certain external characters indicate a disposition to feed, and at an early age. Other characters indicate a disposition to produce wool, and the quantity of wool, it has been said, is not to be disregarded in the rearing of the sheep. But the main purpose in rearing the sheep in this country being for food, the province of the breeder is to accomplish this object with as little sacrifice as possible of the secondary qualities.

A property that indicates a tendency to feed in the sheep as in the ox, is a general rotundity of form and fineness of the bones. The chest should be broad, the ribs well arched, and the back and loins accordingly broad, flat, and straight. The sheep, like the ox, occupies, independently of the neck and head, nearly a rectangle, and the larger the proportion of this rectangle which the body occupies, the more perfect is his form as a feeding animal. His body, therefore, should be large in proportion to his limbs, or, in other words, his limbs should be short in proportion to his body; his breast should be well forward, and his belly straight; his head should be small and his ears thin; his limbs to the joint should be fleshy, below delicate and covered with short hair: his skin should be soft and elastic; his wool soft to the touch, thick, and coming well forward to the face, but not covering it: his face and forehead should be covered thickly with short hair, and his eyes, as indicative of health, should be lively.

From Ruffin's Essay on Calcareous Manures.

EXPERIMENTS IN MARLING.—*Continued.*

As most of the experiments on new land were made on a single piece of twenty-six acres a general description or plan of the whole, will enable me to be better understood, as well as to be more concise, by references being made to the annexed figure. It forms part of the ridge lying between James River, and the nearest stream running into Powell's Creek. The surface is nearly level. The soil in its natural state very similar throughout, but the part next to the line B C somewhat more sandy, and more productive in corn, than the part next to A D—and in like manner, it is lighter along A *e*, than nearer to D *f*. The whole soil, a gray silicious acid loam, not more than two inches deep at first, resting on a yellowish sandy subsoil from one to two feet deep, when it changes to clay. Natural growth mostly pine—next in quantity oaks of different kinds—a little of dogwood and chinquepin—whortleberry bushels throughout in plenty. The quality of the soil is better than the average of ridge lands in general.



Experiment 1.

The part B C *g h*, about 11 acres, grubbed and cut down in the winter of 1814—15; suffered to lie three years with most of the wood and brush on it. February 1818, my earliest application of marl was made on B C *m l*, about 2½ acres. Marl 33-100 of calcareous earth, and the balance silicious sand, except a very small proportion of clay: the shelly matter finely divided. Quantity of marl to the acre, one hundred and twenty-five to two hundred heaped bushels. The whole B C *g h* cultered, and planted in its first crop of corn.

Results.—1818.—The corn on the marled land, evidently much better—supposed difference, forty per cent.

1819.—In wheat. The difference as great, perhaps more so—particularly to be remarked from the commencement to the end of the winter, by the marled part preserving a green colour, while the remainder was seldom visible from a short distance, and by the spring, stood much thinner, from the greater number of plants having been killed. The line of separation very perceptible through both crops.

1820.—At rest. During the summer marled all B C *g h*, at the rate of five hundred bushels, without excepting the space before covered, and a small part of that made as heavy as one thousand bushels, counting both dressings. The shells now generally coarse—average strength of the marl, 37,100 of calcareous earth. In the winter after, ploughed three inches deep as nearly as could be, which made the whole new surface yellow, by bringing barren subsoil to the top.

Results continued.—1821.—In corn. The whole a remarkable growth for such a soil. The oldest (and heaviest) marled piece better than the other, but not enough so to show the dividing line. The average product of the whole supposed to have been fully twenty-five bushels to the acre.

1822.—In wheat—and red clover sowed on all the old marling, and one or two acres adjoining. A severe drought in June killed the greater part of the clover, but left it much the thickest on the oldest marled piece, so as again to show the dividing line, and to yield in 1823, two middling crops to the scythe—the first that I had known obtained from any acid soil, without high improvement from putrescent manures.

1823.—At rest—nothing taken off, except the clover on B C *m l*.

1824.—In corn—product seemed as before, and its rate may be inferred from the actual measurement on other parts, which will be stated in the next experiment, the whole being now cleared, and brought under like cultivation.

Experiment 2.

The part *e f n o*, cleared and cultivated in corn at the same times as the preceding—but treated differently in some other respects. This had been deprived of nearly all its wood, and the brush burnt at the time of cutting down—and its first crop of corn (1818) being very inferior, was not followed by wheat in 1819. This gave two years of rest before the crop of 1821—and five years rest out of six, since the piece had been cut down. As before stated, the soil rather lighter on the side next to *o e* than *n f*.

March, 1821.—A measured acre near the middle, covered with six hundred bushels of calcareous sand, (20-100,) the upper layer of another body of fossil shells.

Results.—1821.—In corn. October—the four adjoining quarter acres, marked 1, 2, 3, 4, extending nearly across the piece, two of them within, and two without the marled part, measured as follows:

Not marled,	No. 1, 6⅛	average to the acre 22½ bushels of grain.
DO.	No. 4, 6⅜	
Marled,	No. 2, 8½	average 33¼ bushels.
DO.	No. 3, 8½	

The remainder of this piece was marled before sowing wheat in 1821.

1823.—At rest.

1824.—In corn—distance 5½ by 3¼ feet, making 2436 stalks to the acre. October 11th, measured two quarter acres very nearly coinciding with Nos. 2 and 3 in the last measurement. They now made

No. 2, 7 bushels 5¼ pecks, or per acre,	31.1	Average
No. 3, 8 bushels, ...	32.0	31 2½
Average in 1821, ...		33.1

Experiment 3.

The part *e f g h* was cut down in January, 1821, and the land planted in corn the same year. The cultering and after-tillage very badly executed, on account of the number of whortleberry and other roots. As much as was convenient was marled at six hundred bushels, (37-100) and the dressing limited by a straight line. Distance of corn 5½ by 3½ feet—2262 stalks to the acre.

Results.—1821.—October—on each side of the dividing line, a piece of 28 by 21 corn hills measured as follows:

No. 1. 588 stalks, not marled, 2 bushels, equal to........ 7¾ the acre.
No. 2. 588 stalks, marled, ... 4¼, 16⅝ the acre.

1822.—In wheat, the remainder having been previously marled.

1823.—At rest. During the following winter it was covered with a second dressing of marl at 250 bushels, (45-100,) making 850 bushels to the acre altogether.

1824.—In corn. Two quarter acres, chosen as nearly as possible on the same spaces that were measured in 1821, produced as follows:

No. 1, 8 bushels, 2 pecks, or to the acre,....................	34
The same in 1821, before marling,..........................	7.3¾
No. 1, 7 bushels, 2½ pecks, or to the acre,..................	30.2
The same in 1821, after marling,..............................	16.1½

1825.—The whole twenty-six acres, including the subjects of all these experiments and observations, were in wheat. The first marled piece in Exp. 1, was decidedly the best—and a gradual decline was to be seen to the latest. I have never measured the product of wheat from any experiment, on account of the great trouble and difficulty that would be encountered. Even if the wheat from small measured spaces could be reaped and secured separately, during the heavy labors of harvest, it would be scarcely possible afterwards to carry the different particles through all the operations necessary to show exactly the clean grain derived from each. But without any separate measurement, all my observations convince me, that the increase of wheat from marling, is at least equal to that of corn, during the first few years, and is certainly greater afterwards, in comparison to its product before using marl.

It was from the heaviest marled part of Exp 1, that soil was analysed to find how much calcareous earth remained in 1826, (page 26.) Before that time the marl and soil had been well mixed by ploughing to the depth of five inches. One of the specimens of the soil then examined, consisted of the following parts—the surface, and consequently the undecomposed weeds upon it, being excluded.

1000 grains of soil yielded

769	grains of silicious sand, moderately fine.
15	finer sand.
784	
8	calcareous earth, from the manure applied,
180	finely divided clay, vegetable matter, &c.
28	lost in the process.
1000	

This part, it has been already stated, was originally lighter than the general texture of the land.

Experiment 4.

The four acres marked A D *n o* were cleared in the winter of 1823—4. The lines *p q* and *r s* divide the piece nearly into quarters. The end nearest A *p o* is lighter, and best for corn, and was still better for the first crop, owing to nearly that half having been accidentally burnt over. After twice cultering, marl and putrescent manures were applied as follows; and the products measured, October 11th, the same year.

	Bush.	Pecks.
s q not marled nor manured—produced on a quarter acre, (No. 4.) of soft and badly filled corn, 3 bushels, or per acre	12	
q r and *r p*, marled at 800 bushels, (45-100) by three measurement of different pieces—		
¼ acre (No. 1.) five bushels, very nearly, or.............	19	3½
⅛ acre (No. 2.) 2.3¼ average 24.1½..................	22	2
⅛ acre (No. 3.) 3.1¼	27	
s t manured at 900 to 1100 bushels to the acre, of which,		
¼ acre (No. 5.) with rotted corn stalks, from a winter cow-pen gave 5.2½, ...	22	2
⅛ acre (No. 6.) with stable manure, 4.1¾,..............	35	2
⅛ acre (No. 7.) covered with the same heavy dressings of stable manure, and of marl also, gave 4-2,............	36	

p w, marled at 450 bushels, brought not so good a crop as the adjoining *r p* at 800.

The distance was 5½ by 3½ feet. Two of the quarter acres were measured by a surveyor's chain, (as were four other of the experiments of 1824, and found to vary so little from the distance counted by corn-rows that the difference was not worth notice.

1825.—In wheat; the different marked pieces seemed to yield in comparison to each other, proportions not perceptibly different from those of the preceding crop—but the best not equal to any of the land marled before 1822, as stated in the 1st, 2d, and 3d experiments.

1827.—Wheat on a very rough and imperfect summer fallow. This was too exhausting a course, (being three grain crops in the four shift rotation,) but was considered necessary to check the growth of bushes that sprung from the roots still living. The crop was small, as might have been expected from its preparation.

1828.—Corn—in rows five feet apart, and about three feet of distance along the rows, the seed being dropped by the step. Owing to unfavorable wheather, and to insects and other vermin, not half of the first planting of this field lived—and so much replanting of coursed caused its product to be much less matured than usual, on the weaker land. All the part not marled, (and more particularly that manured,) was so covered by sorrel, as to require ten times as much labor in weeding as the marled parts, which as in every other case, bore no sorrel. October 15th, gathered and measured the corn from the following spaces, which were laid off (by the chain) as nearly as could be, on the same land as in 1824.

The products so obtained, together with those of the previous and subsequent courses of tillage, will be presented below, in a tabular form, for the purpose of being more easily compared.

On the wheat succeeding this crop, clover seed was sowed, but very thinly and irregularly. On the parts not marled, only a few yards width received seed, which the next year showed the expected result of scarcely any living clover. On the marled portions, the growth of clover was of middling quality; was not mowed nor grazed, but seed gathered by hand both in 1830 and 1831.

1832.—Again in corn. It was soon evident that much injury was caused to the marled half, *q p o n*, by the two great quanti y applied. A considerable portion of the stalks, during their growth. showed strongly the marks of disease from that cause, and some were rendered entirely barren. A few stalks only had appeared hurt by the quantity of marl in 1828. On the lightly marled piece, *w p*, and where the heaviest marling was accompanied by stable manure, there has appeared no sign of injury. The products were as follows:

Mark.	DESCRIPTION.	Products of Grain per acre. 1st course. 1824. Oct. 11.		2d course. 1828. Oct. 15.		3d course. 1832. Oct. 26.	
		Bush.	Peck	Bush.	Peck	Bush.	Peck
s q	Not marled or manured,............	12		21	1	17	3½
q r 1	Marled at 800 bushels, ...	19	3½	28	1½	28	
r p 2	The same,......	22	2	31	0¼	27	3
r p 3	The same,......	27					
s t 5	Cow-pen manure, 900 to 1100 bushels,	22	2	25	2	bet. than *sq*	
s t 6	Stable manure, 900 to 1100 bushels,.	35	2	29		28	1
w t 7	Marl and stable manure, both as above	36		33	2	37	3½
w p	Marled at 450 bushels,............	Less than *r p* (800)		Equal to *r p.*		31	3

An accidental omission prevented the measurement of *s t* 5. in 1832.

This experiment has been made with much trouble, and every care bestowed to ensure accuracy. Still several causes have operated to affect the correctness of the results, and to prevent the comparative products showing the true rate of improvement either from marl, or the putrescent manure. These causes will be briefly stated.

1s . The quantity of marl (800 bushels,) on *q r* and *r p* is nearly double the amount that ought to have been used: and this error has not only increased the expense uselessly, but has served to prevent the increase of product that would otherwise have taken place. This loss is proved by the gradual increase, and at last the greater product of *w p* marled at only 450 bushels.

2d. The comparative superiority of all the marled ground to *s q* not marled, is lessened by this circumstance: most of the large logs as well as all the small branches, were burnt upon the land, when it was cleared in 1824, before the experiment was commenced: and the ashes have durably improved a spot where each of these large fires were made on *s q*, but have done no good, and perhaps have been injurious, to the marled pieces that were made sufficiently calcareous without the addition of ashes. At least, the good effect of ashes is very evident on *s q*, and has helped somewhat to increase all its measured products, and no such benefit has been visable on the marled parts.

3d. The quantity of putrescent manure applied to *s t*, (900 to 1100 bushels,) was much too great, both for experiment and profit: and the quantity, together with the imperfectly rotted state of the stable manure, has given more durability to the effect, than is to be expected from a more judicious and economical rate of manuring.

For these several reasons, it is evident that far more satisfactory results than even these, would have been obtained if only half as much of either marl or manure had been applied.

There are other circumstances to be considered, which if not attended to, will cause the comparative increase or decrease of product in this experiment to be misunderstood. It is well known that poor land put under tillage immediately after being cleared, as this was in 1824, will not yield near as much as on the next succeeding course of crops. This increase, which depends merely on the effects of time, operates independently of all other means for improvement that the land may possess; and its rate in this experiment may be fairly estimated by the increase on the piece *s q* from 1824 to 1828. The increase here, where time only acted, was from 12 to 21¼ bushels: but as the corn gathered here was always much the most imperfectly ripened, and would therefore lose the most by shrinking, I will suppose eight bushels to be the rate of increase from time, and that so much of the product of all the pieces should be attributed to that cause. Then to estimate alone the increased or diminished effects of marl, or manure on the other pieces, eight bushels should be deducted from all the different applications, the estimate will stand thus.

	1824.			1828.		Deduct for time.	Increase.		Decrease.		
	B.	P.		B.	P.	B.	B.	P	P.	P.	
q r 1	19	3½		28	1½	8	0	2	—		From 800 bushels of marl.
r p 2	22	2	24 1½	31		8	—		1	1½	From 800 bushels of marl.
r p 3	27										
s t 5	22	2		25		8	—		5	2	From 1000 bushels cow-pen manure.
s t 6	35	2		29		8	—		14	2	From 1000 bushels of stable manure.

Even the piece covered with both marl and stable manure, *(w t.)* shows according to this estimate, a diminished effect equal to 10½ bushels which was owing to the marl not being able to combine with, and fix so great a quantity of manure, in addition to the vegetable matter left by its natural growth of wood. The piece *w p* marled at 450 bushels alone, has shown a steady increase of product at each return of tillage, and thereby has given evidence of its being the only improvement made in such manner as both judgment and economy would have directed.

From the Genesee Farmer.

DISEASES AND ENEMIES OF FRUIT TREES.

The fact that many valuable fruit trees, and sometimes even whole orchards, are destroyed by diseases and insects, shows the importance of attention to the subject. A concise account therefore, of the various diseases and enemies to which fruit trees are liable, and the most efficient remedies which have yet been made known, may prove acceptable to young or inexperienced cultivators of fruit; especially as this information is now scattered through a great number of horticultural works, which perhaps are accessable to a few only. We therefore propose to give brief descriptions of the most formidable and common of these evils, and their respective remedies,

Apple.—The hardiness and vigor of this tree is such, and its enemies comparitively so few in the western part of New-York, that little difficulty has been yet experienced in its successful cultivation. It has occasionally however, its evils to contend with. Among the most common are 1. Canker. 2. The Borer. 3. The Caterpiller. 4. The American Blight.

1. *Canker* is a disease ascribed to various causes. Some attribute it to the poorness or wetness of the soil; others to the trees being exposed in a bleak situation to frosts and cold winds; but the most probable cause is external injuries sustained by applying ladders in gathering the fruit, leaving dead branches remaining on the tree, and by injudicious pruning. Where trees thus receive large wounds, decay frequently commences in those parts, and gradually extends until the tree dies. Wherever therefore wounds have been made, whether by pruning or otherwise, they should be protected from the air and moisture by a thick coat of paint or a mixture of tar and brick dust.* Where canker has actually commenced, either in apple or other fruit trees, the only remedy is to cut away, (with a drawing knife or other suitable instrument,) all the affected parts, protecting the freshly cut surface with a coating of paint, wax, or other similar substance. Canker is sometime caused by pruning in the spring while the sap is in rapid circulation, as it then oozes out upon the wound, causing it to turn black and producing decay in the branch.

2. *The Borer* is an insect which perforates the wood at or a little below the surface of the earth. They may be taken out by means of a slender

* There is nothing equal to a cataplasm of fresh cow-dung. Plaster it upon the wound while fresh, and cover it with a coarse cloth or swingling tow, and tie, loosely. It not only protects from the air and moisture, but possesses remarkable healing qualities, whether applied to the wounds of animals or vegetables.—*Cultivator.*

barbed wire, which can be introduced into the hole for this purpose. Whcie the hole is too crooked for this, soap suds, or strong decoction of tobacco, injected into it, will destroy them. Whatever mode is adopted to destroy them, the operation should be repeated several times during the summer, in order completely to extirpate them.

3. *The Caterpillar* has heretofore been the most formidable enemy to the apple tree in western New-York. It first makes its appearance in the spring, just as the leaf buds begin to open, when it is not the tenth of an inch long, and no larger than a cambric needle. It is then very easily destroyed by means of a brush dipped in some caustic or poisonous solution, as of lime, soap, or tobacco. It is destroyed with less ease as it increases in size. When fully grown it is two inches long and a quarter of an inch in diameter. It then spins a cocoon and passes to the pupa state, and in the latter part of the summer comes out a brown miller. It then deposites its eggs near the ends of the smaller branches, in the form of a band or broad ring round them, each ring of eggs containing about five hundred. These may be cut off and destroyed at any time during the autumn or winter. Every ring of eggs thus destroyed, will prevent a nest of caterpillars the next season.

4. *The American Blight*, (so called,) is caused by the *Aphis lanata*, a small insect, so thickly covered with fine white hair as to appear enveloped in fine cotton ; hence it is sometimes, and more appropriately, termed *white blight*. In England, apple trees have been greatly injured, and sometimes destroyed by it. The insect is described as furnished with a fine bristle-like beak, with which it pierces the bark and abstracts the nourishment from the cambium or newly formed sap wood. The sap wood being thus wounded rises up in excrescences over the whole surface—the limb grows sickly, the leaves turn yellow, and the branch perishes. Branch after branch is assailed in turn, until they all become leafless and the tree dies. The insect spreads from tree to tree, by being carried on the wind by means of its long cottony tufs of hair. It is easily destroyed on young trees, and those older which have been recently attacked, by a coating over with a painter's brush, the affected parts, with a mixture consisting of equal parts by weight, of rosin and fish oil, melted together and applied warm. This prevents the escape of the insects and stifles them. The operation should be performed early in the season, or as soon as the hoariness accasioned by the insects, appears on the branches. As this insect has as yet been introduced into this country in but small numbers, it becomes important to watch it closely, and destroy it now at the outset before it becomes extensively spread. The application of soft soap has been recommended for its destruction when it first appears on trees from infected nurseries.

The canker worms is perhaps the most destructive insect to the apple trees which has infested American orchards, but it appears to have been hitherto confined to certain parts of the country only, particularly of New-England. It ascends the trunks of the tree in the spring and in a short time destroys all the leaves of the tree, and thus eventually causes its death. The most common method is tarring daily the body of the tree, during the season of its activity, and thus preventing its passing up the tree.

Quince.—The most formidable, and perhaps nearly the only enemy to the quince, is *the Borer*, which attacks the tree in the same manner as that of the apple. The same remedy is to be applied. It is said that the borer may be excluded by enclosing the lower part of the trunk in tan or unleached ashes during the spring months. Grafting the quince above ground on pear stocks, will also in a great measure save it from the attacks of the borer, as the pear is rarely touched by it.

Pear.—The pear, in common with the apple and other trees, is liable to occasional attacks from the catterpillar, and sometimes from a few other insects, but its great and peculiar malady is the *Fire Blight*. This first affects trees generally during the early part of summer, sometimes later, causing the branches and leaves suddenly to turn black and die. It is attributed to a very small insect *(Scolytus piri)* which eats a small circular ring under the bark, round the branch, thus cutting off the upward flow of the sap. Where the insect has been discovered, it has been some inches below the affected part. The only remedy is to cut off the diseased branch immediately, at some distance below, and commit it to the fire. This course when faithfully and unremittingly pursued has been found entirely effectual in preventing the ravages of this formidable enemy of the pear. Some attribute fire blight to other causes than the work of an insect, but all agree that the only effectual cure is to cut off and burn the limb.

Plum.—The principal enemy to the plum, as well as to all smooth stone fruit, is the *Curculio*. This is a small beetle or bug, about a quarter of an inch long, (its head and thorax resembling at first glance, a long beak, serving at once to distinguish it,) which punctures and deposits its egg in the young fruit. A worm proceeds from this, which feeds upon the fruit, and causes it prematurely to fall to the ground ; when the worm passes immediately into the earth, and continues (as is supposed) in the pupa state during winter, and the next season comes out in the perfect state to propagate its species by again puncturing the fruit. Now if, when the fruit falls, it be destroyed immediately, before the worm escapes, the fruit of the succeeding year will be saved. This may be easily affected by suffering a number of swine to feed among the trees to devour all that fall. But where swine cannot be admitted, the best way is to jar down the insects during the time of laying their eggs, by a stroke of the hand or of a mallet, when they may be caught in white sheets of cloth spread under the tree to receive them, and destroyed. Where this operation has been performed two or three times a day, it has soon cleared the tree of them.

The plum tree is liable to a disease sometimes called canker, which is an excresence upon the branches, at first green, and afterwards becoming black ; the diseased branch soon dies and the whole tree gradually perishes. It is prevented by cutting off all the affected branches as soon as the disease appears, and burning them: By seasonable care, it may thus be prevented from doing further mischief with little trouble.

A large number of plum trees in this state suffered greatly from some unknown cause, in the early part of the autumn of 1833. The leaves fell prematurely, in consequence of which the fruit was not perfected, and the trees themselves received a check from which many of them did not recover. A large number have since died ; many however, perhaps the greater part, are now recovering, and some have assumed their former thriftiness.

Peach.—The peach is particularly subject to the attacks of an insect called the *Peach worm*, and to a disease known by the name of the *Yellows*.

1. The *Peach worm* is produced from the eggs of a lepidopterous fly *(Ægeria persicæ)* which deposites its eggs during summer in the bark of the tree near the roots. The worms which these produce, penetrate the bark to the external surface of the wood, and commence the work of destruction, sometimes devouring the inner bark entirely round the tree, and speedily causing its death. It is rare however, except in very small trees, that death is produced, as the worm seldom eats completely round; in which case the injury only retards its growth. Its presence is readily detected by the gum filled with excrementitious matter, which oozes from the tree, near the surface of the ground. The best remedy is to remove the earth from round the foot of the tree, together with a small portion of the injured bark, when the worm will be exposed and may be readily destroyed. All the holes should be traced to their end, in order to see that the tree is cleared of them, cutting the bark as little as possible, so as not to injure the tree unnecessarily.

2. *The Yellows.* This disease is by far the most formidable evil which the peach has to encounter. It is entirely peculiar to the peach and nectarine. Its cause is unknown. It is first indicated by the fruit ripening three or four weeks earlier than usual, generally with red specks and blotches upon it. This commonly takes place on a part of the tree only. The following season, a number of very small wiry shoots grow from the larger branches, the leaves become yellow, the whole tree assumes a sickly appearance, and eventually perishes. What renders this disease the more to be dreaded is its contagious nature. If not checked, it commonly spreads through the orchard. The infection is supposed to be communicated at the time of flowering by the pollen or farina which is carried from tree to tree; the fruit thus receives the malady, which is quickly carried by the circulation of the sap through the branches and trunk. The disease is also always communicated where a bud from an infected tree is inserted on a healthy one; and even by prunning a healthy tree with a knife which has been previously used on a diseased one. After it has once attacked a tree, there is no remedy; it must inevitably perish.—Wherever therefore a tree is seen ripening its fruit prematurely, especially if that fruit be marked with red blotches unusual in it, it is to be looked upon as a lost tree—nothing can save it; and nothing can save adjacent ones from becoming infected but by destroying it before it blooms again. No peach tree should be planted on the same spot until several years of intermediate cultivation; perhaps it will be best in most cases to plant fruit trees of some other species, which are not attacked by this disease, in places where such peach trees have stood.

Nectarine.—This fruit tree is subject to the same diseases as the peach, of which indeed it is considered as but a variety; and the same remedies apply to both. Its fruit is also subject to the attacks of the curculio, for an account of which, see the article on the *plum*.

Apricot.—The principal enemies of this fruit, are 1. *The worm* or *Ægeria*, which has been described in the account of the peach; and 2. *The curculio*, described in the account of the plum.

Cherry.—In western New-York, the cherry has but few diseases or enemies, and those of little importance. Some varieties are attacked by an insect which causes large excrescences on the branches. Whenever these appear, they should be immediately cut off and committed to the fire. Perhaps the greatest enemy is the *Cedar bird*.* The only known way of repelling them is to thin their ranks by means of powder and shot, when they become suspicious and fearful, and less voracious in their depredations. Small trees of choice varieties may be protected from the birds by covering them with a large coarse net, made of bass matting or other material.

* This is a small bird about the size of the blue bird, of a light brown colour, readily distinguished by its crest; and is by its voracity very destructive to ripe cherries.

Household Affairs.

" *To make Currant Jelly.*—Take the juice of red currants 1 lb. sugar 6 oz. Boil down. Or,

Take the juice of red currants and white sugar equal quantities, stir the mixture gently and smoothly for three hours, put it into glasses, and in three days it will concrete into a firm j-lly."

For making Currant Wine, numerous methods have beeen published. The juice of the currant consists, principally of water, saccharine matter and vegetable mucilage. Its convertion into wine is effected by what is termed the vinous and spirituous fermentations, which transform the saccharine matter into alcohol. If the must, or expressed juice, is deficient in saccharine matter, the fermented liquor will be weak and vapid, and run into the acetous, or vinegar, and sometimes into the putrid fermentation. Hence the practice of adding sugar to the must, to give it body, &c. The more violent the spirituous fermentation, the more the strength of the liquor will be dissipated; and therefore the process should progress as slowly as possible, and under a temperature not exceeding 70°. The vinous and spirituous fermentations not only convert the sugar into spirits, but they separate the mucilage, or yeast, from the liquor, in a great measure, which latter then becomes clear and transparent. If the fermentation, in wine or cider, is checked, by natural or artificial means, before the saccharine matter is converted into spirits, the liquor remains proportionably sweet; but when the conversion is complete, the product is what is termed dry liquor. If the mucilage is left in the cask after it has performed its office, it is apt to commingle again with the liquor, render it turbid, and induce, under a warm temperature, the acetous fermentation. Hence the practice, in some cases, of conducting the vinous fermentation in open vessels, and of *then* separating it from the scum and lees; and in other cases, of racking it off, before the action of summer heats upon it. We shall give directions for making wine in both these modes. The first is from the American Philosophical Transactions, and the latter from our friend Judge Patterson, of Columbia, who successfully adopted it for many years. For ourselves we prefer the latter mode, though we think the brandy superfluous, where 80 lbs sugar are employed in the fabrication of a barrel.

First mode.—" Gather the currants when they are fully ripe, and dry, break them in a tub or vat, then press and measure the juice, to each gallon of which add too gallons of water, and to each gallon of the mixture put 2½ lbs. sugar; agitate the whole till the sugar is dissolved, when it may be barrelled. The *juice* should not be left to stand during the night, as the fermentation ought not to take place till all the ingredients are compounded. Lay the bung lightly on the hole to prevent flies, &c. creeping in, and in three weeks bung up, leaving only the vent hole till it has fully done working, which will be about the latter end of October. Rack into a clean cask the spring following. For a barrel of 28 gallons will be required, 8 gallons currant juice, 16 gallons water, 4 gallons sugar, or 60 lbs.

Second mode, in which the vinous fermentation is managed in an open vessel. Pick and press the currants as before, and add two gallons of water to one of juice, and 80 lbs. sugar to a barrel of 32 gallons. Stir well, and cover the must, in an open vessel, with a linen cloth, place it where the temperature is from 60 to 70°, and next day skim off the impurities which rise to the surface and stir again the liquor. Repeat this operation as long as the scum rises. Then barrel, rejecting the lees, adding 2½ gallons good brandy, and bung close. No racking is required.

In the last mode the vinous fermentation is completed before barrelling. The spirituous soon follows, if the temperature remains as high as 60°, and abates in 6 to 12 days.

If the wine becomes foul or ropy, take half an ounce of chalk in powder, half an ounce burnt alum, the white of an egg and a pint of spring water, beat the whole in a mortar, pour it into the cask, and roll it ten minutes; and as soon as the wine becomes fine rack it off.

Sea-weed Manure—Fleets of boats, to the number of sixty or seventy, are daily arriving at Galway with sea-weed for manure, from Cunnamara, Arran and the county Clare, which is purchased with avidity, and conveyed on carts all over the country, in various directions, even to the distance of forty or fifty miles into the interior.—*Galway paper.*

THE CULTIVATOR—OCT. 1835.

TO IMPROVE THE SOIL AND THE MIND.

CHAPTAL'S CHEMISTRY.

We have been kindly presented, by the publishers, with a copy of CHAPTAL'S "*Chemistry applied to Agriculture*," a 12mo. volume of 366 pages, translated from the French, and recently published by Hilliard, Gray & Co. Boston.

The American public are under great obligations to the fair translator, and to the publishers, for giving us this valuable work in an English dress. Count Chaptal, the author, was one of the most eminent chemists of the day, and one of the best and most extensive practical farmers in France. While he taught the great principles of science, or laws which regulate matter, he illustrated their use and application to rural labor, not only on the farm but in the more humble business of the dwelling. "In order," says he, "to make a useful application of science to agriculture, it must be profoundly studied, not only in the closet, but abroad in the fields." He was a man of *practical* science, and of *scientific* practice. His work possesses an advantage over Davy's, because it is more recent, and embraces the modern discoveries in chemistry; and particularly because it is more practical, and better adapted to the understanding and business of the farmer—the principles of science being illustrated and established by the writer himself, in an extensive agricultural practice. The volume is calculated to become in the hands of our intelligent and enterprising yeomanry, a valuable means of advancing the condition of our husbandry, and of our husbandmen, and of elevating their character. While, in the language of the translator, it "sheds all the light of modern science upon the humblest details of rural labor; and while it increases the productive skill of those who are engaged in practical husbandry, it at the same time 'advances them in the dignity of thinking beings.' "

In his introduction, the author dwells upon the enervating influence of sedentary and city life; he ascribes to agriculture, the means of counteracting this influence, and of preserving to a country its health, strength and good morals; considers it the purest source of public prosperity, and ranks the agriculturist first in usefulness among men. He speaks of the abject condition of the agriculturist in past ages :—"Without emulation, without knowledge, and nearly without interest, the thought of improvement scarcely presented itself to his mind;" and he contrasts the former with his more recent condition, when "the farmer recognized his strength, and felt himself rising into the true importance and dignity of his state; when intelligence was extended to the business of the fields; the means of ameliorating the soil, and improving its productions, were established and increased; and private interest was united to the public good. At that period, agriculture took a new impulse; and since then its progress has been rapid. The nature of soils has been better known; the cultivation of artificial meadows has been extended; and a rotation of crops has been established upon principles recognized in all those countries where agriculture has made the most progress. The number of domestic animals has also progressively increased, and with them, the manures and the labors which form the basis of agricultural prosperity."

We leave the reader to determine, whether he belongs to the ignorant, abject class of past ages, or to the more enterprising one of recent times. If he is young, and his habits are not fixed, we conjure him, as he regards his future prosperity and happiness, to strive, by all honest means, to gain admittance into the latter class. Let him bear in mind, that excellence and distinction, in any honest calling, is only to be achieved by industry and perseverance; and that the reward is generally proportioned to the labor which it costs. Though all do not "earn their bread by the sweat of their brow," those who do so have the best relish for, and participate most largely in, the substantial enjoyments of life.

Upon the pleasures and advantages of science to the agriculturist, Count Chaptal very justly and eloquently remarks :

"It remains to us, at this day, to improve agriculture by physical science. All the phenomena which it presents, are the consequences necessarily resulting from those eternal laws by which matter is governed; and all the operations which the agriculturist performs, serve only to develop or modify these laws. It is, then, to the acquisition of a knowledge of these laws, in order to calculate their effects, and modify their action, that we ought to direct all our researches.

"Can any study present to the agriculturist more attractions, than that which has for its object the explanation of those effects, which every day captivate his senses and astonish his reason? Without doubt, observation has made him acquainted with the uniform march of nature. In all her operations, he can judge of the modifications effected in her productions by the state of the atmosphere, the variation of climate and the nature of the soil. Even this practical knowledge enables him to direct many of the labors of the field. But, if he be permitted to ascend from effects to their causes; if we can determine, and demonstrate to him, the action which is exercised upon vegetation by the air, water, heat and light, the sun, various kinds of manure, &c. &c. and assign to each of these agents the parts which it performs in these grand phenomena, how much will he be moved! Even while an ignorant witness of these wonders, he is lost in admiration of them; but, more enlightened, he will feel this sentiment constantly increasing, as he rises to the causes which produce them."

Count Chaptal presses upon the consideration of his government, the justice and policy of giving legislative aid to agriculture, by providing national schools of instruction, and by exciting emulation among cultivators by liberal premiums. His remarks upon this head are so just and forcible, that we shall transfer a portion of them to the columns of the Cultivator.

"But it is not sufficient to enlighten the agriculturist," says he, "in order to facilitate the progress of the art; the government has an important duty to perform towards it. It is only when intelligence and encouragement are united, that the former can be assured of lasting prosperity.

"Agriculture is the most fruitful source of the riches of a country, and of the welfare of its inhabitants; and it is only as the state of agriculture is more or less flourishing, that we can judge unerringly of the happiness of a nation, or of the wisdom of its government. The prosperity which a country derives from the industry and skill of its artizans, may be but a passing gleam; that alone is durable, which has its rise in a good cultivation of the soil. These facts ought to be constantly present to the mind of the government, and to influence all its measures."

"By encouraging improvements in agriculture, and favoring the increase of production, government enriches the agriculturist less than its own revenues; since by these means the quantity of taxable matter is increased, and the right of government recognized under all its forms, whether the article produced be employed in its crude state for domestic use, or whether it furnish the workshops of the artizan with the materials of his handicraft."

Again—"It would be necessary that at least two experimental schools of agricultural instruction should be established in France, one in the north and the other in the south, in order to embrace all kinds and varieties of culture adapted to the climate.

"The extent of land devoted to each establishment should be about 200 *hectares* [nearly 500 acres] and the buildings should be able to lodge at least one hundred pupils.

"The nature of the soil must be sufficiently varied to admit of all the different kinds of culture adapted to the climate.

"There would be required in said establishment a director, entrusted with the care and management of it, and two professors, one of chemistry applied to agriculture, the other of veterinary medicine.

"The purchase of lands and the cost of the establishment might be estimated from a million to twelve hundred thousand francs, [180,000 to 200,000 dollars for both] but the money paid for board, and the products of cultivation, would at least cover all the annual expenses.

"It would be useful to connect with each establishment a workshop, for the manufacture of all implements of husbandry, perfected or newly invented, or employed in rural operations. The profits of the workshop would form a considerable revenue for the establishment.

"The young people admitted into the establishment as boarders, should be employed in all agricultural labors; they should be instructed in the responsible management of an estate.

"There should be annually a formal distribution of prizes to those pupils who have distinguished themselves by good conduct, and to those who have made the greatest progress.

"A royal ordinance should establish these principles, and the minister of the interior should make the rules necessary for securing their execution in every particular.

"I have no doubt that these establishments would produce, in a few years, the best effects upon French agriculture. The pupils who left these schools would diffuse every where instruction and good methods of cultivation, and the first of arts would no longer depend for preservation on a mere routine, which perpetuates error and prejudice.

"In establishing these two schools, the government will have fulfilled only one part of its duty to agriculture; it owes it roads and canals to facilitate the transportation of commodities; it owes it a wise regulation of taxes, so that they may never represent a single part only of the benefit derived from agricultural operations; it owes it a kind and paternal administration; it owes it assistance when accidental casualties or diseases have ravaged crops and destroyed cattle.

"And even in this, the government has not yet fulfiled all its duties to agriclture, to their full extent; it should excite emulaion which, in the arts, works miracles, and should reward agriculturists who make important discoveries; and those who improve and extend useful methods of cultivation.

"These pecuniary encouragements should not be distributed at random, nor badly bestowed, for they would then extinguish emulation instead of rousing it.

"A well selected jury should designate, every year, to the authorities, those cultivators of the department who have deserved best of agriculture, and the distribution of prizes should be made in a public and solemn sitting.

"The object of the examination of the jury should be to determine who are those agriculturists who have introduced upon their estates animals more valuable and more useful than those of the country, and those who have improved the native breeds;

"Those who have established the system of cropping most favorable to the soil.

"Those who have discovered modes of manuring and improving the soil, before unknown or not used;

"Those who have planted the largest number of trees;

"Those who have opened to culture lands hitherto barren;

"Those who have introduced the cultivation of plants, the produce of which is more profitable than that of those usually raised;

"Those who have invented or improved agricultural implements;

"In a word, all those who should have rendered services in any department of agriculture, would be entitled to these rewards.

"I believe that prizes to the amount of ten or twelve thousand francs [1,800 to 2,000 dollars,] annually distributed in each of the departments, would be sufficient to excite a happy emulation among agriculturists.

"The government should also reserve to itself some places in the two principal schools of agriculture, and there place the children of the most distinguished cultivators, to be maintained at its expense."

Then follows some excellent suggestions in regard to public roads, as channels for the transportation of agricultural produce to market; and he recommends that there be attached to each department, a superintendent of bridges and highways, whose duties should be confined to whatever relates to the district roads.

There are chapters of this work particularly adapted to household affairs, for instance, *on the preservation of animal and vegetable substances; on milk and its products; on the means of preparing wholesome drinks; and on washing and bleaching.* There is also a chapter, containing judicious and useful suggestions, on the construction of *farm buildings, both for men and animals, and the means of making them healthy*—also, one *on the cultivation of wood, and the extraction of indigo from it;* and another *on the cultivation of the beet root, and the extraction of sugar from it.* M. Chaptal, it is believed, went extensively into the culture of the two last named products; and he has furnished minute details, particularly in regard to the latter, from the sowing of the seed to the refining the sugar and the profitable disposition of the refuse products. No person should enter upon the manufacture of sugar from the beet without the aid of this valuable manual. We will abstract a few facts from this treatise, as supplementary to the article we published in our August number on this subject.

On choice of soil.—Dry, calcareous and strong clays are bad, as are also grass lays. Beets do best in a loose, fertile soil, having a bed of vegetable mould of at least 12 or 15 inches in depth. Good soil will give 100,000 lbs. per hectare [equal to two acres, one rood, thirty-five perches English,] a poor soil from 10 to 20,000 lbs.—average say 40,000. Roots weighing from one to two pounds yield nearly double the sugar to those weighing from 10 to 20 lbs.

Preparation of soil.—Prepare it as for wheat, and bury the manure with the last ploughing, if this is applied, but it is unnecessary on rich ground.

Harvesting.—The time of gathering is indicated by the larger leaves turning yellow. If left longer in the ground a portion of the sugar is converted into salt-petre—if gathered sooner, they wither, wrinkle and grow soft. A good hint this for those who cultivate the root for culinary uses. Gardeners should treasure it up.

Preserving the roots.—They should be kept at a temperature near the freezing point, as they freeze one degree below, and grow a few degrees above. Frost softens and destroys their saccharine principle; heat develops the stocks at the necks of the roots, and decomposes the juices which supply their growth. They should be thoroughly dried before they are housed. These too are valuable hints to the gardener and housewife. For family uses they are best kept in a box or cask, mixed with dry earth, and placed in a cool cellar.

Preparation of the roots.—They must be freed from the radicles, necks, diseased parts, and all dirt. Eight women can prepare 10,000 lbs. in a day.

Rasping—The rasps are sheet iron cylinders, 15 inches in length, and 24 in diameter, having their surfaces furnished with 90 iron plates, armed with saw teeth, and fixed with screws—driven by horse or steam power. The beets are pressed against the rasp by means of a piece of wood held in the hand. With two rasps, (says M. Chaptal,) I have reduced 5000 pounds of beets to a pulp in two hours. The grater cider mill would do this admirably.

The processes of manufacturing are too long to copy, and too important to abridge; they should be studied in detail.

Product in Sugar.—The product of 10,000 lbs. of trimmed beets is stated,

In sugar of the first quality, (double refined loaf,)....	187 lbs.
In sugar of the second quality,....................	60 lbs.
Total, ...	244

In his *general considerations*, M. Chaptal remarks, "From 12 years experience I have learned, in the first place, that the sugar extracted from beets differs from that of the sugar cane, neither in colour, taste, or crystalization; and in the second place, that the manufacture of this kind of sugar can compete advantageously with that of the sugar cane, when the price of the last is in commerce one franc and twenty centimes per demi-killogramme:" (=18½ cents per pound, reference being had to refined sugar.)

We have been tedious, we are afraid, in our notice of and extracts from this work. Yet we shall have occasion hereafter frequently to refer to the principles of agricultural science which it illustrates. Its general circulation cannot but have the happiest effect in instructing our farmers, should it fail in the more desirable object of enlightening our statesmen and legislators.

PRESERVING MEATS.

The intrinsic value of salted meats, whether for family use or for market, depends materially upon the manner in which they are preserved. An excess of salt renders lean meats, as beef and hams, hard, tough and unpalatable, besides destroying much of their nutritious properties; while too little salt, or an equivalent of some other antisceptic, will not preserve them in a healthful state. It is as easy and as cheap to preserve meats well, as it is to do it badly, if we are furnished with good rules, and duly observe them. There are, no doubt, many rules adapted to this end. We have tried many, and have finally, for some years, adopted, with perfect satisfaction, for family use, the pickle which we give below, for the curing of beef and hams. It is said to be equally good for pork, though we have not used it for this purpose, as we lay down none but the fat part of the hog, which is not injured by an excess of salt. This has been denominated the

Knickerbacker Pickle.—Take six gallons of water, nine pounds of salt, three pounds coarse brown sugar, one quart of molasses, three ounces salt petre and one ounce pearlash—mix and boil the whole well, taking care to skim off all the impurities which rise to the surface. This constitutes the pickle. When the meat is cut, it should be slightly rubbed with fine salt, and suffered to lay a day or two that the salt may extract the blood; it may then be packed tight in the cask, and the pickle, having become cold, may be turned upon and should cover the meat. A follower, to fit the inside of the cask, should then be laid on, and a weight put on it, in order to keep the meat at all times covered with pickle. The sugar may be omitted without material detriment. In the spring the pickle must be turned off, boiled with some additional salt and molasses, skimmed, and when cold, returned to the cask.

For domestic use, beef and pork hams should not be salted the day the animals are killed, but kept until its fibre has become short and tender, as these changes do not take place after it has been acted upon by the salt.

Meat that is to be dried and smoked, requires less salt than that which is to remain in pickle, on account of the preserving qualities of pyrolignic acid, which is supplied by the smoke of the wood. The great art in smoking meat well, seems to consist in having the meat dried by smoke, and not by heat. The hams of Westphalia and the smoked beef of Hamburgh, which are unrivalled in reputation, are managed in this way. The Westphalian farmers have a closet in the garret, joining the chimney, made tight, to retain smoke, in which they hang their hams and bacon to dry, out of the effect of the heat of the fire. Two apertures are made from the closet into the chimney, and a place is made for an iron stopper to be thrust into the funnel of the chimney, to force the smoke through the lower hole into the closet. The upper hole must not be too big, because the closet must be always full of smoke, and that from wood fires.

The Hamburgh method of making their superior smoked beef is this: Fires of oak chips are built in the cellars, from whence the smoke is conveyed by two chimnies into the fourth story, and thrown into a chamber by two openings placed opposite to each other. The size of the chamber is proportioned to the quantity of meat to be smoked, but the ceiling is not raised more than five feet and a half from the floor. Above this chamber there is another made with boards, into which the smoke passes through a hole in the ceiling of the first, whence it escapes by openings formed in the sides. The pieces of meat are hung up at the distance of a foot and a half from each other, and a fire is kept up night and day for a month or six weeks, according to the size of the pieces.

PRESERVING ROOTS.

We find in Chaptal's "*Chemistry applied to Agriculture*," an excellent chapter on the preservation of animal and vegetable substances. We extract the following from the preliminary remarks.

"The nature of all bodies which have ceased to live or vegetate, are changed, as soon as the physical or chemical laws, by which they were governed cease to act; the elements of which they were composed then form new combinations, and consequently new substances.

"Whilst an animal lives, or a plant vegetates, the laws of chemical affinity are continually modified in its organs by the laws of vitality; but when the animal or plant ceases to live, it becomes entirely subject to the laws of chemical affinity, by which alone its decomposition is effected.

"The principles of the atmospheric air which is imbibed by the organs of living bodies, whether animal or vegetable, are decomposed and assimilated by them, whilst dead dodies are decomposed by its action. Heat is the most powerful stimulant of the vital functions, yet it becomes, after death, one of the most active agents in the work of destruction. Our efforts, then, for the preservation of bodies, ought to be directed to counteracting or governing those chemical or physical agents, from the action of which they suffer; and we shall see that all the methods which have been successful, are those which have been formed upon this principle.

"The chemical agents, which exert the most powerful influence over the products of the earth, are air, water and heat; the action of these, however, is not equally powerful over all classes of plants; the soft and watery, and those which approach the nearest to animal matter, decompose most readily: the principles of such are less coherent, less strongly united than that of others; so that the action of disorganizing agents upon them is prompt and effectual.

"All the methods now employed for the preservation of bodies, consist in so far changing their nature, as to deprive them of the elements of destruction contained within their own organs; or in secluding the substances to be preserved from contact with the destructive agents mentioned in the preceding paragraph; or in causing them to imbibe certain other substances, the anti-putrescent qualities of which counteract all action, whether of internal or external agents.

"In all vegetable products, water exists in two different states, one part of it being found free, and the other in a state of true combination; the first portion, not being confined except by the covering of the vegetable, evaporates at the temperature of the atmosphere; the second is set free only at a temperature sufficiently high to decompose the substances containing it: the first, though foreign to the composition of the vegetable, enters into every part of it, dissolving some of its principles, serving as a vehicle for air and heat, and being converted by cold into ice; by these several properties it greatly facilitates decomposition: the second portion, from which no evil of the kind arises, is found combined and solidified in the plants, and its action is thus neutralized."

Drying fruits, then, in order to preserve them, consists in depriving them of the water contained in them in a free state. This may be done by subjecting them to heat not exceeding 95 to 113° —either by exposing them to the sun, or in a stove room, or in ovens, which latter practice is resorted to, even in the warmest countries, at the commencement of the drying process. *In preserving the apple*, for instance, our author adds, that by depriving their surface of all moisture before putting them up; keeping them in dry places, where the temperature will be constantly between 50 and 54°, and by separating the fruits that they shall not come in contact, they may sometimes be preserved 18 months. The farmer in Schoharie, who has been in the habit of bringing the Spitzenbergh to our market on the 4th of July, owes his success to the observance of these rules.

On the preservation of the fruits of the earth by secluding them from the action of air, water and heat, M. Chaptal enumerates the following leading causes of decay.

"The atmospheric air, coming in contact with fruits, depives them of their carbon, and forms carbonic acid.

"Fruits exposed to the solvent action of water suffer decomposition, by having the affinity existing between their constituent principles weakened, and at length destroyed.

"Heat dilates the particles of bodies, and thus diminishes the force of cohesion and attraction, and favors the admission of air and water.

"The combined action of these three agents produces very speedy decomposition; the effect produced by any one of them is slower, and the results different. So that in order to preserve fruits from decomposition, it is necessary to guard them from the power of these three destroyers."

Practically applied, these axioms teach, that to preserve roots in good condition, the following precautions should be observed:

1. That their surfaces be entirely freed from moisture before they are housed or buried, and that they be deposited in a dry situation, where water will not have access to them.

2. That they be excluded from the air, by burying them in dry earth, or slightly covering them in the cellar with earth. And,

3. That they be kept in a cool temperature—the best ranging from 34 to 45 degrees.

We frequently hear housekeepers complain, that their potatoes, turnips and other vegetables soon deteriorate, and lose their fine flavor, after they have been a short time in their cellars. This is a natural consequence of the injudicious way in which they are too frequently kept—exposed to the atmosphere, and to a high temperature, in a cellar adjoining the kitchen, or perhaps in the kitchen itself Again, potatoes or turnips buried in a wet condition, or the latter with parts of their tops left on, are very liable to ferment and spoil. We find it to be a necessary precaution in burying turnips, to make one or more holes in the crown of the pit, to let off the rarified air, and abate the heat which is almost invariably generated on their being buried.

In preventing the total loss of potatoes that have been affected by frost, Thomas Dallas directs, that when they are slightly touched by the frost, it is only necessary to sprinkle the roots with lime to absorb the water under the skin; that when the outer portion of their substance is frozen, the tubers may be pared, and thrown for some hours into water slightly salted; and that when they are wholly frozen, they will yield, upon distillation, a spirituous liquor resembling the best rum, and in greater quantity than roots which have not been frozen.

The quotations we have made above are invaluable to the farmer and house keeper; and if the principles which they establish are understood and practised upon, we shall have no cause to regret the length to which we have extended this article.

FORTY YEARS AGO.

Forty years ago, William Strickland made a report to the British Board of Agriculture, on the condition of American Husbandry, the result of travel and observation among us. We quote from this report the remarks upon the mode and products of New-York farming, with the view of showing with what fidelity the bad practices of '94–95, are still persisted in by a portion of our farmers, and of enabling the reader to note the marked difference between the *good* farming of that and the *good* farming of the present day.

"The course of crops in this state" [N. York] says Strickland, "is as follows: first year maize, second rye or wheat, suceceded immediately by buckwheat, which stands for seed; third flax or oats, or a mixed crop; *then a repetition of the same thing, as long as the land will bear any thing*; after which it is *laid by*, without seed, for OLD FIELD; or, *burn the woods;* 1 wheat, 2 rye, then maize for four or five years, or *as long as it will grow;* then *lay it by*, and begin on fresh woodland; or, burn the woods, then wheat four or five years; then one or two maize, or *as long as it will grow*, then laid by for four or five years for OLD FIELD, *without seeds*. A Dutchman's course on the Mohawk: first year wheat, 2 peas, 3 wheat, 4 oats or flax, 5 maize. In his father's time, the produce of wheat used to be 20 bushels an acre; but he complained much now, that his land only produced ten bushels. The best rotation I have met with was in Dutchess, where it much prevails: 1 wheat, 2 and 3 pasture without seed, 4 maize, or flax, or oats, or a mixed crop. In a good season this produced about 15 bushels, more commonly twelve. *Manure is rarely made use of;* but what little is collected is given to the maize, which requires every support that can be bestowed upon it."

"Clover is just beginning to be cultivated, in consequence of which; good pasture and plenty of hay take place of *old-field*, and by the use of gypsum astonishing crops are obtained."

"The average produce of wheat in the state of New-York, has been stated to me by very intelligent persons, at twelve bushels to the acre; which agrees with the general opinion, and, I believe, is as high as ought to be stated. The average of Dutchess county, which under a proper cultivation would be a most productive, as it is a most beautiful, country, at 16 bushels: 20 bushels are every where a great crop. The average of maize may be above twenty-five bushels; thirty is a great crop. With a mode of agriculture as before stated, it is not to be wondered at that the produce should be so small, and it will be found that the average of this state is superior to that of any other in the union."

"Should this deduction [interest on capital and expense of cultivation] be made, little profit can be found in the present mode of agriculture in this country, and I apprehend it to be a fact, that it affords a *bare subsistence*."

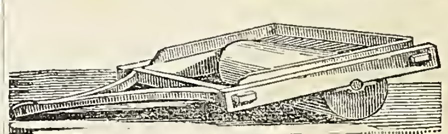
"The wheat of New-York is esteemed the best in the United States, and that grown on the banks and branches of the Mohawk the best in the state."

Thus far our extracts. It will strike every observer, that the wretched system here described, which procured a "bare subsistence" to the cultivator, particularly so far as regards the repetition of the farm crops, so long as a field will bear them, and the *old field* system, is yet very much in vogue in many districts. While on the other hand, what astonishing strides have been made in other districts, and on well managed farms, where a judicious rotation has been adopted, manures carefully husbanded, and artificial grasses multiplied. The mean corn crop, where there is good farming, is at least 40, and the maximum is often 80 and 100 bushels on the acre; wheat 20, and reaching as high as 40 and 50; and, instead of *old fields*, pastures clothed in perennial verdure; Dutchess, we apprehend, has quadrupled her products, and is now, as she was then, the best cultivated county in the state, if not in the union. We wish we could say as much for the banks and branches of the Mohawk. These, we fear, are still retrograding. Wheat is no longer the great staple of the Mohawk, nor does it *now* surpass in excellence. Whence this difference—but in the progressive improvement of the mind, the great lever to human industry—in the one more than in the other district.

Ruta Baga.—John Cousin, of St. Simons, Georgia, publishes in the Farmers' Register, that he raises corn and ruta baga, in alternate rows, and that the turnips prove a better crop than the corn. He plants his corn in rows five feet apart; in August and September, he tops his corn and strips the blades, and *then* sows his turnips, with a light dressing of manure, between the rows of corn. The next season, he plants corn in the turnip rows and turnips where the corn grew. Mr. Cousin, by carrying the turnip growth into the cool weather of autumn, obviates the great difficulty of growing this northern product in a southern latitude. He does not sow till the heats of summer have past, while a mild autumn and winter brings the crop to maturity. These facts we hope will not be lost upon our southern readers.

We find by another communication in the same paper, from J. H. Gibbon, of Philadelphia, that this crop is *now* cultivated, and its value highly extolled, in the neighborhood of that city. Mr. G. commends it for all cattle; thinks that cows thrive better upon the roots in their dirty state, and that it gives to their butter, (in winter) the flavor and appearance of grass butter; that in fattening cattle, Swedish turnips, sprinkled with corn meal, give the meat a finer quality, juice and relish. Mr. G. has an ingenious substitute for the drill barrow, in sowing, viz. a porter bottle, with a quill fixed in the cork, having a hole of sufficient size in the small end of the quill. He does not earth the plants, but rather draws the earth from them; his crop averages 300 bushels the acre.

THE ROLLER,



Is constructed of wood, stone or cast iron, according to convenience, or the purposes for which it is used. In American husbandry, we have yet no reason to expect, or perhaps desire, any but those made of wood, and such as any farmer, who has a moderate degree of mechanical skill, and the carpenter's tools which every farmer ought to keep, may readily construct himself. A good sound oak log, with the frame and shafts appended, makes a good roller. They are made of different lengths, and sizes varying from 15 to 30 inches in diameter. The lighter kinds are made in one piece, but the larger and heavier kinds are advantageously made in two pieces, with an iron rod passing through the centre of both, and upon which they revolve. English farmers construct the frame so as to rise above the roller, upon which a box is fixed, either to contain stones to add to the pressure of the roller, or to receive small stones and rubbish, collected on the field while at work, which are to be carried off. Their shafts, when at work, are generally horizontal. We think the roller is more easily drawn when the draft is on a right line from the collar or yoke of the team to the point of resistance. This may be done and the advantages of the box retained.

The uses and advantages of the roller are many and important, and no farmer should be without one. They are particularly important in the seeding process, to break down the clods, pulverize and smooth the surface, and to press the earth to the smaller seeds, which otherwise often fail to germinate for lack of moisture.—This is particularly the case with oats, barley and the grass seeds. In autumn the roller is sometimes passed over winter grain, with a view to counteract the effects of frost the following winter. In spring it is advantageously passed over winter grain, as soon as the ground is so solid and dry that the feet of the cattle will not poach the surface. It renders light ground more compact; presses the soil to the roots of the grain and thus promotes their growth; and upon all soils closes the innumerable cracks and fissures which abound on the appearance of dry weather in spring, and, by partially burying the crown, causes grain to tiller better, that is, send up more seed stalks. Finally, the roller is of great advantage to grass grounds in the spring, by reducing inequalities of surface, and pressing down the plants or earth which have been thrown up by the frost.

There are also rollers for other purposes, viz. the *spiked roller*, which is used for pulverizing stiff soils, preparatory for wheat.

This is formed by inserting several rows of spikes, or cast or wrought iron darts, in a common hard wood roller. The *concave* or *scalloped roller* is adapted to the form of ridges, and is often attached to the turnip drill.

The Season has virtually terminated, as regards the crops of this year. The corn crop will be a light—very light one—not much if any more than half a fair average, in this and neighboring counties. We have not had the usual *hot* weather. We have seen the thermometer but once over 90° during the summer, and then it was but 91°. The ground has at no time, therefore, received its accustomed warmth—and consequently vegetation is at least two weeks later than ordinary. We visited Otsego in the middle of last month. The oat crop, which is unusually large and productive, was then mostly standing, or in the field. Some barley remained to be harvested, and in some instances we saw the farmers still gathering their hay. We learnt, that in the counties lying upon the head waters of the Susquehannah, the corn had been much injured by the frost of the 4th August, and that the frosts of the first half of September, had seriously augmented the calamity. Hardly enough has ripened well for seed the coming year. Throughout the north part of the state, the crop, we fear, is thin, light and late. This lesson should admonish our farmers to select for future culture, the earliest varieties, and to plant early. We would suggest, as further precautions, to underdrain corn grounds, if they are not perfectly dry in early spring—and to dung well with *unfermented* dung. This will enable them to plant early, and will accelerate the growth and maturity of the crop from ten to fourteen days.

The backwardness of the season is not only indicated by farm crops, but by the products of the garden, and the indigenous plants of the forest. The fruits of the former, particularly grapes, have been unusually late, and many did not reach their accustomed maturity before they were cut down by the frost. We apprehend serious damage to the hop crop, which in frosty situations could hardly have had time to ripen well.

Sheep.—Our correspondents, it will be seen, differ upon the relative profits, to the farmer, of different breeds of this animal. While these differing opinions are maintained with decorum, they serve to enlighten the public mind as to the good qualities of each. The Merino and the Saxon, we believe, had a common origin at no remote period; and their present difference is owing to breeding and climate. Upon the same farm, and under a like management, they will probably again approximate more and more to each other. It seems to be a well established fact, that the fleece of a breed cannot be improved in fineness except at the expense of carcase; nor the carcase improved, by high keep, or cross with a larger breed, without deterioration in the quality of the fleece. A friend a few days ago, informed us, that by graining some fine fleeced sheep, during the last winter, he had added half a pound to the weight of their accustomed fleece, but that this increase in weight was made at the expense of quality; and he doubted whether the intrinsic value of the fleece had been increased. Another fact is worth remembering—the sheep, like the horse and ox, "is vastly modified in its form and characters by the physical condition of the countries in which he is naturalized."—*Low.* If fed in a country of plains and rich herbage, he tends to become large, his fleece heavy and comparatively coarse. If in an elevated country, where the herbage is scanty, the size and fleece diminish, while the texture of the latter is improved.

Agricultural School—Pattern Farm.—We invite the reader's attention to the communication of the Hon. James Barbour, which we copy to-day from the Farmers' Register, with the accompanying remarks of the editor of that paper. Although written for Virginia, by one of her most eminent statesmen, the remarks apply with equal force to New-York; and we cannot but hope, that the friends of agricultural improvement (and who are not professedly such?) in our state, will adopt some efficient course to speak so that they can be heard, and their wishes respected, on these and other subjects of abiding interest to our country.

The difference between ripe and unripe fruits, is strikingly illustrated in the following table, which we copy from Chaptal. Whether used in the kitchen, for the dessert, or for cider, the intrinsic value of fruits depends in a great measure upon the relative quantity of sugar they contain, this being principally what imparts to them nutritive and grateful properties. Although the experiment was made upon the apricot, the principle, it is believed, will hold good in regard to the apple, and most of the garden fruits.

	Apricots very green.	More advanced.	Ripe.
Animal matter,	0.76	0.34	0.17
Green coloring matter,	0.04	0.03	0.10
Woody substance,	3.61	2.53	1.86
Gum,	4.10	4.47	5.12
Sugar,	*some appearances.*	8.64	16.48
Malic acid,	2.10	2.30	1.80
Water,	89.39	84.49	47.84

THRESHING MACHINES.

Two new machines have fallen under our recent notice, *Shaw's* and *Pitt's*. They are both from the far east, always prolific in inventions. They are sold at moderate prices, are of two horse power, and *promise* to perform well. As both of these machines will probably be exhibited at the Fair on the 13th and 14th October, we rather await the opinion of the examining committee than hazard our own prematurely, on their relative merits.

The proprietor of the latter (*Pitt's*) has handed to us the certificates of a number of Maine farmers, and of a committee of the Kennebeck Agricultural Society, commendatory of his machine. The latter say, "the improvements appear to be—1, a greater ease for the horse, [two are more advantageously used.] 2. Less weight in the machine. 3. Less expense to the purchaser."

THE IMPOLICY OF MEASURING LIME BY WEIGHT.

"Bishop Watson found by experiment, that upon an average, every ton of limestone produced 11 cwt. 1 qr. 4 lbs. quick lime, weighed before it was cold; and that when exposed to the air it increased in weight, *daily, at the rate of a hundred weight per ton,* FOR THE FIRST FIVE OR SIX DAYS after it was drawn from the kiln."—*Park's Chemistry.*

Notwithstanding this palpable fact, the common council of the good city of Albany have ordained, that lime shall be bought and sold by weight in our market. The consequence is, that the seller, by exposing his lime to the air, for *six* days after it is drawn from the kiln, adds to its weight, and consequent value in the market, more than 25 per cent, and the buyer pays for this amount over and above the true value of the lime. A ton of fresh well burnt lime will absorb and solidify 680 lbs of water, without any sensible deterioration, to a superficial observer, in its quality, and without the lime being slaked. One bushel of fresh burnt stone lime will make two bushels of slaked lime. The buyer should, therefore, obtain it in the stone, fresh drawn from the kiln, and buy by measure, and not by weight.

Weeds exhaust the fertility of the soil as much as cultivated plants. Though it may be too late to prevent their growth the present season, it is not too late to destroy the seeds of many which have been permitted to attain maturity, and the labor of doing this will be amply repaid another season, in the comparative cleanness of our gardens and fields. It is particularly the fault of farmers to neglect their gardens after midsummer, and to suffer them to be overgrown by rank weeds, whose seeds multiply a hundred fold. A day or two employed in the early part of the present month, in collecting them from the garden and fields, will be profitably spent. They may be thrown into the cow-yard or on a dung-pile, where fermentation will generally destroy their vitality before the dung is carried to the field in the spring. They had better be collected and burnt, than suffered to spread their seeds over the farm.

To preserve Cellery.—Get up the cellery on a fine dry day, before it gets injured by frost, cut off all the leaves and roots, [fibrous roots] and lay it in a dry airy place for a few days, then remove it to a cool cellar, where it will be quite secure from frost, and pack it up with sand, putting layers of sand and cellery alternately.—*Loudon.*

The Grain Worm has reached as far west as Minden, between fifty and sixty miles west of Albany. A farmer residing there informed us, that there were some of the worms in his wheat, and that seven miles east of him they had destroyed half of the crop.

To destroy lice upon cattle.—H. H. C. in the Farmers' Register, recommends "the use of a little flour of sulphur, given internally once or twice a week, with salt, which is eaten kindly," and which he says he has practised with great success.

CORRESPONDENCE.

STACKING HAY—DUTTON CORN, &c.

Hamptonburgh, Orange Co. September 7th, 1835.

J. Buel, Esq.—Having recently, in consequence of impaired health, relinquished an active business in the city, our great commercial metropolis, for the more quiet, retired, and I would hope more healthful occupation of an agriculturist, I take the liberty of making some inquiries in regard to my new employment, through the medium of your most interesting and useful publication, the Cultivator.

There is just now one subject strongly on my mind, to which I will first call your attention. I refer to the mode almost universally pursued in this vicinity, and indeed so far as my observation extends, in this county, of securing hay, stalks, &c. for winter use, in stacks scattered in various parts of the farm. I came to the country strongly opposed to this, as I considered it a doubly wasteful practice. But when I find our best and most intelligent farmers, men who have acquired wealth by their system, defending the practice both by argument and example, I am almost staggered in my intention of putting up preparatory for the ensuing season, additional buildings to secure the hay, &c. which we are now obliged to stack, and to afford shelter to the stock of cattle from the severity of our winter storms. The opinions of such men are entitled to much respect, but still I am not altogether convinced that theirs is the better practice. They say it saves much labor in the carting of both hay and manure. I say it occasions a ruinous waste of both. They also say, and this view of the subject is of much moment, that cattle do not do well confined to a yard or sheds and stalls; that they thrive and do better in the open field, exposed to all the inclemencies and changes of the weather. Of this I cannot judge from experience, but as it is a matter of deep interest to the grazier, I shall be thankful to you, Mr. Editor, for more light on the subject.

Much has been said on the advantage of cutting hay and straw both for horses and neat cattle, and the estimates have been various as to the amount of saving in provender, but all agree in making it very large; none I believe less than one half Can this, Mr. Editor, be correct? Can it be possible that so much is wasted in the usual mode of feeding cattle? If one half can be saved by this method, it follows of course that double the quantity of stock can be wintered, and how much would this add to the manure and to the profits. But what has been your own experience? for plausible theories and hear-say stories will not do; facts, well authenticacated facts, are all we can depend on.

Should you recommend this mode of wintering our stock, you will see the necessity of informing us where we can obtain the most approved kind of cutting machine; a kind not too expensive will be required to come into general use. Will it answer to cut corn stalks for our cattle? It strikes me a great saving would be realized in that article, provided the whole would be eaten, if cut.

Our corn crops in this region promise to be abundant. A few days more exemption from frost will put it beyond its reach. Last spring before leaving the city, I procured a few ears of your Dutton corn of my friend, Thorburn, which I had planted. I am much pleased with it; it is very productive, and is now ripe. We shall commence cutting it up at the ground to-day or to-morrow.

Excuse this long epistle. My anxious desire to profit by your knowledge and experience in a business new to me, and in which I shall doubtless commit many blunders, but a business to which, nevertheless, I feel much attached, must be my apology. W. W. I

By the Conductor.—Our correspondent will find most of his queries anticipated in our last paper. But we repeat our strong conviction, that the feeding hay from the stacks in the field is a most wasteful and slovenly practice. Much of the hay is certainly wasted, and the manure is virtually lost. If hay *must* be stacked out, there is economy and neatness in putting it in large masses, and thatching it well, to preserve it from the injurious effects of storms and winds; of cutting it down, and carrying it to the barn, when required for use. In regard to corn stalks, we have a machine to cut them, worked by hand, the knives of which move horizontally. It works expeditiously, was bought in this city, and cost $20. We intend to scald the cut stalks the coming winter, for our cows, and to feed them while warm, sprinkled with ship stuff. In regard to the best straw and hay cutter, we are disposed to give the preference, at present, from our partial knowledge of the many in use, to Green's patent, the description, cost, and performances of which are noticed in another column of this paper. We have not hitherto cut our hay, but intend doing it the coming winter, when we shall be better qualified to answer our correspondent as to our own experience.

ORIGINAL CHINA HOGS.

Mr. Buel—Sir—Having been disappointed in procuring a drawing of one of my Berkshire hogs in time for this number, I have substituted the original China. which I have copied from Loudon's Encyclopedia of Agriculture.

The finest specimen of this breed which I recollect ever to have seen, was a sow and litter of pigs exhibited at the Albany County Fair and Cattle Show in 1824, by the late Thomas Hillhouse, of Watervliet. They were perfectly black, and excited the admiration of all who saw them.

Yours, &c. C. N. BEMENT.

"*Original China Hogs.*—The Chinese hog is distinguished from the common, by having the upper part of its body almost bare, its belly hanging nearly to the ground; its legs are very short, and its tail still more disproportionately short. The flesh of this variety is whiter and more delicate. The colour is commonly a dark grey. It abounds in China, and is diffused through New-Guinea, and many islands in the South Sea. The new Hebrides, the Marquesas, the Friendly and the Society Islands, possess this animal, and cultivate it with great care, as it is almost the only domestic animal of which they can boast. The varieties of hog cultivated in Britain, are partly the result of climate and keep, in the European variety, and partly the effects of crossing with the Chinese. At the same time, it is only in particular districts that so much attention has been paid to this animal, as to give rise to any accurate distinction of breeds; and no where has it received any considerable portion of that care in breeding, which has been so advantageously employed on the other animals of which we have treated. Yet, among none of the varieties of these is there so great a difference as among the breeds of this species, in regard to the meat they return for the consumption of a given quantity of food. Some races can with difficulty be made fat, even at an advanced age, though fed from the trough with abundance of such food as would fatten any other animal; while others contrive to raise a valuable carcass out of materials on which no other creature could subsist."

"*The Chinese race*, according to Cully, has been subdivided into seven varieties or more; and it would be easy to point out twice the number of as prominent distinctions among the sorts in the third class. But such an affectation of accuracy is as useless as it would be tedious. One general form, approaching to that of other animals kept for their carcass, ought certainly to be preferred; and the size which is the other distinguishing characteristic, must be chosen with a view to the food provided for their maintenance, and not because it is possible to raise the individuals to a great, and probably, unprofitable weight. The fineness of the bone, and the broad, though also deep, form of the chest, denote in this, as in the other species, a disposition to make fat with a moderate consumption of food; and while it may be advisable to prefer the larger breeds in those places where bacon and flitches are in most demand, the smaller breeds are most esteemed for pickling, and are beyond all doubt, most profitable to those farmers who allow them little else than the range of the farm yard, and the offals of the kitchen."

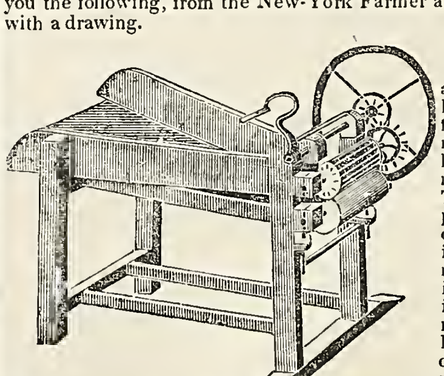
To the Editor of the Cultivator:—Sir—For the last seven years I have been in the practice of cutting my hay, straw and cornstalks, for my horses and cattle, and can assure you, have profited much by the use of the cutting box; not only by the great saving of hay, but by the superior condition in which my stock are wintered. Some pretend to say that one-half is saved, but I think that is asking a little too much—one third, I think, would be a fair calculation.

By cutting, the coarsest hay, cornstalks, and straw may be used to advantage. My corn, last year, was cut near the ground, and cut and fed out to my cattle in January, which they ate readily, and throve well on them, with hay at noon.

In feeding sheep, I found it particularly useful, as when cut they would eat with avidity, that when fed long they would reject.

I have used, until last winter, one of Safford's cutting machines, and supposed it the best one in use, until I accidentally found one of *Green's* patent, which I think, exceeds all others, that has fell under my observation, in execution, with the small power required.

For a particular description of the machine, I cannot do better than give you the following, from the New-York Farmer and Gardeners' Magazine, with a drawing. ŒCONOMIST.



"*Greene's Straw Cutter.*

"This is the most simple and efficient machine of the kind that has yet been offered to the public. It is made very strong, and not liable to become injured, nor to get out of order. The apparatus consists principally of two cylinders; the upper one is of iron, having the requisite number of knives secured in groves. The under cylinder is of lead, and can be raised or lowered, so as to have the knives merely to come in contact with it. It will be perceived that the knives perform the double operation of cutting and feeding. All that is necessary in operating is to put in the straw, and turn the crank. After the straw is once cut, it can be put in again, and cut, with increased rapidity, the second time. More than double the quantity can be cut in the same space of time by this than by any other machine, used in this section of the country.

"I set a man at the crank, and with the hay close to the machine commenced feeding. With my utmost exertion, I could not keep it regularly supplied. In *five minutes* we cut *eleven bushels*, heaping measure, of hay. Had it been fed according to its power of execution, one-fourth more would have been cut.

Had I used straw instead of hay, the quantity cut in the above time would have been as great, as it is more easy to supply the machine without interruption. It cuts cornstalks with rapidity, particularly small ones. The box is made large, and by putting a good deal of hay in at once, or by having it close to the machine, one person can feed it and turn the crank at the same time."

The above machines may be obtained by applying to C. N. Bement No. 82 State-street, Albany.—Price $30.—*Cultivator.*

SAXONY SHEEP.

J. Buel, Esq.—The August number of the Cultivator contains an extract from the reply of Mr. Henry D. Grove, (published in the N. York Farmer,) to a communication signed "R." in the May number of the Cultivator, on the subject of the relative profits of different breeds of sheep. Mr. Grove, after conceding to R. all that he claims in respect to the quality and quantity of the wool of the English breeds, (Bakewell and South Down,) shows by *facts*, that the pure Saxon, under judicious management, give a greater return of wool, in value. The most liberal allowance for weight and fineness, according to Mr. Grove's estimate, brings the South Down to only $2.12 the fleece; and the Bakewell $2.31, while Mr. Grove's Saxon fleeces, at 80cts. will fetch him $2.40. This estimate allows the Bakewells 1 lb. more a head than is claimed for them by their advocate, R. Deduct the value of this (33cts.) and they stand only $1.98 a fleece.

Mr. Grove, as he himself states, was trained up a shepherd in Germany, and of course, is presumed to be perfectly familiar with the constitution, habits, wants, &c. of the Saxon sheep. It struck me on reading his communication, that for these very reasons, the impression might be received that the productiveness of *his* flock, would not be a fair specimen of that of Saxon flocks generally, as it might, very reasonably, be supposed that his superior knowledge and care in the selection and management of this breed, would give him the advantage over the other growers. That this distinguished importer had succeeded in obtaining a more productive stock than those who have purchased haphazard, and without judgment; who because a sheep is imported, *take it for granted* that it is perfect; and more especially that class of buyers who have regarded *fineness only*, preferring for instance, a buck shearing $2\frac{1}{2}$ lbs. to one shearing 4 lbs. where the first happened to be a barely perceptible shade the finest;—I say that Mr. Grove excels, and entirely excels such, is neither untrue, nor is it surprising. But to show that his estimate of the productiveness of the Saxon breed (in wool) is not exaggerated in the flocks of those who BEGIN RIGHT, I subjoin the following statement.

Mr. Hamilton Rogers, of Truxton, in this county, sheared a large flock of young 'full blooded' Saxon ewes, which had not obtained their full growth, the average weight of the fleeces of which was 3 lb. 9 oz. They are descended from the flock of Mr. Grove. The wool sold at 80cts. —making $2.85 to the fleece on not fully grown sheep.

I will give you another instance, though not proving so much, as the flock alluded to (like most of those of Bakewells and South Downs, from which the breeders of these kinds have drawn their estimates,) is a very small one of picked sheep. I have among my sheep a lot of pure Saxon yearlings, which clipped this spring, 3 1-5 lbs. a head. I sold the wool at 80cts. which brought me $2.56 to the fleece. This excels the South Downs by 44cts. according to Mr. Grove's estimate, which I believe to be a liberal one, and the Bakewells by 58cts. taking R.'s own estimate!

Yours truly, H. S. R.

Cortland Village, Aug. 20, 1835.

J. Buel, Esq.—Sir—In your last number I mentioned a remedy for the foot rot in sheep, but was not perhaps sufficiently particular in describing the manner of applying the remedy, as several gentlemen have applied to me since its publication for more explicit information. I therefore will state that for an effectual application of the medicine too much care cannot be taken, and that the cure will not be certain unless the remedy is applied to every hoof in the flock effected indiscriminately. I have adopted the following method. I yard my sheep near a stream of shallow water, one person then washes the sheeps' hoofs clean, and hands it to a second person, who holds it while a third pairs off the decayed parts and applies the medicine; those hoofs that are not affected of course will need no paring, but should have the liquid applied notwithstanding, as the disease is very infectious, and may exist in a latent manner. If the disease is of long standing, it gets into the blood of the animal, and in such case sulpher should be mixed with their salt at the rate of $2\frac{1}{2}$ or 3 lbs. to each half bushel of salt; it physics their blood and drives the disease into their feet, which when cured removes the complaint. The sheep should run in dry pastures, as the disease originates from their being confined to wet and marshy land until the glands of the hoof swell and suppurate, after which it becomes infectious; the application of the medicine should be repeated as often as once in three or four weeks until the cure is effected.

Nelson, N. Y. Sept. 5*th.* S.

Crawford, Orange Co. Aug. 3, 1835.

Mr. J. Buel,—The fact that our fruit trees generally alternate barrenness and fruitfulness, in a biennial period, is (I presume) known to all the inhabitants of this community. To change the habit of the trees by art, is a desideratum amongst the lovers of good fruit, such as apples, pears, peaches, plums, &c. To obviate barrenness, is the object of this communication.

It is well known to botanists and others, that the germ or bud of the future blossom is in an embryo state in autumn. Guided by that fact, I began with a peach tree on the 25th of August, whilst the sun was in the first degrees of Virgo, by making a strong decoction of hops, in quantity about 5 gallons, and poured it around the root of the tree in the evening. The subsequent season, (which would according to habit have been barren) the quantity and quality surpassed the products of any previous period. A repetition of the experiment for six or seven years, on the 25th of August, liberally remunerated me for the extra trouble and attention.

Encouraged by success, I tried the apple, pear, and plums (several species,) with similar success. But on account of the inconvenience of preparing the decoction, I substituted aloes, an half pound to six gallons of rain water, and applied it on the first of September. Repeated experiments will justify the assumption, that aloes is a catholican in the vegetable kingdom, both as a preventive and cure. It has proved a preventive to the malicious trespasses of a species of the wood-pecker perforating the bark of young apple trees, and a palliative to the ravages of the curculio. Whilst I commend to public attention, from a conviction of utility, the application of aloes to fruit trees, by painting the bodies, every spring, from the ground to the branches, (based upon actual experiments and observations during a quarter of a century) as an agent to accelerate the growth of the tree and ameliorate the fruit in quality and quantity, at the same time I will take the liberty to protest against a practice I have frequently seen in my tours through this part of the state, of painting the bodies of fruit trees annually with lime, (commonly called white washing.) Experience, the best of teachers, affirms, that the fruit deteriorates in quantity and quality, and the tree decays, and if repeated, will in less than seven years be useful only as fuel.

NATHANIEL GILLESPIE.

P. S. If the above communication should contain any new idea, you will confer a public benefit by publishing it in the Cultivator. With the author, the facts stated were the offspring of his own deliberations and experiments, not aided by the suggestions of any individual. But when I reflect on the numerous titles of books announced in the catalogues of our public journals, on horticulture and orchards, which I have never read, I deem it improbable that the principles commended have escaped the observation of so many laborious and indefatigable observers and investigators of the laws of the vegetable kingdom; nor can I calculate beyond mere conjecture, the difference that latitude, seasons, and soils, &c. may produce in the success or failure of those experiments. If any thing more in detail has been printed in any of those books which you habitually read, of a similar import, and better calculated to excite public attention, you will subserve the welfare of the community by devoting a column of your useful paper in giving it publicity. N. G.

Elements of Practical Agriculture,

By David Low, Professor of Agriculture, &c.

SUCCESSION OF CROPS.

As crops of the cultivated plants succeed to each other upon the same ground, a question to be determined is the order in which the different kinds should follow each other.

All plants which are cultivated, and which are carried from the ground where they are produced, tend to render the soil less productive, or, in the language of farmers, to exhaust it.

But plants which are suffered to decay, or which are consumed by animals on the ground on which they grow, do not exhaust the soil. On the contrary, the decay of the stems and leaves of such plants, either naturally, or by the consuming of them by animals, tends to add those decomposing organic matters to the soil which form one of the elements of its fertility. This process may be imperceptible and slow, but it is that which Nature herself employs to form the soil, as distinguished from what has been termed the subsoil.

Sometimes this process of decay is counteracted by the singular natural provision, of a conversion of the decomposing vegetables into a substance which itself resists decomposition—peat. But with this exception, the tendency of the decay of vegetables upon the surface is to add to the fertile matters of the soil.

This is well understood in the practice of agriculturists. When the productive powers of a soil have been exhausted by cultivation and the carrying away of its produce from the surface, it is laid down to herbage, in which state the future vegetation which it produces tends, by its decomposition upon the surface, to renovate the productive powers of the soil. Land in this state is said to rest.

When land, however, has been impoverished by successive crops, and has become full of weeds, the laying it down to rest in that state is attended with less beneficial consequences than when the soil has been previously cleaned of injurious weeds, and fertilized by good culture. In the former case, the process of renovation is slow, if perceptible at all; the useless plants increase, and not those which are beneficial and afford food to pasturing animals. Land, when properly laid down to grass, therefore, tends to recover its wasted powers of production. Land not properly laid down has less of this healing property, and may be more full of weeds, and no richer when ploughed up again after a time, than when first laid down. Under good management, however, the laying down of cultivated land to grass aud other herbage-plants to be consumed upon the ground, is a means of resting the soil, and renovating its powers of production; and this mode of recruiting an exhausted soil being always at the command of the farmer, its application is important in practice. It is to be observed also, that the poorer soils require this species of rest and renovation more than those which are naturally productive.

The experience of husbandmen from the earliest times has shown, that the same kinds of plants cannot be advantageously cultivated in continued succession. The same or similar species tend to grow feebly, or degenerate, or become more subject to diseases, when cultivated successively upon the same ground ; and hence the rule which forms the basis of a system of regular alternation of crops is, that plants of the same or similar species shall not be cultivated in immediate succession ; and further, the same rule has been thus far extended, that the same species shall recur at as distant intervals of the course as circumstances will allow.

All herbaceous plants whose produce is carried off the ground which produces them, may be said to exhaust the soil upon which they grow. But all such plants do not exhaust the soil in the same degree ; for after some species the soil is seen to be more impoverished than after others.

And not only do different species of plants exhaust the soil in a greater or less degree than others, but the same species does so according to the different period of its growth at which the plant is removed from the ground.

When a herbaceous plant is suffered to mature its seeds, it exhausts the soil more than when it is removed before its seeds are matured. All herbaceous plants, therefore, when cut in their green state, that is, before they have matured their seeds, exhaust the soil less than when they remain until they have ripened their seeds. Thus the turnip, when used in its green state, is one of the least exhausting in the agricultural class of plants to which it belongs : but the turnip, when allowed to remain upon the ground until it has ripened its seeds, is one of the most exhausting plants that is cultivated amongst us ; and so it is with the rape and others.

Further, certain plants, by the larger or smaller quantity of manure which the consumption of them afford, are more or less useful in maintaining the fertility of the farm.

When an herbaceous plant is suffered to mature its seeds, and when any part of these seeds is carried off the farm, the plant affords, when consumed by animals, a smaller return of manure to the farm than if the same plant had been cut down before it had matured its seeds, and been in that state consumed by animals. Thus it is with the turnip plant referred to. This plant is with us sown before midsummer. In the first season it forms a napiform root, and puts forth a large system of leaves. Early in the following season it puts forth a long stem, which bears flowers, and the seeds are generally matured about midsummer. If this plant is removed in the first stage of its growth, that is, after it has put forth its large leaves and formed its bulb, and is then consumed by animals, it returns a great quantity of manure ; but if it remains until the second state of its growth, then the consumption of its stems and leaves returns scarce any manure. The juices of the root have apparently been exhausted in affording nutrition to the flower-stem, the flowers, and seeds.

It is beyond a question, that, in order to bring a plant to its entire maturity, by the perfecting of its seeds, a larger quantity of the nutritive matter of the soil is sucked up by it than when it is brought only to its less advanced stages. When crops of plants, therefore, are suffered to arrive at maturity, they are greatly more exhausters of the soil on which they grow than when they are cut down while they are green ; and if those seeds are in whole or in part carried off the farm, the crops are exhausters of the farm, as well as of the ground which had produced them. Were the ripened seeds to be wholly returned to the soil, it may be believed that they might give back to it all the nutritive matter which had been derived from it. But, in practice, seeds are employed for many purposes, and are generally carried off the farm which produces them. When this is done in whole or in part, the plants produced are in an eminent degree exhausters of the farm, as well as of the soil on which they have grown.

Further, certain plants, from their mode of growth and cultivation, are more favorable to the growth of weeds, than other plants. The cereal grasses, from growing closely together, and not admitting, or admitting partially, the eradication of weeds, are more favorable to the growth and multiplication of weeds than such plants as the turnip and the potato. which are grown at a considerable distance from each other, and admit of tillage during their growth; and whose broad systems of leaves tend to repress the growth of stranger plants.

Having these principles in view, certain rules may be deduced from them, for the order in which the crops of plants in cultivation in a country shall succeed to each other on the same ground.

1*st*, Crops consisting of plants of the same or similar species, shall not follow in succession, but shall return at as distant intervals as the case will allow.

2*d*, Crops consisting of plants whose mode of growth or cultivation tends to the production of weeds, shall not follow in succession.

3*d*, Crops whose culture admits of the destruction of weeds, shall be cultivated when we cultivate plants which favor the production of weeds. And further, crops whose consumption returns to the soil a sufficient quantity of manure, shall be cultivated at intervals sufficient to maintain or increase the fertility of the farm.

And, 4*th*, when land is to be laid to grass, this shall be done when the soil is fertile and clean.

These rules may be applied to the plants which form the subject of common cultivation in the fields. In this country, the plants chiefly cultivated on the large scale are,—the cereal grasses, chiefly for the farina of their seeds ; certain leguminous plants, as the bean and the pea ; plants cultivated for their fibres as the flax and hemp ; for their leaves, roots, or tubers, as the turnip, the cabbage, and the potato ; and certain leguminous and other plants for forage or herbage. The plants of these different classes are yet to be described ; and they are now only referred to with relation to the order in which they may succeed to each other in cultivation. The 1*st* class of these plants consist of the cereal grasses. These are chiefly wheat, barley, oats, and partially rye. All these plants are in an eminent degree exhausters of the farm. They are all suffered to mature their seeds, and are wholly or partially carried away from the farm. Further, from the manner of their growth, and mode of cultivation, they all tend to favor the production, of weeds. For these reasons, and on the general principle that plants of the same or similar kinds should not follow in succession, the cereal grasses should not succeed each other, but should be preceded or followed by some crop, which either exhausts the soil less, or admits of a more perfect eradication of weeds.

2*d*, The leguminous plants cultivated for their seeds, as the bean and the pea, are all exhausters of the soil.* They ripen their seeds, and the seeds are for the most part carried off the farm. Some physiologist suppose that they are less exhausters of the soil than the cereal grasses. It is probable that they do exhaust the soil somewhat less than the cereal grasses. But the essential difference between them, when considered with relation to their effect upon the soil, is, that, from their growth, and the manner of cultivating them, they are greatly less favourable to the production of weeds than cereal grasses. By their broader system of leaves, they tend to stifle the growth of weeds more than the cereal grasses; and further, they admit of tillage during a great part of their growth. This is especially the case with the bean, [and maize] which is therefore regarded as a useful cleaning crop, and so is cultivated in rotation with the cereal grasses, as a mean of preserving the land clean.

3*d*, Hemp and flax, which are cultivated chiefly for their fibres, and all plants cultivated for their oils, are exhausters of the soil. They are suffered to form and ripen their seeds, and their stems afford no return of manure to the farm.

The next class of plants, form the large return of manures which the consumption of them affords, may be regarded as enriching or restorative crops, in contradistinction to the others, which may be termed exhausting crops :—

1. The turnip, the rape, and other plants of the cabbage genus, cultivated for their roots and leaves, and consumed upon the farm.
2. The potato, the carrot, the parsnip, the beet, and other plants, cultivated for their tubers, and roots, and consumed upon the farm.
3. The leguminous plants,—the clover, the tare, the lucerne, and others, —when cut green for forage, and consumed upon the farm.

The plants of the latter class, namely the leguminous, when mixed with gramineous plants, as the rye-grass, are commonly termed the artificial grasses, but would be more correctly termed the cultivated herbage or forage plants. They are often suffered partially to ripen their seeds, and are made into hay ; and in this case they follow the general law, exhausting the soil more than when used green. And when the hay-crop is carried away from the farm, they are to be regarded as exhausting rather than restorative crops.

In speaking of these different classes of plants, the following terms may be employed:—

1. The cereal grasses may be termed Corn-crops.
2. The leguminous plants cultivated for their seeds, Pulse [and maize] crops.
3. The turnip, and other plants of the same kind, cultivated for their roots and leaves, may, with reference to the mode of consuming them, be termed Green crops; or, with reference to the manner of preparing the ground for them, Fallow-crops.
4. The potato, and plants of other families cultivated for their roots and tubers, may, in like manner, be termed Green or Fallow crops.
5. The leguminous plants cultivated for green food, as the lucerne and tare, may be termed Green Forage-crops.

And, lastly, the mixture of gramineous and leguminous plants cultivat-

* Indian corn may be included in this class of plants.—*Cultivator.*

ed for herbage or green feed, may, in compliance with common language, be still termed the Sown or Artificial Grasses.

Further, distinguishing these different classes of crops according to their effects upon the fertility of the farm, they might be divided thus:

1. Corn-crops,—exhausting crops, and favorers of weeds.
2. Pulse-crops—exhausting but cleaning crops, or capable of being rendered so.
3. Green or fallow-crops,—restorative and cleaning crops.
4. Green forage-crops,—restorative and sometimes cleaning crops.
5. The sown grasses,—restorative crops.

Knowing these the general characters of the cultivated plants, we have, in devising a rotation, to cause the restorative and cleaning crops so to alternate with the exhausting crops, as that the land may be preserved fertile and clean. Further, when we find that land cannot be sufficiently cleaned by means of cleaning crops, we must make use of the summer-fallow; and again, when we find that land requires rest, we may lay it down to grass for a longer or shorter time, taking care when this is done that the land shall be in as fertile a state as circumstances will allow, and free of weeds.

Science of Agriculture.

From Chaptal's Chemistry applied to Agriculture.

THE CHANGES PRODUCED IN PLANTS BY NOURISHMENT.

Plants are principally nourished through their leaves and roots; the first absorb from the atmosphere oxygen, carbonic acid, and water; and the second receive from the soil the oxygen and carbonic acid contained in it in a free state, or dissolved in water, and also the juices and salts which are mixed with the earth.

Water appears to be the necessary vehicle of nearly all the nutritive portions of the soil; so that it not only serves to nourish plants, by yielding to them the elements of which it is itself composed, but it conveys into their internal organs all the substances which can serve them as food.

The substances which chiefly afford nourishment to plants, present in their composition only carbon, hydrogen, and oxygen; the numerous products formed in the course of vegetation, do not upon analysis furnish any other principles: the salts, the earths, and the metals are generally found in them in very small quantities, and under a very different form from that in which they exist in the soil.

Strictly speaking, the three principles necessary to vegetation, are oxygen, carbon, and hydrogen, combined in various proportions; and it is this difference in the proportions which causes the immense variety in the vegetable kingdom; some hundredths more or less of carbon, oxygen, or hydrogen change the character of the body.

The chymist in experimenting upon dead plants produces at pleasure a part of these effects; fermentation and spontaneous decompositions give rise to a great number. But the constant uniformity of the products in the same species of plants, and the analogy existing between those derived from different species of the same genus; their variety in the different organs, and the peculiar compounds, apparently so complicated, of each one of them, form altogether so many phenomena beyond the power of art to explain.

We know the substances received by plants, and those which they reject; we determine by analysis the nature and the composition of the products which they form; but this is the utmost extent of our knowledge. All that passes within the plant is still a mystery, and belongs to the laws of vitality, which modify by their action those physical laws that are known to us.

However, as the laws of vitality governing vegetables are in their application less independent of the physical laws, than those that reign in the animal kingdom, we can even now raise a portion of the veil, and follow at least the progress of the changes, though we can as yet neither produce them nor discover their mode of action.

The germination of seeds and the swelling of buds in the spring, are almost entirely the result of physical laws: oxygen is the only agent necessary to produce them; water and heat are necessary auxiliaries, but they do not in any way enter into the new combinations; they only facilitate the changes that are going on. The oxygen unites with carbon to form carbonic acid gas; by this means the mucilage and starch are reduced to the state of a milky liquor, which serves as the first aliment of the young plant or twig.

As soon as the plant has unfolded its leaves, or the radicles of the seed have penetrated into the soil, the system of nourishment is changed: every part of the plant in contact with the atmosphere gives out carbon during the night, or when in darkness; but the carbonic acid which this forms with oxygen, instead of remaining in the air, as at the period of germination, is absorbed principally by the roots and leaves, and decomposed in the last by the solar rays; the carbon remaining fixed in the plant, whilst the oxygen is exhaled in the form of a gas. Plants are likewise nourished by that aqueous fluid which, constantly existing in the atmosphere in greater or less abundance, is, by the diminished temperature of the air during the night, deposited in the form of dew. The water contained in the soil dissolves the juices of the manures, and transmits them to the plants.

But in order that plants should flourish, it is not sufficient that they have at their disposition all their necessary aliments; it is further requisite, that the elaboration of these be favored by other causes possessing equal influence over vegetation.

I have already remarked, that leaves do not transpire oxygen excepting when exposed to the rays of the sun; so that the carbonic acid remains in the plant during the whole time that the solar rays are hidden. The establishment of this fact enables us to explain many of the most important phenomena of vegetation: we learn from it, why plants that grow in the shade never produce fruits having the same taste, perfume, or texture, as those borne by plants of the same kind growing in the sun; and why the various sorts of fodder and green herbs are of bad quality, when the sun has not access to them to facilitate the decomposition of carbonic acid and the elaboration of nutritive fluids.

Independently of the light of the sun, without which the plants cannot flourish, vegetation requires a certain degree of heat; buds generally do not begin to unfold till the atmosphere is at the temperature of from 50° to 54°; and vegetation gains strength in proportion as the heat of the atmosphere increases, provided that at the same time the earth be sufficiently moist for the water to convey to the plants the nourishment it contains, and to furnish to them the means of transpiration. The influence of temperature over vegetation is so marked, that we can see the latter diminish as the heat lessens, and resume its energies as that is augmented. Warmth renders the sap fluid, and quickens its circulation; cold thickens it and renders it stagnant. If a right degree of atmospheric temperature, the influence of the solar rays, or a suitable quantity of the aqueous fluid be wanting, the growth of plants is retarded. Thus we see it is not enough that plants are abundantly supplied with nourishment; it is necessary that the concoction of it should be favored by agents which concur in causing its digestion.

When the soil is too abundantly provided with manures, especially of kinds that may be easily conveyed into plants by water, their growth may be prodigiously increased: but if the digestive organs and the constant influence of the sun do not concur in elaborating their juices, the result will be, as I have before remarked, a kind of obesity; and none of the products will have either the savor or the odor that they would have acquired if the nourishment had been less abundant and better digested. It is not uncommon for fruits and herbs to yield the odor peculiar to the manure with which they have been nourished, when it has been too abundantly supplied.

The juices circulate in plants, not only with the same regularity of movement that we observe in animals more perfectly organized, but with a degree of force sufficient to carry them into all the organs, that they may receive in each one of them a peculiar elaboration.

The roots absorb fluids from the earth by means of their capillary vessels; but the force with which they are conveyed into the internal organs of the plant, and even into the leaves, where their carbon combines with oxygen, is superior to that of capillary attraction, and the weight of the atmosphere.

The celebrated Hales cut a branch of a vine four or five years old; this he cemented carefully into a glass tube bent in the form of a siphon, filled with mercury; by the force of the ascending sap alone, the mercury rose at the end of some days to 38 inches. M. Mirbel has confirmed this experiment, and added many others of great importance, but which would carry me too far from my subject.

As the sap circulates in plants by the aid of numerous vessels and cells, which have no rectilinear communication, the force with which the sap ascends may be explained by a principle deduced from the experiments of M. de Montgolfier, who has proved, that, by means of a very small force, liquids may be raised to an almost indefinite height, provided the pressure of the column of liquid be destroyed by numerous interceptions or valves.

The force with which the sap ascends is proportioned to the health of the plants, and the abundance of its transpiration; a stalk deprived of its leaves will raise less mercury than one retaining them; and trees having smooth, spongy leaves abounding in exhaling pores, such as the wild quince, the alder, the sycamore, the peach, the cherry, &c. raise it to a much greater height than those of which the leaves are varnished or dry. The beautiful experiments of Hales have verified these results.

All the water imbibed by the different parts of plants, but especially by the roots, is first employed in mixing the juices; and facilitating their circulation; it is then decomposed, and a part of it furnishes hydrogen, so abundant in the products of vegetation, but the greatest portion is evaporated, principally by the leaves, and thus maintains their temperature below that of the atmosphere during the burning heat of summer. Hales observes, that a sun-flower plant transpired by the leaves, in the space of twelve hours, 1lb. 14oz. of water.

The cold which begins to make itself felt in autumn, retards the movement of the sap; the fluids become thickened, the solids contracted, the leaves cease to inhale, and the roots no longer absorb nourishment from the soil, and at length the vital functions are suspended. The returning warmth of spring brings renewed life to the organs; the fluids and the solids receive a greater expansion, circulation is restored, and the sap deposited in the vessels during the summer and earlier part of autumn, affords the first nourishment to plants.

The branches of trees that are lopped off in winter, put forth buds and stalks in the spring; a branch of a vine introduced during the winter into a hot-house, vegetated as it would have done in the spring, whilst that portion of it which remained exposed to the cold, experienced no change. Plants that have been browsed in autumn, do not put forth so early, nor with so much strength as those of which the roots, and the parts immediately surmounting them, have been preserved by mowing.

All agriculturists have observed, that young trees transplanted in the spring appear to flourish for three or four months, and then die; if when taken up they have examined their roots, they have almost invariably found that they presented no appearance of having increased; which proves that vegetation is carried on in the spring by the nourishment provided, and deposited in plants before the fall of the leaves.

The difference which exists in the vegetation of the same branch, one end of which is placed in the earth, and the other rising above it, must strike every observer. The part which is planted in the soil, sends forth roots, whilst that which rises into the air produces leaves; and if any part of the root be uncovered, so as to come in contact with the air, it produces stocks and leaves; whilst that which remains beneath the soil continues to grow as the root of them. All parts of plants then are organized by their growth in such a manner, as shall enable them, most conveniently, to imbibe at the same time their nourishment from the soil and from the atmosphere.

It is in the power of art to influence the flow of the sap, nearly at will. When the nourishment afforded by the earth is too abundant, it is but imperfectly digested, and is exclusively employed in the growth of the plants; a tree in this case produces neither flowers nor fruit, but expends all its strength in leaves and wood. To remedy this superabundance of sap, some of the roots may be separated; or what is still better, incisions may be made in the bark of the tree to cause the escape of a portion of the sap.*

If it be wished to facilitate the growth of the fruit, a portion of the branches may be pruned, and part of the fruit plucked off; in this way a greater quantity of sap may be supplied to the fruit that remains; tight ligatures upon the branches, and incisions surrounding them through the whole thickness of the bark, produce the same effect. The pruning of fruit trees is principally designed to limit the production of fruit to the quantity that can be properly nourished by the plant. The grafting which is practised upon trees of analogous species, only presents to the juices of the wild tree an organic tissue different from its own; in the cells of which the juices receive a peculiar elaboration, which changes the nature of their products.

It is not by an analysis of plants, nor by the proportion of their constituent principles, which can be extracted by water, that we can judge of the nutritive quality of vegetables, or other alimentary substances. I have already proved, that a nutritive substance, deprived of all its soluble parts by water, is capable, in the progress of its decomposition, of forming new and soluble compounds. It is only by experiments, and by the effects of this or that kind of food upon animals, that we can ascertain the difference existing between various nutritive bodies.

The digestive juices of the stomachs of animals and the organs of plants animated by vital powers, of which we are ignorant, have also their chymistry, with which we are unacquainted, and of which we can understand only the results. It is surely erroneous to pretend to determine the quantity of nourishment, by that portion which can be extracted from any article of food by water; but upon this principle Davy has represented the nutritive virtue of beets by the number of 136, and that of carrots by 98; whilst M. Thayer has by his experiments estimated that of the first to be 57, and of the last 98. Upon the same principle Davy has valued the effects of linseed cakes at 151, compared with those of beets as 136; while it has been proved that 70lb. of beets are hardly equivalent in nourishment to 10lb. of linseed cakes.

In order to estimate the nutritive merits of any substance, it is necessary to have less regard to its chemical character, than to the nature of the animal to be nourished by it, one is disgusted by that which pleases another; and this will decompose what that will reject; it is only by observation that we can decide.

These principles are still less applicable to the nourishment of plants, than of animals; because of the first it is necessary that their food should be presented to them, and in a state of solution or mixture; whilst the last seek theirs where it may be found, and make choice of such as are suitable for them; but in both cases the nutritive virtues of the food can be estimated only by the results of its elaboration in the digestive organs, and by the effects produced on the economy of the animal or vegetable. It should besides be remembered, that the nutritive qualities of the various products of vegetation depend less upon their weight, than their kind; and that a substance may be insoluble in water, which may, when acted upon by the gastric juices, become excellent food.

NOTE BY THE CONDUCTOR.

* We would call the reader's attention to the principle here laid down, as important in the management, not only of fruit trees, but of many of the crops of the farm. It is a common, but mistaken notion, that by putting fruit trees into rich ground, or rendering the soil very rich in which they grow, they may be forced into an early and abundant state of bearing. Precisely the reverse is the case; a great growth of wood may be induced; but the production of fruit, by this means, is in a measure prevented, till the plant arrives at a mature state, or the growth of its wood is checked. Rich grounds will produce the *largest* fruit, but poorer soils will produce the *richest* fruit, in all the properties which give it value—the juices will be more concentrated, and the flavor higher. The best wines are made from grapes grown on thin dry soils. The same is the case in regard to the juice and flavor of the apple.

The principle is also illustrated in farm crops. The maize and potato, for instance, whose sap vessels are large, and which may be denominated coarse feeders, are not prejudiced by the strong gases which are given off from stable manure in the first stages of fermentation; indeed those gases constitute the proper pabulum for these crops at midsummer, when they are most abundantly furnished by manure buried in the soil, and when they are most needed to give a vigorous growth to the stalk. These gases are in a great measure exhausted, ere these crops produce their seeds and tubers in autumn, and when they would be prejudicial. Not so with the smaller grains. These produce their seeds at midsummer, when fermentation is at its greatest height; and the gases cause too vigorous, or an unhealthy growth of straw, to the prejudice of the grain. It is for these reasons that we so often insist on the propriety of applying all the manure which a farmer has on hand in the spring, in an unfermented state, exclusively to hoed crops. These crops reduce the manure to a proper state for sustaining small grains and grasses, without diminishing the value of the dung any more for them than would be occasioned by a summer fermentation in the dung yard. We find it to be a general practice in parts of Otsego and Montgomery, where we have lately travelled, to leave all the dung in the yard till autumn, and in too many cases, it is allowed to accumulate for years. Such a practice is the most wretched feature of bad farming. In the first case, the best half of the manure is lost, and the crops which it ought to nourish, and which it would double in product, are consequently light and meagre. Farmers who permit the dung to accumulate about their barns for years, must be either wretchedly indolent, or grossly ignorant: for this dung is to their crops what hay is to their farm-stock—the food destined by nature to nourish and perfect them.

Miscellaneous.

From the Farmers' Register.

On the advantages to be derived from the establishment of an agricultural professorship.

Barboursville, July 23, 1835.

Sir—It has been a settled conviction on my mind for years, that a professorship of agriculture—a pattern farm, and such a paper as yours, united therewith, would be productive of incalculable benefit to the commonwealth. The space of a letter is too confined to admit of one-half being stated. Suffice it to say, it would elevate the science—add dignity to the pursuit—call off from encumbered vocations a portion of the mind of our citizens now lost to the community—present a rallying point for all the scattered information of the land—reduce to the test of experiment every theory plausible enough to justify it—by the same standard to prove the value of every discovery or improvement—promote economy by causing one experiment for many—a certain and rapid communication, through the state, of the results—furnish a sure means of ascertaining the nature of our climate—the quantity of rain falling in the year—the seasons when drought most generally prevails—and by consequence, furnish data to guide the husbandman in the cultivation of crops, both as to time and kind. But I must stop—for I find no end to the advantages that would result from such an establishment. Let me, however, add one more. All these things are to be done before the youth of Virginia—the future men of the commonwealth, destined eventually to influence her destiny. A portion of these, selected from every part of the state (say one to each congressional or senatorial district,) of promise, but unable, from poverty, to educate themselves, to become the adopted children of the state, would be able by alternate labor and study, alike to keep up the farm, and to improve themselves. Indeed, it is worthy of the profoundest consideration, whether every student of the University would not profit by a few hours' work daily, in the proper season. These being my views, I submit to you whether it does not behove the tillers of the earth to make an effort to induce the legislature to attend to their neglected interests. How is this to be done? I answer, as every other sect effects every thing, by conventions—to that alternative we must also resort. What say you to such a convention, to meet in Richmond the first Monday in January? Let any one who feels an interest in the object attend. Let each agricultural society in the state be represented there. If it be asked what good can come of it, the answer is, let us try. A free communion of the intelligence of the land cannot be altogether unproductive of good fruit. Apart from what can be done by such a convention on its own means, an appeal may be made to the legislature under the weighty sanctions of their united wishes, to do something for us. If the view which I suggest is esteemed impracticable, they may incorporate an agricultural society in each congressional district, and award a small sum to each, to be distributed in premiums, after the manner of New-York and other states.

But it is objected that it will cost something. Have we not as a class offered our fleece annually, without a murmur, to be appropriated to other improvements? Is it unreasonable that in turn we should require a small portion of our own to be applied to our peculiar benefit? A small portion of the interest paid annually to the University, would in a few years put our scheme completely in operation, and I verily believe after that it would be able to support itself. However, all these things might be discussed in convention, and digested in a form that would be most acceptable. And I may be permitted to add, that for once we should have a convention whose sole object would be the good of the country—a spectacle so singular in these times, that it could not fail to be as consolatory as the oasis to the weary traveller of the desert.

If you agree with me on this point, you can greatly promote the object by inviting the meeting in your journal. If I thought my name would be of any service, you would be at liberty to use it with my remarks. But I fear not. However do as you please. I have it much at heart to do something. Better heads than mine may suggest better plans, to which I will most cordially submit.

Accept assurances of my high consideration,

JAMES BARBOUR.

We concur entirely with the foregoing views and recommendations, and shall be pleased to aid them, as has heretofore been attempted, through this journal. We are also clearly of the opinion that nothing in aid of agricultural interests, or agricultural science, is to be expected from our legislature, unless prompted and urged by the expressed wishes of their constituents: and therefore the more ready admission of the necessity, and probable advantages, of consultation among the zealous and intelligent friends of agriculture—either in the mode proposed above, or in some other. There is no individual whose voice is entitled to be heard with more respect on this matter, than our correspondent; but it is desirable that others should also present their views, both as to the objects to be sought, and the mode of seeking them. Though willing to support, and lend our efforts to further any other plan of combining our force that may be found more pleasing to the great number of the agricultural community, we see no reason now to object to the particular plan proposed above, viz: a meeting and free conference of all the members of the agricultural interest in Virginia, who may have enough zeal to join in the effort, for the purpose of determining on what aid of government agriculture most needs, and of asking it respectfully of the legislature. In the mean time the expression of different views on this subject, and discussing the comparative merits of the different ultimate objects in view, will greatly facilitate the operations of such an *agricultural conference*—and we invite to our pages, the expression of opinion of any of those who feel an interest in this important subject.

It is hoped that the several societies will take the proposal into consideration, and give it their support. In whatever manner the meeting may be constituted, there can be no sound objection to the qualifications of any individual as a member. The agricultural interest in Virginia, however overlooked and neglected by the government, is still the *national interest*—and nothing can be derived for its benefit, by the whole or by any portion of those belonging to it, which would not be as beneficial to the commonwealth, as to agriculture. Such a meeting could not do otherwise than honestly labor for the good of the country—because that would be most effectually done by supporting their own. All bodies of men may be trusted implicitly when their private interest is to be promoted by the same measure, that will support that of their country—and none ought to be trusted when these interests are separate and opposed.—*Ed. Reg.*

From the Genesee Farmer.

MANAGEMENT OF THE VINE.

My management of the vine is,

First—to get the most ripe wood: and,

Second—to perfect the ripening of the grape.

1. In order to get the most ripe wood, I, in my summer training, take out all the wood which shows no fruit, and also pinch off all the laterals, taking care to give about one foot space between each shoot, to the top of my trellises, which are about 6½ feet high. I train my vines, (i. e. the Catawba, Fox, Munier, Sweet Water, and White Frontenac and White Chasselas,) fan shaped; and as soon as I find my grapes out of blow, I head down my vines to the top of the trellises, leaving about two buds from the fruit upon each shoot. By this means I get light and air through my vines, which 2d, ripens the fruit much sooner. As the foliage is thinned out, the sap flows more readily to the fruit, and does not evaporate upon the leaves, but is retained in the fruit, which is certainly a benefit. I keep my vines as free as possible from grass and weeds, and loosen the earth around them once or twice a week with a garden hoe, thereby giving the roots all the advantage of a loose soil.

During the dry weather in the latter part of May, I found that the ants had taken possession of several of the roots of my vines, and nearly, before I was aware of it, laid the roots near the surface bare of earth. I soon removed these trespassers by applying a shovel or two full of ashes on the spot infested, and in a few hours they removed, and I have not been troubled with them since.

I am training this year an Isabella vine upon a little different plan. I lead out upon each side of the vine four or five arms, and tie them fast to the trellises, to the length of eighteen or twenty feet, which gives me eight arms from thirty-six to forty long. I thin them as the shoots grow, lead them up to the trellis above, and tie fast. In that way I fill up all the space, say of seven feet high by forty feet long, say 280 square feet, each shoot averaging three clusters of grapes. My vine thus trained, this year will yield me from four to five bushels of ripe fruit.

Rochester, June 27, 1835. A. M. CLARK.

From the New England Farmer.

MERINO SHEEP.

MR. FESSENDEN—Having for many years been a breeder of fine wool sheep, I beg leave to offer you the result of my experience, and if it should not correspond with the observation of other breeders, I can assure them, my flock has never suffered, from want of care and expense in their first purchase, for unwearied attention to their management or for the good condition in which they have uniformly been kept. The sheep were provided with good pasture in summer, and extensive airy sheds in winter, and fed on English hay, with a few potatoes towards spring. The merino sheep imported into this country, from **1803** to **1811**, were chiefly of the Spanish Escurial, the Poular, Gaudaloupe, Infantado, Montano, and Nigretti.

The Escurial were beautiful fine wooled sheep, free from grease, *not* carrying a very heavy fleece, or a very strong constitution. The Nigretti were the largest sheep of any imported. The other three flocks were of good size, short legs, round chest and sheared very large and heavy fleeces. My flock was from the Paular and Gaudaloupe, and particularly distinguished for the quantity and quality of their wool, and differs from the others in a looseness of skin on the neck, with a more evident degree of throatiness. Their lambs were generally produced with a coarse, hairy appearance, which was succeeded by a coat of unusual closeness and of excellent quality. Among the great numbers of sheep imported into this country, individuals belonging to the same flocks differ greatly in the size of the carcass, as well as the weight and fineness of the fleece. The great object, at that time in forming my flock, was quantity and quality, for, with the first requisite, I always found the hardiest, strongest constitutions. I endeavored to obtain a fleece that would produce the greatest profit, and so well had I succeeded, that to the time when Saxony sheep were introduced, the entire flock averaged four and a quarter to four and a half pounds of washed wool, and sold at seventy to seventy-five cents per pound. There were no wethers in the flock. Ewes would shear from three and three quarters to four and a quarter pounds. Bucks from six to nine pounds. Yearlings from four to four and a half.

On the importation of Saxony sheep I bought largely, confident I should soon realize in fineness, more than I lost in the diminished quantity of the merino fleeces. But I was sadly disappointed, for I lost not only in the *value* of the fleece, but still more by feebleness of constitution. My merino lambs used to drop in March, and their close hairy coats afforded a protection at once. But I found March was too cold for my delicate, half naked little Saxons. I was obliged to have them drop in May. This was a bad arrangement, for when the lambs were weaned, it was so late in the season, that the mothers would not get fat, as formerly. The merino lambs were so hardy that the loss of *one*, could almost always be traced to some accident or neglect, but the Saxons would die in spite of all my care and attention, full fifteen and twenty per cent. The average weight of my fleeces became very much reduced, and I never sold my clip for over eight cents per pound. Two years ago I became satisfied of my mistake and loss, occasioned by the Saxons, and sold out the whole, reserving to myself such of my old merinos as I could select, that had escaped the general slaughter, and by repurchasing some, I had previously sold, I have now a small flock of merinos with which I shall be satisfied, without further experiments. The ewes, with two exceptions, have lambs by their sides and their fleeces in June averaged four pounds one ounce. Some of the oldest shearing less, and others more, and one reaching five pounds fourteen ounces. One of the bucks sheared eight pounds and one quarter. This wool, washed on the sheep, sold at sixty-seven cents per pound cash.

It is a peculiarity of the merinos, of which I am speaking, that they abound with a greasy secretion, from the skin,—(not stiff hard gum) but an oily substance, which spreads itself through the whole fleece so that the surface assumes a blackish or dark brown appearance and retaining the dust and soil, forms with it a coat that contributes largely to defend the animals from the ill effects of cold and wet. It improves rather than injures the quality of the fleece beneath, and it is easily removed by ordinary brook washing.

The wool is of very uniform fineness, close and compact, and extends quite down to the hoofs and over the face.

In this part of the country there is a general disposition to get rid of the light *fleeced* and light *constitutioned* sheep and replace them by the Spanish merinos, as we formerly had them. Before the return of another season I intend to import from Spain, for the use of my own little flock, (for the benefit of a cross of blood) two merino bucks, that shall possess as far as possible, the great requisite of *quantity* and *quality*. T.

Hartford, Ct. August, 1835.

From the N. Y. Mechanics' Magazine.

MR. BURDEN'S SPIKES.

The public has already had the means of knowing that the above named enterprising individual invented some years since, a machine for making spikes of wrought iron, chiefly for the purposes of being used in constructing ships and railroads; but their value, compared with other spikes, seems to be but very sparingly known. These spikes to any competent judge, will show themselves to be far superior to any spikes ever manufactured for the above purposes, for the following reasons. The iron being selected by Mr. B. himself, and in large quantities of the first quality, no other being used, its uniform excellence must infinitely surpass that of common spikes, which are made of such small lots of iron as come to hand promiscuously; the body of these spikes being of exactly even and uniform size, and without hammer strokes, when once entered they have no tendency to split the wood, and, having a square chisel shaped edge, they cut their passage instead of forcing it.

But Mr. B. is emphatically an experimentalist, and he wished to test the comparitive value of his spikes by some precise data. He wished to ascertain first with what degree of safety his spikes might be driven into wood without splitting; second, what was the tenacity of the iron; and third, what power it would require to draw them out.

To test the first point, he took a piece of seasoned white oak joist, 3 by 6 inches, and sawing off 3 inches, produced, of course, a piece 3 inches square and 6 inches long, but with the grain running crosswise. In one end of this block, he entered, without boring, the point of a spike 5 inches long, with the edge of its point across the grain, and drove in the whole length without splitting the block.

To ascertain the second and third points, he drove another and similar spike into a similar block, leaving its head a little distance out, and securing the block in a firm situation, and griping the head by a strong instrument, similar to a pair of wire tongs, he suspended to the tongs 100 56-pound weights, equal to 5600 pounds, and these neither breaking the spike nor drawing it out, he took a sledge and struck forcibly upon the apparatus attached to the head of the spike, when it drew out and left the spike and the wood unbroken.

These experiments were made at the store of Messrs. I. & J. Townsend, in this city, in presence of the President and Directors of the Albany and Schenectady Railroad Company, and if they do not remove all doubts as to the superiority of these spikes for ships and railroads, I know not what would. S. B.

Albany, June 15, 1835.

THE USE OF FRUIT.

As various kinds of fruits are beginning to make their appearance, and as no inconsiderable amount of disease is usually imputed to their agency at this particular season, it may not be inappropriate for physicians to institute some inquiries in relation to their supposed deleterious effects on the health of people of different ages and conditions.

We are familiarly acquainted with the prejudices existing against the free use of our domestic fruits, but very much question whether they have ever operated so unfavorably as is generally believed. It would be quite as philosophical to discard bread stuffs, the various leguminous productions of the garden, and the meats offered in the market, as to interdict the rich fruits which nature has scattered around us. If a careful register were made of all the deaths arising from excess in eating these two species of food, it is quite probable as many would be found attributable to one cause as the other. Eating and drinking have become altogether too artificial; people consult their books oftener to discover how, when, and what sort of a meal should be taken, than to ascertain the state of their finances. Life is thus reduced to an unnatural scale, and the capacity of the stomach measured, as a tide-waiter would guage the dimensions of a hogshead, instead of following the simple indications of hunger, which makes no dangerous mistakes, under ordinary circumstances, in well regulated society. There is a vast difference between gorging beyond the ability of the stomach to relieve itself, and satisfying the cravings of appetite. Were an individual never guilty of any excesses, he would be exempt from the penalty invariably imposed on the breach of any law of the animal economy.

Instead, therefore, of standing in any fear of a generous consumption of ripe fruits, we regard them as positively conducive to health. The very maladies commonly assumed to have their origin in a free use of apples, peaches, cherries, melons, and wild berries, have been quite as prevalent, and equally destructive, in seasons of scarcity. All natualists will testify to the importance of the fruit seasons to the lower animals, particularly to birds. When there is a failure, or an insufficient supply, the feathered tribes are less musical, less numerous, and commence their migrations much earlier, than when amply supplied with the delicate nutrition designed for them at certain periods of the revolving year.

In the scheme of creative wisdom, the indications are clearly manifested that man is omnivorious; and it was not until muzzled by the opinions of one, perplexed by the ridiculous hypothesis of another, touching the subject of his food, of which he is himself better qualified to judge than the most learned physician in chistendom, that he relinquished the faculty of discrimination implanted in his nature, to become the foot ball of those who raise themselves into a short lived notoriety by giving to unfounded theories the character only belonging to well established facts.

There are so many erroneous notions entertained of the bad effects of fruit, that it is quite time a counteracting impression should be promulgated, having its foundation in common sense, and based on the common observations of the intelligent. We have no patience in reading the endless rules to be observed in this particular department of physical comfort. No one, we imagine, ever lived longer or freer from the paroxysm of disease, by discarding the delicious fruits of the lands in which he finds a home. On the contrary they are necessary to the preservation of health, and are therefore caused to make their appearance at the very time when the condition of the body, operated upon by deteriorating causes not always understood, requires their grateful, renovating influence.—*Boston Medical and Surgical Journal.*

TO CORRECT MUSTINESS IN GRAIN.

Corn which is housed without being thoroughly dried, or which is stored in a damp place, acquires a musty smell and taste, which render it unfit for the customary uses; but as this alteration affects only the outer covering, and not the substance of the kernel, it may be easily removed by throwing upon the grain double its weight of boiling water, carefully stirring the mass till the water becomes cold. The spoiled kernels, which swim upon the top, must then be removed, the water poured off, and the grain spread to dry. M. Peschier preferred employing for this purpose boiling water rendered slightly alkaline, and afterwards washing the grain in pure water.

When corn has been heated, or injured in a perceptible manner, the vegeto-animal portion is almost always changed; in this case the farina is not susceptable of a good fermentation, and the bread made from it is unwholesome: such grain is fit only for the manufacture of starch.—*Chaptal.*

COMPARATIVE VALUE OF MANURES.

Report of Competitors for Premium of £20 for the most satisfactory experiment in the application of different sorts of manure.

Aimsfield Mains, Dec. 5, 1834.

Dear Sir—Agreeably to the written intimation which I made to you some time ago, I now beg to state, that in order to ascertain the relative value of Street Dung, Rape Dust mixed with Braised Bones, and Farm-yard Dung, I selected twelve ridges in the middle of a field for the experiment, alloting four of these ridges to each portion. A furrow tile drain separated the lots to which I applied the respective manures, in the following proportions per Scotch acre:

1st. 20 cart loads of street dung, at 5s. 6d.................... £5 10 0
2d. ½ ton of rape dust, at 110s........ ....£2 15
3 qrs. bruised bones, at 19s. 2 17
——— 5 12 0
3d. 16 cart loads of farm-yard dung, at 7s........ .... 5 12 0

The whole turnips brairded beautifully, and from the first, till the time of lifting, it was impossible to decide which would be the weightiest crop. I therefore determined, on the last week of November, to take up alternate rows. The tops were taken off, and the result was found to be as follows:

	cwt.	lbs.
1st. Half a Scotch acre manured with street dung, produced of common globe turnip,	301	92
2d. Do. with rape and bone dust,	304	99
3d. Do. farm-yard dung,	312	30

I hope the above will be sufficiently explanatory of the experiments, so far as tried. I am, dear sir, yours faithfully,

JOHN BRODIE.

Linkfield, Nov. 15, 1834.

Sir—I hereby send you the weight of four acres of Swedish turnips, grown on the farm of *Linkfield*, crop 1834, after being topt and rooted, the ground manured as follows:

1st. One acre with very fine home-made dung, 12 double cart loads, say 7s. 6d. per cart,.. £4 10
Weight of turnips, 27 ton, 14 cwt.
2d. One acre with Dunbar street dung, 12 double carts, not counting carriage, 7s. 6d.............................. 4 10
Weight of turnips, 23 tons, 14 cwt.
3d. One acre with bone dust, without carriage, ... 4 10
Weight of turnips, 26 tons, 7 cwt.
4th. One acre with rape dust, without carriage, ... 4 10
Weight of turnips, 25 tons, 11 cwt.

Your laying the above before the Agricultural Society, will much oblige yours truly. JAMES ALLAN.

From the Genesee Farmer.

PROPER TIME FOR CUTTING TIMBER.

Mr. Tucker—I observe in your paper of the 22d August last, that you are calling the attention of your patrons to the durability of posts, &c. During the last twenty years I have been engaged more or less in the preservation of timber, and from my experience am able to say with confidence, the old opinion of the English writers to the contrary notwithstanding, that the best time to cut timber to ensure its durability, is when the tree is in its GREATEST VIGOR; and in this latitude, say middle of June—then the sap is in its most fluid state, and entirely escapes through the several pores of the tree. The idea that the sap of a tree recedes to its roots during winter, is in my opinion a mistaken notion. The sap is distributed through the tree in winter the same as in summer, and circulation never ceases, except with the life of the tree. The sap in winter is less in quantity and thicker, and owing to its stagnant state, remains in the timber when it is cut in the winter, and become the principle of its destruction. Let timber for rails, posts, or other purposes, be cut when it is in its greatest vigor, (never mind the phase of the moon,) and keep it off the ground until seasoned. In support of my position, I will repeat two instances which have lately come to my knowledge. A farmer of North Carolina wishing to fence a certain lot, went to work according to the old theory, and cut his rail timber during the full of the moon in February; but when he came to make his fence in May he was deficient about 40 pannels: he went into the woods and cut the necessary quantity and put it up as the only alternative; and after some ten or twelve years, his attention being called to the fence, he found the rails cut and split in May infinitely more sound than those cut in February. Another gentleman in New-England had an accident befall a gate post in midsummer, and not having any seasoned timber on hand, sent to the woods for a green one, and expecting that it would only last one or two years, had one cut during the next winter and laid by to supply the place of the green one at his leisure. But during the ensuing summer the other post failed, and the one cut secundem artem, was taken to supply the place of the last failure, and the green post thought no more of until at the end of 7 or 8 years, when the post last put in was found to fail, while the summer cut post was in a perfect state of preservation.

These hints are not prepared with sufficient care for publication, but are only intended as hints for you to reflect upon, &c.

With great respect, yours, JOSHUA HOWARD.

Dearbonville, Sep. 3, 1835.

"I owe my success in business chiefly to you," said a stationer to a paper-maker, as they were settling a large account; "but let me ask how a man of your caution came to give credit freely to a beginner with my slender means?" "Because," replied the paper-maker, "at whatever hour in the morning I passed to my business I always observed you without your coat at yours."

There is a world of wisdom in this little anecdote; more good sense and more judicious admonition than are to be found in all the declamation of all the "ten-hour" orators that ever made a speech, or drew up a resolution. Practical mechanics will never grow rich by standing out for limits to working hours, or by any other mode or form of striking for wages.

Few parents realize how much their children may be taught at home by devoting a few minutes to their instruction every day. Let a parent make the experiment with his son of ten years old for a single week, and only during the hours which are spent in school. Let him make a companion of his child—converse with him familiary—put to him questions—answer inquiries—communicate facts, the result of his reading or observation,—awaken his curiosity—explain difficulties,—the meaning of things, and the reason of things—and all this in an easy, playful manner, without seeming to impose a task, and he will himself be astonished at the progress which will be made.—*President Linsley.*

MAMMOTH CHEESE.

We are informed that Col *Thomas S. Meacham*, of Richland, Oswego county, who keeps 154 cows, and has made this season 300 cheese weighing 125 lbs. each. has made one weighing FOURTEEN HUNDRED POUNDS, which he intends to present to the President of the United States. He has also made several, weighing EIGHT HUNDRED POUNDS, each, one of which he intends for the Vice President, one for Gov. Marcy, and one for each of the cities of New-York, Albany, Troy and Rochester.—*Genesee Farmer.*

Young Men's Department.

I send you, Mr. Cultivator, the first of a series of "*Letters from a Father to a Son*," and intend to send you others, should this be thought worthy a place in your paper, as leisure may permit, or inclination prompt.

PRELIMINARY.

Dear Son—At no time in life do we stand more in need of parental counsels, or are more likely to be benefitted by them, than at the period when we are throwing off the boy, and are about to assume the cares and responsibilities of manhood. Youth are accustomed to look only upon the bright side of the picture; their anticipations are sanguine; their hopes ardent; and they need to be brought often to consider the sober realities of life, to check their unreasonable aspirations. They see not the sands and breakers which begird the ways of life, and upon which very many are early shipwrecked. They need the experienced pilot. Having served in this capacity for a score or two of years, in the school of experience, where all *may* learn though all *do not* learn to profit, and being deeply interested in your future welfare, I propose to make over, for your use, some of the lessons which I have been taught in the school where you are yet but a noviciate. They constitute capital, if put to good use, and will be sure to make good returns, in the multiplied enjoyments of life. These will be given as they occur, without regard to arrangement.

Learn early to depend on yourself. Your physical and intellectual powers must be your main dependence for fame and fortune. The ground has been fitted for the seed. Your hands have been taught to labor; your mind to reflect. You must be the husbandman; you must sow the seed and nurture the plants; and the reward of the harvest will depend upon your personal diligence and good management. If you sow tares, you cannot reap wheat; if you sow idleness you *will* reap poverty; for however abundant the parental bequest, few can retain wealth who have never been accustomed to earn it.

Beware of extremes—the *two* often meet—and by following the one too far, we often insensibly slide into the other. Thus prudence may run into parsimony; patriotism into peculation; self-respect into pride; and temperance in our habits into intemperance in our partialities, prejudices and passions. While you claim and exercise, as the high prerogatives of a freeman, the free expression of your political and religious opinions, and the right of disposing of your time and property in any way, that shall not infringe upon the rights of others, nor compromit the peace and good order of society, forget not to respect the same rights in your neighbor, whom education or association may have imbued with opinions differing from your own. Reform others by your example: for you can never make a sincere proselyte, in religion, politics or morals, or even in the arts of labor, by *coercion*. You may compel men to become hypocrites, sycophants and servile imitators, but you do it at the expense of the best feelings that dignify our nature—at the expense of piety, patriotism and self-respect. Be moderate in all things—in your pleasures as well as in your toils—in your opinions and in your passions. Past experience should teach you, that your opinions may honestly change; and however long you may have cherished wrong ones, or obstinately defended them, to renounce error, when palpable, will reflect lustre upon your character. As it is human to err, so it is magnanimous to confess and renounce one's faults.

Intermeddle not officiously in the affairs of others. Your own concerns will demand all your care. Those who busy themselves with other people's business, seldom do justice to their own. Seek for enjoyments in the domestic circle, and make home agreeable to all around you. This is your duty as well as interest. Seek rather to be good than great; for few *can* be great, though all *may* be good; and count the approbation of your own conscience, above the applause of the multitude. Act in secret as you would in public—as though your motives were scanned by those around you—and you will seldom do wrong. Adieu.

J. BUEL, Esq—Sir.—Permit me to present to your readers a translation of the story of Lucius Quintius Cincinnatus. In order duly to appreciate the history of this man, whose name after the lapse of centuries has reached even this western world, it is necessary to be able to peruse it in the simple but inimitable language of the great Roman Historian. There is in the original description, a beauty and simplicity, which are unrivalled. When Rome was distracted by commotion within, and assailed by hostile bands without—when the army commanded by the consul was besieged even within their camp, and dared not go forth to meet the foe,—when all was confusion and dismay, and destruction seemed to threaten even the city itself, Lucius Quintius Cincinnatus, was appointed dictator by the unanimous voice of the people. The affair as recorded by Livy, is as follows:

"Let those listen to the story of Cincinnatus, who despise every thing when compared with riches, and who deem the poor neither virtuous or honorable. Lucius Quintius, the only hope of the Roman empire in the hour of peril, cultivated four acres of land upon the banks of the Tiber. He was there found by the commissioners despatched for this purpose, while engaged in *ploughing*. Having exchanged salutations, they beseeched him for his own sake, and from his regard for the Republic, to listen to the commands of the Senate. Amazed, and anxiously inquiring "if all was well," he desires his wife Racilia to bring his gown from the cottage with all possible haste. No sooner had he wiped away the dust and sweat, and thrown around him his garments, than the ambassadors with congratulation, salute him dictator, and invite him to the city, declaring that the army was overwhelmed with terror. In a ship prepared at the public expense, Quintius and his three sons are conveyed to Rome: his relatives and friends, and all the nobles go forth to meet him. Surrounded by an immense multitude, and attended by lictors, he is conducted to his future abode. Having met and overcome the enemy, and restored peace to the city, he resigned the office of dictator at the close of the sixteenth day, although elected for six months, choosing to cultivate his humble farm, and abide in his humble cottage, rather than control the destinies of the Roman people."

Let those who cultivate the soil with their own hands, reflect upon the following facts in the story of Cincinnatus. He was a humble farmer—possessed only *four acres* of land—dwelt in an humble *hut* or cottage—was found by the commissioners actually employed in labor—was covered with dust and sweat, the necessary accompaniments of rural toil; and yet even this man by the unanimous voice of the people, was placed at the head of the Roman empire, with absolute power over the property and lives of his fellows citizens. Having accomplished the object for which he was elected, he most readily and cheerfully resigns his office and retires to the shades of private life. The name of Cincinnatus will never die; while simplicity and virtue remain on earth, it will stand emblazoned in characters that "can be seen and read of all men."

Vernon, June 21, 1835. ONEIDA.

INTERESTING FACTS IN CHEMISTRY.

1. Chemistry is the study of the effects of heat and mixture, with the view of discovering their general and subordinate laws, and of improving the useful arts.—*Black.*

2. Whenever chemical action takes place, a real change is produced in the substance operated upon; and its identity is destroyed. If a little carbonate of lime (powdered chalk,) be put into a glass of water, the chalk will sink to the bottom of the vessel. Though it should be mixed with the water, if left at rest it will soon subside; no chemical action has taken place; therefore the water and the carbonate of lime both remain unaltered. But if a small quantity of diluted sulphuric acid be added to a glass of chalk and water, a violent effervesence will commence the moment they come in contact with each other; a chemical union of the two substances will be the consequence of this chemical action; the identity of each substance will be destroyed, and sulphate of lime, or gypsum (a body very different from either of the substances employed) will be produced.

3. Heat has a tendency to separate the particles of all bodies from each other. Hence nothing is more necessary to effect the decomposition of many bodies than to apply heat, and collect the substances which are separated by that means.

4. It is evident that water exists in the atmosphere in abundance, even in the driest season, and under the clearest sky. There are substances which have the power of absorbing moisture from the air at all times, such as the fixed alkalies, potash and soda, and sulphuric acid, the latter of which will soon absorb more than its own weight of water from the air when exposed to it. Fresh burnt lime absorbs it rapidly; and earth that has been freshly stirred absorbs it in a much greater degree, at night, than that which is crusted and compact. Hence the importance of stirring the soil among tillage crops in time of drought.

5. Bishop Watson found, that even when there had been no rain for a considerable time, and the earth was dried by the parching heat of summer, it still gave out a considerable quantity of water. By inverting a large drinking glass on a close mown grass plat, and collecting the vapor which attached to the inside ot the glass, he found that an acre of ground dispersed into the air about 1600 gallons of water in the space of 12 hours, of a summer's day.

6. Lavoisser has explained solidity thus: "The particles of all bodies," says he, "may be considered as subject to the action of two opposite powers, repulsion and attraction, between which they remain in equilibrio. So long as the attractive force remains stronger, the body must continue in a state of *solidity;* but if, on the contrary, heat has so far removed these particles from each other as to place them beyond the sphere of attraction, they lose the cohesion they before had with each other, and the body ceases to be solid."

CHAPTER OF FACTS.—MEASURES OF LENGTH.

Measures in length are the distance of one object from another, in some agreed standard.

A line is the tenth of a digit and the 100th of a foot.

A geometrical pace is 4-4 feet English; and an English mile contains 1200, or 1760 yards, or 5280 feet.

A Scotch mile contains 1500 paces; a German mile 4000; a Swedish and Danish mile 5000; the Russian mile 750 paces.

A hand, used in measuring the height of horses, is 4 inches.

A degree of latitude at the equator, is 69 1-7th English miles.

A surveyor's chain is 4 poles, or 66 feet, divided into 100 links of 7-92 inches. A square chain is 16 poles, and 10 square chains are an acre. 640 acres are a square mile; and 4,840 square yards are an acre. 169-58 yards each way.

The Irish acre 7840 square yards.

The Scotch acre 1.27 English.

A French arpent $\frac{5}{6}$ths of an English acre.

121 Irish acres are equal to 196 English.

48 Scotch acres are equal to 61 English.

11 Irish miles are equal to 14 English.

80 Scotch miles are equal to 91 English.

A sea league is 3.4536 miles, or the 20th of a degree.

6078 feet are a sea mile.

A degree at the Equator is 365,101 feet, or 69.148 miles, or 67 1-7th nearly. In latitude 66.20 Maupertius measured a degree of latitude, in 1737, and made it 69.403; and Swanburgh in 1803, made it 69.292. At the equator in 1744, four astronomers made it 68.732: and Lambton, in lat. 12, 68.743. Mudge, in England, makes it 69.148. Cassina, in France, in 1718 and 1740, made it 69.12, and Biot, 68.769; while a recent measure in Spain, makes it but 68.63, less than at the equator; and contradicts all the others, proving the earth to be a prolate spheroid, which was the opinion of Cassini, Bernouilli, Euler, and others, while it has more generally been regarded as an oblate spheroid.

Degrees of longitude are to each other in length, as the cosines of their latitudes. For every 10° they are as follows:—

Equator,	69.2	50°	44.48
10°	68.15	55	39.69
20	65.27	60	24.6
30	59.93	70	23.67
40	53.1	80	12.02

The pendulum which vibrates seconds, 39.1393 inches at London, is the standard for the British measures. One mile is equal to 1,618.833 such pendulums.

WEIGHTS.

The standard of weights, is, the cubic inch of distilled water, weighing 253.458 Troy grains; the Troy pound 5,760 grains, or 2,281.57 inches. The same standard of 7,000 Troy grains, makes the pound avoirdupois, 277.274 cubic inches; ten of which, or 277.274, being the imperial gallon, or a quart 69.32; and a gill of five ounces of water, equal 8.664.

The American quintal is 100 pounds.

The weight of a cubic inch of distilled water, in a vacuum, is 252.722 grains, and in air, is 252.456 grains.

The Turkish pound is 7,578 grains—the Danish 6,941—the Irish 7,774—the Naples 4,952—the Scotch, pound Troy, 7,620.8.

A cubic foot of loose earth or sand weighs 95 pounds.

A cubic	foot of	common soil	weighs	124	pounds
do	do	strong soil,	do	127	do
do	do	clay,	do	135	do
do	do	mason's work,	do	205	do
do	do	distilled water,	do	62.5	do
do	do	cast iron,	do	450.45	do
do	do	steel,	do	489.8	do
do	do	lead,	do	709.5	do
do	do	platina,	do	1,218.75	do
do	do	copper,	do	486.75	do
do	do	cork,	do	15	do
do	do	tallow,	do	59	do
do	do	oak,	do	73.15	do
do	do	brick,	do	125	do
do	do	air,	do	0.0753	do

THE CULTIVATOR—NOV. 1835.

TO IMPROVE THE SOIL AND THE MIND.

REPORT *of the* COMMITTEE ON FARM IMPLEMENTS, &c.

The Committee examined five THRESHING MACHINES.

1. "*Lane's patent rail-way horse power threshing machine*," presented by D. Roberts, and manufactured at Waterford, Saratoga county. The proprietor alledges that one horse will thresh 75 bushels of wheat in 8 hours, attended by four men; that when the horse walks 2½ miles per hour, the cylinder. or thresher, revolves 1,200 times per minute. Price of the machine $150. For sale by Charles Down and others, at Waterford. The horse power is on the principle of the endless chain, and the power is imparted to the thresher by means of a band. The four arms of the thresher are cast iron, with wrought iron teeth. The wheel disbands when the motion is obstructed by a stone or other hard body. The horse treads upon iron rollers.

2. "*Shaw's patent threshing machine*," one horse power—price $75—alledged by the proprietor to thresh 80 bushels of wheat in 8 hours, attended by four men and a boy. The machine occupies 8 by 2½ feet and is moved by straps. The horse moves in a circle. A wheel and strap are affixed to each one of the axes of the threshing cylinder, which equalizes the motion. The cylinder has four arms of wood, and the teeth are secured in them by wood screws—length of the arm 18 inches—supposed to revolve 1,400 times in a minute. Wolverton, Barney and Hart, of Albany, proprietors for the counties of Albany, Schoharie, Saratoga, Rensselaer and Montgomery.

3. "*Pitts' patent horse power, and threshing machine*," constructed on principles somewhat similar to No. 1—2 horse power. The horses tread abreast upon wood, and the legs are prevented from sagging by a series of what the inventors call "surface rolls." The cost is $125—the fourth of which is for the thresher; will thresh 100 bushels wheat in 8 hours, attended by three men and a boy—4,000 bushels of grain have been threshed without any repairs. This machine is manufactured at Waterford and Buffalo.

2. "*Gleason's patent threshing machine, with Baker's horse power*"—one horse power upon the chain principle—price $150. The horse travels upon wood. Machine is said to have threshed 275 bushels of cats in nine hours, with two horses to relieve each other. The frames of the horse power and machine were of *cast iron*, admirably adapted to combine strength and *lightness!* The first weighing 350, and the latter 180 lbs.—manufactured at Waterford.

5. "*Burrall's new combination threshing machine*," presented by the inventor, Thos. D. Burrall, who resides at Geneva, Ontario county—price from 35 to 45 dollars, without horse power; of machine and four horse power $125; do. do. two horse power $100. The larger machine requires six hands to attend it, and will thresh 200 bushels wheat in 8 hours; the smaller, with four hands, will thresh 100 bushels in the same time. Cylinder 14 inches in diameter: 2½ feet long, and performs from 1,200 to 1,300 revolutions in a minute. Have threshed from 10 to 20,000 bushels of grain without repair. This machine differs from most machines, in being so contrived as to separate the grain, principally, from the straw, in the process of threshing, as threshers and screens alternate in the bed piece, which may be varied at pleasure; threshes all kinds of grain. As the committee could only *examine* the machines, and saw but the momentary action of the three first named, they cannot safely give opinions as to their absolute or comparative merits; they appeared all to be substantial and useful labor-saving machines, entitled to public notice and patronage.

CORN CULTIVATORS.

1. "*Van Bergen's Corn Cultivator*," (Coxsackie) presented by C. N. Bement. The sides expandable in parallel lines so as to be adapted to spaces between rows of different breadths, and the shares may be adjusted to turn the earth in or out. A new implement, and apparently a good one, drawn by a horse. Price $15.

2. *Bement's expanding Corn Cultivator.*—C. N. Bement, of Albany, proprietor and inventor. The improvement on the common cultivator consists in a wheel and clevis, by which the depth may be regulated by double pointed shares, and two scarifyers inserted between the shares. Expandible from 18 to 36 inches.—Price $.

The utility of the Cultivator in dressing corn and other hoed crops, in saving a vast amount of manual labor, in almost superseding the hand hoe, and in doing the work better than the plough, in most cases, induces the committee to recommend them to the general notice of our farmers. [See the common corn cultivator figured in the June number of the Cultivator.]

DRILL BARROWS AND CORN PLANTERS.

1. *Bement's Turnip Drill.*—C. N. Bement, of Albany, proprietor.—A hand barrow for drilling turnips—price $8, and an extra cylinder, adopted to sowing peas, mangel wurtzel, &c. for an additional 50 cents. [This is a modification of the drill barrow figured in the June number of the Cultivator.]

2. *Burrall's Corn Planter*—for one horse, arranged to plant corn in hills or drills, at any required distance, and to regulate the quantity of seed. A nose piece levels the ground, a coulter opens the drills, into which the seed passes through a conducter close to the coulter—two teeth cut the little side furrows made by the drill, and throw the mould over the seed—a wheel follows to press the ground upon it,—and a scraper cleans the wheel of dirt. Invented by T. D. Burrall, Geneva.—Price 16 to 18 dollars. This is an ingeniously contrived and useful machine, altogether new to us, and promises to be of great utility, not only in planting corn, peas and beans, but under simple and cheap modifications, in drilling in small grains.

3. *Robbin's Corn Planter and Turnip Drill.*—invented by Mr. Robbins, of Lewis county, and presented by C. N. Bement. It drills six different kinds of grain—has been some time in use, and is highly approved. Price $15.

The drill barrow is of modern introduction among us, and is a valuable labor saving machine, particularly in the cultivation of ruta baga, turnips, mangel wurtzel, &c. The drilling of small grains is much practised in Europe, and with the introduction of these implements, the practice may be found to be advantageous here, as it affords the advantage of keeping the crop free from weeds, and of keeping the surface of the ground loose.—In the turnip culture, which is now fast gaining a footing among us, the drill barrow is almost an indispensible implement.

STRAW CUTTER.

Green's Straw Cutter, presented by C. N. Bement, was the only implement of this kind exhibited. It is a hand crank power. It is 5 feet long by 2½ feet wide. It has 12 knives, 8 inches long. on a 4 inch cylinder, and works upon a cylinder or roller of lead—will deliver two bushels of cut hay per minute—feeds itself, and may be managed by a stout boy. Price, highly finished, $30.—The committee do not hesitate to recommend this as the most complete and perfect implement of the kind which has come under their notice. [Figured in the Oct. number of the Cultivator.]

CLOVER MACHINE.

Burrall's Clover Machine, invented and presented by D. T. Burrall, appears to be a very perfect machine. It may be propelled by a two or four horse or water power, and with the attendance of a man will clean from 16 to 32 quarts of seed in an hour. The current of air created by the motion of the cylinder, with its serrated teeth, is made to perform the winnowing process in the upper half, or simi-circle of the machine—the chaff being thrown off, and the seed falling into a box beneath, while the clover heads or hulls, are whipped out in the lower half. No seed is apparently wasted, and all resisting bodies are readily thrown out without injuring the machine. The proprietor asserts it to be the only machine which separates the seed from the hull *without rubbing, heat or waste, at a single operation.* Price $60.

The highly profitable practice, in improved husbandry, of alternating clover and other grasses with tillage crops, and the consequent increasing demand for seed, renders every improvement in the process of cleaning clover seed a public benefit. The committee recommended this machine, with strong confidence, to the public patronage.

STUMP EXTRACTOR.

Burrall's Stump Extractor, invented by D. T. Burrall, is of cast iron, about two feet square. It is a combination of power afforded by the screw, lever and wheel. Mounted on an axle and wheel, one horse, operating on a ten foot lever, will raise 25 tons. Price $80.

HARROW.

The only one exhibited was a pair of "*Craig's Scotch angled*

Harrows," presented by Mr. Craig, the maker, West Galway, Montgomery county. The wood work is light but strong, contains 40 teeth, each tooth is ⅝ inch, square and 10 inches long, of highly tempered Swede's iron. The harrows may be worked together or separate; an excellent implement on all soils—particularly for seeding. Price $15 the pair. [Described and figured in the August No. of the Cultivator.]

Smut Mill.

Smut Mill and Grain Cleaner—invented by Wm. Battle, Albany, a cast iron cylinder, 2 feet 4 inches diameter, 3 feet high. Mr. Battle being engaged on another committee, no information was obtained of its performance and price.

Cheese Press.

Kibbee's Cheese Press. This press is figured in the May No. of the Cultivator, since which it has undergone material improvements by the inventor, S. Kibbee, Esperance, Schoharie. It is three feet long, 16 inches broad, and 5 feet high. It is a combination of mechanical powers—the force being applied to a short lever—the power of which may be judged from the fact, that a 10 pound weight, at two feet from the fulcrum, causes a pressure of 1,600 pounds, and its power may be carried to any extent by corresponding strength in the main wheel and shaft. The piston decends perpendicularly, and its friction is taken off by a friction roller. Price $15.

This press is admirably adapted, on a commensurate scale, to the pressure of hay, hops, cotton, &c. and to the manufacture of cider.

Cheese Shelves.

Wilber's *semi-revolving slide cheese shelves*, is an admirable contrivance to save labor in the cheese dairy. By it a woman can easily turn 24 heavy cheeses in a minute, and is enabled to rub them without their being lifted from the shelves. The model consists of an upright frame, suspended by an axis passing through its horizontal centre, and into which slide eight pair of shelves, the distance of which may be graduated to the size of the cheeses. The cheeses are placed alternately above and below the axis. Slats are fixed upon the back of the frame to prevent the cheeses falling out when the frame revolves. The frame is made stationary by a pin; and when this is withdrawn, it is made to revolve half round upon its axis, which turns the cheeses; the shelves over them, and upon which the cheeses have lain the preceding day, may then be withdrawn, and left to dry, till the next day, when they may be returned, the turning process repeated, and the other shelves cleaned and dried in turn. The improvement is a valuable one in large dairies. Henry Wilber of Richfield, Otsego county, is the inventor. The price of a single right to construct is $5. [For further description see letter of E. Perkins, in this number of Cultivator.]

Though not coming exactly within their province, the committee cannot but notice, with high commendation, an improved *Bee Hive*, with a swarm of bees in it at work, exhibited by the inventor, Levi H. Parish, of Brighton, Monroe county. Externally it appears as a square box. The two ends and back have doors which open upon hinges, the end ones into the interior of the hive, and the back one covers a large pane of glass through which the condition of the interior, and the operations of the bees, may be observed. There is an upper chamber above these doors, which opens by a lid at the top, and discloses four boxes, nicely adjusted, into which the bees ascend through apertures, from the main hive, and deposite their honey. These boxes may be taken out and returned at pleasure, without destroying or disturbing the bees, and thus the proprietor may be furnished with a constant supply of truly excellent honey without diminishing his stock of bees. The bee moth, it is believed, is less liable to trouble this than ordinary hives. Channels are cut in the under side of the upper lid, leading to an aperture in the edge, to carry off the rarified and vitiated air which is engendered in the hive. The price of a single right to construct these hives is $5.

The committee regret that time and circumstances did not afford them a better opportunity of examining the several machines and implements offered for their inspection, and of testing their utility by a satisfactory trial. Yet they cannot refrain from expressing their strong conviction, that an annual examination of new agricultural machines and implements, by a competent board of scientific and practical men, to be selected and paid by the government, would prove of incalculable advantage. Human labor has been astonishingly abridged in the mechanic and manufacturing arts, by improved machinery and labor saving contrivances—agriculture is also susceptible of being benefitted in like manner; but the incompetency of the farmer to judge of the intrinsic value of an implement at first sight, the frequent imposition of spurious and defective ones upon him, and the difficulty of obtaining correct knowledge of their merits, induces distrust, and prevents the more general introduction of many implements that would be highly valuable. A board of inspectors would stamp a seal upon whatever is of value, determine its relative merits, and give confidence to the purchaser; while on the other hand, the want of the approving certificate, would justly excite distrust, and prevent imposition. This board might make an annual report, which by being promulgated in our 150 journals, would give, to the state at large, interesting and prompt notices of all new inventions calculated to promote the agricultural, and consequently *every* subordinate interest of the state. The committee hesitate not to say, that $1,000 annually appropriated to this object, to be awarded in premiums by a competent board, would add ten times its amount to the products of agricultural labor, and yield a compound interest to the revenue of the state.

J. BUEL, *Chairman.*

SUCCESSION OF CROP.

We gave, in our last, part of a chapter from Low's "Elements of Practical Agriculture," explaining the principles upon which a succession of crops is rendered beneficial to the farmer; and considering the subject of the first importance to profitable husbandry, and as one but imperfectly understood or appreciated among us, we insert in this number, the views which Chaptal has given us in his "Chemistry applied to Agriculture," upon this interesting topic. We cannot quote better authorities. The quotations from Chaptal in this number, are alone worth to the farmer, capable and desirous of improving, three years' subscription of the *Cultivator*, and the price of the volume from which we make them in the bargain.

We have omitted to copy the courses of crops recommended in either work, because many of *their* crops are not cultivated, or but partially so, among us; while maize, one of the staple products of our soil, is neither grown in England or the north of France. The principles or laws which regulate matter apply every where, though the correct practice under these principles may vary in every latitude.

Substitute for Indigo.—A patent has been taken out, in England, and a company formed, for the manufacture of a cheap dye, which answers all the purposes of indigo, and which promises a great saving in this important item of manufacture. It is said to give colors which resist the action of light, air and friction. The new material seems to be similar to Prussian blue, without its objectionable caustic qualities, which are neutralized. With it wool may be dyed in the flock, the fleece, the yarn or skein, or when woven into cloth; and in many respects the substitute is found to be superior, in giving brilliancy and durability to colors, to indigo itself. The principal ingredients, as in Prussian blue, are common potash and blood or animal carbon. For the animal carbon, horns, hoofs, bones, fish, cuttings of leather, old harness, and all other kinds of animal substance, old woollens and the refuse of woollen manufactories, even in a corrupt state, are employed. The fair average price of indigo, in Great Britain, is considered to be 5s. sterl. per lb. and of the substitute 2s. at most, so that the latter is likely to effect, in Great Britain alone, an annual saving of £450,000, (equal to about $2,000,000) with the further advantage, that the gross amount of cost for the substitute would be expended for what is now wasted, and in the labor of its poor inhabitants.

Strawberries.—We find detailed, in the Q. J. of Agriculture, the mode by which London is supplied with Strawberries. It is stated, that within ten miles around London, 1,000 acres are devoted to the culture of this fruit, the product of which is transported to market almost exclusively by women, who carry the baskets upon their heads! The fruit is first put into small pottle baskets, holding about a pint; fifty or sixty of these are placed in a large basket, which is then placed upon a woman's head, on a small cushion, who trudges miles with it to market. The weight of the baskets and fruit is from 30 to 40 lbs. The pottle baskets are manufactured by women and children; they pass through several hands in the fabrication, and are yet sold at about 6d. per doz. It is stated that the number of women employed, during the season of this fruit, in marketing it in the metropolis, is not less than 2,000.

Mangel Wurzel.—John Schmoldt has published, in the Farmer and Gardener, some facts in regard to this crop, which possess interest to those who cultivate and use it as cattle food. He states—

1. That plucking the leaves, as has been often recommended, for cattle food, before the crop has attained maturity, is always prejudicial to the growth of the roots. Here experiments have confirmed what reason would dictate, that nature furnishes no more leaves than what are necessary for the plant. A square rod, where the leaves had been plucked, gave 117½ lbs roots; and an adjoining square rod, on which the leaves had been left, gave 157 lbs. Other experiments gave similar results.

2. That a greater product is afforded when the plants are two feet apart than when they are one foot.

That at 1 foot each way a square rod gave,............ 192 lbs.
That at 1½ feet each way a square rod gave,........... 235 lbs.
That at 2 feet each way a square rod gave,............ 305 lbs.

This is owing to the roots growing larger at the greater distance. Here Chaptal's remark occurs to us, that small beet roots contain double the per cent of sugar, and consequently of nutritious matter, that very large roots do. And this reminds us too of a very dissimilar fact in regard to ruta baga, viz., that the larger the roots of these the more they abound in nutriment.

3. That it is difficult to preserve the roots during the winter. A little frost destroys them, and if in large masses, or in a damp or warm situation, they are subject to grow, or to spoil.

4. That 45 lbs. mangel wurzel roots is equivalent, in nourishing properties, to 10 lbs. hay, and that consequently it is necessary to give daily 100 to 150 lbs. to fatten a bullock. The ruta baga, mangel wurzel and potato yield about the like nutriment to cattle. We have fed oxen two bushels a day, of the former, each for three months, with a little hay, and had them fatten well; and some Scotch feeders have gone as high as four bushels a day to a fattening ox.

5. That the mangel wurzel is liable to produce a surfeit, and to impair the digestive organs, if given in too great quantities, or continued for a long time. Hence hay, or straw, or other roots should be given with them.

The foregoing facts are not given to discourage the culture, but to remove error.

On a recent visit to a friend in Hartford, Conn. we had ocular demonstration of *the influence of the stock upon fruit.* Our friend had in his garden a pear tree bearing large summer fruit, which ere it was ripe became rotten at the core. The fruit being consequently worthless, he engrafted the St. Germain pear upon several of the side shoots, and the Vergalue upon the top. The effect has been, to enlarge the fruits last grafted, and to accelerate their ripening at least a month. The St. Germain, of which we took several, are of double the size of those grown on the tree from which the grafts were taken; the Vergalue is somewhat increased in size, though deteriorated in quality, and one of the fruits which we ate showed a partial rottenness at the core. The effect of growing butter, or melting pears, on the quince, a practice general in France, is to impart more solidity to the flesh. These facts may become important, as they seem to suggest a new means of crossing fruits, by which the maturity of those that ripen too late for a northern climate may be accelerated; and those which ripen too early for winter use, may be retarded in their maturity. The grape affords a good subject for experiment; and the Isabella, Catawba and Blands, may thus be brought to ripen their crops with more certainty, and in greater perfection among us.

The Peach.—A new method of propagating, and of preserving from the worm, this valuable tree, is published in the last *Farmer and Gardener*, by an Alabama correspondent. He makes 12 inch cuttings of the *water sprouts*, and inserts them 9 inches in well dug mould, between the middle of Nov. and 1st Feb. They mostly live and do well; and after four years trial, he declares, that not one of the many trees propagated in this way has been affected by the peach worm, although his other trees have been seriously injured by them. He sows early peas in his peach orchard, which his pigs consume upon the ground—keeps three feet of surface about his trees loose and clean with a hoe, and puts a shovel full of leached ashes about each in the spring.

The statistics of the *Coal Trade* in Great Britain will astonish those who do not appreciate its extent. The annual consumption of coal is stated at 12,000,000 chaldrons. Of this quantity three and a half millions of chaldrons are used in manufactories, chiefly to propel machinery, as a substitute for water power,—an expense we are likely to avoid from the extent of our hydraulic power. 1,400 ships and 15,000 seaman are employed in the transportation, and 21,000 at the mines, upon the rivers Tyne and Wear alone. The coal fields of Durham and Northumberland are estimated at 837 square miles. Of these only 79 miles have been excavated. The residue is estimated to furnish 6,046,320,000 tons a year for 1727 years. But for her coal mines, the expense of fuel would form a serious drawback upon the profits of British industry. These facts should admonish the west, the *far west,* to be provident of its fuel.

The Silk business.—Since the commencement of two or three periodicals specially devoted to the silk business, we have avoided publishing much on this subject, from a wish not to conflict with the interests of the proprietors of those papers. But the inquiries and requests on this subject have so multiplied, that we propose to give, before the opening of another season, concise directions for the management of the whole business, from the planting of the seed of the mulberry to the completion of the cocoon.

The importance of canals and good roads, and the value of manures to agricultural prosperity, are strikingly illustrated in the following incident related by Chaptal.

"During a tour which I made with Bonaparte in Belgium," says he, "I heard him express to one of the council of a department, his surprise at the vast extent of waste land over which he had just travelled: he was answered thus: 'Give us a canal to transport our manures, aud to convey away our produce, and in five years this sterile country will be covered with crops.' The canal was constructed and the promise realized in less than the required time."

Rheumatism.—A highly respectable correspondent in Massachusetts has requested us, from motives of philanthrophy, to publish the following recipe for curing the rheumatism, the efficacy of which he has witnessed. We can only repeat to the afflicted his words—"*Try it*"—we do not think it can do harm, and it may do good.

"Take one gill of alcohol and one gill of spirits of turpentine —mix them in a bottle and add one ounce of camphor. Apply this compound by rubbing thoroughly with a piece of flannel the part affected, three nights in succession—then omit three—and so on till a cure is effected. It is a powerful medicine, and if it should affect the stomach, take a small quantity of brandy, ginger tea, or something of a like exciting nature."

The complete Farmer, and Rural Economist.—Mr. Fessenden, the compiler, has presented us with a copy of the second edition of this work, which has been revised, improved and enlarged. This is rather a compilation than an original work; but it is a compilation peculiarly adapted to the wants of the American farmer—containing the pith and marrow of what is most important to success in his business. We do not think a greater quantity of valuable instruction to the practical farmer, can be found combined in so small a space, or purchased at so low a price, as is offered in this volume. It is a duodecimo volume, of 370 pages, from the press of Russel, Odiorne & Co. Boston—price one dollar. We commend it to our patrons.

PARKER'S FARM GATE.

We are induced to give a cut and description of this gate, and to commend it to the public, from a conviction, that if not the best, it is *one* of the best that we have ever seen. We saw it first figured and described in the American Farmer, and about sixteen years ago had a dozen of them made. They have been in use to this day, save one, some of the tenons of which have rotted. The expense of repairs has been virtually nothing, and they have always remained in order. We think we estimated their cost, when made, at about $3 each, perhaps exclusive of the iron work. The timber, which is white oak, was sawed at the mill to pattern. The principle trouble has arisen from the fastening posts having been put down without anchors; they were raised by the frost, and required in the spring a new adjustment of the ketch. Both the hanging and fastening posts should have anchors, that is, a stout piece framed on the bottom, with two braces extending from it to the post near the surface of the ground; and the former should also have a second anchor at a right angle with the first, at least on the side to which the gate is to open, thus ⊤. We have adopted a different fastening from the one figured, the model of which was obligingly sent to us by Dr. Hosack.—See Fig. x.*

The advantages of these over ordinary gates are—

1. They are very light, and yet strong, and the principle weight is thrown upon the heel.
2. They are easily opened, even by a child, and will readily shut and fasted themselves. They never drag, if hung properly.
3. They cannot be opened by an unruly animal.
4. They are not liable to get out of repair.
5. In the *long run* they are cheap: For who that has counted the cost does not know, that an ordinary gate, or rails or boards as a substitute, cost as much or more, in the course of 15 or 20 years—to say nothing of the damage occasioned by their being half of the time out of order. And
6. They are durable—the wood, if good and well painted, lasting 20 or 30 years, and the irons, which constitute the principal expense, an age, or a century.

Subjoined is a description of the gate, in which reference is had to the cuts.

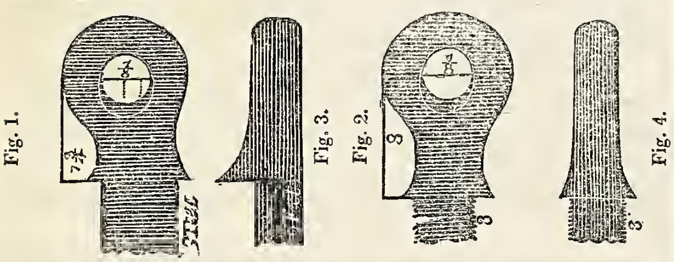


Fig. 1—Is the upper thimble adapted for a gate opening one way; with an iron strap which is to fasten with screws along the top of the gate, made to extend the whole length of the gate, and finish with a round screw nut let into the fore part of the head of the gate as at Fig. 5; the thimble being bent 1-4 of an inch bearing towards the hanging-post.

Fig. 2—Is the lower thimble of a gate proportioned to the upper thimble, Fig. 1, as 1 3-4 inch is to 3 inches, in regard to the distance between their centres and shoulders respectively. These thimbles are adapted for a gate whose hinges are 40 inches asunder; and as 40 is to 1 1-4, the difference in this instance, so should be any other distance from hinge to hinge to the proportionate difference or extra length of the lower thimble; and the greater the extra length might be made, over and above such proportion, the greater must become the velocity of the gate's fall, or tendency towards the line of rest, until its course is arrested by the fastening-post 1-16th part of the circle, or 22 deg. 30 min. short of the line of rest. The lower thimble is let into the gate by a screw of equal substance throughout its length, or not tapered, in order that the adjustment of the thimbles as to the velocity of the gate's fall, may be regulated to so great a nicety as half a turn of the screw: and the thimble may either be let into the heel of the gate, or lengthened out by a washer, as occasion shall require. The position of the thimbles, in respect to each other, must be favored also by the lower thimble, which being placed 1-4 of an inch out of the middle of the heel of the gate, in the contrary direction of the upper thimble, the whole difference, as to the distances of the two thimbles from the hanging-post, will be 1-2 an inch; and their vertical plane, which is the same as that of the lines of rest and equilibrium, will form an angle with the line of fastening of 22 deg. 30 min. or 1-10th part of a circle; this adjustment, in effect, adds 1-12th of an inch to the extra length of the lower thimble, so that, by a plumb-line, it will be found (when the gate is hung upright, as it always ought to be) that the actual extra length of the lower thimble, or horizontal distance of the two centres from each other, will be 1 1-4X1-9=1 1-3 inch.

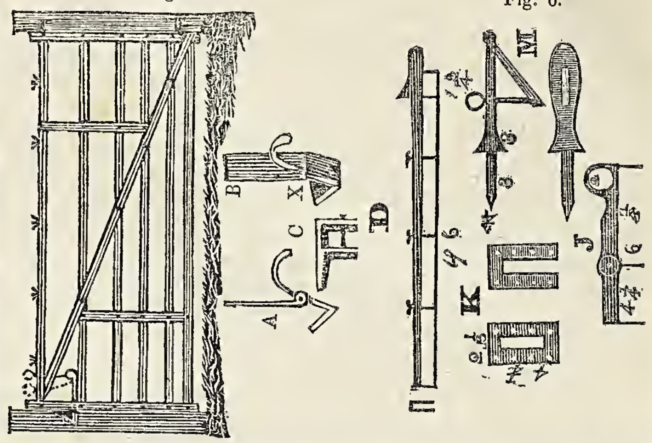
Fig. 3—Represents the side view of Fig. 1.

Fig. 4—Gives the side view of Fig. 2.

Fig. 5—Is a complete gate for opening one way, and constructed in such a manner, that it shall not sink at the head, as ordinary gates are apt to do. The bars are let into the middle parts of the head and heel, and the braces are tapered for finishing upon a level surface with the heel, head, and rail; as is evident in the following directions for the sawing out the timber, which should be of kind oak, not too tough, and entirely free from sap.

Fig. X. A. and B present front and side views of the jointed ketch, which is nailed or screwed upon the shutting post, in which a box of about 5 inches long and 4 deep is made for the play of the ketch. C is fastened upon the head of the gate, by the bolt and screw shown in the cut, so as to fit the ketch. The thumb-piece is attached to the lower joint of the ketch, and when pressed upon, the gate readily opens.

Fig. 5. Fig. 6.



The waste in planing and finishing a gate may be allowed for or not, as the gate is desired to be a little more or less strong: but when the timber is good, it is reduced so little by being planed and finished into a gate, that no allowance need be made for the waste; or, at all events, if the sawer attends to the dimensions recommended, the gate will be quite strong enough for its size.

Directions for sawing the Timber for the Gate.

	Length.		Greatest thickness.		Tapered to the head.		Solid contents.
	f.	*in.*	*in. by*	*in.*	*in. by*	*in.*	*cubic in.*
Heel, ...	4	4	$4\frac{1}{2}$	$3\frac{1}{2}$	..	..	= 832
Head, ...	4	4	$2\frac{1}{2}$	$2\frac{1}{2}$	..	..	= 325
Rail, ...	9	0	$3\frac{1}{2}$	$3\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{1}{2}$	= 972
5 Bars each, ...	9	0	$3\frac{1}{2}$	1	$2\frac{1}{2}$	$\frac{3}{4}$	= $1417\frac{1}{2}$
Diagonal Brace, ...	9	6	$3\frac{1}{2}$	$1\frac{1}{2}$	$2\frac{1}{2}$	1	= $427\frac{1}{2}$
Larger upright brace, ...	2	8	3 1-4	1 1-4	..	..	} = 250
Smaller do.	2	8	3	1 1-4	..	..	}
							4224

which will be found to form a well proportioned gate, the whole of the eight parts at the head presenting to the eye $2\frac{1}{2}$ inches; and seven out of the eight parts at the heel, that is, all excepting the heel itself, present $3\frac{1}{2}$ inches. Its solid contents of timber is 4224 cubic inches=2 feet $5\frac{1}{3}$ inches, or nearly $2\frac{1}{2}$ cubic feet.

The diagonal brace is fitted into the heel by a strong butment, even with the lowest bar, and its smaller end meets the upper angle at the head, and is confined laterally by two upright braces; which would keep up the rail, provided the head were not pushed forward; and that is prevented by an iron strap of equal length to the gate, being attached to, or forming a part of the upper thimble in the first instances, where it holds the heel of the gate by the shoulder of the thimble: it is afterwards screwed to the rail at proper distances; and, lastly, secures the whole work together by a screw nut, rounded and let into the front of the gate's head.

The fastening is remarkably easy for a horseman to open, and as difficult, if not impossible, to be opened by cattle; the upright wire of the latch is furnished with a guard, and the mortise of the head of the gate through which the latch passes is finished with sheet iron escutcheons, like those at K, the fastening being completed with the catch M, having a button in the place of the ring.

If it were wished to make a larger gate of this pattern, let the above column of lengths be altered accordingly; but the column of greatest thickness, and that of the sizes to which the parts are to be tapered, may remain as they are: suppose the gate is to be $9\frac{1}{2}$ or 10 feet long, instead of 9 feet, then add about half of what the length of the gate is increased to the lengths of the head and heel, with as much as is wanting to the braces, and the gate will be in a good form, the rails and bars being of course cut out to the new length.

Those numbers in the table denoting the distance of hinges, which are marked with an asterisk, are precisely proportioned to the horizontal distance of the lines falling from the hooks, for as 40 : $1\frac{1}{3}$: : 32 : 1, &c. and the intermediate numbers are nearly enough calculated, but as 40 : $1\frac{1}{4}$: : 41 : 1, and a further fraction, 42 to a still greater sum, but not amounting to 1-12 inch difference till the distance of the hinges becomes 43 inches: and the same will apply to other parts of the table.

Take any other distance of the hinges from each other, and the required extra length of the lower thimble may be found, by placing the numbers 110 and 6 7-8 as the first and second terms of a rule of three proportion, and the new distance of the hinges must be the third term: the answer divided by two will be the sought for horizontal distance of the two perpendicular lines falling from the hooks: and as the extra length of the lower thimble should always be the same as the horizontal distance of the perpendicular lines falling from the hooks, [adding the loss in hanging the gate] the answer for the one is the measure for the other.

When the hinges of gates are more or less than 40 inches asunder, the new position of the hooks may be found by the following TABLE :

Distance of the two hinges or pivots of a gate's suspension.	Horizontal distance of two perpendicular lines, one falling from the centre of each of the hooks.
11, 12, 13	1-3
14, 15	5-12
16*, 17, 18	½
19, 20, 21	7-12
22, 23	2-3
24*, 25, 26	¾
27, 28, 29	5-6
30, 31, 32	11-12
33, 34	1
35, 36, 37	1 1-12
38, 39	1 1-6
40*, 41, 42	1 1-4
43, 44, 45	1 1-3
46, 47	1 5-12
48*, 49, 50	1½
51, 52, 53	1 7-12
54, 55	1 2-3
56*, 57, 58	1¾
59, 60, 61	1 5-6
62, 63	1 11-12
64	2

* The iron strap is about an inch by a quarter of an inch in substance, for one half of its length, when it is tapered towards the head of the gate. At the end nearest to the thimble, it is made stronger for a few inches; and close to the shoulder of the thumber, it should be about an half inch square: the edges are chamfered off, and the whole appears to be gradually tapered from the heel to the head of the gate, widening a little round the whole which is left for the upright part of the latch adjoining to the handle.

FLORICULTURE.

In accordance with the wishes of some of our correspondents, we intend to devote an occasional column to Floriculture, for the special benefit of our female readers, and to diffuse a taste for rural embellishment, sufficient to instruct beginners in the selection and management of the best ornamental garden shrubs and flowers.

"What are all these things good for?" was the cynical interrogatory of one who valued every thing according to what it would sell for in market, on being shown into a pretty flower garden. "They are some of the handy works of our Creator, who gives us nothing in vain," was the reply: "these are kindly bestowed upon man for the innocent, but high gratification, of his intellectual faculties—faculties which distinguish him from the brute." "Grains," said the great Newton, "are God's bounties—flowers his smiles." Those who can be grateful for the *bounties*, cannot be indifferent to the *smiles*.

The advanced state of the season leaves little to be done in the flower garden, except planting bulbous and perennial roots and shrubs, and securing those that are tender.

Of *bulbous roots*, the tulip, hyacinth, daffodil, crocus, and crown imperial are deemed hardy, and highly ornamental.

The varieties of the *tulip* and *hyacinth* are innumerable, and vary in price according to quality Good ones are sold at $1 per doz. They flower in May, and increase by offsets. The soil should be dry, and well prepared, for them. They may be planted 3 or 4 inches deep, and 6 inches apart either in beds or upon borders. The tulip does best when the bulb is surrounded by a sprinkling of coarse sand. It should be taken up at least once in two years, to separate the offsets. Although deemed hardy, a covering of litter, or tan, is servicable to these bulbs during the winter.

The *crocus* is among the earliest vernal flowers. Plant 2 inches deep, and from 2 to 4 apart. The blossoms are of various colours, and frail, but coming in April, and sometimes in March, are very desirable.

The *crown imperial* may be planted 6 inches deep, in a rich soil, and 8 to 10 inches apart. They are perfectly hardy. Several varieties.

Most of the varieties of the *narcissus* and *jonquil* require some protection during winter. They may be planted like the tulip. They flower in April and May.

Of other perennial hardy flowering plants, there are many that are very ornamental. These require no other care than to be kept free from weeds, and to have the ground dug around them in the spring.

Of *peonies*, the Chinese are preferred for beauty and fragrance, the double white and rose scented in particular, though the common crimson is quite ornamental. They cost from 50 cents to one dollar.

The most ornamental of the *lilies* are the white, tyger, Chinese white day, and the common pendant lily of our meadows, which latter improves under cultivation.

It is yet in season to plant shrubs and creepers. The *mazereon* is the earliest to flower, and is very pretty. The *lilacs* and *seringoes*, of which there are several varieties, and the *snowball*, or Guelder rose, soon follow in bloom. There are several climbing *honeysuckles*, which are ornamental upon arbors and about dwellings. The fragrant monthly, yellow monthly and scarlet trumpet are a good selection ; and the upright Siberian and Tartarian are no less ornamental when in bloom. The *Pyrus Japonica*, scarlet and white, are dwarf, hardy shrubs, the former is covered with brilliant scarlet, and the latter with white flowers, early in the spring.

The *rose* in its varieties, displays all the desirable colours, and many hundreds of them are hardy, and several of them climbing.

We have only referred to a few of the hardy ornamental shrubs and plants which are for sale at the nurseries. Indeed our woods and fields abound with flowering plants which are highly ornamental, and which improve under culture.

The roots of tender perennials, as the *tyger-flower*, *tuberose*, *ferraria* and *Dahlia*, if not already done, should be taken up, well dried, and secured for the winter. The first three may be tied in bunches, and hung up where they will be secure from frost. The Dahlia must be preserved from too much moisture as well as from frost. They may be put in a box with dry sand, and placed in the kitchen or *dry* cellar. Seeds of annuals and perennials are best preserved in their capsules or seed vessels. They should be kept dry.

CORRESPONDENCE.

SHEEP HUSBANDRY, No. 1.

Sir—Having noticed in some of the late periodicals, some communications on sheep and sheep husbandry, which appear to me to contain some misapprehension ; and having noticed your solicitation in the Cultivator, for contributions, of information on sheep and their management, I submit the following remarks :

Independent of the consideration that the productions of the soil furnish sustenance for man and beast, agriculture is advanced from this basis to an exalted summit. During a long period of human history, ethics and physics were shrouded in mystery, and wrapped in unintelligible and boastful phraseology. But the book of nature has always presented an open page to the discerning and unprejudiced eye.

Agriculture and husbandry justly sustain a pre-eminence over other pursuits, in that, he who cultivates an acre of ground to most profit, or who rears the best domestic animal, does not hesitate to disclose all the means by which that object was attained.

That an animal which furnishes us with warm and elegant clothing, with delicious and wholesome food, and light to prosecute our noctural pursuits, is worthy of the fostering care of our government, and the assiduous attention of intelligent individuals, will I think be readily admitted.

I have been interested, and to a limited extent, personally engaged in the cultivation of fine wooled sheep, from a less to a greater number, for 22 years past.

An acquaintance with the character of the sheep is a science ; the proper and profitable management of sheep, is a great art—I think next, if not equal to manufacturing prime cheese,—requiring great skill and unremitting vigilance.

In what way the fine woolled sheep of Spain originated, whether produced in that country, or procured from some other, has not yet been decided by naturalists.

Whether they are a distinct race of sheep, or whether the fineness of their fleece is dependent on climate and cultivation, any more than the peculiarities subsisting between the European and the African, is yet left for scientific investigation.

But it is a fact generally known, that Spain has until within a few years furnished about all the fine wool manufactured in Europe, and that she was so tenacious of preserving this monopoly, as to enact severe penal laws against the exportation of Spanish sheep from that country.

It was only by royal munificence and favoritism in two instances that any sheep were carried out of that country. The first a present to the Elector of Saxony, at the beginning of the eighteenth century. The second to the King of France, now constituting the celebrated Rambouilet flock.

That a present of this description to the Elector of Saxony, in the face of all Europe, should be so appreciated as to elicit sovereign care is obvious. They were styled the Electoral flock, the most intelligent shepherds procured, and they were cultivated with unremitting attention. This flock, by great care and selection of bucks, has established and maintained its pre-eminence. The numerous private flocks of the nobles and gentry of Saxony, under various denominations, are derived from the increase and culling of the electoral.

The Arabians have advanced the noble horse to a degree of excellence beyond rivalry. The Saxons, proceeding on the same principles, have advanced the domestic animal next in importance to an exaltation that ought to make the inexperienced and uninformed pause, before they reject tho results of the interesting and intelligent operations of a century. I lay it down as an axiom, that so much of human operation as is based on scientific principles must necessarily stand.

The improvement of the Spanish sheep to that of Saxony was effected, and has been preserved entirely, by a scrupulous attention to purity of blood and the most discriminating selection of bucks. A superior Saxony buck is now worth in that country four times what he would bring in this. The traffic of the world has become too well disciplined to warrant the expectation of high pay in the market for a worthless article; Saxony wool yet maintains the highest quotations.

The first Saxony sheep imported into the United States were sold at auction three miles from my former residence, at which I was a purchaser. The novelty of the consideration that a new kind of sheep far surpassing the Merino, which in preceding estimation had been considered the ultimatum of excellence; and so recently sold in this country of such extragant prices, in one instance of a buck sold in Philadelphia for $1400 and an ewe for $1000, at once excited the highest sheep frenzy, and assembled at the sale all those who had imbibed a particle of taste and interest in sheep culture. The recollection of the characteristic distinctions which others and myself at that time made between Saxony and Merino is now truly ludicrous. For we were entirely in the dark as to the facts above narrated, and we were proceeding on the information that Saxony washed wool sold for $2 per lb. And yet strange as it may appear to some, I have seen one sample of Saxony staple and washed wool sent to this country, which, to a scientific manufacturer, furnished with the requisite machinery, would, at the price cloth at this day brings in our market, be worth $2 per lb.

From the preceding narrative it is plain, that the Saxony sheep imported into this country were from a variety of flocks of which the electoral was the parent.

Of the sheep introduced into this country from *Saxony*, four flocks might be admitted to be called *Saxony* sheep; of these one half might be denominated *prime*,—these sheep were generally labelled, but the best were branded either with a cross or a crown. I saw two entire flocks sold, which were brought as a return cargo, the captain being master and factor, which would disgrace any country whose name should be associated with pure blood and fine wool. These sheep were purchased by speculatois and sold through the country at high prices as *Saxony sheep*, from which as one source has originated the misapprehensions and discordant opinions of our best wool growers.

It was not until the distracted and disorganized state of the Spanish government, arising out of faction and French invasion, that some American gentlemen were able to transport some Merino sheep to this country. The first importation of Spanish sheep came distempered with foot rot, itch, and a long train of ails, whether owing to transportation and confinement or derived from their home flocks, I am unable to say. But such was their crippled and forlorn condition as to excite a long enduring prejudice against their introduction and cultivation, far exceeding any thing pertaining to *Saxony* sheep.

This indiscriminate application of the term Merino, and some recent recommendations of old fashioned Merino sheep and crossing with Bakewell, impose the necessity of going into the history of the Spanish flocks, which will be reserved for a future paper. F.

SAXONY SHEEP.

J. Buel, Esq.—Sir—In your last number, by my own, or a typographical error, I am made to say that Mr. Hamilton Rogers' flock of full blooded Saxon ewes sheared 3 lb. 9 oz. a head, making at 80 cents per pound, $2.85 to the fleece. It should have read 2 lb. 9 oz., making at 80 cents, $2.05 to the fleece. The account then stands thus:—

Mr. Grove's Saxon fleeces,		$2 40
Mr. Rogers' do (young sheep)		2 05
My own,		2 56
Average of Southdown fleeces,	$2 12	
Average of Bakewell do	1 98	
Difference between two highest,		$0 44

Cortland Village, Oct. 20, 1835. H. S. R.

Maple Grove, Oct. 4, 1835.

Mr. Buel—Sir—The weakness of my eyes has of late made it difficult for me to give even the necessary attention to my private correspondence, or I should have earlier noticed your extracts from Mr. Grove's reply to R.; so far at least as to have corrected its errors and supplied its omissions; for it will certainly puzzle any of your readers to make 2¾ lb. of Saxon wool at 80 cents, amount to $2.40, and I think they will be at a loss to account for the exclusion of our old friends the Merinos from this comparative estimate of the value of wools predicated, he says, on the price current for New-York, as published in the Cultivator for May.

However, leaving all this for Mr. Grove's explanation, let us take his own data, and from it, make a *corrected* calculation, and we shall arrive at results that will place the Saxon pretensions to superior value in fleece where they belong.

Merinos averaging 4 lb. of wool, at 60 cents, would yield	$2 40
Bakewell averaging 7 lb. of wool, at 33 cents, would yield	2 31
Saxons averaging 2¾ lb. of wool, at 80 cents, would yield	2 20
South Downs, averaging 4 lbs. of wool, at 53 cents, would yield	2 12

Thus we find by Mr. Grove's *own scale of valuation*, that the Saxons, with the exception of the South Downs, yields the least valuable fleece of the whole!! As to their *relative* grade of merits in constitution, early maturity, and size, nothing need be said.

But the fact is, that my merino flocks, of which, *five-sixths* are *ewes*, yielded this year an average of 4½ lbs. of well washed wool—still in my possession, for the inspection of those who may wish to examine it. Now let us compare them with Mr. Grove's *selected* flock of Saxons—not a "speculative breed of Saxon sheep," but a flock selected by one, than whom, it has been said, there is not in America "a more *exact*, skilful, and, for his age, experienced shepherd"—a flock chosen on the spot by one "brought up from childhood in the care of the best flocks of Germany." The advocates for Saxon wool could not desire a more advantageous selection for their cause. Now let us see the result.

R.'s merino flock averaged 4½ lb. at 60 cents	$2 70
Mr. Grove's Saxons, estimated at 2¾ lb. at 80 cents	2 20
Leaving a balance in favor of the merinos, of	$0 50

If any question should arise in Mr. Grove's mind, as to the *average* stated—the wool is still in my possession—if any doubt as to its *estimated value*, I can only say, that a friend of his, a near neighbor and a breeder of Saxon sheep, and who was also a large purchaser of wools, did me the favor of a visit; and on examinging the fleeces informed me that he considered the wool worth 60 cents.

If I am not mistaken, the Cultivator has repeatedly called the attention of its readers to the important subject of sheep-husbandry; I therefore presumed its columns were open to a free discussion of the subject, provided all personality was avoided; if so, may I ask of you to give place to an article that appeared sometime since on Merino and Saxon sheep, in the August number of the New-England Farmer, signed T, published in our last number—as it appears to be written by a practical man, well acquainted with both varieties of sheep. R.

SKINLESS OATS--INCREASE 28 FOLD.

J. Buel Esq.—Sir—In communicating the produce and cultivation of skinless oats raised by E. Holbrook, Esq. I beg you will not think me arrogant, or having any pretensions to great agricultural skill—our motive simply is, that we hope some experienced agriculturist will (through that truly valuable agricultural publication, the *Cultivator*,) communicate the result of their experience in the cultivation of the skinless oat. Mr. Holbrook procured four quarts of skinless oats, which I sowed broad-cast. The crop gathered and taken to the barn, was threshed, cleaned and measured: the product is three bushels and a half—the bushels weighing forty-four pounds. In consequence of a miscarriage when the oats were forwarded, they were not received until the 19th of May, when they were immediately sowed. The land appointed and prepared to receive them, was joining a timothy-field; the consequence was, when the timothy was mown down, an innumerable host of grasshoppers took possession of the oats, and commenced their usual destructive havoc, which prevented a much greater yield.

Preparation of the soil.—A piece of land from which a large crop of ruta baga was taken last November. As soon as the turnips were taken from the field, we run the plough up and down the furrows, (the turnips being cultivated upon the four furrow system.) The land remained in this state during winter, receiving all the benefits of the frost without exposing the soil to heavy rains &c. In March, the ridges with a plough, were struck down and harrowed; when ready for sowing, they were formed into eight step lands, ploughed deep, and sowed. I must remark, in consequence of the protracted sowing, I formed a composition of sheep manure, ashes, plaster, &c. &c. with which we gave a top dressing to expedite their growth, selecting a proper period according to our judgment, for the application: although we received scarcely any rain from the time of sowing, to the time of harvesting, they continued to grow luxuriantly. It may be well to remark, this mode of cultivation is not applicable to all soils, particularly sandy land. Yours with great respect,

THOS. MIDFORD.

Hyde-Park, Oct. 15, 1835.

EXPERIMENT ON FEEDING CALVES.

J. Buel, Esq.—Sir—If nothing of more importance is on hand to fill a column in your useful Cultivator, the following is at your service, to dispose of as you see fit.

As it is difficult to speak of one's own concerns without egotism, I hope that fault will be pardoned.

Long and careful observation has convinced me, that cows give more milk through the season, to take their calves from them the first or second week. Calves with kind treatment, will usually in two or three days, learn so as readily to drink the milk when presented to them, but they require about one-fifth more milk when fed to them; probably the saliva they swallow in sponging the milk from the teat may account for the difference, but they learn to feed on grass or fodder younger, and their food may more gradually be changed from milk to other feed, than can conveniently be done with a suckling.

Calves suddenly taken from a liberal supply of milk, to grass, are frequently affected with a diarrhœa that sometimes proves fatal.

I must acknowledge that I have been prejudiced against making any substitute for milk for the first ten or twelve weeks, with any expectation of raising a thrifty animal, till last year, 1834, I had two heifer calves dropped the 4th May: anxious to raise them, altho' of our common breed, but their dams were excellent milkers, I determined to try to raise them on whey. When they were 4 weeks old, I began to mix whey and a small quantity of shorts of wheat with their milk, and gradually lessened the quantity of milk, till they were 5 weeks old, and stopped the milk and fed them whey three times a day, and at morning and evening mixed a single handful of shorts for each calf with the whey; at noon, fed the whey alone. We set the whey in a clean vessel in a cool place, where it would not sour, for evening, warming it to near animal heat. In the morning, fed the first whey dipped from the cheese, and when about ten weeks old, one of them was killed by accident; to the other, we fed shorts till it was three months old; after fall feed was good, we fed her whey twice a day for a time, and then once a day, as long as we made cheese. In the winter, besides hay, she was fed a single handful, about ⅔ of a gill of flaxseed, mixed with a pint of wheat bran, twice a day; did not feed her any higher, as she was in as good flesh as was desired. She is now the largest heifer of her age in the vicinity—is as large as my two years old heifers that had a liberal supply of milk for the first ten or twelve weeks, and much more grain the first winter.

This year, 1835, we have fed two calves in the same manner; one of them has had no milk since it was twenty days old; it was in as good flesh but I think did not grow as fast for two or three weeks as it would on milk; they are doing as well as the one last year. I think they are now gaining of some calves in the vicinity that run with their dams.

From the above observations, I have drawn the following conclusions:

1st. That a calf may be raised well, on less than half the milk required to fatten it; that if they do not grow as fast for two or three weeks, they will gain it in the latter part of the season, and be better in the fall than those fed in the usual way.

2d. That the feed of calves should not be changed suddenly from a liberal supply of milk to grass, as it would not be very dissimilar to forcing a plant forward in a hot bed, and then transplanting it into the open air, when the temperature is but just above freezing.

3d. That it is more profitable to feed whey to calves than to hogs.

4th. That the practice is inexcusable of slaughtering calves and throwing their flesh to the hogs, because their milk will fetch more in cheese, than the veal will for the table. If the Creator had given us liberty to destroy the lives of his creatures thus wantonly—the flesh of the swine thus fed, must be unwholesome food. The fluids and flesh of carniverous animals, or such as feed on flesh, are highly charged with acrid particles, which may strictly be termed poisonous. It is believed that nothing but extreme hunger will induce one carniverous animal to eat the flesh of another, except, that dogs kept on vegetable food, have sometimes been eaten by wolves; and it is believed that the flesh of dogs thus fed, would be less deleterious than pork fed on flesh; pork thus fed, should be prohibited from being sold for food, as it is calculated to produce the most virulent disorders, such as putrid fever, cholera, &c.

M. R. PORTER.

Fowler, Tumbull Co. Ohio, Oct. 12, 1835.

IMPORTATION OF VALUABLE ENGLISH STOCK.

I observe in the last number of the Genesee Farmer, a recommendation for the formation of an association to import Short Horned Cattle.

I beg to state, that I have myself recently brought from England a number of the best description of cattle, sheep and horses. The cattle are chiefly of the improved Durham Short Horns, amongst which are 4 yearling bull calves, several heifers of the same age, and the rest milch cows; many of which are now in calf to my pure bred bull "*Rover*," sired by "*Rockingham*." My sheep were obtained from the best English breeders, and are of the most improved sort, remarkable both for quality and quantity of wool. The horses, comprise two yearling stud colts from the celebrated racing horse "Humphery Clinker," (out of thorough bred mares which I now have) one two year old stud colt of the hunting breed, by old Catfoss—one three year old stud of the Cleveland Bay, by "Strickland's King Alfred," and several mares of the various breeds. The whole of the above were selected by myself from the most superior stock of that country. Should any of those gentlemen who are so laudably coming forward to form the association alluded to for the important purpose of improving the stock of this country, deem it worth their notice to view the above, I shall have great satisfaction in showing the same to them. I likewise brought over with me some hogs, which I consider of an excellent kind.

THOS. WEDDLE.

East-Bloomfield, October 6, 1835.

BERKSHIRE PIGS.

Mr. Buel,—Sir—If your patience is not already exhausted with my *piggish epistles*, I will trouble you with this, my last.

The Berkshire breed of pigs now in my possession, were imported by Siday Hawes, Esq. in 1832.

Previous to his leaving England to settle in this country, Mr. H. spent some time in search of the *best breed* of pigs to introduce here, and finally settled upon the Berkshire, as uniting the most desirable qualities; viz. *good breeders, early maturity,* and *great aptitude to fatten.* They are thick, shortlegged, round bodied animals; remarkable heavy in the hams, and very peculiar for smoking, being more lean than fat, and may be killed at any weight from 25 to 700 lbs.

I have tried this cross with my *Improved China*, and was much pleased with the result. A pig is now fattening, which when killed you may hear the results.

This breed of pigs is spreading over the country—having sold them to Edwards Ogden, Esq. of New-Orleans—J. Elliot, Esq. of Tuscumbia, Alabama—Geo. S. Attmore, Esq. Newbern, N. C.—A. A. M. D. Robinson of Kentucky, and to gentlemen in various parts of this state. I have only a few males on hand for sale. My price for these, as well as the Chinese, is Ten Dollars a pair, not over eight weeks old—after that age, twelve and a half cents per pound extra for all over 45 pounds.

The above cut represents a Berkshire sow—and from "Parkinson's Treatise on live Stock" I have transcribed the following account of this celebrated breed.

"The Berkshire pigs are distinguishable by their colour and shape. Their colour is spotted white, and some are sandy with small black spots irregularly all over them—a few are entirely sandy. The hair is long and thinly set, but much curled, looking very rough, and the real true breed feather-eared, which looks rather unseemly, but is found not to be an imperfection. The hair indicates a coarseness, as if their skins were thick, but they are quite the reverse, the best sort, although very large, remarkably thin in the rind, and equally fine in the flesh; they are with very few or any exceptions better known by their hair than by any other appearance, and the best of these pigs have no bristles; indeed so remarkable are they in that respect that those I took to America received the name of 'Parkinson's no bristle pigs.' The Americans were so partial to this breed that I sold sucking pigs weighing 30 to 32 lbs. each when seven or eight weeks old at $20 for a sow, and $30 for a boar. I sold a sow pig at six months old for $70. One sow of this kind made $125 in eleven months: and Gen. Stone offered to lay 100 guineas that he would raise two of these pigs, and produce an increase of one pound a day for a whole year. This bet was offered in a public company and canvassed over, but was not taken, as their perfections had been seen. I knew a pair of the same breed, killed at the age of one year and a quarter, which weighed 41 stone, consequently the pigs' age being 456 days and the weight 574 lbs. the increase for the time was 1 lb. 4 oz. and 9ds. a day.

I have purchased of E. Phinny, Esq. of Cambridgeport, Mass. a sow pig of a breed very famous in that state known as the "*Mackey Breed,*" which have taken several premiums at Brighton and other fairs, with which I intend crossing with my China and Berkshire as an experiment. I also engaged of a gentleman near Charlestown a pair of pigs of the same breed, but from some cause or other, they have not come to hand.

I have also a pair of pigs which I procured of Judge Geer, of Glen's Falls, very celebrated in the county of Saratoga, for great weight, having attained at nine months 300 lbs. It is my intention to keep each breed pure and distinct, as well as to try the different crosses. Should I be successful in my experiments, you may hear from me again.

CALEB N. BEMENT.

Watervliet, Oct. 14, 1835.

J. Buel, Esq.—Sir—Believing it the duty of every man to communicate to the public any information that he can give, tending to the advancement of agricultural improvements, I take the liberty to communicate the effect of an experiment on the use of clothier's flock as manure.—Observing at a woollen factory in my neighborhood, that they were throwing the shearings of the cloth and waste wool into the river, it occurred to me, that it being an animal substance, it would be a good manure. I procured several wagon loads and spread on my land; but in order to test the value of it, I spread on a small piece of ground before ploughing about one bushel of the flock to a rod square of old corn hills, on a gravelly, pavingstone soil; and by the side of this, I spread hog manure at the rate of at least double that quantity, and ploughed both in. Where the flock was spread, I suffered no other manure to be used, and planted both with Indian corn. On the ground where the hog manure was used, I manured in the hill with the same, and plastered twice; after the corn came up, and between the hoeing and harvesting the corn, I measured off seven square rods as correctly as possible, allowing half the space between the outside rows. The produce was $8\frac{1}{2}$ bushels of ears, large measure, which is a fraction over 99 bushels of shelled corn to the acre. The same quantity of the land, where the hog manure was used, did not produce 50 bushels to the acre. The land was as near equal in quality as could be—planted the same day, with the same kind of seed, and treated exactly alike, except in the manuring and plastering. I have learned since trying the experiment, that flock has been used by some in this country, as a manure; yet I believe the value of it is not generally known. You will make such use of the above information as you think proper.

Very respectfully your ob't serv't, J. BURROWS.

PATENT CHEESE-SHELVES.

MR. BUEL.—Dear Sir—I deem it due to the public to offer for the columns of the "Cultivator," some notice of "The semi-revolving cheese rack or shelves"—an improvement for which Mr. Henry Weber, of East Richfield, Otsego county, has lately obtained a patent, and which I doubt not, will meet the approbation of every dairy man who will make trial of the same, and which, I think, will go into general use at no very remote period. The saving in labor and risk of the cheese are great, and the expense of fitting up a new room on his plan would not greatly exceed that in common use, as the room may be much smaller.

One rack with 6 shelves six feet long, 24 inches wide, set 11 inches apart, will hold 18 cheeses weighing from 100 to 140 lbs. each, suspended by a wooden shaft 2 inches square, resting on 2 rails extending the whole length of the room, $3\frac{1}{2}$ feet high, or if only a single rack, on 2 posts; each rack requires about 4 feet on the length of the rails, to turn well.—and its cost will not exceed 6 dollars, including the materials of which it is made.

On this system, the cheese dries much faster, as it is turned on to the dry side of the shelf every day, and has a sound and dry rind. He has one set of extra shelves, which are slipped in close about the cheese before turned, on which shelf the cheese lies when turned over; the others are then liberated for another rack, and so on through the room. By the aid of these 6 extra shelves the cheese need not fall but a trifle, if any. An examination of this improvement may be had by any one calling on Mr. Weber, at East Richfield, or the subscriber, in South Trenton Oneida county. EPHRAIM PERKINS.

NEW CONTRIVANCE.

JESSE BUEL—Dear Friend—Having found it troublesome to boil potatoes for my stock in a potash kettle, and to get them out of the water when cooked, I had a thing made that has very much lessened the difficulty.

It is a square wooden basket about 24 inches at top, 20 inches at bottom and 17 inches deep; frame of oak 2 by $1\frac{1}{2}$ inches with oak slats of 1 inch, and same distance apart, to fill sides and bottom, two of the top rails projecting at each end, made longer than the diameter at the kettle, serving as handles to lift the basket and as a rest on the brim of the kettle for the purpose of keeping the potatoes above the water in it. I first put the potatoes into the basket, and by throwing upon them a few pailsful of water, and a person at each end lifting and shaking them, most of the dirt is washed out; then set the basket in the kettle with only water enough to reach the bottom of the basket, throw a piece of old carpet over the kettle to keep in the steam, make a brisk fire and the potatoes are soon *fit to put on a table.*

A boy at each end can lift the basket out, refil, and set another mess cooking in a short time, a little hot water should be added as each new mess is put into the kettle to replace the waste by steam.

In the last Cultivator, under the article "*The Roller,*" you speak of "*the spiked roller* which is used for pulverizing stiff soils preparatory for wheat." I was before ignorant of such an implement, but had concluded to make one for the purpose of disturbing the moles, which are numerous and destructive in my newly made clover fields. It has also occurred to my mind that a narrow rotary harrow may be constructed to till growing corn advantageously, and I mention it in hopes that some ingenious person may propose a model, or construct one.

Thy assured Friend, ROB. WHITE, Jr.

Shrewsbury, 10th Mo. 1835.

CANADA THISTLES AND SWEET ELDER.

There is nothing that indicates in a greater degree, the spirit of improvement among our farmers, than the frequent queries that are made in the agricultural papers, in respect to "the best ways and means" of managing their lands,—and the frequent answers that are given to such questions by scientific agriculturists. It is thus that any information obtained by one man, either by scientific observation or by accidental causes, becomes the public property, and is equalized through the community.

For instance, it has been found difficult to construct *Ice Houses* in a gravelly soil, that would keep ice through the summer. But it has been ascertained by philosophical experiment and observation, that *tan bark* is a most perfect non-conductor of heat,—and that, consequently, by surrounding the ice 2 or 3 feet in such *tan*, it can be kept with ease and certainty.

So also in regard to *Cider*—it is satisfactorily settled by *experience*—the best teacher of wisdom,—that after it is placed in the cellar in barrels, the *bung should never be taken out*,—allowing only a *small gimblet hole*, for a vent, to prevent the fermentation from bursting the barrels. Cider thus kept, is far superior to that which is exposed in a greater degree to the open air. And so I could go on almost ad infinitum, illustrating the same idea.

These to be sure, are small things,—but remember, the mountain is composed of mites,—and that many *small things, well conducted,* go to make up the mass of a family's happiness and prosperity.

The poet says,

"Great oaks from little acorns grow.
"Large streams from little fountains flow."

A neighbor of mine, who is also a constant reader of the excellent and useful paper, *the Cultivator*, desires me to say that he had on his farm, last year, a quantity of *Canada Thistles*, growing very thrifty,—that just before the blossoms began to open, he caused them to be mown, and every one of them were entirely destroyed, root and branch. He thinks, and others have expressed the same opinion, that by mowing them at the particular time, just before they begin to blossom, they are *sure to be destroyed.* Some people think they must be cut at a particular time during the moon's changes in order to kill them. How much *influence the moon has on Canada thistles*, I shall leave to all the *old women* and Sir John Herschel to determine!

I have heard it suggested that the severe frost of last winter killed many Canada thistles. If so, it makes good the old adage,—"There is no *great evil* without *some good.*"

A friend wishes me to inquire of the numerous readers of the Cultivator, if they know of any method of destroying the *Sweet Elder.* It grows very luxuriantly on his farm, and is very troublesome. He has tried to kill them by repeated mowing—but it rather seems to increase their growth. He has also tried ploughing and pulling them up—but all to no purpose, as they will grow again from a small root—and some land is so wet it cannot be ploughed

Can any one tell how to *exterminate* the *Sweet Elder ?** If they possess any such information and will communicate it for the Cultivator, they will do a favor to at least *one New-England Farmer.*

Bernardston, Mass. Oct. 1835. H. W. C.

To the Conductor of the Cultivator.—Sir—I think if I understand thy suggestions in the Cultivator, for to say that you feel yourself excused from giving the public any information on the subject of rearing and feeding silk worms, as some one has issued a paper devoted to that subject.† I confess that I should not be satisfied to take a paper that would tolerate the idea, that farmers should be at the expense and trouble to take one paper devoted to the improvement of Indian corn, another to potatoes, and a third, to treat of the matter and efficacy of manures. The paper that farmers should patronize, should treat of every subject connected with farming, and indeed of every subject connected with rural economy. I therefore conclude, that notwithstanding Mr. Blydenburgh's very respectable paper, you will think it an object to give your patrons all the light on the subject of rearing and feeding silk worms, that may be in your power—and to render that information useful to the people, I should think, as a proper means of encouraging the growth of silk, you also should inform cottagers and operatives how to reel and prepare their silk for market. All these subjects are so intimately connected with agriculture, and the subject is so new in this country, it should supersede other matters. I learn from the few publications I have seen, that a great mortality often attends the feeding of silk worms.

The only silk worms I have ever seen were of my own hatching last spring. A very polite neighbor sent me about 500 ova, which were hatched at the right time to be fed from three small mulberry trees of two years' growth, that I had procured for ornament, rather than use. From these trees, one about 7 feet, the other about $2\frac{1}{2}$ feet high, I collected probably food enough for my worms until three days before they began to spin. And then the consumption was so great that I was obliged to inquire for the wild mulberry of the neighborhood, and this brought me to examine the varieties that our woods and hills produce. Some had small hard leaves, others bore large stiff thick leaves like unto the drawing No. 1.‡

These produce very fine fruit, and the last I found in my search was a tree growing on the farm of Jacob R. Snyder, Esquire, near the Rosendale Bridge ; this grew on the side of a steep mountain, very much in

* Our *Massachusetts* correspondent will find this inquiry answered by a *New-Jersey* Farmer, Simeon M'Coy, in page 81 of this volume—another evidence of the facility afforded by agricultural papers, of diffusing useful agricultural knowledge.

† We *now* publish, that we *shall* take cognizance of whatever concerns the silk grower, and thank Agricola for his hints, as well as for his practical information on the subject.—*Cond.*

‡ The drawings here referred to came to hand, and may be examined at the Cultivator Office. No. 1 is about 8 inches long, above the footstalk, and of like breadth, and is much contracted in the longitudinal centre, resembling in shape the form of the leaves of the common white Mulberry. No. 2 resembles the leaf of the Chinese Mulberry, and is 8 inches broad and more than 10 long, narrowed and pointed at the apex. No. 3 is about 11 inches broad and the same in length.

the manner the China Mulberry is said to grow; in clumps with strong sprouts and succors starting out from the roots and at the bends of the tree, and bore pretty large fruit sparsely over the main branches. The leaves, a drawing of which I have herewith enclosed, marked No. 2* is of the exact dimensions of several leaves taken from different parts of the tree.

These leaves were of a bright green, more smooth than any American mulberry I had before seen, and very tender, and when given to my silk worms with the white Italian mulberry leaves, they appeared to prefer these large leaves. I attempted to inoculate these on the branches of my Italian mulberry but failed. They did not take.

Drawing No 3* is taken from a leaf raised from the seed of the China mulberry. This drawing does not describe the actual size of the leaf as it was much puckered and very uneven on the surface, but the size is exact as to the circumference, for like all the rest the leaf was laid down on the paper and a pencil run accurately round the edge.—Thus much for the mulberry leaves on which I feed my 500 worms. I shall now describe the progress of my brood.

My silk-worms began to hatch on the 29th May, 1835, when the mulberry leaf was a little larger than a shilling piece; I fed them to the 20th July, on three trees, two years' growth from lays. Then obtained leaves from a wild mulberry on the mountain at Rosendale. Up to this time I did not discover that more than two worms had died. I now fed them with the wild mulberry leaves to the 26th July, when they began to spin. The distance to Snyderville being about two miles, and the weather very warm, I only went twice for leaves, and kept them in a cellar wet, in which state they were fed with occasionally some young leaves that would come on my Italian mulberry trees. Under this treatment, I lost 5 or 6 worms before they all had spun; that of 500 worms not more than 8 died during their whole progress from the egg to maturity, and all but two died I think by reason of feeding wet leaves

On the whole, I conclude, from my self-taught experiment, (for I have never seen any worms but those I have reared this season) that it would require very few Italian mulberry trees to feed 60 or 100,000 silk worms. And 2d, I am led to believe there are such an extensive variety of native mulberries, that some of them may on experiment be found to be equally suitable for the feeding silk worms as the Italian, or Chinese mulberry, and of all that I have seen there are two sorts or varieties at the Rosendale, that appear best calculated for that purpose. These grow conveniently: the leaf is very large and succulent; the tree appears inclined, if it had room, to grow low with spreading boughs, and the worms eagerly eat the whole leaf with the exception of the spine, and if fully grown, a few of the largest ribs. AGRICOLA.

Science of Agriculture.

From Chaptal's Chemistry applied to Agriculture.

SUCCESSION OF CROPS.

A soil may be forced, by extreme care, enormous expense, and the use of manure without measure, to produce all sorts of crops; but it is not in such sort of proceedings that the science of agriculture consists. Agriculture ought not to be considered as an object of luxury; and whenever the produce of agricultural management does not amply repay the care and expense bestowed upon it, the system followed is bad.

A good agriculturist, will, in the first place, make himself acquainted with the nature of his soil, in order to know the kind of plants to which it is best adapted; this knowledge may be easily acquired by an acquaintance with the species of the plants produced upon it spontaneously, or by experiments made upon the land, or upon analogous soils in the neighborhood.

But however well adapted the soil and climate may be to the cultivation of any particular kind of vegetable, the former soon ceases to be productive if constantly appropriated to the culture of plants of the same or analogous species. In order that land may be cultivated successfully, various kinds of vegetables must be raised upon it in succession, and the rotation must be conducted with intelligence, that none unsuited either to the soil or climate may be introduced. It is the art of varying the crops upon the same soil, of causing different vegetables to succeed one another, and of understanding the effect of each upon the soil, that can alone establish that good order of succession which constitutes *cropping*.

A good system of cropping is, in my opinion, the best guarantee of success that the farmer can have; without this, all is vague, uncertain, and hazardous. In order to establish this good system of cropping, a degree of knowledge is necessary, which unhappily is wanting to the greater part of our practical farmers. I shall here state certain facts and principles, which may serve as guides in this important branch of agriculture. More extensive information on this subject may be found in the excellent works of Messrs. Yvart, and Pictet †

PRINCIPLE 1. *All plants exhaust the soil.*

Plants are supported by the earth, the juices with which this is impregnated forming their principal aliment. Water serves as the vehicle for conveying these juices into the organs, or presenting them to the suckers of the roots by which they are absorbed; thus the progress of vegetation tends constantly to impoverish the soil, and if the nutritive juices in it be not renewed, it will at length become perfectly barren.

A soil well furnished with manure may support several successive crops, but each one will be inferior to the preceding, till the earth is completely exhausted.

PRINCIPLE 2. *All plants do not exhaust the soil equally.*

Plants are nourished by air, water, and the juices contained in the soil; but the different kinds of plants do not require the same kinds of nourishment in equal degrees. There are some that require to have their roots constantly in water; others are best united with dry soils; and there are those again, that prosper only in the best, and most richly manured land.

The grains and the greater part of the grasses, push up long stalks, in which the fibrous principle predominates: these are garnished at the base by leaves, the dry texture and small surface of which do not permit them to absorb much either of air or water; the principal nourishment is absorbed from the ground by their roots; their stalks furnish little or no food for animals; so that these plants exhaust the soil, without sensibly repairing the loss, either by their stalks, which are cut to be applied to a particular use, or by their roots, which are all that remain in the ground, and which are dried and exhausted in completing the process of fructification.

Those plants, on the contrary, that are provided with large, fleshy, porous, green leaves, imbibe from the atmosphere carbonic acid and water, and receive from the earth the other substances by which they are nourished. If these are cut green, the loss of juices, which the soil has sustained by their growth, is less sensibly felt, as a part of it is compensated for by their roots. Nearly all the plants that are cultivated for fodder are of this kind.

There are some plants which, though generally raised for the sake of their seed, exhaust the soil less than the grains; these are of the numerous family of leguminous plants, and which sustain a middle rank between the two of which I have just spoken. Their perpendicular roots divide in the soil, and their large leaves, and thick, loose, porous stalks readily absorb air and water. These parts preserve for a long time the juices with which they are impregnated, and yield them to the soil, if the plant be buried in it before arriving at maturity; when this is done, the field is still capable of receiving and nourishing a good crop of corn. Beans produce this effect in a remarkable degree; peas to a less extent.

Generally speaking, those plants that are cut green, or whilst in flower, exhaust the soil but little; till this period they have derived their support almost exclusively from the air, earth, and water; their stalks and roots are charged with juices, and those parts that are left in the earth after mowing, will restore to it all that had been received from it by the plant.

From the time when the seed begins to be formed, the whole system of nourishment is changed; the plant continues to receive nourishment for the perfecting of its seed, from the atmosphere and the earth, and also yields to the grain all the juices it had secreted in its own stalks and roots: by this means the stalks and roots are dried and exhausted. When the fruits have arrived at maturity the skeleton remains of the plant, if abandoned to the earth, restore to it only a small portion of what had been taken from it.

The oleaginous seeds exhaust the soil more than the farinaceous seeds; and the agriculturist cannot be at too much pains to free his grounds from weeds of that nature, which so readily impoverish them; especially from the wild mustard, sinapis arvensis, with which cultivated fields are so often covered.

PRINCIPLE 3. *Plants of different kinds do not exhaust a soil in the same manner.*

The roots of plants of the same genus or family, grow in the soil in the same manner, they penetrate to a similar depth, and extend to corresponding distances; and exhaust all that portion of the soil with which they come in contact.

Those roots which lie nearest the surface, are more divided than those that penetrate deeply. The spindle or tap roots, and all those that penetrate deeply into the earth, throw out but few radicles near the surface, and consequently the plant is supplied with nourishment from the layers of soil in contact with the lower part of the root. Of the truth of this I have often had proof, and I will mention an example. If when a beet or turnip is transplanted, the lower portion of the spindle be cut off, it will not grow in length, but in order to obtain its supplies of nourishment from the soil, it will send out radicles from its sides, which will enable it to obtain the necessary supplies from the upper layers of the soil; and the root will become roundish instead of long.

Plants exhaust only that portion of the soil which comes in contact with their roots; and a spindle root may be able to draw an abundance of nourishment from land, the surface of which has been exhausted by short or creeping roots.

The roots of plants of the same and of analogous species always take a like direction, if situated in a soil which allows them a free development; and thus they pass through, and are supported by, the same layers of earth. For this reason we seldom find trees prosper that take the place of

* See note on page 121.

† "Cours complet d'Agriculture," articles *Assolement* et *Succession de Culture*, par Yvart. "Traite de Assolemens," par Ch. Pictet.

others of the same species; unless a suitable period has been allowed for producing the decomposition of the roots of the first, and thus supplying the earth with fresh manure.

To prove that different kinds of plants do not exhaust the soil in the same manner, it is perhaps sufficient for me to state, that the nutrition of vegetables is not a process altogether mechanical: that plants do not absorb indiscriminately, nor in the same proportions, all the juices and salts that are presented to them; but that either vitality, or the conformation of their organs, exerts an influence over the nutritive action; that there is on the part of plants some taste, some choice regarding their food, as has been sufficiently proved by the experiments of Messrs. Davy and De Saussure.* It is with plants as it is with animals, there are some elements common to all, and some peculiar to each kind: this is placed beyond doubt, hy the preference given by some plants to certain salts, over others.

PRINCIPLE 4. *All plants do not restore to the soil either the same quantity or the same quality of manure.*

The plants that grow upon a soil, exhaust more or less of its nutritive juices, but all return to it some remains, to repair a part of its loss. The grains and the oleaginous seeds may be placed at the head of those which exhaust a soil the most, and repair the least the injury done it. In those countries where plants are plucked up, they return nothing to the soil that has nourished them. There are some plants to be sure, besides those mentioned above, that by forming their seed consume a great part of the manure contained in the soil; but the roots of many of these soften and divide the soil to a considerable depth; and the leaves which fall from the stalk during the progress of vegetation restore to the earth more than is returned by those before mentioned. There are others still, the roots and stalks of which remaining strong and succulent after the production of their fruits, restore to the soil a portion of the juices they had received from it; of this kind are the leguminous plants.

Many plants that are not allowed to produce seed, exhaust the soil but very little; these are very valuable in forming a system of successive crops, as by introducing them into the rotation, ground may be made to yield for many years without the application of fresh manure; the varieties of trefoil, especially clover and sainfoin, are of this sort.

PRINCIPLE 5. *All plants do not foul the soil equally.*

It is said that a plant fouls the soil, when it facilitates or permits the growth of weeds, which exhaust the earth, weary the plant, appropriate to themselves a part of its nourishment, and hasten its decay. All plants not provided with an extensive system of large and vigorous leaves, calculated to cover the ground, foul the soil.

The grains, from their slender stalks rising into the air, and their long, narrow leaves, easily admit into their intervals those weeds that grow upon the surface, which being defended from heat and wind grow by favor of the grain they injure.

Herbaceous plants, on the contrary, which cover the surface of the soil with their leaves, and raise their stalks to only a moderate height, stifle all that endeavors to grow at their roots, and the earth remains clean. It must be observed, however, that this last is not the case unless the soil be adapted to the plants, and contain a sufficient quantity of manure to support them in a state of healthy and vigorous vegetation; it is for want of these favorable circumstances that we often see these same plants languishing, and allowing the growth of less delicate herbs, which cause them to perish before time. Vegetables sown and cultivated in furrows, as are the various roots and the greater part of the leguminous plants, allow room for a large number of weeds; but the soil can be easily kept free by a frequent use of the hoe or weeding fork; and by this means may be preserved rich enough for raising a second crop, especially if the first be not allowed to go to seed.

The seeds that are committed to the ground often contain those of weeds amongst them, and too much care cannot be taken to avoid this; it is more frequently the case, however, that these are brought by the winds, deposited by water, or sown with the manure of the farm yard.

The carelessness of those agriculturists who allow thistles and other hurtful plants to remain in their fields, cannot be too much censured; each year these plants produce new seeds, thus exhausting the land and increasing their own numbers, till it becomes almost impossible to free the soil of them. This negligence is carried by some to such an extent, that they will reap the grain all round the thistles, and leave them standing at liberty to complete their growth and fructification. How much better it would be to cut those hurtful plants before they flower, and to add them to the manure of the farm. From the principles which I have just established, we may draw the following conclusions.

1st. That however well prepared a soil may be, it cannot nourish a long succession of crops without becoming exhausted.

2d. Each harvest impoverishes the soil to a certain extent, depending upon the degree of nourishment which it restores to the earth.

3d. The cultivation of spindle roots ought to succeed that of running and superficial roots.

* The new theory teaches, that plants do not part their food, but that they throw off, as excrementitious matter, whatever is not adapted to their wants. —*Cult.*

4th. It is necessary to avoid returning too soon to the cultivation of the same or of analogous kinds of vegetables, in the same soil.*

5th. It is very unwise to allow two kinds of plants, which admit of the ready growth of weeds among them, to be raised in succession.

6th. Those plants that derive their principal support from the soil should not be sown, excepting when the soil is sufficiently provided with manure.

7th. When the soil exhibits symptoms of exhaustion from successive harvests, the cultivation of those plants that restore most to the soil, must be resorted to.

These principles are confirmed by experience; they form the basis of a system of agriculture rich in its products, but more rich in its economy, by the diminution of the usual quantity of labor and manure. All cultivators ought to be governed by them, but their application must be modified by the nature of soils, and climates, and the particular wants of each locality.

To prescribe a series of successive and various harvests, without paying any regard to the difference of soils, would be to commit a great error, and to condemn the system of cropping in the eyes of those agriculturists, who are too little enlightened to think of introducing into their grounds the requisite changes.

Clover and sainfoin† are placed amongst the vegetables that ought to enter into the system of cropping, but these plants require a deep and not too compact soil, in order that their roots may fix themselves firmly.

Flax, hemp, and corn require a good soil, and can be admitted as a crop only upon those lands that are fertile, and well prepared.

Light and dry soils cannot bear the same kind of crop as those that are compact and moist.

Each kind of soil, then, requires a particular system of crops, and each farmer ought to establish his own upon a perfect knowledge of the character and properties of the land he cultivates.

As in each locality the soil presents shades of difference, more or less marked, according to the exposure, composition, depth of the soil, &c. the proprietor ought so to vary his crops, as to give to each portion of the land the plants of which it is best adapted; and thus establish a particular rotation of crops upon the several divisions of his estate.

The wants of the neighborhood, the facility with which the products may be disposed of, and the comparative value of the various kinds of crops, should all be taken into the calculation of the farmer, in forming his plan of proceedings.

There is another point in regard to crops that ought to be well weighed hy the farmer; though his lands may be suited to cultivation of a particular kind, his interests may not allow him to enter upon it. The more abundant any article is, the lower will be its price; he ought then to prefer those crops of which the sale is most secure. If a product cannot be consumed upon the spot, it is necessary to calculate the expense of transporting it to a place of sale in countries where it is needed.

A proprietor ought to provide largely for the wants of his animals and of the men living upon his estate, before arranging for the disposal of surplus crops; he will then calculate his various harvests in such a manner, as to be always secure of receiving from the earth the means of subsistence for those employed in performing the labor.

An intelligent farmer, whose lands lie at a distance from a market, will endeavor to avoid the expenses incident to the transportation of his products; and in order to do this he will give the preference to those harvests of fodder or of roots which may be consumed upon the place by his dependents and his animals.

There is another circumstance which must be attended to in sowing those lands which are light, or which lie upon a slope; for these it is necessary to employ such vegetables as cover the soil with their numerous leaves, and unite in every direction by their roots, thus preserving it from being washed away by rains, and at the same time protecting it from being too much dried by the burning rays of the sun.

I hope it will be written upon the tables of your heart, in characters not to be effaced by ambition, avarice or pleasure, that the only sure and certain happiness to be found on this side of the grave, is a consciousness of your own rectitude. All peace and homefelt joy are the reward of virtue. And there is no applause in this world worth having unless it is crowned with our own.—*Sir J. E. Wilmot to his Son.*

* In addition to the reasons I have given why plants of the same or analogous kinds should not be cultivated in succession upon the same soil, there is another which I will here assign. M. Olivier, member of the French Institute, has described with much care all the insects which devour the neck of the roots of grain; these multiply infinitely if the same or analogous kinds of plants be presented to the soil for several successive years; but perish for want of food whenever plants not suited to be food for their larvæ, are made to succeed the grains. These insects belong to the family of Tipulæ, or to that of flies. (Sixteenth Vol. of the *Memoirs of the Royal and Central Agricultural Society of Paris.*)

† Sainfoin thrives, we believe, only in a calcareous soil. The various attempts to raise it in the states, have hitherto, we believe, wholly failed.—*Cult.*

Miscellaneous.

PINE PLAINS.

[Large districts of our country bear this denomination. Their intrinsic value for agriculture is daily becoming better appreciated; and under improved management, with the aid of the clay marl which generally underlays them, they promise soon to be among our most profitable lands. The following judicious remarks, on the proper mode of cultivating these lands, on "frequent ploughings," and on "natural meadows," although written for Saratoga, have a general application, and cannot but be read with profit by all who cultivate sandy lands. They are extracted from a geological survey of Saratoga county, written by Dr. *Steele,* of Saratoga Springs.]

The method which should be pursued with this soil, in order to obtain the greatest possible profits, seems to be agreed, among the most experienced farmers, to be the following: First crop, winter wheat; second, Indian corn; third, barley, oats, spring wheat or rye, with which grass seed should be sown, (clover and timothy is preferred) and the whole ploughed or dragged in, at the same time. Experience has likewise given currency to the belief that the *roller* is a very important implement in seeding sandy soils. It should be employed immediately after the seed is put in. This renders the surface compact and smooth, and gives a depth and firmness to the roots of the young plants, that they do not possess when the seed is strewed over the surface, as is the usual custom; and besides, it is supposed to protect it very materially against the effects of the winter.

On the following season, the clover is to be well plastered, and the crop mowed for hay: the next season it should be again well strewed with plaster, and it then may be fed until the latter part of August or the beginning of September; at which time it is to be turned over with the plough, and prepared for a future crop of grain. Wheat succeeds well, but there is some contrariety of opinion as to the mode of putting in the seed; the usual practice is to cross plough and break up the sod before the seed is sown; but those who have practised it, think the crop succeeds best when the seed is sown on the top of the furrows, and for this purpose the earth, after being well turned over, is rolled and merely harrowed. The seed is then sown and dragged in with a light harrow, or ploughed in the way of the furrows, with a very light plough; but not so as to disturb the sod.

Some farmers, who have not made themselves acquainted with the use of the roller, have adopted the following method: they simply turn over the sod, and then cast the seed immediately on the top of the furrows; but it is obvious, that passing a roller over the surface, and then a light harrow would have the effect to fill up the interstices of the furrows, and render them more even for the reception of the seed; besides, it would render the earth more compact, and press it more closely to the green crop turned under, and this is considered very essential in order more readily to perfect its decomposition, and thereby render it subservient to the growth of its successor, for which purpose it is buried.

Many farmers prefer Indian corn, instead of wheat, on the sod, and some difference of opinion exists as to the propriety of turning over the sod in the fall, or in the spring immediately before planting. It should always be turned over in the fall, before it has ceased growing, and in the spring after it has pretty well advanced.

It seems to be agreed on all hands, that three successive crops are all that should be attempted before the field be again seeded, and the same rotation of crops be pursued. Under this course the quality as well as the quantity of the produce will annually improve, and an increase of fertility be constantly added to the soil.

This soil would receive great and lasting improvement from the transposition of the marl which lays at the bottom, to the surface. This would give more tenacity and consistency to the soil, and prepare it more effectually for the benefit of the vegetable manure, which is to be supplied by frequent seeding. With this dressing, all those sandy hillocks, which are blown about like snow drifts, might be reclaimed and converted into ornamental as well as profitable appendages to the farm.*

The practice of clovering and plastering has been resorted to, and is in general use for the purpose of improving the soil; and it is universally acknowledged to be by far the cheapest and best method hitherto adopted. Much complaint is, however, made of the liability of the clover to be killed out during the winter; but several distinguished practical farmers speak with confidence, that if the seed be ploughed or well harrowed in, and then well rolled, this evil will no longer exist. Covering the seed when it is sown, is in practice with some farmers, and the effects resulting from it justifies the procedure; but the roller, so far as my knowledge extends, has seldom been used on these soils, although it has been resorted to, and, indeed, is in general use with some of the farmers on the loamy soils, where its good effects have not been denied by any.

The idea of rendering the earth "*mellow*" for the reception of the seed, which means, to have it finely pulverized and light, in common language, "*like an ash heap,*" does not appear to be so important as many of our farmers seem to imagine. The great object of ploughing, is to destroy and cover in the earth every species of vegetation, that the crop to be expected from the seeding, may have nothing to choke and impede its growth, or deprive it of any share of the nutriment that there is in the soil, which would be useful to its own health and vigour; when this object is effected, the plough can be of no further use, except to cover the seed.

The prevalent opinion, that turning in the *dew* or exposing a *new surface* of the earth frequently to the rays of the sun, enriches the soil, has likewise no foundation in fact. The earth can imbibe nothing from the sun's rays but heat and light, which it possesses in sufficient quantity for all the purposes of vegetation, where it has not been moved at all. Who has not observed the most luxuriant spontaneous productions, where the soil had not been stirred for years? and it is a maxim with farmers, that "where weeds grow luxuriantly, any other vegetable will." Indeed, the frequent exposure of a new surface of the soil, during the summer months, must expose the volatile principles which it may contain to exhalation, and thereby endanger the loss of one essential article to its fertility, which, in soils that contain much animal matter, is very considerable. The turning in of the dew, is equally absurd; it can contain no ingredient that is not found in rain-water, which is nearly pure. The dew is simply the exhalations of the day, which are condensed during the cool of the evening; like rain, it forms an essential moisture for the support of vegetation, but can have no other effect.

I saw several fields, in the town of Providence, in the fall of 1821, where rye had been gathered which had been sown the fall before, on sward or old pasture; the grass among the stubble was, undoubtedly, more abundant than it had been for some years before it was ploughed. This could not have failed of rendering the crop much less productive than it otherwise would have been, for beside diverting a share of the nutriment in the soil from the rye, it must have crowded and prevented its spreading.

This luxuriant growth of grass was, undoubtedly, owing to two circumstances in the mode of tillage: 1st, the imperfect manner in which the sod, during the first ploughing, was turned over, owing to the great number of loose stones, which impeded the free and direct motions of the plough; and 2d, to the subsequent dragging and cross ploughing, which had the effect to place a great proportion of the sod grass-side up again, with the additional advantage of having the compressed and distorted roots torn asunder, and thinned in such a manner as to render them more susceptible of nutriment.

The evil might have been prevented, not only to the immediate advantage of the crop, but to the permanent benefit of the soil, by devoting the time that was spent in "*cross ploughing and harrowing,*" to removing the impediments to the free motions of the plough, and then carefully turning the sod so effectually as perfectly to cover the face of it; a heavy roller then passed over the surface, would have the effect to secure it in its place, to press the loose earth more firmly into the spaces between the furrows, and prevent more effectually, the possibility of its again vegetating. In this situation, it is ready for the seed, which should be covered with a light plough or harrow, special care being taken not to disturb or displace the sod which, thus confined, soon commences decomposing, or, in the common phrase, "*rotting,*" thus furnishing an important and wholesome nutriment to the corn plants, whose roots are pushing in all directions into its substance.

The thick, stiff, and tough nature of the soil of this region, is offered as an objection to this mode of procedure. I am aware that the spontaneous grasses, particularly on a fertile soil, commonly produce a more stubborn and unmanageable sod than that produced by the grasses usually cultivated, but I believe no method will be found more effectual in decomposing it, as that of covering it closely in the earth. The objection, however, may be remedied by substituting the more useful grasses, as clover or timothy, which furnish a much better pasture, give a greater abundance, and a better quality of hay, and when turned under, yields a much more prolific ingredient to an exhausted soil. If this practice were pursued, I can see no reason why *wheat* cannot be produced here as well as in the adjoining town of Galway, where more wheat is raised than in any other town in the county, particularly should the mode of manuring with *lime* be adopted.

It should be observed, that in Galway, as in most places where wheat is raised in the greatest perfection, lime forms one of the ingredients in the composition of the soil, while in that of Providence, and in the whole

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* Some years ago I published a paper on the existence of marl in this county, and its application as a manure; but I have yet to learn whether any use has ever been made of it

The Agricultural Society of this county have this year, (1822) awarded a premium of $6 to Gilbert Waring, of the town of Saratoga Springs, for the best experiment with marl—(I believe there was no competition.) He applied it to some light sandy knolls, which were so poor as to be incapable of producing even weeds. The rest of the field, excepting several of these hillocks, was a thick clover-sward, which was turned over in the fall, and about the same time the marl was conveyed to these barren spots, in the proportion of from 60 to 100 loads to the acre. In the spring succeeding, the whole field was planted with Indian corn. The young plants, on the places where the marl was applied, began to distinguish themselves at an early period, by a much darker colour, and a more luxuriant growth, which they continued to exhibit through the season; and at harvest, the crop was judged to be one-third better than any other part of the field, from an equal quantity of ground.

The marl which was used has the appearance of *blue clay,* but effervesces very strongly with acids.

of the primitive region of this county, where wheat is considered a very precarious crop, lime is hardly discernable among its component parts.

Experiments made with lime in Galway, and along the secondary region, have added but little to its credit as a manure. This result, is owing to the soil already containing a sufficient quantity for all the purposes of vegetation. It is in the primitive region where this article is deficient, and where its application can be expected to have a good effect.

FREQUENT PLOUGHING.

That frequent ploughing is useless, and frequently injurious, may be inferred from the experience of many of the most observing farmers. The practice of merely turning over the sod and sowing on the furrows, (see page 64,) is becoming every year more popular, and an intelligent farmer has just given me the following account of a process, which he tried the season past.

Having a clean clover field, which he intended to plant with Indian corn, a part of it was ploughed and planted in the usual way, while the other part was merely ridged or "*back-furrowed*," at sufficient distances for the rows, while the space between was left unmoved and green with clover, to be turned over to the hills during the process of hoeing; the corn was planted on the centre of the ridge. The success of this process was very observable through the season; the corn had a much more rapid and luxuriant growth, and at harvest yielded a considerable more abundant crop than the other parts of the field.

The result is imputed, by my informant, to the following causes: 1st. "the ground beneath the hills of corn remaining unmoved and covered by the furrows, retained the moisture longer than that which had been turned over and exposed to the air and sun; hence the plants did not suffer by the drought, as did those on the other part of the field." And 2dly, "the turning of the sod, which was permitted to grow between the rows, up to the hills at hoeing time, furnished the roots, as they extended from the ridge, with a new supply of vegetable matter and moisture.

NATURAL MEADOW.

Perhaps no kind of land has been more eagerly sought for, or more highly prized as an appendage to the farm, by the most of our farmers, than what is usually termed "*natural meadow;*" and yet probably no part of the farm is so *unprofitable*. The object is to secure a crop of hay, which it seldom fails to produce; but, it should be remembered, that the quantity is always much less than what might be produced from the same quantity of land by cultivation; its quality is vastly inferior, and the land is totally lost to the production of any other crop. I have frequently counted ten and twelve different species of grass within the compass of a few rods square, and not more than one or two of them that has ever been noticed as furnishing food suitable for the sustenance of stock, to say nothing of the great variety of ferns, rushes and mosses growing upon the same spot, which every farmer would be pleased to have annihilated.

Every farmer should calculate upon the cultivation of his grass, as he does upon that of his grain ; he will then be sure always to have a supply, and that too of a quality agreeable to his choice, while the system, if properly pursued, will have the effect to increase the quantity and quality of all his other crops to a degree, that those who are not acquainted with the facts, can hardly believe.

The question has often been asked. What shall we do with the field? it is too wet to plough. The answer is, *drain it*. I have seldom seen a field of this description but what might be drained for a sum considerably less than what the first crop would amount to, and the effects of draining, if properly executed, is permanent.

Since the introduction of gypsum as a manure, the plain lands have greatly increased in value and importance in the estimation of farmers generally; indeed these lands have been commanding a higher price, in this co. than those of any other description, under the same state of cultivation, and it is now believed, by those who have the best opportunity to judge, that no soil can be brought so easily and cheaply into a state of profitable cultivation as that of the plains. This opinion has caused them to be sought after more, and, of course, has raised their value. The soil of these plains being naturally light, is soon exhausted by improper tillage; but where the plan laid down in pages 63 and 65 has been adopted and pursued, there has been no depreciation in its productions, but, on the contrary, they have been almost incredibly augmented.

The subject which excites the most serious apprehensions with regard to the profitable tenure of this class of soil, is the deficiency of fencing timber; but this defect will probably be supplied by the introduction of "*hedges*," and it is believed that our own forests contain the necessary materials for effecting this object, in the CRATÆGUS CRUS-GALLI, or COCCINEA, (*common thorn-bush*) There are several species of this shrub, natives of the soil, some of which will unquestionably answer our purpose better than any that can be introduced from abroad

The first and only attempt, which I know of in this county, to bring this system into operation, was undertaken by Mr. Davis, on land belonging to J. K. Beekman, Esq. During the fall past, 500 of the plants of this shrub have been placed by Mr. Davis in regular order to form a hedge; they are planted in two parallel lines, twelve inches apart, and at regular intervals of six inches. Mr. D. has likewise planted a quantity of the seed, with a view of ascertaining the best method of obtaining the plants. This is an experiment of much interest, and the result will be looked for with anxiety.

ON STEAMING FOOD FOR HORSES.

It has been ascertained, though perhaps not generally known, that *grain of any kind cannot be dressed or cooked by dry steam applied to the dry grain.* If the steam is at a low pressure, or a little above atmospheric, a species of parching is produced on the grain so treated; and if steam of very light pressure is applied, the grain may be entirely carbonized. An intermediate and very simple process has however been found, whereby grain of any sort can be completely boiled, which is done by *soaking* the grain in water for a period of from six to twelve hours, according to its state of dryness; and then placing it in the receiver described for steaming roots, and applying them for an hour, the grain will come out completely boiled. From this it may be inferred, that each grain becomes a little cauldron, containing as much absorbed water as serves to boil it by the application of steam; but whatever be the rationale of it, we are thus provided with a simple and efficient steaming and boiling apparatus applicable alike to the cooking of juicy roots or tubers, and dry grains.

That horses on a farm may be kept more economically on prepared food than in the state and manner in which food is usually administered to them, I have no doubt. The fact, however, will soon be ascertained, in consequence of the premium which the Highland Society has just now announced on the subject. The results of the experiments which some farmers will make, will, we fondly anticipate, prove the facility of preparing food, and economy in the use of it. We have the authority of the owners of some of the coaching and posting establishments in Edinburgh, for stating, that the saving which will arise from the use of prepared food, in the keep of forty horses, will amount to 140*l*. a year. We have also the high authority of Mr. Dick, the Professor of Veterinary Surgery in Edinburgh, for saying, that *the general health of horses under work, is much better on prepared than unprepared food.*

It is obvious, says Mr. Dick, the grand desideratum is to give food containing as much nutriment, and in as small bulk, as is consistent with the economy of the animal. If this problem is solved, it will follow, as a corollary, that it will be important to give that food which has been found best suited to its proportions, in such a state as is best suited for digestion. This is a point, however, worthy of consideration; and naturally suggests the question, How is the body supplied with nourishment in taking food into the stomach? The common notion is, that much depends, as I have indeed before mentioned, on the hardness of the food; and it is a common saying, in order to show off a horse which is in condition, "that he has plenty of hard meat in him." Now this is a very silly and erroneous idea, if we inquire into it; for, whatever may be the consistency of the food which is taken into the stomach, it must, before the body can possibly derive any substantial support or benefit from it, be converted into chyme—a pultaceous mass, and this, as it passes onwards from the stomach into the intestinal canal, is rendered still more fluid, by the admixture of the secretions from the stomach, the liver, and the pancreas, when it becomes of a milky appearance, and is called chyle. It is then taken into the system by the lacteals; and in this fluid, this soft state, and in this state only, mixes with the blood, and passes through the circulating vessels for the nourishment of the system.

Now if the hardest of the food must in this manner be broken down and dissolved before it can really enter into the system, it must appear evident that something approaching to this solution, if done artificially, would greatly aid the organs of digestion in this process, and that thereby much exertion might be saved to the system, and at the same time nourishment would be rapidly conveyed into it. It is with this view that I would recommend the general adoption of cooking food for horses.—*Edinburgh Quarterly Journal of Ag.*

HOVEN IN CATTLE.

I beg leave to add here some observations to the paragraph in 3d number of the Farmer and Gardener, headed, On the swelling of cattle.

They also in Germany make use of the knife in this disease; but in a less dangerous way, and with better success. It is done with an instrument, called the *Troicar*, a thin and sharp pointed iron in its scabbard, which is pushed into the noted place, then the iron is withdrawn, but the scabbard remains in the wound, for the escape of the gas, it may even be kept there for some time to prevent the new formation of the gas, this is the great advantage of the iron over the knife, on account of the immediate contraction of the wound, following the use of the knife.

Another well approved means, which is accompanied by no danger, and which every farmer may easily prepare and provide for use, is the following: Take a few crude lime stones and burn them, then pound them while they are glowing hot, and put the flour, before it can be impregnated with the air gas, into a bottle, and cork it well to prevent the communication of the external air to the lime. In case of a swelling, put a teaspoonful of the same into a bottle with a pint of warm water, shake it and give it to the sick animal, which immediately will be restored. This means is based upon chemical principles in absorbing the fixed air, (the gas) by the alkalies.—*Farmer and Gardener.*

Profits of the Mulberry.—A gentleman in New-York, who has devoted much time and attention to the planting of mulberry trees, gives a statement from two acres, which divided, will give the following for one acre.

One acre of ground fenced by mulberry hedges and set out with trees,	$250 00
Interest and additional expense during five years,	187 50
	$437 50

The acre will then produce—From 5 to 10 years, 10 per cent, from 10 to 15 years, 47 per cent, from 15 to 20 years, 112 per cent, averaging nearly 45 per cent, for the first 20 years, and continued at 112 per cent, afterwards. The culture of silk is becoming so profitable that it would seem advantageous for farmers generally, to give it their attention.—*N. B. Gazette.*

Mulberry trees.—If the growth in France of raw silk be estimated at 3,000,000lb. the quantity of cocoons may be estimated at 36,000,000lb. It is calculated that 16lb. of mulberry leaves will be consumed for the production of 1lb. of cocoons, so that the annual produce of France must be 577,000,000lb, of leaves; and giving to each tree an average annual produce of 10lb., the number of mulberry trees must be above 5,700,000. One ounce of eggs will, on an average. produce 100lb. of cocoons. An ounce of eggs is calculated to give at least 30,000 worms. The quantity of silk worms annually reared in France cannot, therefore, be less than 10,800,000,000.—*Dr. Bowring's Report.*

Dr. Clarke's Direction to his Son for Avoiding Contagion.—While you are ready at every call, make use of all your prudence to prevent the reception of contagion. Do not breathe near the infected person; contagion is generally taken into the stomach by means of the breath, not that the breath goes into the stomach, but the noxious affluvia are by inspiration brought into the mouth, and immediately connect themselves with the whole surface of the tongue and fauces, and in swallowing the saliva, are taken down into the stomach, and, there mixing with the aliment that is in the process of digestion, are conveyed by means of the lacteal vessels, through the whole of the circulation, corrupting and assimilating to themselves the whole mass of blood, and thus carry death to the heart, lungs, and the utmost of the capillary system. In visiting fever cases, I have been often conscious of having taken the contagion. On my return home, I have drunk a few mouthfuls of warm water, and then with a small point of a feather irritated the stomach to cause it to eject its contents. By these means I have frequently through mercy, been enabled to escape many a danger and many a death. Never swallow your saliva in a sick-room, especially where there is contagion; keep a handkerchief for that purpose, and wash your mouth frequently with tepid water. Keep to windward of every corpse you bury. Never go out with an empty stomach, nor let your strength be prostrated by long abstinence from food. *Life of Adam Clarke.*

Young Men's Department.

[The following brief address to young men was inserted in the Specimen Number of the Cultivator, issued in January, 1834. As this specimen number had but a partial circulation, we comply with the request of a valued correspondent in republishing it.]

"The YOUNG MEN we would especially appeal to. You are destined soon to occupy the stage of public action, and to fill the important stations in society. *Now* is the time to *prepare* for those high duties, as well as for profit and distinction in your business. Your characters are but partially formed, and are yet susceptible, of receiving good or bad impressions, which are to last through life. It is important to you, to your friends, and to society, that these impressions should be for good. We will lay before you rules and examples of the wisest and best men, to aid you in the formation of your characters—to enable you to become intelligent and successful in your business,—useful and respectable in society,—and beloved and happy in your families. Do not object that you have no *time* to read. Few young men labor more hours than did Benjamin Franklin, or are more humble and self-dependent than he was in his youth; and yet Franklin found abundant time for self-instruction; and so indefatigable and successful was he in his studies, that he became one of the most useful and celebrated men of the age. We need not limit the remark to Franklin. Most of the distinguished men of the day have risen from humble stations by their own industry and frugality, and have acquired a great share of their knowledge in the hours not allotted to ordinary business. Your winter evenings are your own, and may be applied usefully. They may be computed at one-fourth of the day, or one entire month in the year. Time is money: and the young man who appropriates this month to the acquiring of useful knowledge, does more to add to his future fortune, to say nothing of his intellectual wealth, than if he received pay for this month and loaned it upon interest. Knowledge is, in another respect, like money: the greater stock of it on hand, the more it will administer to the respectability and enjoyments of life. But knowledge is not to be acquired without exertion, nor is any thing else that is useful in life. It is the labor we bestow in acquiring an object that imparts to it an intrinsic value. It has been well said that 'although we may be learned by the help of others, we never can be wise but by our own wisdom.' It is the humble design of this monthly sheet to excite a laudable ambition to improve the mind as well as the soil. If we succeed in awakening the latent energies of the former, we think the latter will follow as a natural consequence, and our object will be attained."

FROM A FATHER TO HIS SON.—No. 2.

EDUCATION.

There are few terms of more indefinite meaning than the one which heads this letter. Some suppose it consists in learning to read, write and cipher; while others contend, that no young man can be deemed educated, or at least *well* educated, until he has been dubbed *A. M.* at the college, has passed a term at some academy, or has become a licentiate in one of the learned professions. My definition varies from both, and comprises more than either. I define education—*a knowledge of our religious, moral, political, social and relative duties*,—AND THE HABITUAL PERFORMANCE OF THEM. The apprentice, who has merely acquired the names of the tools which belong to a trade, may as well be deemed to have learnt that trade, as the boy to be educated, who has merely obtained school instruction. The tools are the means by which the apprentice, by attention and industry, is to acquire a knowledge of the trade, and his reputation as a mechanic will depend upon the fidelity and skill with which he employs them. Schooling is to the mental what tools are to the physical powers—the *means* of becoming useful to one's self, and to society at large;—and in both cases success and distinction are wisely made to depend upon individual exertion. The *boy* may acquire the mechanical art, but the noblest powers of the mind are seldom developed but in *manhood.* Thus you perceive that I consider your education as having but commenced; and that you have yet to learn, by study and reflection, those high duties of manhood which are to have an intimate bearing upon your future happiness and prosperity. Your mind has yet to be disciplined, by reading, observation and reflection, and your habits are yet to be fixed. Practice is as necessary in this as it is in mechanics—it is as necessary to make a fluent orator, or a graceful writer, as it is in cutting well a coat, or shoeing a horse. To stimulate you to the performance of duty and to deter you from habits of sloth, indolence and vice, I here venture to assure you, as a conviction growing out of half a century's experience and observation,—that the practice of every virtue will bring its reward, in one shape or another—and that indulgence in vice, will as assuredly be followed by some corresponding suffering, in mind or body. We enjoy animal propensities in common with the brute creation;—but the higher feelings—the moral sentiments,—the pleasures of intellect,—belong peculiarly to man—and man rises in the scale of beings in proportion as he cultivates and improves these peculiar gifts of his Creator.

THE NECESSITY OF GENERAL INTELLIGENCE IN A FREE GOVERNMENT.

When the people govern, they should be virtuous and intelligent. They should be not only willing to obey the laws, but competent to make them. The very foundation of a republican government is based on good morals, and a general diffusion of knowledge among the whole people. Knowledge is not only essential to the prosperity of a free government, but absolutely necessary to its existence; it is at once the vital principle and the sustaining power. The experience of the past has told us, that wherever there has been mental and moral light, there has been liberty; and wherever the people were ignorant, there was slavery. Since this is so, ignorance, which might be a misfortune in another country, is a crime in this; especially, since the means of knowledge are within the reach of every individual. In this republic, the intelligence of each individual is the depository and defence of his liberty. The free institutions of the United States are not secured by armies, revenues or constitutions; but by universal education. The education of the people stands in the place of armies, bulwarks and a throne. Knowledge and virtue are not only power and happiness, but they are "*liberty.*"

In the first place, knowledge is necessary to *perceive the nature and value of literary and civil institutions.* The half-educated may know enough to desire these, but not enough to respect and sustain them. The illiterate cannot see the nature and object of literary institutions, which are to liberate the mind, and raise the intellectual and moral condition of a nation—to increase the necessaries, and furnish the elegancies of life; and to let man feel and know the greatness of his nature. This can be known by those only who have felt the power, and tasted the pleasures of knowledge; and such institutions can be established and sustained by those only who can estimate their exalting influence. The nature and value of civil institutions, the educated will much better understand and honor. A high degree of knowledge is requisite to see the nature and necessity of civil government Man's weakness makes society desirable, and his wickedness makes government necessary. This government he supports to protect his life, his property, and his natural rights. The great object of government is to preserve order and distribute justice. The intelligent can estimate the value of such a public check and judge; for they can see the consequences of the selfishness and maliciousness of men.

Men, living in a civil government, have natural and civil rights; and knowledge becomes necessary *that they may know when justice is administered.* And, in the first place, men should know what their rights are; how many of them they have surrendered up to the general government, that they may enjoy its protection and the advantages of society; and what rights they have retained, and of which nothing should deprive them.

Having learned their rights, they should know whether or not they were respected by their rulers. When there is fraud and injustice on the part of those who govern, the governed should be intelligent enough to know it, and able to defend themselves. The natural love of power, and the extreme selfishness of man, should excite him for preparation to judge of those who are in office, and have the opportunity of gratifying these oppressive principles. Respect and obedience are due to those in office, for they are the guardians and ministers of that government which has been established for the promotion of human happiness. But corrupt rulers may forfeit their claims by personal wickedness and public injustice; and if this should take place, the public should be able to perceive it, and stop the abuses before their liberties are in danger.

On the other hand, the half-educated know not when their government is well administered. They are discontented and clamorous when they have their rights, and all the blessings of a well-ordered administration. They know not the value of the privileges they enjoy, and are always ready for a change in their rulers. They see not the excellencies of their civil institutions, and do not feel respect enough for them to preserve them. In a government where the people not only make the laws, but select those who are to administer them, there is the most imperious necessity for high intelligence and moral worth in every individual. The people should well understand their government, and be qualified to know that it is ably and justly administered; or whether it is not made the instrument of gratifying the ambition of the few, and of destroying the rights and of oppressing the many. The people should be educated to know whether or not they are restrained by any law which does not conduce to the greatest private and general good. The people may see evils, but they ought to be able to take that general view of the whole which would show them advantages (if there were such) which more than overbalance these evils.

In this government, justice is very often administered by a jury: and as this jury is taken from among the people, all should prepare themselves for being called upon to apply the law, and judge of the rights of their fellow men. In the inferior courts of justice, the people are the judicial as well as the legislative part of the government. These important offices demand intelligence in every citizen. When those who are to be chosen for jurors are known to be ignorant or corrupt, dishonest individuals will claim the rights of others, and hope, through the known imperfection of the jury, to obtain those unjust demands which they are certain that right and the law would deny them. Thus, the ignorance of man may be the loss of their rights, when they themselves are to be judges. It is desirable, too, that there should be general intelligence to ensure uniformity in jury decisions; for nothing excites a spirit of litigation more than uncertainty. When men differ, they should see the certainty of the decisions of the law. Again, the laws were made to keep men honest. If they are disposed not to be so, the law may compel them. It hence becomes necessary to know when we should ask assistance from the laws, or, in other words, when litigation is necessary and justifiable. To judge correctly in this, we must know what our rights are, and how far the law may assist us in securing them; and this presupposes general information, obtained only by much study and reading; but which all may get if they will avail themselves of all the means of knowledge which may be obtained.—*Taylor's District School.*

THE CULTIVATOR—DEC. 1835.

TO IMPROVE THE SOIL AND THE MIND.

AGRICULTURAL CONVENTION.

It will be seen, by the notice inserted in to-day's Cultivator, that an Agricultural Convention is proposed to be held in Albany, on the second Monday in Feb. next. The notice has appended to it the names of many highly respectable citizens, to whom the proposition was submitted—enough to give to it all the weight and consequence which is desirable in a preliminary measure. This is the era of conventions; and when their object is praiseworthy, they are seldom otherwise than beneficial. They tend to bring about a concert of action, and to concentrate the energies of many for the accomplishment of a common good. And if the agricultural community can in this way do any thing to advance *their* interests, we may rest assured that the *state* will be benefitted, so intimately is the prosperity of the first identified with that of the latter. The discreet farmer must graduate the extent of his purchases from the merchant, manufacturer, &c. by the nett profits of his farm. If we can double these profits, as we feel assured may be done, the other classes of society will be correspondingly benefitted.

There are many topics which present themselves as worthy the consideration of an agricultural convention, and in which the whole community have a deep interest. We will endeavor to point out some of the more prominent ones.

1. *The establishment of a School of Agriculture.* "It remains to us," says Chaptal, "to improve agriculture by the application of physical science. All the phenomena which it presents, are the consequences necessarily resulting from those eternal laws by which matter is governed; and all the operations which the agriculturist performs, serve only to develop or modify these causes. It is, then, to the acquisition of a knowledge of these laws, in order to calculate their effects, and modify their action, that we ought to direct our researches." These laws relate not only to the organic and ponderable matters with which we have to do, as animals and vegetables, earths and manures, but to light, heat and moisture, which exercise a controlling influence over animal and vegetable life. "Discoveries made in the cultivation of the earth," it is well remarked by Davy, "are not merely for the time and country in which they are developed, but they may be considered as extending to future ages, and as ultimately tending to benefit the whole human race; as affording subsistence for generations yet to come; as multiplying life, and not only multiplying life, but likewise providing for its enjoyment." And if the sciences, as is often asserted, are worthy of our ardent pursuit, merely on account of the intellectual pleasures they afford—"by enlarging our views of nature, and enabling us to think more correctly with respect to the beings and objects around us,"—how much more worthy are they of our regard, when employed to multiply the products and profits of human labor—to increase the comforts and happiness of the human family. But it is not desired to make mere scientific farmers, but intimately to blend the practice, and the *best* practice, in all the departments of rural labor, with the theory, and to test and correct the one by the other. In the plan of a school which has been partially promulgated, it is set down as an indispensable rule, that during the seven farming months, both teachers and students shall devote at least one half of the time to the *practical* labors of the field, the garden or the mechanic's shop. The plan has been objected to on the ground, that few, comparatively, can become its inmates. The same objection exists to all our higher literary schools: not one individual in five thousand receives instruction in our colleges; and yet it would subject one to ridicule to contend, that these colleges do not exercise a highly salutary influence, indirectly, upon the best interests of the community. So of our canals and public improvements; they do not directly benefit property where ample

facilities of commercial intercourse previously existed—they have in fact comparatively and seriously diminished the value of real estate in some districts; yet no one doubts their utility to the community at large. Besides should the predictions of the usefulness of an agricultural school be verified, schools of the kind can be readily multiplied.

The pupils of an agricultural school would not only carry with them into business life, those principles of science and that general knowledge which would be calculated to improve our husbandry, and to add to the stock of general knowledge—but they would carry with them, and disseminate, *practical* knowledge in all the departments of agricultural labor. They would carry with them a knowledge of the various breeds of farm stock, of their relative value,—of the diseases to which they are incident, and the methods of treating them, when well or sick—a knowledge of the nature and proper management of different manures—of the principles and methods of draining and irrigation—of the principles and value of alternating crops—of the best varieties of fruits and culinary vegetables, and the modes of propagating, cultivating and preserving them—a knowledge of all new plants, profitable in our rural culture, method of treatment, the soils to which they are adapted, and mode of preparing for market—of the leading principles of mechanical science, highly essential in the construction and management of farm implements. They would carry with them, also, habits of application and reflection—hands inured to labor, and minds imbued with light and truth, and animated with an ardent desire to obtain distinction for usefulness. The example of a *good* farmer exerts a magic and benign influence upon all around him. *His* light is not hid under a bushel; but shines forth to illuminate and instruct all who are within its influence. Who will set bounds to the benefits which would result from annually locating one or two hundred *such* pupils in various parts of the state.

2. *The standard of instruction in our common schools should be raised, to fit the pupils for the high duties and responsibilities of freemen, and to aid them in their future business of life.* This is required, as well by political and moral considerations, as by a desire to keep pace, in the arts of labor, with the improvements of the age. The preservation of our civil rights depends upon the intelligence and independence of the middle class of society —the pecuniary prosperity of our state upon their habits of profitable industry. It is in our common schools that we are to lay the foundation of this intelligence and independence, and to inculcate principles and habits of useful industry.

The reports from our penitentiaries furnish us with two remarkable facts, viz. that of 180 convicts in the Connecticut state prison, "*there is no one who, before his conviction, could read and write, and who was of temperate habits, and followed a regular trade*"—and that "*there never has been, in that prison, a convict who had received either a collegiate or classical education.*" Volumes could not enforce more strongly the propriety of adopting a high standard of common school instruction, nor urge stronger considerations for multiplying incentives to honest labor. These matters come within the special province of the agricultural class, who must from their numbers and influence give the impress to our character so long as our freedom shall survive. How little is now done in our common schools to instruct the boy in his future business of life, or in his civil rights and responsibilities.

The importance of the middle class of a population, under a free government, is forcibly shown in the following extract, which we make from Sismondi's History of the fall of the Roman empire.

"But one effect," says this historian, "of the long duration of states, and of their extended power, is, to separate the inhabitants into two classes, between whom the distance is constantly widening, and gradually to destroy the intermediate class, together with which all the social virtues are gradually uprooted and annihilated. From the time that this gulph is once opened between the two extremes of society, every successive revolution does but contribute to widen it; the progress of wealth had been favorable to the rich, the progress of distress favors them still more. The middle class had been unable to stand the competition with them during prosperity; in adverse times it is crushed under those calamities which only the wealthy can stand against. The corruption of Rome had begun from the time of the republic, *from the time that the middle class ceased to impress its own peculiar character on the whole nation;* this corruption increased in proportion as the intermediate ranks disappeared; it was carried to the highest pitch when the whole empire consisted of men of enormous wealth, and populace.

"It is, in fact, in the middle classes that the domestic virtues, —economy, forethought and the spirit of association,—mainly reside. It is in them that a certain degree of energy is incessantly called into operation, either as a means of rising, or of keeping the position already acquired. It is in them that alone the sentiment of social equality, on which all justice is based, can be kept alive. We must see our equals, live with them, and meet them daily and hourly, encounter their interests and their passions, before we can get the habit of seeking our own advantage in the common weal alone. Grandeur isolates a man; vast opulence accustoms each individual to look upon himself as a distinct power. He feels that he can exist independently of his country; that his elevation or his fall may be distant; and, ere long, the servile dependents, by whom a man who spends as much as a petty state is sure to be surrounded, succeed in persuading him that his pleasures, his pains, nay, his slightest caprices, are more important than the welfare of the thousands of families whose means of subsistence he engrosses.

"The morality of a nation is preserved by associating its sentiments with all that is stable and permanent; it is destroyed by whatever tends to concentrate them on the present moment. So long as our recollections are dear to us, we shall take care that our hopes be worthy of them; but a people who sacrifice the memory of their ancestors, or the welfare of their children, to the pleasures of a day, are but sojourners in a country—they are not citizens."

3. *A portion of public money may be usefully applied in aid of county agricultural societies, to call forth talent and to excite industry.* Of the salutary effects of premium rewards, for skill and enterprise in agricultural improvement, we have testimony enough in the experiment which our state made in 1817, and which is yet exerting a beneficial influence among us. We see it confirmed also in the states which surround us, some of which have for a long time been liberal of their funds to this object, while others, yet in their infancy, have recently began to copy the provident example. There is no country which has made greater advances in improved husbandry, during the last fifty years, than Scotland, and there is none perhaps which now excels her. Her agricultural society has been in existence about fifty-one years, and in that time has distributed, to the tillers of the soil, premiums to the value of about half a million of dollars. The value of her agricultural products has been augmented, in the mean time, several millions annually. Who will deny, that her premiums have contributed largely to bring about this wonderful improvement in Scotch husbandry. The remarks of Chaptal upon this subject, inserted in our October number, are so pertinent and forcible, that we beg leave to refer to them, as further illustration upon this head.

4. *We want better common roads.* The existing laws are defective, or they are not faithfully executed. Nothing tends so rapidly to improve and enrich a district, as good roads. The profits of agricultural labor, as well as the stimulants to industry, are increased by every new facility for transporting its products to market. The attention of our legislatures has been so much engrossed by party politics, private claims and monied incorporations, as to leave little time to deliberate upon the matter, and to digest a better system. In truth, a goodly portion have been strictly political or professional gentlemen, whose study has been more to improve *the road to office,* and the *road to preferment,* than the common roads of the farmer. Plans of improvement have been suggested, and we are advised that some of these will probably be submitted.

5. We have a formidable enemy in the *Canada thistle,* which it requires the united efforts of all landholders to put down, aided by legal penalties. Lastly.

6. The serious depredations of the *Grain-worm* upon the wheat crop of some districts, and the apprehended danger, that it will extend itself over the state, is a matter highly worthy the consideration of an agricultural convention.

We have thus suggested some prominent subjects which may engage the attention of an agricultural convention, of manifest importance to the farmer and the public. Whether all or any of them will be discussed it is not our province to say. And we will close our already too protracted remarks, by calling upon the agricultural interests in the several counties to weigh the matter with all deliberation, and if they concur with us in the belief, that much good may result from the proposed meeting, to give it their cordial and efficient support. We would in particular address those who are just entering upon the stage of business life—who are anxious not only to acquire fortunes, but reputations for public usefulness, and who are to give a character to our agriculture in coming years. "Nothing," said an ancient sage, "can be more despicable than an old man, who has no other proof of having lived long in the world than his age." "It should be the object of our ambition that we should all signalize the period of life allotted to us, by some exertion, either mentally or bodily, which may be useful to mankind, and give us a claim to their remembrance, to their respect, and to their gratitude."

Agricultural Fairs have diminished in our state, while they are increasing in number and interest elsewhere. The states of Massachusetts, Ohio and Indiana, and we believe some other states, have made liberal provisions for these fairs from the public treasury. In Massachusetts, most of the agricultural societies have a permanent fund, the interest of which only is annually expended. The fund of the Worcester county society amounts to $8,000, mostly in bank stocks, which gives them an income of five hundred dollars a year. The distribution of this sum annually in the county, in exciting emulation, and in rewarding rural skill and industry, has done much there, as it would be likely to do every where, to increase individual wealth and comfort, and thereby to promote the public prosperity.

It seems now to be reduced to a certainty, that agricultural fairs cannot be sustained in New-York, with any degree of usefulness, without the efficient patronage of the legislature. It is for the farmers themselves virtually to decide, whether this patronage shall be had: for we have little reason to doubt the disposition to grant, what the unequivocal and expressed wishes of the yeomanry may ask on this head. We repeat, that there is *now* no diversity of opinion as to the benefits which have arisen from former appropriations. We are yet young in agricultural improvement. We have no doubt the products of our soil may be doubled, with the laborers which it now employs. This would soon add millions to our wealth, while an annual appropriation from the treasury would return to it compound interest in the form of increased revenues.

EXPERIMENTS.

In our farming operations of the past season, we have made some experiments rather out of the ordinary routine of practice, the results of which we here state, for the benefit and admonition of others.

1. We drilled in half a pound of ruta baga seed between the rows in a field of corn, after the last dressing. On harvesting the corn, about the 13th Sept. but a few drawn plants of the ruta baga were found. The corn stood well and stout, 3 by 2½ feet, and pumpkin vines covered the surface. The turnips did not fail for want of nourishment in the soil, but from the absence of heat, light and air, to elaborate this food, and to produce a natural development of the plants.

2. We drilled buckwheat between rows of China beans. We lost more in the bean crop than we gained in the buckwheat. The beans did not mature and ripen well.

3. We sowed half a pound of Aberdeen turnip seed, broad-cast, upon half an acre of corn, after the last hoeing. The corn having been replanted, and yet thin, from the devastations of the worm, was not cut up till about the 25th Sept. On the 10th Nov. we gathered 70 bushels of good turnips, many small ones being left, the crop not having been thinned.

4. Manured 100 rods, or five-eighths of an acre, of one year ley, from which the clover had been mown the last of June, ploughed, harrowed, and drilled in half a pound of ruta baga seed, on the 4th July. The after culture consisted of two dressings, with cultivator and hoe, at the first of which the plants were thinned to 8 or 10 inches in the drill. The crop was taken up the 18th Nov. and the product was 350 bushels. The ground and crop were measured. The seed was drilled in by a bungler, who made the drills too distant, often four feet. At regular intervals of 2½ feet the product would have been at least 100 bushels more. This practice is not new, nor is the product great; but the result is given to show the profits of *root* culture. The expense of curing the clover, of 12 loads manure, and of cultivating, harvesting and securing the turnips for winter, I estimate at $18. The product of the 100 rods may be put down as follows:—

1 ton clover hay,	$15 00
350 bushels ruta baga, at 1s. 6d	65 62½
Tops, say	1 00
	81 62½
Deduct charges,	18 00
Profits,	$63 62½

5. We burnt a strip of wheat stubble, first scattering upon it some light straw, sowed upon it the seed of the white turnip, and harrowed it in thoroughly, the 4th August. The plants were thinned with the hoe, and we gathered a fair crop of handsome table turnips.

6. We mixed pumpkin seed profusely with our seed corn. Where the corn stood well, the pumpkins were tolerably productive; where worms thinned it they grew in great abundance. We gathered from seven acres more than forty cart loads. With these, our small potatoes and refuse apples, boiled together, and soft corn, we have put fourteen porkers in good condition for the barrel, and have enough in store to keep them thriving till the middle of December. We thus expect to make 3,000 lbs. of pork from the refuse matters, which every farm may be made to produce, and which are not marketable commodities. We put down the saving in these matters as a prominent item in the profits of a farm.

CUT-WORM.

The ravages of this insect last spring, particularly in our corn fields, gives an importance to every suggestion which may promise a preventive. The remedy suggested below has the sanction of philosophy as well as experience, and promises the further benefit of being decidedly beneficial to the growth of the corn. The labor and expense of making the application are comparatively trivial. It is probably the caustic qualities of the alkali afforded by the ashes and lime, that kept the worm from the circle of its influence, or destroyed it. We copy the article from the *Tennessee Farmer.* It seems to have been penned by its intelligent and practical editor, Judge Emerson.

"As soon as the corn is covered with earth, let a hand follow, having a bag hanging at his side, containing ashes and plaster mixed, one-third of the latter, and two-thirds of the former, or ashes alone, either leached or unleached—the latter would probably be preferable—and let him drop a handful on each hill of corn. We would recommend, where it can be obtained, the partial substitution of lime for ashes, in which case, to preserve the hands of the dropper from injury, it will be necessary for him to use a cup, shell, or gourd, with which to take up the lime—each bag should be large enough to contain as much of the substance used as the dropper can conveniently carry. We request our readers in this vicinity to give the foregoing a fair trial, and to furnish us with an accurate account of the result, both as to its effects in preventing the ravages of the Cut-Worm and in increasing the crop. In our use of ashes and plaster, they were dropped on the seed corn, and covered with it. The effect on the crop was decidedly and greatly beneficial. For preventing the ravages of the Cut-Worm, there is good reason to believe that it would be best to deposite the ashes on the hill after the corn is covered, and this mode will probably be found nearly, if not quite, as beneficial in increasing the crop."

Large Vegetable Productions.—The newspapers teem, as is usual at this season, with statements of the extraordinary weight of vegetable monsters. We are too apt, in judging of both vegetable and animal productions, to let our wonder outrun our reason, and to graduate value according to size—when in truth, as a general rule, the larger productions are of a quality inferior to those of medium or inferior size.

Take, for instance, among roots, the potato: the very large varieties will be found to be coarse, watery and comparatively devoid of flavor and nutriment. So of the *very* large beet, radish or pumpkin—who eats them? The farm stock only. In fruits as the apple, pear and plum, most of the fine flavored and esteemed varieties are of diminutive size. The remark, too, will pretty generally apply in regard to animals: the *very* big are seldom models of beauty or sources of profit.

GREAT PRODUCTS IN OHIO.

Scioto Valley against the World.—N. W. Thatcher, Esq. secretary of the Agricultural Society, has handed us the following statement. It contains striking illustrations of the fertility of our soil, under skilful culture:—

"*One hundred and fifty-four bushels* of corn, *actual liberal measure*, was produced the present season on *one measured acre* of ground, selected from a field of twelve acres, all equally as good, on the farm of Mr. George Renick of this vicinity. Mr. Felix Renick produced *eighty-five and a half bushels* of oats on an acre of ground: the seed of which he recently brought from England. The oats weigh about twelve pounds to the bushel more than the common oats of this country. Mr. Daniel Maderia of this place, raised in his garden, Cauliflowers of most extraordinary size, measuring from 29 to 33 inches in circumference, and weighing three pounds ten ounces in *one solid head*. And a stalk of corn, in the garden of Mr. Peter Douglass, produced *eight good ears of corn!*"—*Chillicothe Adv.*

"*Premium Corn.*—The premium was awarded to Mr. Asahel Renick, by the Agricultural Society of Pickaway county, on Monday last, for the best acre of corn. ☞ *One hundred and fifty-seven bushels and one peck!* Let those who can, beat that. We learn from the president of the society, that the corn was planted in hills, a little more than three feet asunder, and received no more than the ordinary cultivation. So much for Darby creek *bottoms*. We were gratified to observe an increased interest in the society, manifested on the part of the farmers of the county."

Estimating the cost of culture at $15 per acre, and the price of corn at fifty cents per bushel, the growers of the above corn crops realized a nett profit of $62 per acre. We are not sure that the valley of the Hudson can compete with the vallies of the Scioto and Darby creek, but we *are sure* that eighty bushels of corn per acre can be raised here, on proper corn ground, *without extra expense*: and this, at present prices, affords a profit of $65 per acre.

Yield of Carrots.—Mr. Wilson, of the Albany Nursery, sowed last spring, a piece of ground 111 feet in length, and 39 broad, with carrots, in drills 18 inches apart. The product was 6,321 pounds, topped and freed from dirt. This is at the rate of about 31 tons, or 1,030 bushels of 60 pounds each bushel, per acre. The ground was first trench ploughed, then well dunged, and ploughed again; unleached ashes were then spread upon the ground at the rate of fifty bushels the acre, the ground well harrowed, and the seed sown.—The plants were thinned to six inches. Mr. Wilson thinks it would increase the crop, to sow in drills at two feet, and that in this case, the crop might be cleaned principally with the cultivator, particularly with Van Bergen's.

Carrots are fine food for all farm stock, and are particularly beneficial to horses, and are considered to be worth for this purpose, as much per bushel as oats. At three shillings per bushel, a thousand bushels would be worth $375.00. They are worth at least half this for any kind of farm stock, which would still make them a *very* profitable crop.

Mr. Brewster's Experiments.—The communication of Mr. Brewster will be read with interest. The great secret of his success, we trow, is to be found in the *manure*—the food upon which his crops fed and flourished. Mr. B. has made no charge for this in his expenses; we do not know the reason of this, except that he *saved* it, while his neighbors *wasted* theirs—a practice too common. In travelling in Otsego and Schoharie, and seeing the large piles of manure which were rotting—and rotting—in the barn yards, we thought of the fine corn, and potatoes, and ruta baga which these piles might produce, if they were used as Mr. Brewster used his manure. But we saw not there but few if any crops like those of Mr. B.; and had this gentleman left his dung to waste in the yard, we venture to say we should have had no statement from him of his abundant crops.

We do not expect to learn old birds to sing, or to persuade the old farmer to forsake the footsteps of his father—yet we would have him look abroad, and have the candor to admit, that the old way is not always the best way—that agriculture, like every other branch of labor, is constantly undergoing improvement. If he has sons, and has a regard for *their* welfare, he *must* wish them to learn how to turn their labor to good profit. The experiments of Mr. Brewster alone are worth much to the young men who are ambitious to improve; and the agricultural papers are filled with such information. We have seen hundreds of farms with meagre starved crops, which might have produced as fine crops as Mr. Brewster's, had the manure been saved and judiciously applied. We thank Mr. B. for the service he will render our young farmers by this communication. We advise every young farmer, who is sensible that he has a head capable of assisting his hands, to peruse the Cultivator or some other agricultural paper.

Apple Pomace.—On a late visit to the town of Marlborough, in Ulster county, we found that the Mess. Hallocks, very intelligent and extensive farmers, and withall great cider manufacturers, were husbanding their apple pomace with great care, and feeding it to their milch cows. They begin with small feeds of it, and find that it adds greatly to the quantum of milk. The Mess. Hallocks manufacture their refuse pippins into cider separately, and if the liquor does not retain the peculiar flavor of the fruit, it gives a rich and racy liquor which commands the first price in market. When we practice making cider from a single species of fruit, and that species affording a rich must, we shall treble our quadruple the value of this product of the farm.

This town of Marlborough, by the bye, has undergone, and is undergoing, important changes in the productiveness of her lands. Thirty years ago, when we first knew it, it was one of the poorest towns in the county; its agricultural products were trivial, and its wood-drawing population had much ado to make their ends and means meet. It now verifies the remark that we have often made, that where nature has done least, industry and skill are most active, and most successful, in maintaining good habits and good morals. There is no stimulant so salutary as the habit of depending upon one's own exertions. Farmers in fertile districts, like the sons of wealthy parents, seem to be content with the bounties which Providence has alloted to them, without heeding or profiting from the improvements which art or industry are evéry where making around them. The common schools of Connecticut, since the state has provided bountifully for their support, are said to be rapidly declining in character: the people *lean* upon the state—they neglect their own interests and duties, from a reckless hope, that others will perform for them what they can only properly do for themselves. Fifty years ago the fertile flats in several of the towns of Ulster, exhibited patterns of profitable husbandry and of tidy neatness and comfort. But the sons have been living upon the fame of their fathers. Their lands have deteriorated under old exhausting practices—and they have been virtually standing still, while around them, where nature has been less kind, industry and enterprise have been carried into action, and improvement has progressed. Thus while in the once fertile towns, the products and profits of agriculture have been stationary or retrograding, they have been more than quadrupled in the now thriving town of Marlborough. These facts suggest an admonitory lesson to those who are flying to the fertile west in anticipation of all the choice pleasures of life. Our habits, more than the soil we till, influence our happiness; and where incentives are lacking, and we are afraid they will be lacking in the west when the country becomes filled with population, to industry, economy, and the other social virtues, society, we fear, will become lax, and the enjoyments of life be blended with more than an ordinary share of evils.

The Sap of Plants.—It is a received opinion among the unlearned, and even some of the learned, that all the sap of the trees decends to the roots in autumn, and remains till the genial influence of spring causes it again to ascend. This is disproved by numberless facts which come under our observation. "Not only do plants," says Chaptal, "prepare all the juices which are essential to vegetation, and to the formation of fruits; but after having fulfilled those functions, they continue to extract, from the earth, and air, the principles of their nourishment; *these elaborate and deposite between the bark and wood, to serve for their first aliment on the return of spring, till the development of the leaves, and the excitement of the roots by heat, can provide for their nourishment by the absorption of foreign substances.*" The volume and fluidity of this elaborated sap are diminished, in winter, by the absence of heat and by evaporation.

The West—far West.—We have received from *Galena*, a town hardly yet noticed in our gazetteers, so recent being its name and settlement, situate near the banks of the Mississippi, 480 miles north of St. Louis, TWENTY DOLLARS in payment, in advance, and a portion of it *four years*—for the Cultivator. We note the fact for the double purpose of showing the advance of population in the far west, and of suggesting the example to subscribers who find it inconvenient to transmit a single years subscription. The Cultivator will continue to be published, we trust, without any diminution of character for usefulness. Our correspondent says, in concluding his letter—

"You may expect additions to this list, as many persons in this young and prosperous settlement, prefer to read useful works, and attend to their own business, rather than to pay for, and read, slanderous publications, and attend to other people's concerns."

We gave in our last, a communication from Mr. Burrows, detailing the uncommon fertility produced by the wool tags and other refuse of a woollen factory. We have another remarkable fact to narrate, in corroboration of Mr. B.'s statement:—Mr. Hubbard, of Middletown, Conn. informs us, that he cut *fifteen* tons of hay from three acres of land, at one cropping, which had been brought to this state of fertility, from a low condition, by the sweepings of his woollen factory. Bets having been made by his neighbors on the amount of the crop, the whole was accurately weighed. Mr. H.'s profit at this time, may be estimated at $100 per acre—a handsome return for Yankee industry. Chaptal pronounces this manure the most valuable that can be employed.

MAMMOTH PRODUCTS OF A MAMMOTH DAIRY.

We called to see the extraordinary cheeses from the dairy of Col. T. M. Meacham, of Oswego county, when they were exhibited in town. There were ten, weighing in the aggregate nearly 8,000 lbs. and surpassing in magnitude any thing of the kind we had before seen, or read of. One, weighing more than 1,400 lbs. is destined as a present to the President of the U. States. The others, weighing 700 lbs. each, have inscribed upon them, severally, the names of cities, public bodies and individuals, that is to say—the Vice President of the United States, the Governor of the State of New-York, the Congress of the United States, the Legislature of the State of New-York,—the Cities of New-York, Albany and Troy.—the Hon. Daniel Webster, &c. The cloth cases which severally enclose these monstrous productions, are tastefully decorated with mottos, inscriptions and paintings, and they are transported in boxes made to fit them. The proprietor is desirous of receiving contributions to remunerate him somewhat for his expense and labor, in which we hope he may prove successful, and to present the cheeses according to the inscriptions upon them, *in behalf of the people of the state of New-York*. We highly commend the enterprise of Col. Meacham, yet we confess we cannot exactly applaud the manner in which it has been displayed.

The advantages of a farm upon the Hudson are particularly illustrated by the fact, that a farmer in our vicinity has sold his surplus crop of hay, recently for $4,000, destined for the *New-Orleans market*.

CORRESPONDENCE.

CORN—POTATOES—RUTA BAGA.

Trenton, Oneida Co. Nov. 1835.

Dear Sir—Agreeable to your request, when I saw you in May last, I herewith transmit to you the result of some experiments, I at that time contemplated making, particularly in the growth of Indian corn, potatoes, and ruta baga turnip. This section of country is celebrated for grass and grazing, and most of our farmers have embarked in the dairy business, under a belief that the soil and climate is unfavorable to the growth of all kinds of grain excepting oats. This being the second year that agricultural business has occupied exclusively my attention, my operations as yet are small.

I had a ten acre lot of stiff, strong sward, that had not been ploughed for many years; this I intended turning over chiefly for Indian corn; in one corner of which I measured off one acre for corn, and by the side of it, one other acre for potatoes, drew on about twenty loads yard manure to the acre, on each, turned it over, following the plough with the roller, harrowed and furrowed it three feet apart from north to south, put down about the same quantity of manure in the hills that was turned under. Commenced planting corn 20th May, seed soaked, rolled in tar and water and plaster: put down 4 grains in a hill, one foot apart; we planted the first day about one quarter of an acre, which came up well, the rest was planted on the 22d and 23d, and owing, as I thought, to the seed laying too long in the hot sun after being soaked, before it was planted, did not come up scarcely one hill in a row: we replanted on the 2d and 3d June, which came up well.

In consequence of the late planting and the unfavorable season, I long since abandoned the idea of obtaining more than a common crop. It however, grew well; we gave it two good dressings with the cultivator and hand hoe. On the 6th Sept. we had a frost that checked its growth, and on the nights of the 12th and 13th Sept. were killing frosts; while it appeared to be in full bloom, on the 14th, we cut it all up by the roots and placed it in small stocks, where it remained until about the middle of October, when we husked it out, taking care to keep the one-fourth acre first planted, by itself. We husked in a large basket holding little more than a bushel. We took from the quarter acre, forty-eight baskets, one of which we spread on the shelves in the milk house, where we kept a fire in a stove, and left it about ten days, then shelled it out, and got 17 quarts 1 pint shelled corn, giving 26 bushels 8 qts. or 105 bushels to the acre. The other three-fourths did not do as well, but taking it together, we got 94 bushels and 2 qts. shelled corn. I would not wish it understood from the above, that I am in favor of late planting, by no means. I am decidedly in favor of early planting, (weather and land permitting.) I would never leave it later than 10th May. Urgent business calling me f om home, was the cause of my late planting at this time.

Potatoes.—My potato ground was prepared the same as for the corn and planted the first and second days of June—furrows three feet apart one way, seed all whole and large, put down one in a place, one foot apart; we gave them one good dressing with the plough and hand hoe, which was all that was done to them until harvesting. About one-quarter was planted with the pink-eye, the rest with the orange potato. We took up 519½ baskets weighing each 69 lbs. A fair measured bushel potatoes weighs 64 lbs. By this standard we got 560 bushels as fine potatoes probably as is often taken out the ground. The orange yielded about 8 per cent more than the pink-eye. In no part of my farm did potatoes yield as much by one-quarter, as they did the preceding year; I do not, therefore, consider the yield of 560 bushels to the acre, by any means a large one.

Ruta Baga.—The ground planted was barely sufficient to give a fair trial, less than half an acre, part of it on sward, and part on ground where potatoes were raised last year. Those where potatoes grew the preceding year, were the best. I measured from one end of the patch, twenty square rods, from which we got 154½ bushels, or 1,236 bushels to the acre, 55 lbs. to the bushel. The ground was ploughed but once, threw into ridges about three feet apart, a man sent ahead with a hoe to level the tops of the ridges, following myself with a tin canister with two small holes in it, with the seed in. (And here, in justice, I must acknowledge the receipt of the simple idea obtained from the Cultivator, in a communication in the May number of this year, from William R. Smith, of Macedon, which I consider of more value to me, than many years subscription to the Cultivator.) This canister I shook over the ridge, passing nearly on a common walk; a boy following with a garden rake, to cover the seed, and it was done. The seed came up well—required a little thinning in some places, and filling up in others. I consider the ruta baga a crop which every farmer should raise, particularly the poor man, who keeps but one cow, and hires a tenement, with but one acre of land. Let him set off one quarter of an acre and plant it with ruta baga; with proper treatment, this would furnish his table nearly the year round with an excellent vegetable, and with the aid of a few bundles of straw, winter his cow better than she could be wintered on hay. Mine were planted 7th. June, which in our latitude I think is not too early. I will endeavor to make as near an estimate of the expense of the cultivation as I can, commencing with the corn.

Dr.—Ploughing, harrowing and furrowing 1½ days, at 16 shillings per day,	$3 00
Planting, 4 days' work, at 6s. per day,	3 00
Drawing on 40 loads manure, at 20 cents,	8 00
First dressing with cultivator, half day,	1 00
Six days' work hoeing first time,	4 50
Six days' work second dressing,	4 50
Half day with the cultivator,	1 00
Seed $1, interest on cost of land, $3.50,	4 50
Total,	$29 50
Cr.—By 94 bushels of corn, at 6s.	$70 50
Expenses,	29 50
Profit,	$41 00

I have not taken into calculation the expense of harvesting, considering the fodder to be ample pay.

Potatoes.	*Dr.*
Ploughing, harrowing and furrowing,	$3 00
Planting, 4 days' work, at 6s. per day,	3 00
Ploughing 1 day,	2 00
Hoeing 4 days, at 6s.	3 00

Digging and housing 560 bushels, at $3 per hundred bush.		16 80
Interest on cost of land,		3 50
35 bushels seed, at 2s		8 75
Drawing on 40 loads manure, at 20 cents,		8 00
Total,		$48 05
Cr.—By 560 bushels, at 20 cents,	$112 00	
Expense of cultivating, &c	48 05	
Profit,	$63 95	

Ruta Baga.		*Dr.*
Ploughing, harrowing and ridging,		$3 00
Putting in the seed, 2 days' work,		1 50
2 days' dressing through with the Cultivator,		2 00
First thinning and hoeing, 8 days, at 6s		6 00
Second do. 8 days,		6 00
One pound seed, 8s		1 00
Interest for cost of land,		3 50
Total,		$23 00
Cr.—By 1,236 bushels, at 20 cents,	$247 20	
Expenses of cultivating, &c	23 00	
Profit,	$224 20	

The tops will pay for harvesting. I am fully of opinion that any land that will grow fifty bushels Indian corn to the acre, will grow five hundred of potatoes, or ten hundred of ruta baga.

Yours, very respectfully, J. W. BREWSTER.

N. B. The soil on which the above crops were grown, was a dark loam with a small mixture of clay, a hardpan underneath, say ten or twelve inches from the surface, and has by the oldest and most experienced farmers in the the neighborhood been considered entirely unfit for the growth of Indian corn.

SHEEP HUSBANDRY.—No. II.

The common sheep of Spain have coarse light fleeces, being worth from 10 to 12 cts. per lb. and reared principally for their flesh.

"The word *Merino* is Spanish, it signifies governor of a small province, and likewise him who has the care of the pasture and cattle in general. The *Merino Mayor* is always a person of rank, and appointed by the king: the duke of Infantado is the present *Merino Mayor.*"

The *mayors* have a separate jurisdiction over the flocks in Estramadura, which is called the *mesta;* and there the king is the merino mayor. Each flock consists of 10,000 sheep with a mayor or head shepherd, who must be an active man, well versed in the nature of pasture, as well as in the diseases of his flock. It might be interesting to some to pursue this part of the subject further, but I fear encroaching on the limits of your paper; if it should excite an interest to consult standard authorities and investigation, my present object will be attained.

The word *merino* is now by general usage applied to the fine woolled Spanish sheep.

From the earliest history of Spain, the possession and cultivation of a peculiar breed of fine woolled sheep has been a subject of high national legislation, and although it was carried to an extent greatly oppressive and injurious to some other interests, yet it resulted in preserving and improveing their sheep above those of the whole civilized world.

The origin of the fine Spanish sheep as stated in the preceding number, is yet left for ingenious investigation.

Strabo, speaking of the beautiful woollen clothes that were worn by the Romans, says that the wool was brought from *Truditania,* in Spain. After the conquest of Spain by the Romans, the elder Columella was one of the early emigrants to Spain. For "Spain was at that time highly civilized; and agriculture was the favorite pursuit of all who were not occupied in war." How desirable is it that our country should properly appreciate this great source of happiness, wealth and true greatness.

Mr. Fessier, a distinguished member of the French institute, and who was commissioned to investigate this subject, says, "all that we know of the *merino,* is that they have a long time existed in Spain; the *merino* is a distinct breed of sheep; as in the class of dogs, the Danish dog, the grey hound, the shag dog, the lap dog, &c. And in the same manner as among dogs, the cross breeds may afford individuals more or less approximating to the species, but never the species itself." Another writer says, "the *merino* differs more essentially from every other kind of sheep, than the spaniel does from the mastiff. And yet no one has seen any change in either of those species of dogs in the course of generations, or in any climate, except by intermixture of the breeds. I say the *merino* differs essentially from all other sheep, and even from all other quadrupeds of which we have any knowledge, as an annual does from a perennial plant. All quadrupeds change their coats every year, and indeed generally twice a year; the *merino* sheep never changes his coat; on the contrary, it will continue to grow from year to year, and at the end of the third year the fleece will yield a three years crop, with little or no diminution. This has been tried in France, Switzerland, and England."

Sportsmen, for the purposes of the chase and the turf well understand their business, in breeding the grey hounds, and blood-horses. Will the deliberate scientific agriculturist be shamefully distanced in the comparison of his pursuit with that of play and recreation? Will he rear a cock that will not fight on his own dunghill? Excite an interest, raise a competition, and any subject at this day will be investigated. Let us observe the course which nature treads.

"God never made his works for man to mend."

I would with Franklin conduct the lightning harmless down, but not in folly strive to stay its force.

Mr. Livingston says, "It will be of use to be acquainted with the several breeds of Great Britian and Spain, as a direction to those who may endeavor to import sheep from thence; for though every *variety** of the *merino* is valuable, yet they differ widely from each other in beauty, in form and in fineness of fleece, as may be judged from the prices in Spain, where Leon and Escurial wool sells for 100 cts. while that of Aragen brings only 60 cts. with several intermediate kinds."

The principal flocks of Spain are divided into the (*Transhumanta,*) or which migrate from north to south twice every year, and include the greatest number, their route having been regulated from time immemorial by legislation. The privilege of a route ninety paces wide across the cultivated fields, is claimed and maintained by the government for the passage of the public flocks.

Then the (*Estantes,*) or stationary flocks.

These are next subdivided into several varieties and denominations, originating either in ownership or locality of production, of which the most prominent are the following, viz:

Those of the Escurial convent are altogether the finest and most perfect of any of the Spanish flocks, combining excellence scarcely admitting of improvement.

Those of the duke Infantado and of the countess Nigretti are but imperfectly known in this country.

Those of Monturio and Gaudaloupe, of those brought to this country, rank next to the Escurial in their most essential qualities.

Those of the Paulaur convent. Of all the Spanish flocks this is the largest sheep, elegant in form, and producing the greatest fleece, but at the same time coarse, and abounding in jarr and yolk. He has a large dew-lap extending from the chin to the breast. This wool, though not answering the full requirement of the market, nor meeting the nicety of modern machinery; still however, standing in advance of all crossing with Dishley, Lincolnshire or other mongrel productions, and of all others are the most rugged and hardy, almost answering the requirement of a *sheepman,* who thinks sheep require no care.

I have seen some fleeces of Paulaur bucks highly fed, weighing unwashed, twelve and fourteen pounds.

Besides these there are many other flocks which I shall omit to describe.

The *emigrant merino* will form the subject of the next paper.

F.

* I have substituted the term variety for species.

COMPARISON IN CUTTING UP AND TOPPING CORN.

To the Editor of the Cultivator:—It is a fact of general observation, that the past season has been very unfavorable to the maturing of the corn crop; consequently much of the corn was unripe at the usual time of frost, and as there was a prospect that fodder would be scarce, it became an object to make the most of the corn stalks. With this view, and also to ripen the corn, many farmers topped their corn, while others cut it at the ground. To test the comparative merits of these two methods, a part of a field was topped at the time of the first frost in September, and the rest of the same field was cut off at the ground at the same time, and set up in small stooks, tied near the top. It may be observed that the wire worm cut off the first planting to a very considerable extent, and that all the second planting was nearly or quite unglazed at the time of harvesting,—and for this reason it was supposed that the topping would hasten the maturity of the grain, but far otherwise was the fact. The part that had been topped, when gathered, had undergone fermentation to such a degree as to be quite offensive, so that no creature would eat it; while the other had become partly glazed, and what remained soft, was perfectly white and sweet, and was eaten greedily by swine and cattle; and the difference in the value of the fodder was nearly equal to that in the grain. OBSERVER.

Coxsackie, November, 1835.

Note.—The stocks of the uncut corn were succulent, with mostly unelaborated juices,—which, during the warm weather, readily fermented; while in the cut portion the juices were mostly already elaborated, the watery portion evaporated, and much of the nutriment was transfused into the grain.—*Cond.*

GAMA GRASS—INDIGENOUS GRASSES.

Stratford, Conn. Nov. 3d, 1835.

J. Buel, Esq.—Dear Sir,—In the September number, page 94, of the "Cultivator," you stated that "the *gama grass* is not found growing naturally in Connecticut."* I feel a great interest in the progress or success of the Cultivator, having taken it from the first, and subscribed this year for three copies, two of which were for gratuitous circulation. I take the liberty to correct your mistake, and especially as I am a Connecticut man, I wish Connecticut to claim all her *grassy* as well her civil and religious rights.

I am happy to inform you that the *gama grass* (*Tripsacum dactyloides*,) is growing luxuriantly in this town, from three to five feet high, and is unquestionably *indigenous*, because the owner of the land is unacquainted with the fact that such grass is on his farm, and I believe the land has been in his family for something like a century, and besides, I presume the land was never ploughed. The situation is such, that you could not hesitate to pronounce it indigenous. The grass is now well seeded, and I would send you some of it by mail, but it takes only about one hundred seeds to make an ounce, besides being very bulky. If I have a private opportunity, I will do myself the pleasure to forward you some of the seed.

It was first discovered in this region by H. C. Beardsley, M. D. a distinguished botanist from Monroe, in this state. I should presume from its appearance and habits that it would not be judicious to cultivate this grass on a good soil, because it must be almost impracticable to plough it up, as the roots are as large as the root of the (Acorus calamus) *sweet flag*, and all completely matted together. But as the soil on which it grows is little else than a sand bar, I presume it might be valuable as a coarse grass on a sandy soil, that would produce little or nothing else.

Near to the locality of the gama grass grows spontaneously the *Panicum vargatum*, which is believed to be the *prairie grass* of the western country. It is now well seeded, and about five feet high.

I enclose a few seeds of another kind of grass, (Aristida,) that grows near the same locality. The species is a new one and not known in the books. It was first discovered by Dr. B. The seeds are remarkably curious, on account of the long spiral awns attached to each. The grass is about a foot high, and I presume not very valuable except as a curiosity.

Again, sir: As your paper is useful to the horticulturist as well as the farmer, allow me to suggest the result of an experiment with an accommodating crop of *raspberry vines*.

Gardeners usually find it difficult to perfect any vegetables among them. I have tried potatoes and sundry articles unsuccessfully until this season. I tried as an experiment the old fashioned striped *bell-pumpkin*, used for the table (and by the way the best article after all of the pumpkin kind for the table that I have ever seen, from Patogonia to Quebec.) I planted six hills, putting two seeds in a hill, only seven seeds however vegetated. They were planted so late that they did not begin to run or spread at all, until the fruit of the raspberry was ripe, but began soon after. From the product of these seven seeds I gathered thirty-four pumpkins, the largest weighed twelve pounds, all averaging about eight pounds, total weight was 265 pounds, and they are all, except one, unusually good of the kind.

I planted but a part of my raspberry ground, but the part planted was but a fraction over one rod square. This crop therefore is entirely gratuitous, because it is no more trouble to cultivate the raspberry with, than without the pumpkins; as the new crop of raspberry vines fall upon the ground and cover it, the pumpkin vines rise above them, and thus prevent nearly all other vegetation. If you deem the preceding articles worthy an insertion in your valuable paper they are at your service. I am, sir, respectfully yours,

JAMES H. LINSLEY.

* We stated this as a matter of inference, from the fact, that it had neither shown any indications of seeding, or acquired any growth to make it an object of culture with us—it seemed to belong to another and a warmer climate. We find our opinion, that it is not worth the notice of northern farmers, which is the main point to be ascertained, fully confirmed by the Hon. John Lowell, of Boston, who, in the last Gardener's Magazine, laconically remarks: "I have tried it in all soils. With us it is worthless, as much so as fiorin, which made *two hours* noise in the world, and then expired."

THE YELLOW LOCUST.

Montgomery County, Md. 10th mo. 27, 1835.

Respected Friend—I have heard that in some parts of the state of New-York, they make a business of raising locust trees for posts, and as thee seems to know every thing, would be glad if thee would give us some information on the subject;—how far apart to plant them—what cultivation they need—what kind of soil is best adapted to them—in how many years they will be fit to use as posts, &c. &c.

And oblige A SUBSCRIBER.

BY THE CONDUCTOR.

The locust referred to by our correspondent, presumed to be the common yellow locust, (*Robina pseudo-acacia*,) is a plant of extremely easy propagation—of rapid growth, and valuable not only for fence-posts, but for ship-timber and mill-works. Forests of it, of indigenous growth, have existed in the south-east part of Broome county, but they have in a measure been prostrated, and the timber floated down the Susquehannah, to Pennsylvania and Maryland. The tree is cultivated in many parts of the state, and would be in all, if its value was justly appreciated, and were it not for a formidable enemy, a *borer*, which has attacked it within a few years. In some locations, the tree is not molested by the insect, while in another, perhaps contiguous, it is wholly destroyed. The cause of this partial exemption, we cannot explain, except it be owing to soil—having remarked, that the insect is found to abound most in soils that are light and sandy.

It may be propagated by seeds, of which it furnishes a great abundance, or by sprouts, which spring up wherever the roots are wounded or severed. The seeds are enveloped in a hard shell, impervious for a long time to cold water. Hence, in order to induce prompt germination, they should have scalding water turned upon them, and the operation should be repeated upon such as do not swell from its first application. They may be sown pretty thick in drills, one foot apart, and planted in nursery rows, three feet apart, in the fall, with an interval of eight to twelve inches between the plants; or sown thin in drills, two feet apart, and be suffered to stand two seasons, when they may be planted out. While in the seed bed, they should be kept free from weeds. They may be planted at six feet each way, and thinned for fence-posts, when of sufficient size. At this distance, 1,210 trees may be grown on an acre. At a medium calculation, they will be of sufficient size for fence-posts, in ten or twelve years from the seed. The seed may be had at the seed stores, or, if applied to, we might obtain it, fresh gathered. Prices have varied from one to three dollars a pound. The *tree* requires no culture.

To multiply sprouts, it is only necessary to plough about standing trees.—They will spring up in great abundance the first season. The tree grows well on all soils that are not habitually wet, but, like every other plant, will show its keeping. There is no timber tree that makes a quicker or more profitable return to the planter.

P. S.—After the above was penned, we visited some districts of Dutchess and Ulster, in which the locust is pretty extensively grown—and what appeared strange to us, we found them free from the borer, and but very few producing seeds. In the latter county, in particular, we saw hundreds, and perhaps there are thousands, scattered over the farm of the Messrs. Hallocks, tall thrifty trees, and innumerable sprouts springing up around. Here they are exclusively propagated from the sprouts, and the trees seldom produce any seeds.

On turning to Michaux, we find mention made of a new variety, which in its early age, is entirely destitute of thorns, distinguished by the superior size of its leaves, and the rapidity of its growth. We have reason to believe that it was this variety we saw in Ulster. The growth is equal to that of the chesnut. The timber sells at fifty cents to one dollar the cubic foot.

Cattle and Sheep Husbandry.

From the Edinburgh Q. Journal of Agriculture.

ON THE APPLICATION OF THE POINTS BY WHICH LIVE-STOCK ARE JUDGED—I. TO SHORT-HORNS. *By Mr. James Dickson, cattle-dealer, Edinburgh.*

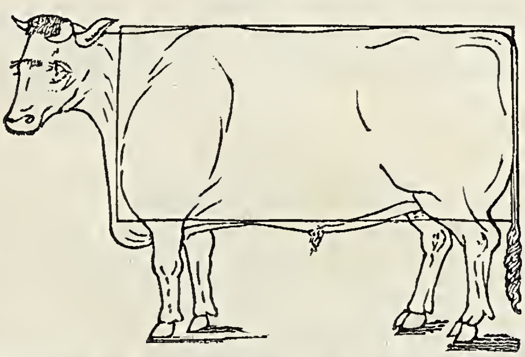
Having, in my former paper, [See Cultivator, vol. I. p. 134,] enumerated the *points* and form by which the value of an ox of any breed ought to be ascertained, let us now apply them to the prevailing breeds of cattle, that we may thereby discover which is the most valuable one existing; and, after having ascertained that by comparison, we will then be prepared to consider whether the less valuable breeds might not be improved by intermixture with the most valuable, or, at least, whether such attempt at crossing would be beneficial to the country.

Before proceeding with this interesting investigation, I may remark, that the points and form recommended for general application are neither imaginary nor arbitrary; on the contrary, they have been discovered and established by long experience patiently acquired, and they have now received the general sanction of competent judges; in short, they form the rule of judgment for our best practical judges of cattle. It may have been observed, however, that I have hitherto applied the rule only to *oxen*, and it may therefore be very reasonably demanded whether it applies well as to heifers, bulls and cows? To this I answer, that it applies to every age, sex and condition of cattle, and that if it did not, it could not be maintained and recommended as a *general* rule; but in its application to bulls and cows there is a slight deviation occasioned by sexual development. In the bull, age produces an enlargement of the muscles of the neck, and a fulness of the gristle, and a consequent dependence under the brisket; these are marks of *virility*, beside others, which cannot exist in the ox; and in the cow, age produces a thinness in the buttocks and an enlargement of the abdomen, and a consequent depression of the loins; these being marks of *calf-bearing*, which cannot exist in the heifer. In all other respects in regard to general form, points, quality and good breeding, the rule applies as strictly to the bull, the cow, and the heifer, as the ox.

Of the various prevailing breeds of cattle in Scotland which I shall enumerate and apply the rule of judgment to, I shall begin with the *Short-Horns*.

When we survey the frame of a short-horn ox, we have a straight level back from behind the horns to the top of the tail, full buttocks, and a projecting brisket; we have, in short, the rectangular form, as represented in a side view by this Fig. 1; we have, also, the le-

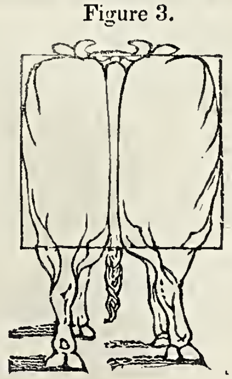
Figure 1.



vel loin across the hook bones, and the level top of the shoulder across the ox, and perpendicular lines down the hind and fore legs on both sides, these constituting the square form, when the ox is viewed before and behind, as represented in Figs. 2 and 3; and we

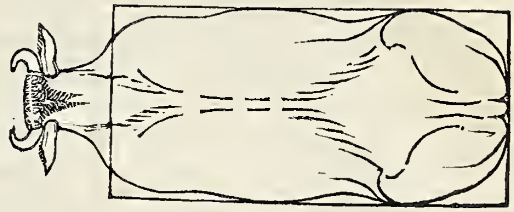
Figure 2.

Figure 3.



have straight parallel lines from the sides of the shoulders along the outmost points of the ribs to the sides of the hind quarters, and we have these lines connected at their ends by others of shorter and equal length, across the end of the rump and the top of the shoulder thus constituting the rectangular form of the ox when viewed from above down upon the back, as represented by Fig. 4. We have, in this manner, the form of the short-horn ox and heifer in perfect accordance with the diagrams of the rule.

Figure 4.



Further, I should be inclined to assert, although I have not directed my attention to the fact sufficiently to be able to prove the assertion from examples, that the carcass of a full fed symmetrical short-horn ox, included within the rectangle, is in length double its depth, and its depth equal to its breadth. Hence, Figs. 2 and 3 are squares, and Figs. 1 and 4 each two similar squares, placed in juxtaposition. The short-horn bull deviates from the rule in a rising of the neck, a dependence under the brisket, and a fulness of the neck vein; the cow only a little from the ox or heifer, in a thinness in the buttocks, and besides this, when aged, in an enlargement of the belly, and mostly, though not always, in a hollowness in the loins. The *form*, therefore, of the short-horn breed is perfect according to the rule.

In its *points*, that for quantity and well laid on beef, the short-horn ox is quite full in every valuable part, such as along the back, including the fore ribs, the sirloins and rumps, in the runners, flanks, buttocks, and twist, and in the neck and brisket as inferior parts. In regard to quality of beef, the fat bears a due and even preponderating proportion to the lean, the fibres of which are fine and well mixed, and even marbled with fat, and abundantly juicy. The fine, thin, clean bone of the legs and head, with the soft mellow touch of the skin, and the benign aspect of the eye, indicate in a remarkable degree the disposition to fatten; while the uniform colours of the skin, red or white, or both, commixed in various degrees—bare cream-coloured skin on the nose and around the eyes, and fine tapering white or light coloured horns—mark distinctly the purity of the blood. These points of blood, and quality, and quantity of beef, apply equally to the bull, the cow and the heifer, as to the ox. Combining all these properties of points and form, we shall find that the short-horn breed illustrates, in a very satisfactory manner, the application of the general rule which has been explained. On account of its valuable properties, this breed demands further illustration.

The external appearance of the short-horned breed is irresistibly attractive. The exquisitely symmetrical form of the body in every position, bedecked with a skin of the richest hues of red and the richest white, approaching to cream, or both colours, so arranged or commixed as to form a beautiful fleck or delicate roan, and possessed of the mellowest touch—supported on small clean limbs, showing, like those of the race-horse and the greyhound, the union of strength with fineness; and ornamented with a small lengthy tapering head, neatly set on a broad firm deep neck, and furnished with a small muzzle, wide nostrils, prominent "mildly beaming" eyes, thin large veiny ears, set near the crown of the head, and protected in front with semi-circularly bent, white or brownish coloured short, (hence the name,) smooth, pointed horns;—all these several parts combine to form a symmetrical harmony, which has never been surpassed in beauty and sweetness by any other species of the domesticated ox.

Enthusiastic as this language may be considered when applied to the external beauty of cattle, it is not more so than the beauty of cattle is entitled to; for when it is considered that symmetry of form generally accompanies mellowness of touch in the skin, and that both constitute the true index to a disposition to fatten, the most *useful property of all*, beauty of external appearance is too valuable a criterion to be overlooked. Fortunately, indeed, beauty cannot be overlooked in cattle, for, even were it useless, it it so irresistibly engaging, that the judgment of a stoic would be biassed in its favor.

To my taste, nothing can be so attractive a spectacle of the kind as a show of fine bred short-horns in high condition, such as are to be seen at Dunse June fair, or the monthly markets at Kelso and Coldstream in May and June.

BREEDING IN-AND-IN.

The preservation of the valuable breed of short-horns is a consideration of paramount importance; and, fortunately, it is in the power of breeders themselves to secure it. It consists entirely in maintaining the *purity of blood in vigor.* This desirable end is best secured by avoiding, on the one hand, the evil of breeding in-and-in, that is, the union of too close relationship in blood, and on the other, too violent a cross. A strong mark of the purity of blood being in vigor, is the circumstance of like producing its like; and no breed will in this respect incur so little disappointment to the breeder as short-horns, after a proper selection of the dam and sire.

The evil of breeding in-and-in, or, in other words, producing too great refinement of tone, is manifested in the first instance, by a tenderness of constitution; the animals not being able to withstand the extremes of heat and cold, rain and drought. If the evil is prolonged through several generations, the forms of the animals become affected, the bone becomes very small, the neck droops, the skin of the head becomes tight and scantily covered with hair, the expression of the eye indicates extreme sensibility, the hair on the body becomes thin and short, and the skin as thin as paper; the *points* continue good, and predisposition to fatness increases, but the whole carcass becomes much diminished in size, though retaining its plumpness and beautiful symmetry. The evil, however, does not terminate in the production of these symptoms. Internal diseases ensue, such as disorganization of the liver, or rot, polypi in the trachea, or clyers, malformation of the bones of the neck and legs, and general deformity.

It is true that both Mr. Bakewell and the Messrs. Collins bred much in-and-in. Such a practice may be excusable in those who are attempting to establish a particular kind of stock, as by that means it will be sooner brought to maturity. But the same license cannot with propriety be taken by breeders who have abundance of well-bred stock within their reach from which to select their breeding stock. The invariable injurious tendency of breeding in-and-in proves that nature herself places a barrier against abuse in breeding.

CHOICE OF BULLS.

The practice of breeding in-and-in leads me to remark on the subject of judging of large and small bulls. I have had frequent opportunities of observing that premiums, at local shows, are given by the judges to *large* bulls. This I conceive a great mistake. In my opinion, the size of a bull ought to be considered of secondary importance in judging of him as a breeding animal. That which shows the greatest number of good *points*, ought to be chosen, and these should be counted by the judges. One bull may possess one point better than another; but that one possessing the greatest number of points ought to be preferred, particularly among a competition of aged bulls. Some young bulls, it is true, do not show their points till they are one or even two years old, whilst others show them from the first. When all the points are not visible on a young bull, he must be partly judged of by his pedigree. If the blood is well descended, free from intermixture, and not too nearly related in blood on both sides, then a young bull may be safely judged of by his pedigree. The points of well-bred young bulls improve as they advance in years.

CHOICE OF COWS.

In judging of cows I should make some modification of the rules recommended for bulls. They should be always large, having capacious parts to support the calf to a large size, and to permit its egress freely at the period of calving. Purity of blood, of course, must be attended to as the first consideration; but, in order to obtain a well-bred large cow to breed from, I would overlook a point or two in the symmetry or quality. As in the case with bulls, small cows will generally show finest symmetry, yet I would deviate a little on the score of points, which are every thing to a bull, to obtain a large capacious cow, which generally carries a strong healthy calf.

MILKING PROPERTIES.

It has been frequently asserted, that short-horned cows are bad milkers, indeed that no kind of cattle are so deficient in milk. Those who say so do not know the still greater deficiencies of the Herefords, a species of cattle quite unknown in Scotland. The higher bred stocks of the Messrs. Collings, Mr. Mason, and Mr. Robertson, yielded little milk. Indeed Mr. Robertson's could not supply milk sufficient for their own calves, at least not in the quantity which it was desired by him they should receive. Cows were kept for the purpose of supplying the deficiency of milk of the high-bred cows. But this deficiency of milk did not altogether proceed from the circumstance of the cows being of the short-horned breed; because those eminent breeders devoted their whole attention to the development of flesh, and not at all to the development of milk. Had the flesh been neglected as much as the milk, and the property of giving milk as much cherished as the development of flesh, their short-horned cows would have been deep milkers. As it is the generality of short-horned cows are not bad milkers. Indeed, it is not to be doubted, that where the general secreting powers of the animal system have been increased, as it has been in that of the short-horns, the power of secreting milk will be increased with the power of secreting flesh and fat; all that seems requisite, is to encourage the power of that secretion, which for the time is most wanted. I have no doubt that it is completely in the power of the breeders of short-horns to make them good milkers. It would be to desire an impossibility, to desire the full development of flesh, fat, and milk, at the same time; but there is no absurdity in desiring a large secretion of flesh and fat at one time, and a large secretion of milk at another, from the same cow. Accordingly, this is the very character which has been acquired by short-horn cows. They will yield from six to sixteen quarts a-day throughout the season; and they are so constant milkers, that they seldom remain dry above six weeks or two months before the time of calving.

But the practice of the owners of public dairies in towns, were there no other proof, would prove the milking powers of short-horn cows. They prefer them as the greatest and most steady milkers; and it is now difficult to see cows of any breeds but short-horns, or crosses with them, in these dairies. In London Edinburgh and Liverpool, fine short-horn cows may be seen at the public dairies.—They are brought by the milkmen whenever they come of age, that is, about five or six years old. They give milk till they attain the age of eight or nine, and are then fed off fat for the butcher. These cows *can* be fed off fat. This property, and that of milking, prove clearly, that short-horns possess both in a remarkable degree. They do not, it is true, possess both in an eminent degree at the *same time;* but they exhibit either property separately when it is desired. They thus give a return in flesh for part of their original high price, whilst they remunerate their owners in the mean time with an abundance of milk for their food.

From the Edinburgh Quarterly Journal of Agriculture.

ON ROT IN SHEEP.

The attention of your readers having again been called to the internal rot of sheep, I would humbly offer the following remarks to their consideration, hoping they may be of some use in leading either to a prevention or cure of that distressing disease which has been the means of ruining so many of our poor farmers, and perhaps of injuring the health of many of our people, who have been fed with unwholesome mutton. I first, then, would recommend your readers to read a small book published in 1823, at Berwick-upon-Tweed, by a Lammermuir farmer,* not that I agree with him as to the cause of the disease, but he gives many interesting facts, and useful hints. He supposes that the rot is occasioned by feeding in a luxuriant after-growth of grass, but I have yet to learn that a luxuriant after-growth of clover occasions this disease. The fact I believe to be, that it is some particular plant which affects the animal. It is surely no longer believed that it is wet or cold; for if a ewe, when giving milk, does not suffer, is she more likely to escape the effects of cold than another sheep? But I believe it is admitted by medical men, that women giving milk are not so apt to suffer from poison as other persons: so also with sheep. I am inclined to believe that the butter-cup (*Ranunculus,*) is the plant which is the cause of the mischief. Green in his Universal Herbal says, all the parts of this plant are exceedingly acrid. In the Isle of Sky, it is used instead of Spanish flies to raise a blister. Curtis states that when cattle are tempted or forced to eat it, their mouths become sore and blistered; and, according to Linnæus, sheep and goats eat this plant, but cattle, horses and even pigs, refuse it. Geese also eat it. Now, sheep

* This is an excellent practical treatise on the management of sheep in upland pastures. Its author, the late Mr. John Fairbairn of Hallyburton, we had the pleasure of knowing well; and many will bear us out when we state that no Lammermuir farmer could show a better flock of Chevoit sheep than he had.—*Ed. Q. J. A.*

and geese are more apt to have enlarged or diseased livers, than any of the other graminiverous animals that I am accquainted with.

But to return to the Lammermuir farmer. He recommends salt as a decided cure for this disease. The dose is 1½ ounces of common salt, given in three-quarters of an English pint of water, to a sheep, with an empty stomach, for three or four mornings. Limewater is also good. I have seen both given: and, on killing the sheep that had two doses of the salt, there were about 160 flukes taken out of its liver, most of which were dead. But as a preventive is better than a cure, I would call your attention next to White, that close observer of nature. He says in his Natural History of Selborne, that "worms seem to be the great promoters of vegetation, which would proceed tamely without them, by boring, perforating, and loosening the soil, and rendering it pervious to rain and the fibres of plants, by drawing straws and the stalks of leaves into it; and, most of all, by throwing up such infinite numbers of lumps of earth."—Again he says, "that the earth without worms would soon become cold, hard-bound, and void of fermentation." But more applicable still to the case of your correspondent, in p. 232, where he says, "Lands that are subject to frequent inundations are always *poor*, and probably the occasion may be, because *the worms are destroyed.*" Now, I observe from your correspondent's remarks, p. 503 of vol. v. of your Journal, that this meadow, although well laid down in grass, soon appeared *starved*, after having been irrigated: so it is well worth his examining whether or not the *worms have been destroyed* by frequent irrigation? If so, I have no doubt he has got rid of the moles also, as the latter feed chiefly on the former. The Ettrick Shepherd says, vol. ii. p. 700, of your Journal, that it is his opinion, as well as that of shepherds, that the extirpating of moles, or doing away with mole-hills, was the primary cause of the disease among sheep, known by the name of pining. Now, the conclusion to which I have come in my own mind is, that earth is necessary for the general health of sheep, be it in the shape of mole-hills or worm-casts. True it is, that there are no moles in the sister island Old Ireland, and the sheep there are in general, I believe, sound, but there must be plenty of worm-casts. Your correspondent strengthens me in this opinion, that earth is good for sheep, when he states that folding them occasionally in fallow, is sometimes a means of preventing the rot.*

I watered a field of old grass in the summer 1833, which I stocked chiefly with sheep, and I found they soon became all tainted, although those of a neighbor from the same breeder were perfectly sound. The shepherd, who had known my field for many years, said he was not aware that sheep had ever suffered in the field before from the rot; and I now think it very probable that I erred in not stocking the field sufficiently, thus by the length of the grass preventing the sheep from getting at the worm-casts or other earth. It occurs to me, that one reason why the disease of the rot is more common in England than in Scotland is, that they do not feed their grass so close as we do. Besides, they do not clean their fallows so well, and have more butter cup, having older and richer pasture. The meadows in the neighborhood of your correspondent are entirely new, so perhaps the worms are not yet destroyed, which may account for no rot being in these pastures; and those that are watered by other streams may perhaps be supplied with mud or earth from such streams.

It is a custom at the Duke of Montrose's, and with others who feed pigs, to give them occasionally ashes or cinders; and as a pig is very apt to overeat itself, and to take all sorts of mixtures, it ought always (when prevented by confinement from getting at the earth of the field) to be provided with some alkali, to correct the acidity in its stomach. I had some time ago a large fat hog, which was confined, and kept very clean, getting nothing to eat but meal of various kinds, with milk; and just about the time I intended to kill it, I was prevented by its becoming very costive and unwell. I did not know how to administer any opening medicine to so strong an animal, but in turning it out of the sty, I found it began to eat earth and lime; I therefore immediately mixed some magnesia with milk, and it soon took a sufficient quantity of it. I would also mention, that when the root of the bitter cassava is given, in the West-Indies, *washed* to pigs, it kills them, but when they make their way into the provision grounds, and take plenty of earth with this root, it has apparently no bad effects on them.

It ought to be generally known whether potatoes, when given raw to pigs or cattle, should be washed. I know not what is the best corrective for the poison of the solanum family, but an alkali is given to counteract the bad effects of meadow saffron and prussic acid. At all events some earth may be the means of preventing swelling in cattle, when feeding either on turnips or potatoes.* I remember a butcher in the West-Indies telling me, that he found cattle which were fed in pastures, through which a pure running river passed, had their livers always diseased, whilst those cattle which had water to drink out of filthy stagnant ponds, in which they stood for many hours in the day, had their livers quite sound. He and I both thought at the time, that it was the difference of temperature in the water, but I am now inclined to think that the earth was the means of keeping the liver sound.

I hope these few remarks may be of some use to your correspondent, or may be the means of drawing out some information from others. Whether the rot is occasioned by some particular plant, or by a luxuriant after-growth, occasioning a fermentation in the stomach of the animal, my firm conviction is, that salt or earth, or both, are of use to graminiverous animals, as grass is occasionally to dogs and cats. Every observer must have seen horses eagerly chewing the roots of grass with earth, and grooms are aware that it is a bad sign of the state of the horse's stomach. Chalk is given to calves, and lime or shell gravel to fowls.

I would now ask, what takes place if a sheep eats some earth? does it not absorb the acid in its stomach and form a salt, thus in part agreeing with the recipe of the Lammermuir farmer? He mentions a striking fact (in his book before referred to,) that the shepherds in Spain, while feeding their flocks on land with lime stone, do not give salt to their sheep, but have occasion to do so when feeding them on any other soils; which I would account for by the lime correcting the acidity and forming a salt. I may here mention the way in which salt is given to sheep in the West-Indies; a large cask without ends is laid upon its side on the ground, a small hole being dug for the swell of the cask; four stobs or stakes are then driven into the ground, two on each side of the cask, to keep it steady; the salt is then put into it, and so protected from the rain. Those who give salt in this way, and feed their pasture close, so that the sheep can get at the worm casts, need not, I think, be much afraid either of the internal or foot rot.

I have thus attempted to say a word in favor of the worm, as the kind-hearted Ettrick Shepherd stood forward in defence of the mole, rook and wood pigeon. I recollect destroying almost all the vermin in a large district of country in Perthshire, with a view of increasing the game; but the rabbits multiplied to such an extent as to become an immense nuisance. By the way, may not the increase of field-mice in a district in France, mentioned in the miscellaneous notices of your last Number but one, be accounted for in the same way. I would recommend to them a large importation of owls. If man sets his wisdom in opposition to the all-wise Lord of the Universe, and destroys in a small degree the balance of creation, every thing suffers from it. We are indeed wonderfully connected together; yes, the meanest and most grovelling animal is needful for the well-being of the whole. S. W.

From the New-York Farmer.

SHEEP HUSBANDRY.

In my communication to the last number of the New-York Farmer, I referred to an account of a sheep establishment, politely furnished me by a very intelligent and experienced shepherd, Leonard Jarvis, Esq. of Claremont, N. H. as accidentally mislaid. It has since come to hand,, and I have the pleasure of presenting it to my agricultural friends, to whom it will be interesting.

Claremont, N. H. August 23, 1835.

Rev. H. Coleman—Dear Sir—My avocations have been so pressing that until this moment I have not been able to communicate, as you requested me, some remarks upon my sheep and their treatment. Though I have been a shepherd thirty years, with a flock seldom ever less than 1,000, more frequently 2,000, I am still somewhat undecided what description of wool can be grown most profitably, and whether carefully breeding in-and-in, or judiciously crossing, produces the greatest improvement.

I commenced growing fine wool with a considerable number of the imported Pauluar and Escurial stock, then considered as the best stock in Spain, which flock I have kept to this day pure and

* Buckbean (Menyanthes), Class 5, Ord. 1, is said to be a cure for the rot in sheep.

* A *large* quantity of earth, particularly in wet weather, eaten with turnips or potatoes, will cause cattle to scour, a *small* quantity will not; but scouring prevents swelling from either root.—*Ed. Q. J. A.*

unmixed, and at the same time, by crossing the two flocks, have a third flock, combining generally the properties of both flocks, but occasionally showing the characteristics of one of them. At the introduction of the Saxons, I procured some valuable bucks, and by crossing them with pure Merinos, acquired a fourth flock, and consequently have had, for the last ten years, four distinct flocks, viz: Pauluar, Escurial, Pauluar and Escurial mixed, and Saxon united with Merinos. These four flocks have acquired great perfection by my unremitted attention to the selection of breeders, the Merino at this time carrying a much finer fleece than in 1810, as is apparent by contrasting the present clips with wool shorn in that year. There is very little difference in the fineness of my Saxon and Escurial fleeces; these last are somewhat heavier, with a staple more elastic. The Escurial has a greater resemblance than any other Merinos, both in form and fleece, to the Saxons that I have seen, and is probably the Spanish flock from which the most approved Saxons originated. The Pauluars are more compact in form, have heavier fleeces, and are constitutionally the most hardy of all the Merino race. I omitted to say that I had also, when I begun to grow fine wool, three other pure Merino flocks, viz: the Nigretta, Equiroz and Montarco; but after a few years' experience, I gave a decided preference to the Pauluar and Escurial, and discarded the others. You have now a concise description of my kinds of sheep; and I will say a word or two as to their general management.

I usually commence with dry fodder by the middle of November, and discontinue by the 5th of May; generally, however, for the first and last fifteen days, giving no hay, unless the ground should be covered, but feeding about half a gill of Indian corn to the sheep twice a day. As far as my experience extends, a ton of *good* hay will suffice for ten sheep, with the above quantity of grain. They are fed from racks in the yard, and have sheds to retire to at will. I have fed under cover, but believe that it tends to diminish the appetite and injure the constitution. They are kept in separate yards, in number from 50 to 100, taking care to keep those of about the same degree of strength by themselves; and have running water, though, when the ground is covered with snow, I think they do well without it. I allow about four bushels of salt to the 100 sheep, the greater part of which is consumed when the sheep are at grass. My bucks run with the ewes from the 1st to the 10th of December, allowing three to the 100. The number of lambs reared depends much upon the season; 60 lambs from the 100 ewes may be the average from flocks in quality like mine; from coarser flocks the return is greater. The ewes are not permitted to receive the buck till after they are two years old; and I prefer bucks from two years old to four.

These few facts will probably afford you little or no information; but in compliance with your request I communicate them, and should be gratified on receiving some account of your own management.

I am, dear sir, very respectfully, your obedient servant,

LEONARD JARVIS.

To this obliging communication, I take the liberty to subjoin a particular account of the above gentleman's flock, from his printed advertising card:—

"I have four distinct flocks of different properties, but of equal value in the market:

"1. Saxon mixed with Merino: fleeces extremely soft and fine, averaging about $2\frac{1}{4}$ pounds, staple generally very short; these are not so hardy as full blooded Merino, and consequently increase more slowly.

"2. Unmixed Merino of the Escurial or Royal Spanish stock: these are very little inferior in fineness to the Saxon; staple somewhat longer, and more elastic, fleeces rather heavier; these are more hardy and productive than the Saxon Merinos.

"3. Unmixed Merino of the Pauluar stock: these have still heavier fleeces, not so fine or soft as the Escurial; they are compact in form; constitutionally most hardy of the Merinos, and by far the most prolific.

"4. Grand full blood Merinos: stock the result of previous intercourse of Escurial and Pauluar bucks and ewes, and consequently uniting their qualities of form and fleece, but occasionally exhibiting the peculiar characteristics of the Pauluar and Escurial only.

(Signed) "LEONARD JARVIS."

A laugh costs too much if it is purchased at the expense of propriety.—*Quint.*

Elements of Practical Agriculture,

From Low's Element's of Practical Agriculture.

THE HORSE.

The horse is vastly modified in his form and characters by the physical condition of the countries in which he is naturalized. If fed in a country of plains and rich herbage, he tends to become large in his form; and such is the character of the horse of the plains of Northern Europe, as of Holstein, England, and other countries abounding in rich herbage. But in an elevated country, where the herbage is scanty, the size and form of the horse vary with the circumstances in which he is placed. There he becomes small, hardy, and capable of subsisting on the scanty herbage with which the mountains supply him. No contrast between animals of the same species can be greater than that between the horse of the mountains and the horse of the plains. The pony of Norway or the Highlands of Scotland, as contrasted with the huge horse of the Lincolnshire fens, presents such extremes of strength and size that it is difficult to believe that creatures so different can be of the same species. Yet all this great diversity is produced by a difference in the supplies of food, as influenced by the effect of situation. Nor is this peculiar to the horse; the domestic ox and the sheep are subject to the same law, and in a no less remarkable degree. These animals are essential to the subsistence of the human race, and, by a beneficient provision of Nature, they are formed to adapt themselves to the circumstances in which they are placed.

The horse fed on the arid plains and scanty herbage of warmer countries, assumes characters and a form entirely distinct from those of the large and massy animals fed on the rich pastures of temperate countries. It is from this cause that the large horse of England and the northern plains of Europe contrasts in a striking manner with the lighter shape of the horse of other regions. As we pass from the northern to the southern parts of Europe, this change of form and character appears, but yet more when we have crossed into Africa. There the horse of the desert displays the light form and agile shape which fit him for his condition. We see that he is here the creature of the circumstances in which he is placed. The heavy horse of the plains of Germany and England could no more subsist on the dry and scanty herbage of Arabia than on the heaths of Norway. The species would perish in conditions so different did Nature not provide a remedy, by adapting the animal to its condition.

The ancient horses of the north of Europe must have consisted either of the smaller horses of the mountains or of the larger horses of the plains. The horse which was chiefly employed for common uses, for war, for the tournament, and even for the chase, seems to have been of the latter kind. This appears from the accounts and representations given of him, and from the form which he yet retains when unmixed with the blood of the lighter races of the South and East. It is to this intermixture that the technical term *blood* is applied. Importations long ago took place of horses from Spain, from Barbary, and the Levant; and, at a later period, from Arabia. The African and Arabian horses accordingly have given their characters to the blood horse of England and its innumerable varieties.

The animal in which this effect of blood is the most remarkable is the English race-horse. For the combination of speed with the necessary strength this creature can scarcely be surpassed. He forms, however, a race of artificial creation, admirably suited for a particular purpose, but not otherwise deserving of cultivation, except from this, that it is the stallions of his race that continue the excellence and purity of the parent stock.

The superior class of riding-horses generally termed the hunter, is perhaps the finest race of horses known. It combines the blood of the Arabian, and other races of South and East, with the powerful form of the horses of the north of Europe in a much happier proportion than the race-horse.

From the hunter downwards to the racers where no mixture of southern blood can be traced, the gradations are innumerable. It is in this class that our road-horses and hackneys, the horses employed in our coaches and carriages of all kinds, nay, often in the mere labor of heavy draught, are contained. It forms the most numerous class of horses in the country. But a large proportion is bad, having lost the hardiness and strength of the native race without having arrived at the speed and other qualities of good breeding.

The remaining class of horses consist of those in which no mixture, or a very slight one, of stranger blood is found. These are the ponies of our mountains, or the larger horses of the plains. It is these last that interest the farmer as the animals of labor, and to them we commonly apply the term *cart-horse*, or *farm-horse*.

STABLE AND TREATMENT.

The farm-horse demands, neither in the training nor in the feeding, that nicety which is required in the case of the horse designed for rapid motion or irregular labor. He requires merely to be maintained in good order, never to be worked beyond his power, and never to be allowed to fall, in condition, below the work which he is to perform.

The stable for the farm-horse, as for every other, should be spacious and well ventilated. It is a great error to suppose that horses require a close, warm stable, to preserve them in health. To keep them fully sheltered, and free from the action of any cold current, is all that is requisite. The horse is well suited to bear an equal temperature, but not sudden changes produced by artificial means. Farm-horses regularly worked have been known to be kept throughout the coldest winters in merely open sheds, not only without injury, but with greater benefit to their health than if they had been too closely confined.

Next to ventilation in importance, is cleanliness of the stable. No filth should be suffered to accumulate, but every day the stable should be cleaned out, with the same attention for the farm as for the saddle horse. In the farm-horse stable, every ploughman should have a small fork, a curry-comb, a brush, a mane-comb, and a foot-picker.

Light should be admitted into every stable, to a certain extent. But in the case of farm-horses, which are only in the stable during the hours of rest and feeding, less light is necessary than in the case of the saddle-horse, which passes a great part of his time within doors. The light required for the farm-horse stable is that which is sufficient to allow the workmen to perform their duties in the day-time. Sometimes there is a room adjoining the stable for holding the harness, but it is perfectly convenient and sufficient in practice, to have the simple furniture of the farm-horse hung on pins in the wall behind each pair of horses.

The food of the horse in this country consists of herbage, or green forage, as clovers and sainfoin; of dried forage, as hay and straw; of various farinaceous substances, as oats, barley, pease, and beans; and of the succulent roots of plants, as the potato, the turnip, the carrot, the parsnip, and the beet. Of the grains given to the horse, the most generally employed in this country, and that which is regarded as well adapted to his strength and spirit, is the oat.

The oat is, for the most part, given to the horse without any preparation, though it is sometimes bruised, which is always beneficial, by rendering it more easily masticated and digested. It is usually given in portions at a time, familiarly known under the term feeds, the measure of which, however, varies in different districts. A feed in some places consists of a gallon, being the eighth part of a bushel, and weighing, upon a medium, about 4½ pounds.

Two gallons in the day, or 9 lbs. are considered to be good feeding when the horse is on dry food, and not on hard work; when on hard work, the quantity may be increased to 3 gallons, and when on light work, and green food, it may be reduced to 1 gallon, and sometimes altogether withdrawn. But on an average, 2 gallons in a day, that is, about 90 bushels in the year, may be sufficient in every case for the working-horse of a farm. In practice, too, it is not the superior but the lighter oats, that are given to the farm-horses. These are the light corn formerly described.

Oats may be given to horses reduced to a state of meal, but this is only practised in the case of gruel given to a sick horse. To induce a horse to take gruel, it is put in a pail and placed beside him, so that when thirsty he may drink of it.

Meal is sometimes given with cold water to horses, when travelling. This is a refreshing feed to a horse on a journey, and a safe one when the chill is just taken off the water; but it is chiefly employed in journeys when time is of importance, and it is accordingly rarely given in the case of the farm-horse, who should always have time given him to feed.

When oats are kept in a damp state, fungi grow upon them, and they acquire a musty smell and bad taste. They should never be given in this state to a horse, but should first be kilndried, so as to expel the moisture and destroy the fungi.

Barley is more nutritious than oats, although, in the practice of this country, it is not so much approved of in feeding. But over all the Continent, barley is the most common food of the horse. If bruised and mixed with chopped straw or hay, it is an excellent provender. But the most common method of giving barley to horses in England, is in what is termed a mash. The barley in this case is boiled in water, and the whole is then allowed to stand until it is sufficiently cool. The mash forms admirable feeding for a sick horse; it keeps the bowels open, and is nutritive, without being heating.

In feeding horses, even when upon hard work, a practice has been introduced of feeding the horse entirely on steamed food, with chopped hay and straw. The proportions of the different kinds of food employed in this manner are not subject to rule. But about ¼ in weight of the whole may consist of the chaff of straw, ¼ of the chaff of hay, ¼ of bruised or coarsely ground grain, and ¼ may consist of steamed potatoes. To this should be added about 2 oz. of common salt. From 30 to 35 lb. of this mixed provender, or on an average 32½ lbs. in 24 hours, will suffice for any horse.

Two methods may be adopted in the giving of this food. Either the whole substances may be mixed together, and a certain proportion given to the horses three or four times in the day; or the dry food alone may be given during the first part of the day, and the steamed food mixed with a portion of the dried food in a mess at night.

In the first case, that is, when the whole mess is to be mixed together, the potatoes or other steamed food are first to be prepared, then weighed and mixed with the chopped straw or hay, and with the bruised oats. The quantity for 24 hours being mixed and prepared, the proportion for each horse is to be weighed and set apart in its proper pail, and given to each horse at three or more times, as shall best suit with the work with which he is engaged, taking care that considerably the largest quantity shall be given at night.

When this method of feeding is adopted upon a farm, it should be confined entirely to the months of winter, for the horses of a farm will always be best and most economically fed during the months of summer, on pasture and green forage.

Science of Agriculture,

From Chaptal's Chemistry applied to Agriculture.

OF THE EFFECTS OF THE NOURISHMENT OF PLANTS UPON THE SOIL.

It appears to be clearly proved, that plants imbibe from water and the atmosphere only carbon, oxygen, and hydrogen; but analysis shows us that, independently of these principles and the products arising from their combinations, plants contain azote and some earthy and saline substances, which cannot be produced by either of the three elements mentioned above. It remains then for us to inquire, in what manner these substances have been introduced into plants.

Azote, which is found in the albumen, the gelatine, and the green colouring matter, is not sensibly drawn from the atmosphere, though it constitutes 4-5ths of it, but passes in with oxygen in the water imbibed by plants, and, like that, is separated in their organs.

The earths which are insoluble in water, but which are mixed with, or suspended in that fluid, are not absorbed in large quantities by the pores of plants, but may be conveyed into them by the aid of some chemical agents, as the acids, the alkalies, &c. Besides, if we observe attentively, we shall find that these substances do not abound in plants; and we can easily conceive, that the little they do contain, might, in a state of extreme division, be introduced by water.

There are some plants that fasten themselves and grow upon the most barren rocks, deriving from the surrounding air, and from rains, all the nourishment required by them; of this number are the mosses, the lichens, and the fleshy plants. Their growth is slow, their transpiration almost nothing, and their colour remains nearly the same all the year round; so that they constantly absorb water and carbonic acid, and assimulate their constituent principles.

The soil is always exhausted, in a greater or less degree, by the plants it produces; and much more by those that are annual, than by those that are perennial. Air and water alone do not afford a sufficient degree of nourishment to plants, for when they have been made to grow in well washed sand, watered with distilled water, though they have flowered, their fruits did not arrive at maturity. Experiments to this effect have been made by Messrs. Giobert, Hassenfratz, De Saussure, &c.

Those annual plants which transpire most, generally exhaust the soil in the greatest degree. Pease, beans, and buckwheat, though they have succulent stalks, exhaust it least, because they transpire but little.

When annual plants are cut at the time of flowering, they do not exhaust the soil, as their succulent roots furnish materials for replacing the loss occasioned by their growth; but after having produced their fruits, the soil derives but little advantage from the dry fibres which are the only remains of their stalks and roots.

During fructification, plants absorb but litle nourishment from the soil; the supply necessary to the formation of the seed is furnished by those juices which already exist in the roots and stalks, and this occasions them to become dry and exhausted, so that, when the fruit is perfected, the roots and stalks consist only of woody fibre. It is necessary that this fact should be known, in order that too late mowing of meadows, whether natural or artificial, may be avoided. The most favorable period for cutting grass is that of its flowering; if the operation be postponed till the seed is formed, two great disadvantages will arise; the first is, that fodder obtained will have parted with the greater portion of its nutritive qualities; and the second, that the plants, having fulfilled all the laws of their nature, by providing for their reproduction, cannot flourish again with vigor during the same year.* In support of this doctrine, I will mention one well known fact, which is, that meadows mown before fructification afford the most abundant harvests, and the greatest number of them, as they may be mown several times in a year. The perennial plants which serve as fodder, may by this means be preserved for several years in a state of reproduction, but if mown after the formation of seed, the plants are weakened and the reproduction is lessened. All farmers know, that when they subject to tillage a piece of artificial grass land, which has for several years been constantly mown at the time of flowering, it will yield several harvests without any dressing; but if the grass has been left to go to seed, it will be necessary to supply the earth with manure before it will yield a good return. As those plants that are cut at the time of flowering do not exhaust the soil so much as those that remain for seed, the belief has arisen amongst farmers, that before the period of fructification, they are nourished by the constituent principles of the surrounding air and water; but that during the time of the formation of the seed, their support is almost wholly derived from the earth. But this opinion will not hold in regard to all plants; lettuce, turnips, tobacco, woad, endive, cabbages, and onions exhaust the soil greatly, though they are gathered before producing seed. Potatoes, though they produce but few seeds, impoverish land more than almost any other vegetable. Plants raised in a nursery, and afterwards transplanted, exhaust the soil in which they spring, more than the one in which they complete their growth.

Thus we see, that during the whole time of their vegetation, plants derive their nourishment from the air, and from the substances contained in the earth; but if they are mown at the time of flowering, they leave in the soil their roots and portions of their stalks, which restore to the earth nearly as much as they have received from it; whilst, if they remain uncut till they have completed their course, they return little or nothing to the soil to compensate it for the nourishment they have received from it.

It is well known to farmers, that ploughing in a green crop of any kind whatever, prepares the soil for producing well without any other manure; since, by this process, all that the soil has yielded is returned to it, with some additions resulting from the decomposed principles of air and water, which are contained in the plants.

In order fully to understand this doctrine, which appears to me of great importance to agriculture, it is necessary to consider the successive changes which take place in annual plants during their growth; first, they produce green leaves, which, by coming in contact with the air, receive from it the principles of which I have spoken; subsequently the stalks increase in size and number, and are covered with numerous leaves, which absorb from the atmosphere a degree of nourishment suited to the increasing wants of the plants; the strength, fullness, and depth of hue of the leaves and the stalks, particularly of the latter, increase in proportion to the richness of the soil.

This state continues till after the period of flowering, when a change, worthy of note, takes place; the roots dry up, the stalks wither and change their colour; and when fructification is at length completed, both roots and stalks have become mere skeletons, which answer but little purpose either for nourishing animals or manuring earth. During this period of vegetation what becomes of the juices that were so abundant in the roots and stalks? They have been consumed by the formation of the seeds. It is undoubtedly the case that plants still continue during fructification to absorb some portion of their nourishment from the air and soil; and this assists in the formation of their seeds; but by far the greatest share of the formation of these is owing to the deposites contained in the organs of the plants.*

The same holds true of perennial plants; and it may be observed, that when a tree produces fruit too abundantly it becomes exhausted and dried, and bears only that which is small and misshapen. The difference between annual and perennial plants is, that the former die as soon as the process of fructification is completed; whilst the latter preserve their leaves green and their roots fresh, for the purpose of absorbing new portions of nourishment, to be deposited in their vessels for food when the returning warmth of spring shall cause them to require it.

M. Matthieu de Dombasle, one of our most enlightened agriculturists, has confirmed by experiments the doctrine I have here advanced. On the 26th of June, 1820, at the time of flowering, he selected, within a small space, forty wheat plants of equal size and strength, each having three stalks bearing heads; he pulled twenty of the plants with all their roots, and left the rest to complete their fructification. Having carefully freed from earth the roots of those he had taken up, he cut the stalks two inches above the base, and dried separately the roots, and the stalks surmounted by their heads.

The roots and the portion of the stalks remaining with them weighed, ...	grains,	647
The stalks, heads, and leaves, ...	"	1946.5
Total, ...		2603.5

On the 28th of August, the time of harvesting, he plucked up the twenty plants which had been left for seed, separating the roots, and cutting the stalks as of the first; of these the weight was as follows:

Roots, ...	grains,	419.53
Straw, husks, and beards, ...	"	1318.75
Grain, ...	"	1025.69
Total, ...		2763.97
During these two months, the roots and the portions of stalks adhering to them had lost, ...		237.52
The stalks, head, and leaves had lost.....		624.67
Total, ...		862.19

But as the seed weighed 1025.69 grains, the whole had increased in weight 160.57 grains, Troy. From this experiment we may conclude, that the juices contained in plants, at the time of flowering, contribute to the formation of the grain, in the proportion of $\frac{862.19}{1025.97}$ and that the excess of the weight of the grain which is

* This holds good only in part in regard to timothy *(Phleum pratense.)* According to Sinclair, this grass contains more than double the nutriment when in seed, than when in bloom. At the same time the remark of Chaptel is correct, that the root is much more exhausted by maturing its seed, the aftergrowth is comparatively trivial, and the subsequnt crops are diminished. By cutting rye in flower, or before, which is either annual or biennial, it may be almost rendered perennial, as we have witnessed, in sowing it with lucern. We have observed the same fact in regard to many garden productions—whose existence and vigor are prolonged by preventing the formation of the seed—*Cult.*

* Thus the succulent stalks of the maize contain, when the grain has attained its growth, the deposites of food necessary to ripen and mature the crop, and it supplies this nutriment to the grain, although separated from the root, for a considerable time after the grain is put in stooks. And hence wheat and rye may be cut before the grain is hard with benefit rather than prejudice.—*Cult.*

$\frac{160 \cdot 47}{1025 \cdot 97}$ arises from the nourishment which the plants absorb from the air or soil, during the two months of fructification.

If the wheat is mown when in blossom, it leaves in the earth, to be converted into manure, a quarter part of the weight of the plant; but when it is reaped after having come to maturity, there remains only one-seventh; and this last residue is worthless as manure in comparison with the first; this contains almost nothing but carbon, whilst that is rich in juices and in decomposable matter. Thus we see that those plants which form seed exhaust the soil most, because for all they have received they return nothing but their dry roots and stalks; whilst those that are cut when green give back with their roots and stalks what they have drawn from the soil, and a part of that which they have drawn from the atmosphere.

The nutritive principles contained in the soil pass into plants only in a state of solution, or of extreme division in water. Healthy plants absorb from preference those salts* that are most congenial to them; but if waters be charged with salts unsuited to their natures, they absorb the fluid and reject the salts till the water becomes thickened by them.

There are some salts which enter naturally into the composition of certain plants; the pellitory and nettle, for instance, which grow upon the borders of the sea, contain muriate or sulphate of soda; these vegetables, transported into other soils, afford no vestige of these salts, and their growth is vigorous. M. le Marquis de Bullion has proved that the turnsol, raised in earth containing no nitre, does not, upon analysis, afford a vestige of any; but that plants of the same kind, raised in the same soil, but watered with a solution of nitrate of potash, are charged with that salt.

Generally speaking, a superabundance of salts, especially if they be of kinds very soluble in water, injures vegetation; this is particularly the case when the salts are not such as enter naturally into the plants, amongst the number of their constituent principles. Salts of foreign natures cannot be useful, excepting as they may serve, in very small quantities, to excite and stimulate the organs of plants. The great value of sulphate of lime as a manure, is owing to its insolubility, which allows water to contain but a very small portion of it at once; so that it passes into plants very gradually, and thus its effects are prolonged for several years; till, as I have before observed, the soil is exhausted of it.

The quantity and quality of the salts contained in plants may be ascertained by an analysis of the ashes arising from burning them in a dry state. It may not be useless to mention here some facts which may throw light upon this subject.

Kirwan and Ruckers have proved, that an equal weight of herbaceous plants furnishes more ashes than of ligneous plants. M. Pertuis has found, that the trunks of trees afford less ashes than the branches, and these last less than the leaves. Evergreens yield less ashes than trees and shrubs that shed their leaves in autumn. On the other hand, Hales and Bonnet have observed, that the perspiration of herbaceous is greater than that of ligneous plants, and that that of evergreens is less than that of plants which shed their foliage. These circumstances may explain why some plants afford more ashes than others. The water which is evaporated by transpiration deposites in the cells of the plant the salts which it had held in solution, and is replaced by a new quantity which is in its turn thrown out, leaving behind it an additional portion of salts; so that those plants, and those portions of the same plant, which transpire most, must necessarily contain the greatest quantity of salts.

The salts and earths contained in plants are of the same nature as those existing in the soil in which they grow, but not, according to analysis, in the same proportions; because the plant absorbs more or less of them according to its own nature and their solubility. It cannot, however, be strictly said, that all the salts contained in plants existed previously in the soil, as some neutral salts are evidently formed within their organs; such are those of which the acid is known to us, and particularly those that contain in their composition a vegetable principle: of this sort are the acetates, the malates, and the citrates. The salts do not exist after the burning of the plant, because their acid is decomposed by the action of fire, and there remains only their base, which is usually potash or lime, but an analysis of the plant "by *the wet way*" gives proof of their existence.

It is even possible in some cases to follow the formation of the acid, by observing the progress of vegetation, and the changes produced in its products. Of this I will mention one example Beets gathered late in autumn, in the North of France, do not yield the same principles as those gathered at the same period in the south of France; the first contain sugar, the second salt petre. According to the experiments carefully made by M. Darracq in the department of Landes, the beet roots of the south, yield as much sugar in the month of August and the earlier part of September, as those of the north; this sugar then is replaced by salt-petre, of which the acid is formed during the progress of vegetation. It has been observed, that beets containing sugar frequently underwent a change during the winter by which the sugar entirely disappeared, and was replaced by salt-petre; in this case we can almost follow with the eye the process of decomposition. The juice of beets in which the change has commenced, when thrown into the boilers, becomes covered with a thick, white foam, which gives out a reddish vapor of nitrous gas: in this state the labor of extracting the sugar becomes very difficult; the sugar crystallizes badly, and the proportion of molasses is very great. It may be seen clearly, that in this state oxygen is already united in the beets with azote, and that only an additional portion, which would be gained during the progress of change in the roots, is wanting for the formation of nitric acid; this combined with the potash, which is contained in these roots in the proportion of 1-100 of its weight, would produce salt-petre.

If we observe a plant during the various stages of its vegetation, we shall perceive at these different periods very remarkable differences in the odor, taste, consistency, &c.; from this circumstance we must suppose that it forms new products, new combinations, and consequently new salts.

The alkaline salts are the most abundant in green herbaceous plants. M. de Saussure has observed, that the ashes of young plants that grew upon a poor soil, contained at least $\frac{3}{4}$ of their weight of alkaline salts, and that those of leaves of trees which grew from their beds contained at least $\frac{1}{2}$.

The proportion of alkaline salts diminishes in proportion as the plants advance in age; this remark applies equally to annual plants and to the leaves of those trees that shed their foliage in autumn. The ashes of seeds contain a greater proportion of alkaline salts, than those of the plants that produced them.

These facts are very important to those who are engaged in the manufacture of salts furnished by the combustion of vegetable substances; since they show clearly that it cannot be equally advantageous to them to consume all sorts of plants, nor at all periods of their growth.

Next to the alkaline salts, the earthy phosphates of lime and magnesia are the most abundant in plants, and, like the first, these diminish in quantity in proportion to the age of the plant. Plants also contain, but in very small proportions, silica, and some metallic oxides, especially those of iron.

* Salt is an acid combined with an alkali, an earth, or a metallic oxide, the latter of which are termed the base. They have double names, which indicate both the acid and its base: Thus *muriate of soda,* (common table salt.) is formed of *soda* and alkali, its base, and *muriatic acid; carbonate of lime,* common chalk or limestone, of *carbonic acid* and lime—*sulphate* of lime, or gypsum, of *sulphuric* acid and lime, &c.—*Cult.*

Young Men's Department.

FROM A FATHER TO HIS SON.—No. 3.

MATRIMONY.

The first concern of a young man, in starting in business, is, or ought to be, to connect himself with a suitable partner in life. Early marriages tend to save young men from habits of extravagance and dissipation, to call into wholesome exercise their mental and physicial powers, and to fix them in habits of usefulness. They are calculated to avert evil, and to produce good. Young people can more easily conform to each other's habits, and correct their faults, than old ones. The common objection against early marriages, that a man is not yet able to support a family in the style he wishes, is a fallacious one. Let your *beginning* be humble, not ostentations, whatever be your means; for it is easier to advance, as your ability and prudence will permit, than to retrench, when you find you have graduated your expenses too high. Begin to live upon a small income, and you will soon acquire the means of living upon a larger one —if you desire it.

In choosing a wife, consult judgment before passion; for if the latter gets the rein, discretion is generally disregarded, in matrimonial as in other concerns of life. Choose your wife as you would your farm, on which you design to spend your days,—not for the gaudy exterior of the buildings, but for the intrinsic good qualities of the soil—for the good it is likely to produce you;—not for beauty and wealth so much,—though these are considerations not to be disregarded—as for the abiding good qualities of the mind, and the ability and disposition to perform with fidelity the duties of domestic life. If these qualities were in higher demand by young men, they would be more cultivated by young women. Look for a partner who will take care of the house, while you take care of the farm, and who will bring to the common stock at least her share of industry, prudence and good nature. Seek qualities in a wife which will wear well *at home*, and with which you can be content to *bed and board*, in good fortune and in bad. And having gained your wishes, by honorable means, take care to fulfil your part of the bargain—and to justify the reasonable expectations which you have raised. Use the same assiduity to *preserve*, that you employed to *win*, the affections of your partner. It is dishonorable in a young man to raise expectations, before marriage, which he cannot fulfil after marriage; and possessing the power to fulfil them, he is doubly in fault if he does not exert it habitually in the performance of his plighted faith. You are to look for happiness *at home;* and if you do not realize it there, you will seek it in vain elsewhere. Hence the temporary surrender of an opinion, or the relinquishment of a cherished habit, are trivial sacrifices when put in competition with a life of domestic enjoyment. Matrimonial jars are like fire—the more they are fed the fiercer they burn. Take care that they are never lighted upon your domestic altar. Bad passions and propensities may be overcome or eradicated when in the bud, but indulged, they acquired the firmness of the knarled oak, and corrode the best feelings that ennoble human nature. On this point you are particularly called upon, as the head, to teach, by example, those whom Providence may consign to your care.

Beware of the intoxicating influence of prosperity. "Oh, my son," is the exclamation of Sheikh Al Mohdi, "it is not the power of satisfving our desires, but the courage to suppress them, that insures felicity. The heart of man is insatiable; the accomplishment of one wish leads to the formation of a thousand; these are the pregnant sources of evil, like the small kernel that in an almost imperceptible space contains an immense tree, which will soon raise its head to the clouds, and destroy all the vegetation under its shade, and whose branches will one day or other break the heads of the children of him by whom it was planted. Moderation in our desires, and contentment with what we possess, constitute the only imperishable wealth."

INTERESTING FACTS IN CHEMISTRY.

These aeriform substances (gases and vapors) are called *elastic*, because they are all capable of being reduced into a smaller compass by pressure, and of expanding again to their usual volume whenever the pressure is removed. Thus atmospheric air may be so compressed, that 128 volumes may be forced into a space usually occupied by *one* volume, and the greater the compression the more will its elasticity be increased. It is on this principle that the air gun is constructed.—*Parke.*

Fluidity is owing to the matter of heat being interposed between the particles of the fluid; which heat would dissipate all fluids into the air, were it not the pressure of the atmosphere, and the mutual attraction which subsists between those particles. Were it not for this atmospheric pressure, water would not be known in any other states than those of ice and vapor; for, as soon as ice had acquired caloric enough to give it fluidity, it would evaporate, and be dispersed into the regions of space. This may be proved by direct experiment, as will be shown in the following chapter. The constitution of the world in this respect exhibits a beautiful instance of the harmony of nature, and of the exquisite contrivance of its divine author.

On the other hand, could we totally abstract the matter of heat from any fluid, no doubt but that fluid would by that means be changed to a solid; the lightest vapors being nothing more than solids combined with heat. Not only fluids, but all those substances which are soft and ductile, owe those properties to the chemical combination of caloric. Metals owe their malleability and ductility to the same cause; for in very intense artificial colds, the most ductile metals, such as gold, silver and lead, lose their malleability and become brittle, as Van Mons has shown.—*Annals de Chimie.*

Take, for instance, mercury. This metal is a fluid body in our climate, but by cooling it to 30 degrees below the zero of Fahrenheit's thermometer, it becomes solid; and if it be heated to 660 degrees, it will be volatilized and converted into vapor.

The elasticity of air and steam arises from the caloric being chemically combined with the solid substances of which they are composed. I say *solid*, because we have abundant evidence that oxygen and nitrogen [the principal elements of the atmosphere] are both capable of taking a solid form, and actually do, in many instances, exist in a state of solidity. Nitrogen is a component part of all animal substances, and exists in a solid state in all the ammonical salts. Oxygen takes the same state when it combines with metals and other combustibles; and in the composition of the nitrous salts, they both take the same state of solidity. These facts surely evince that atmospheric air owes it fluidity to caloric.—*Parke.*

Whenever a body *changes* its state, it either combines with caloric, or separates from caloric.—*Dr. Black.*

It is an axiom in hydrostatics, that every substance which *swims* on water, displaces so much of the water as is exactly equal to its own weight; whereas, when a substance *sinks* in water, it displaces water equal to its bulk. Take a piece of hard wood, balance it accurately in a pair of scales with water, and then place it gently on the surface of water in a vessel which will flow over the top of the vessel. If the wood be now taken out with care, it will be found that the water in the scale will exactly fill the vacancy left by the wood.—*Ib.*

The specific gravity of bodies is denoted in chemical writings by comparing it with the specific gravity of pure water, in decimal figures, water being always considered as 1.000 Thus the specific gravity of the strongest sulphuric acid (oil of vitriol) is 1.850, or nearly nine-tenths heavier than water. Iron is 7.650, or more than 7½ times heavier than water; that is, a cubic inch of iron, if put into a scale, would require 7½ inches of water to balance it; silver is 10.470; gold 19.300; and platinum 23.000, or 23 times heavier than water.

All substances that *float* upon water are specifically lighter than it, as oils, alcohol, &c. There are various instruments which, when dropped into liquids, indicate, upon a graduated scale, their specific gravity, be it heavier or lighter than water, as the aereometer, hygrometer, &c. Thus the juice of the apple or grape is heavier than water, in proportion to the quantity of sugar which it contains; and after fermentation, it becomes specifically lighter than water, in the same ratio, the sugar, which was heavier, being converted into alcohol, which is lighter than water. The tendency of wine or cider to run into the acetous or vinegar fermetation, is in proportion to its lightness before, and heaviness after fermentation—the lighter the must the heavier the liquor, and the less sugar in the first, and less alcohol in the latter. The specific gravity of apple juice varies from 1.000 to 1.091. Some we lately tried, from mixed fruit, indicate 1.063 by Baumi's aereometer.—*Con.*

A pint measure of atmosphereic air weighs nearly nine grains; whereas a pint measure of hydrogen gas weighs little more than half a grain. The same measure of pure water weighs upwards of one pound avordupois.

It may be remarked, that the Creator has endowed atmospheric air with the property of preserving its own equilibrium at all times, and in all places. Its elasticity is such, that, however it may be consumed by respiration or combustion, its place is immediately supplied with a new portion, and though by a mistaken policy the doors and windows of our habitations may be constructed so as to exclude it as much as possible, it will have admission; it forces its way through every crevice, and performs the important office assigned it, in defiance of all exertions.—*Parke.*

Philosophical Facts.—The change of properties which takes place when chemical attraction acts, is not confined to metals, but is a general result in every case where different bodies are brought into this state of combination or chemical union. Frequently we find that the properties of each body are totally changed; and that substances, from being energetic and violent in their nature, become inert and harmless, and *vice versa.* For instance, that useful and agreeable substance, culinary salt, which is not only harmless, but wholesome, and absolutely necessary to the well-being of man, is composed of two formidable ingredients, either of which taken into the stomach proves fatal to life: one of these is a metal, and the other an air; the former is called *sodium*, the latter *chlorine.* When presented to each other, the violence of their nature is manifested by their immediately bursting out into flame, and instantly they are both deprived of their virulence. Can any thing be more striking than the change of properties in this case; and who could have supposed that culinary salt is composed of a metal united to an air? The medicine called Glauber's salt is another instance; it is composed of two caustic poisons of different kinds; one called oil of vitriol, and the other barilla or soda. There are also two substances known to chemists, which are disgustingly bitter liquids: one is called nitrate of silver, and the other hyposulphate of soda; when mixed they form a compound of considerable sweetness. But the atmosphere which we breathe is the most extraordinary of all instances: it must be surprising to those who are unacquainted with the fact, that atmospheric air, indispensable as it is to life, is composed of the same ingredients as that most violent and destructive liquid called *aqua fortis*, or nitric acid. This powerful acid being made to act upon sugar, the sweetest of all things, produces a substance intensely bitter to the taste. Charcoal is, of all known substances, the most difficult to convert into vapour; so much so, indeed, that the conversion has never yet been decidely effected: it is also a very solid substance; and diamond, which is nothing but crystalized charcoal, is one of the hardest bodies in nature. Sulphur, in the solid state is also a hard substance, and to hold it in vapour requires a high temperature. But when these two substances, carbon and sulphur, are made to combine chemically, so as to form the substance called bisulphuret of carbon, their properties are strikingly changed. Instead of the compound being hard, it is a thin liquid, and is not known to freeze or solidify at any degree of cold that can be produced. Instead of the compound being difficult to vaporise, it is, of all liquids, one of the most evaporable. Charcoal is the blackest substance with which we are acquainted—sulphur is of a most lively yellow hue; but the compound is as colourless as water. A new smell and taste are acquired, and, in a word, there is not one point of resemblance with the component. These facts are strikingly illustrative of the change of properties which follows on the exertion of chemical attraction between the ultimate particles of bodies.—*Donovan's Chemistry.*

CHAPTER OF FACTS.

MATHEMATICS AND PHYSICS.

If the square of the diameter of a circle be multiplied by .7854 the product is the area. If the diameter of a sphere be cubed and multiplied by .6236, the product is the solidity; and the square of the diameter multiplied by 3.14159 is the surface of the sphere.

To find the contents of a cask, add double the square of the bung diameter to the square of the head diameter, and multiply this sum by the head of the cask; then divide the product by 1077 for all gallons of 280 cubic inches each, or by 882 for wine gallons of 231 cubic inches each.

Quincunx is one at each of four corners, and one in the middle.

The convexity of the earth interposes to prevent the sight of distant bodies. Thus, at 600 yards, one inch would be concealed, or an object one inch high would not be seen in a straight line; at 900 yards, two inches; at 1400 yards, five inches; at one mile, eight inches: three miles, six feet; four miles, ten feet; five miles, sixteen feet; six miles, twenty-four feet; ten miles, 66 feet; twelve miles, 95 feet; thirteen miles, 112 feet, and fourteen miles, 130 feet.

The mechanical powers may be reduced to three, but they are usually expressed at six—the lever, the wheel and axle, the pulley, the inclined plane, the screw and the wedge.

In a single moveable pulley, the power gained is doubled. In a contined combination, the power is twice the number of pullies, less 1.

In levers, the power is reciprocally as the lengths are each side the fulcrum or centre of motion, as illustrated in the steelyards.

The power gained in the wheel and axle is as the radius of the wheel to that of the axle.

The power gained by an inclined plane is as the length to the height.

The power of the wedge is generally as the length to the thickness of the back.

The power of the screw is as the circumference to the distance of the thread, or as 6.2832 to that distance.

Resistance is an affair of experiment, sometimes a third, and at other times less.

The friction of cylinders or wheels is as the pressure, and inversely as the diameter.

The least friction is when polished iron moves on brass.

The area of a circle is the product of the diameter and circumference, divided by 4.

A fall of one-tenth of an inch per mile, will produce a motion in rivers. The greatest velocity is at the surface and in the middle, and the least at the bottom and sides But as the velocity increases, the action on the sides and bottom increases also.

Eclipses return in the very same order every 18 years and 11 days, supposing four leap year in the interval, and if five, then every ten days. Other cycles of motion, however vary the phenomenon or measure. The moon's shadow is less than 170 miles broad; but the eclipse, in degree, for 2000 miles.

A pump ten feet above a well, with seven inches bore will discharge, seventy gallons a minute; and at 30 feet 4 inches, 23 gallons.

The specific gravity of water, being 1.000; that of alcohol, pure 0.829; beer, 1.034; cider, 1.018; milk, 1.032; oil, linseed, 0.94; vinegar, 1.025; sea-water, 1.026; bone, ox, 1.666; brass, 7.824; brick, 2.; cork, .24; gold, 19.2587; granite, 2.728; iron, bar, 7.68; lead, 11.352; lignum-vitæ, 1.33; mahogany, 1.06; marble, 2.716; mercury, 13.58; oak, 1.17; platina, 20.722; silver, 10.474; slate-clay, 2.67; tin, 10.717, lime-stone, 1.386; elm, 0.671; honey, 1.45.—*Treasury of Knowledge.*

Science.—Science, the partizan of no country, but the beneficent patroness of all, has liberally opened a temple where all may meet. Her influence on the mind, like the sun on the chilled earth, has long been preparing it for higher cultivation and farther improvement. The philosopher of one country sees not an enemy in the philosopher of another: he takes his seat in the temple of science, and asks not who sits beside him.

When we set out on the jolly voyage of life, what a brave fleet there is around us, as stretching our fresh canvass to the breeze, all 'ship shape and Bristol fashion,' pennons flying, music playing, cheering each other as we pass, we are rather amused than alarmed when some awkward comrade goes right ashore for want of pilotage! Alas! when the voyage is well spent, and we look about us, toil-worn mariners, how few of our ancient consorts still remain in sight, and they, how torn and wasted; and, like ourselves, struggling to keep as long as possible off the fatal shore, against which we are all finally drifting.—*Chronicles of Canongate.*

THE CULTIVATOR—JAN. 1836.

TO IMPROVE THE SOIL AND THE MIND.

TO THE PATRONS OF THE CULTIVATOR.

Gentlemen—In compliance with custom, and to discharge a duty that a publisher owes to the public at the commencement of the year, we appear for the second time before you. In the first place, in all sincerity we offer you the compliments of the season; in the next, as we follow a common pursuit, we would enjoy with you the pleasure of talking over its progress, its labors, and its prospects. We read "That the Lord God planted a garden eastward in Eden, and there he put the man he had formed. And the Lord God took the man and put him into the garden of Eden, *to dress it and to keep it;* and he further told him, 'in the sweat of thy face shalt thou eat bread, and thou shalt *till the ground* from whence thou art taken.'" We have then the best authority for saying, that from the creation man was made to till the ground, and that all the other employments that have sprung from his wants, created during the progress of society, are secondary and subservient to agriculture. Farming, then, is not only the oldest employment of man, but being of devine command, it is consequently the most useful and honorable. Six thousand years have elapsed since its institution. We have multiplied and replenished the earth—many generations have passed away, still our employment remains the same. Neither is the promise of fruitfulness lessened in the lapse of time, for through the bounty of Providence an Eden may be created any where, where there is industry to till the soil, and skill to direct the labor.

It would be interesting, if we had a knowledge of what farming was in those primitive times, to follow its progress through the successive generations that have passed to our own time, that we could date any improvements, and see in what these improvements consisted. We are afraid, however, that had we the means to make this investigation, we should find that the simple light of nature, that was first implanted in our minds for the cultivation of the soil, has not received that expansion, which so many years of toil ought to have produced, and what the age in which we live demands. If we look at the world now, and what it probably was in the days of Adam, we must see what vast efforts have been made to gratify and supply our artificial wants, and how much more numerous these are now than our real ones; and if farmers had to depend less on the bounties of providence, and more upon their own exertions, it is but fair to presume, judging what the mind of man is capable of when compelled to exert all its faculties, that agriculture, as a science, would at this day have been infinitely farther advanced. It is true, within the last few years an era of improvement, in every branch of science, and every field of labor, has opened upon us, and in our own peculiar employment the glimmerings of nature's light appear to open with little more radiance; but we are yet measurably behind the march of mind, that has led to the adoption and present perfection of all the different systems which have been developed or created by our researches or our wants. Since the days of Adam, the entire system of mechanics has been created, and they are severally advancing to an excellence that even surpasses the expectation and wants of the present state of society. Medicine, Law, and Divinity, have sprung up, and each is pressing onward towards a more perfect development and greater usefulness. Botany, Chemistry, Mineralogy, Geology, with their assistant sciences, have been modelled into rational systems, and whilst they more clearly unfold the wisdom of the great Creator, have administered to man's necessities or enjoyments. Who in primitive times could have comprehended the actual formation of this earth, and who would have thought not of following, but of pointing out with unerring certainty, the track of the heavenly bodies. It is the cultivation of man's reason that has enabled him not only to trace his path across the mighty deep, but that he need not wait upon the movement of either the winds or its waves.

These are a few of the triumphs which have been unfolded by the exercise of our rational powers. How far those powers will carry us, to what extent future attainments may lead, it is impossible now to divine, for the light is apparently just breaking upon us, and past developments are only exciting to a more diligent search into the future. Every art, every science, every branch of study or of business, points to the perfection to which it can and must be carried, and within us we feel the convictions of eventual success, and are cheered with the hope. Shall the cultivation of the earth, the art most useful and first created, lag behind all our contemporaries in the race? Will we permit doctors, and lawyers, and ministers, mechanics and manufacturers, all ranks and classes, by the exercise of those reasoning faculties which we hold in common with them, to take precedence of us, simply because they use their understandings, while we are striving only to use our hands? Will we cultivate the soil, and neglect the culture of our minds, and thus contemn the law of nature which teaches, that it is the intelligent head that can most successfully direct the labors of the hand? Our art as a system, is yet to be arranged, for we know little of the capacities of the soil we nuzzle in, or what are its most bountiful and profitable productions. When our pursuit resolves itself into simple elementary principles, scientifically arranged, and easily understood, our labors will be better directed, and that Eden which was created for the enjoyment of our first parents, will, by our intelligence and industry, be re-created, and the whole earth become, as it were, a paradise to dwell in.

Efforts are now making to reduce farming to a regular system, that like law, divinity, or physic, mechanics or manufactures, a young man shall learn it as those are learned, both theoretically and practically; and it will not be till this is done, that the farmer will take his place along side of the professions in the scale of society. It is but a few years since agricultural newspapers have been successfully established in this state; abortive attempts had previously been made, but the community seemed then not to be prepared to maintain them. They have now thus far fought their way into notice, and from the benefits which they have distributed among the farming community, have established themselves upon a permanent basis. Agriculture, since this period, is looking up. All the former productions of the soil have been greatly increased, and new articles of produce to us have been beneficially introduced. There has been an obvious improvement in our stock of cattle, both by the introduction of foreign varieties, and a more thorough attention to the breeding of better kinds engrafted upon our old stock. We have become better acquainted with the best and most profitable kinds of sheep, and can now compete with any country in Europe in the excellence of our mutton and our wool. In swine, there is an evident improvement, both as regards weight and their facility to fatten. In the cultivation of the soil, new methods have been suggested and beneficially acted upon. New implements have been invented and profitably used; the old ones altered and simplified, so as to make them more manageable and far more useful. Both new and old varieties of grasses have been more successfully cultivated, which have afforded the triple profit of better and more abundant pasturage in summer, more hay in winter, and a richer sod to impart fertility to a succeeding crop. Above all, the old system of exhausting the soil by a succession of grain crops, has been most successfully exposed, and is in a measure abandoned. The subject of manures has been amply discussed, is better understood, the kinds extended, the quantities increased, and this great source of the farmer's wealth receiving more of the farmer's attention. In a word, farming is on the advance, and the hand of improvement discernable, and that the agricultural newspapers have materially contributed to it cannot be denied. We now find that the amount of our prosperity is proportioned to the intelligence with which we cultivate our farms, and as we give it more of our thoughts it seems to require less of manual labor.

These are the first results, the auspicious beginings of all our efforts, thus far, for the amelioration of the soil, which has been enhanced in value since these efforts have been made. But much remains yet to be done. There is yet a vast field open for the exercise of our power, and no man must call himself a farmer who does not endeavor and aspire to raise his fifty bushels of wheat, from seventy to eighty bushels of oats and barley, one hundred of corn, from two to three tons of grass to the acre, with that proportion of other vegetable productions. He must not be content with less. Providence has given the ground the capacity of being made to do more than this—it will be man's own sloth and inattention in abusing the soil, on which he was reared, and on which he treads, if he does not obtain, yea, far surpass, these now to us great results. *Albany, Jan.* 1, 1836.

[This preceding article has been furnished, at our request, by an esteemed and intelligent friend—to whom, in this manner, we beg leave to tender our thanks.]

AGRICULTURAL REPORT FOR 1835.

The season, as a whole, has been cold and dry, and consequently a late one. Natural vegetation was from ten to fourteen days, later than usual. The spring was so dry, that the grasses, sensibly injured by the drought and cold of the winter, did not get their accustomed early growth; and from the scarcity of forage generally experienced, the scanty herbage of the meadows was fed off too late in the spring as a matter of necessity. They did not recover their accustomed vigor. Winter grain withstood the severities of the winter better than the grasses, looked tolerably well when the spring opened, and maintained their good appearance. Indian corn, which habit has rendered almost indispensible in the economy of our farms, was not generally planted so early, by ten to fourteen days, as in ordinary years, on account of the backwardness of the spring; and it had many subsequent difficulties to encounter, which have tended greatly to lessen its product. The season has been more propitious to other crops, particularly to oats and potatoes. Yet on the whole, the products of our agriculture are less than a medium yield, as is evidenced by their high prices in market.

Wheat, we believe, afforded a fair average yield in most of the districts of secondary formation, where it constitutes the great staple. In other districts the result was less favorable. In the south, the product was seriously diminished by the Hessian fly; while in this vicinity, and to the north of us, the grain worm took at least one half the crop. The quality of the grain was good; and there has been a manifest improvement, which we hope will continue to progress, in selecting clean seed. The extra price one pays for clean seed, weighs but as a feather against the advantages of a clean crop. Our apprehensions from the grain worm are in no wise diminished. We have tried the preventive means which have been recommened without any sensible benefit. We hardly know of a more afflicting calamity that could happen to our state, than the extension of this evil, as now experienced here, to our western counties. And what is to prevent it? Is not the subject one of sufficient importance to call for legislative inquiry?

Hay has not been two-thirds, and in some districts not one-fourth, of an ordinary crop, from the causes which we have in part explained,—the want of the early and the latter rain, and the severe cold of the preceding winter,—causes, which human prudence could neither foresee nor guard against. If there is any profitable suggestion which we can make, growing out of the failure of this crop, it is that of renovating old meadows, by subjecting them to the plough and an alternation of crops. So far as our personal observation will serve as a criterion, old grass grounds fell off in their product much more than grounds recently laid down, on our own lands three to one. This disappointment in the hay crop is however likely, we think, to do a vast amount of good—by coercing us to more economical modes of feeding it to our cattle, and to the better husbanding our means—and by extending the culture of roots. The practice of feeding at stacks and in open yards, or even in common racks, where the cattle tread and waste nearly one-half of the forage, is giving way to the better system of feeding in mangers, to which the cattle are tied, and where nothing is lost. The stacks and shucks of corn have been better saved, and if cut, as they are in many instances, they are affording an excellent substitute for hay. We give today a cut and description of a yard rack, well calculated to promote economy in fodder. The hay cutter is coming into general use.

Indian corn, as we have observed, was planted late, and was very generally and seriously injured by the grub-worm. The replanted portion did not come to maturity before the frosts of Sept. 14, 15—the mean temperature of the summer having been some degrees cooler than ordinary. The frost of the 4th of August also destroyed much in the elevated districts, and upon the margins of small streams. Nor were these the only difficulties the crop had to encounter: the warm humid weather of October seemed to saturate the cob with moisture, or to prevent its becoming dry, and caused mouldiness in the grain; and in many cases where this was not fully ripened, absolute putrefaction. This was not only the case at the north, but extensively so as far south as Virginia. We note the fact here, that the reader may compare it with his own practice and its results, that we cut our corn at the ground, before all that had been replanted had become glazed; that it did not mould or sustain injury in the field; but it is due to truth to say, that it required much watchfulness and care to prevent mouldiness after it was husked—constant stirring and exposure,—and that we were obliged to uncrib a quantity, and to spread it, to save it from being injured. We think that corn dries and ripens better in stooks, than in any other situation, even than when topped and left in the hill. In the later case it is receiving a constant accession of sap from the roots, which, for want of leaves to elaborate it, instead of being beneficial to the grain, serves but to bring on fermentation, as was stated by our Coxsackie correspondent, in the last Cultivator. The experience of the year seems to admonish us,—1. to fit our corn grounds for early planting, by freeing them from excess of moisture, by underdraining, or by ridging, where the surface is flat, or the subsoil tenacious. 2. To plant as early as the temperature of the season will admit. And 3. To select the earliest kind of corn for our crop. We have heretofore recommended a 12 rowed yellow variety, which *we* termed Dutton corn, and so far as we have learnt, this has ripened well where it it was planted in ordinary season, and was not destroyed by the grub. The growth is rather dwarfish, but it will the better bear to be planted close; the product is abundant, and the grain hard, heavy and bright. Much of our seed has been sent, during the two last years, to New-Jersey, Pennsylvania and Ohio. We should be gratified to learn the result of its culture in those states as well as in New-York. On the whole, we do not think the corn crop has been half of an ordinary yield.

Barley, which ranks next in importance to the preceding in the husbandry of many of our counties, has been a good, we think better than an ordinary, crop. On lands which will not carry wheat, and which are neither very light nor very stiff, this is a profitable crop. It gives nearly the same yield as oats, while it sells for nearly double in the market; and it is a question of some doubt, considering its superior nutritive properties, whether it cannot be as profitably raised for horse feed. In many of the eastern countries it is extensively cultivated exclusively for this purpose. The culture of this grain is extending in our state. Barley, for malting, should be threshed with a flail, as the machine, with the awn, often takes off the germinated part, which injures it for malting.

Rye is the bread corn of Germany and Russia, and the *natural* bread corn of many parts of the U. States, for we are disposed to adopt, in this case, the opinion of St. Pierre, that every country produces what is most congenial to the wants, and conductive to the health, of its population. One great difficulty is in reconciling this axiom with the actual condition of our bretheren in some parts of New-England. Wheat they cannot grow,—of corn they grow but a modicum—and rye, they will insist their soil is incapable of producing. Whether this latter difficulty arises from actual sterility in the soil, from the absence in it of the peculiar pabulum of this grain, or from the difficulty of tilling the ground, we do not pretend to say; but the fact will not readily be erased from our memory that in passing from Worcester in Massachusetts, to Enfield in Connecticut, in October, a distance, we believe, of 40 or 50 miles, we did not notice a soilitary field of rye or wheat. The puzzle is, what, according to St. Pierre's theory, constitutes the *natural* food of the population? But, to leave this question unsolved, the crop of rye has been good, and the grain heavy. According to Von Thaer, this grain abstracts 30 parts in one hundred of the nutriment contained in the soil where it is grown. It is less exhausting than other small grains, and is ranked next to wheat in its nutritious properties. It contains a substance, in the opinion of Thaer, which facilitates digestion, and has an action particularly refreshing and fortifying on the animal frame.

Oats have been unprecedenedtly fine. The cold season has been propitious to this crop. A large amount was sown, and both straw and grain were heavy. In many cases the crop was not secured till late in September.

Potatoes have, like oats, been favored by a cool summer; and where not cut down by the frost, before they were ripe, the crop has been a very large one. The scarcity of cattle forage and corn, however, will cause heavy requisitions to be made upon the oats and potatoes, to make up the deficiency, and present prices of these articles are likely therefore to be sustained and increased.

Mangel Wurzel and *Ruta Baga*. The culture of these roots, as field crops, has been greatly extended, and as far as we can learn, with very encouraging success. We are yet hardly well enough versed in the management of these crops, and the labor saving machines which should be used in their culture, to enable us fully to appreciate the advantages they are capable of affording to our husbandry.

Hops have made but a very light return for the labor bestowed in their culture. The crop was light in New-York, and the quality generally inferior, on account of their not having matured well before the arrival of the autumnal frosts.

The dairy has been a source of handsome profit, on account of the high prices which butter and cheese have sustained in the market. This branch of husbandry is being considerably extended among us. It probably affords as sure a profit as any other department of husbandry. The gains may not be the greatest, but they are obtained at the least risk and expense.

Butcher's Meat, though rather scarce and high in the early part of the season, has been abundant and cheap towards the close of the year. The apprehension of a scarcity of fodder, has led to the slaughter of a vast number of neat cattle and sheep; and induces an apprehension that both will be high the current year. *Pork* has been rather light, but the article has sustained a very liberal price.

BONE MANURE.

From our restricted limits, we are often compelled to give, in a condensed form, articles which we should prefer to copy entire. The Farmers' Register contains a communication from A. Nicoll, on the effect of bone manure on corn. He induced his servants, by a small reward, to gather bones in his neighborhood, and to break them in a wooden trough with pestles shod with iron, into small pieces. He selected four rows in his corn-field, deposited a small quantity of broken bones in each hill, before dropping the corn, and covered both with earth. The corn in these rows became the most thrifty, maintained a vigorous and rapid growth, while on each side, the crop suffered from drought, the grain ripened better than that in the other parts of the field, exceeded in product that manured with dung at least one-third, and more than doubled that of the land which had received no manure.

We have had considerable experience with this species of manure, appreciate it highly, and have been restrained from recommending its use, from a fear that we should be charged with *quackery*—from the scarcity of the material, and from the want of mills among us to break and pulverize it. The neighborhoods of cities and towns alone abound with the material in sufficient quantities to make it an object for the farmer. In 1834, we purchased 60 cart-loads, from an individual who collected bones from the butchers to *fatten hogs*, and collect grease for the soap boiler. We had them crushed in a plaster mill, and applied to various crops, upon a light sand soil. In most cases, they were applied in excess; and the crops became too luxuriant and lodged. It is extremely difficult for common laborers to appreciate their fertilizing properties, and to apply them as sparingly as they ought. An incipent state of fermentation should be induced, when they are intended to operate immediately upon the crop. We effect this by mixing them in a pile, with ashes, and saturating the mass slightly with water. A fermentation soon ensues, when they may be strewn upon the ground, and buried either with the harrow or a shallow furrow. *The quantity applied should never exceed forty bushels per acre, and may range from that to twenty-five.* We applied them in one instance in the fall, without fermentation.—The crop received no apparent benefit from them; but the second crop, although the ground was not manured, was treble or quadruple the ordinary product afforded by the same field. We estimate that their beneficial influence will not be exhausted under five or six years. It is stated by English husbandmen, that bone manure produces no effect upon stiff clays—we have not tried the experiment—and that it profits the turnip crop most, when drilled in with the seed.

The truth is, all animal matters are manure in a concentrated form, and should be applied sparingly. We have lately published two notices of remarkable fertility induced by the flocks, or tag-locks, and sweepings from woollen factories. We have used, to the extent of fifteen wagon loads in a season, the piths of cattle's horns, after being divested of the horny part by the comb-maker, and we have used some hundred bushels in a season of comb-maker's shavings. We apply the latter at the rate of about thirty bushels to the acre. We first cut the former upon a block, with an old axe, into pieces, then strew them upon the land and plough them under. These are years in decomposing.

THE ATMOSPHERE.

A knowledge of the constituents of the atmosphere, and of the various and important offices which it performs in animal and vegetable economy, is valuable to the farmer, not only as serving to aid him in all his rural, money making operations, but as offering a source of high intellectual enjoyment. Although the subject may be deemed too abtruse for our humble columns, we consider it fraught with so much useful instruction, that we doubt not it will be read with interest by hundreds of our young patrons; and we would fain hope that it may lead some of them into a course of study, in physical science, which will not only benefit them individually, but ultimately become beneficial to man. The Creator has endowed us with power to become acquainted with many of the wonderful phenomena of nature, and of rendering them subservient to our wants; and, in this country, the humblest individual is furnished with leisure and ample means to pursue the inquiry. The time and means that are usually devoted, in early life, to frivolous, and often deleterious pleasures, would suffice to lay in a stock of useful knowledge, which would become a blessing and a treasure in after life. But it should never be forgotten, that in all our undertakings, application and perseverance are the only sure means of success. With these views and hopes, we shall briefly describe the principal constituent parts of the atmosphere, and some of its more important offices, that seem most likely to interest the agriculturist.

The atmosphere is composed principally of two invisible gases, termed *oxygen* (sometimes vital air) and *azote*, or *nitrogen*, in the proportion of about four-fifths of the latter and one-fifth of the former. This proportion is found to exist, with trifling modifications, in all latitudes and at all elevations. Although these elements are invisable in the atmosphere, they both assume liquid and solid forms under many and various circumstances.

Nitrogen abounds in animals, but seldom to a great extent in plants. It is however found in wheat, in what is termed the gluten, and it is this which gives to that grain its prominent value. It abounds in the urine, but seldom in the dung of animals. "It is the base of ammonia and nitric acid (aquafortis) and appears to be the substance which nature employs in converting vegetable into animal substances."—*Fourcroys.* Its principal office seems to be, to neutralize, in some measure, the properties of oxygen, and to render it fit for respiration and combustion.

Oxygen enters more or less into all animal and vegetable matters;—it constitutes 88 parts in 100 of water,—forms from 40 to 70 per cent of all vegetable acids,—more than 40 per cent of the wood of the oak and beech,—about 50 per cent in starch, the principal nutritious property afforded by grain, pulse and roots—and 64 per cent in sugar. It is essential to animal and vegetable life; it is necessary to fermentation, to combustion, to the germination of seeds, and the development and maturity of plants; and combining with the carbon of the blood, it produces the greatest proportion of animal heat. It also combines with metals and forms oxydes, or, in common language, *rust*.

Nitrogen and oxygen are called simple bodies, because they are incapable of division or decomposition.

Carbonic acid gas, also, is found to constitute about one thousandth part of the atmosphere, and in winter, it has been found to amount to one five hundredth part. This is a compound substance, composed of two parts of oxygen and one of carbon, the latter being found pure in the diamond, and forming the substance of mineral and wood coals. This gas is produced in abundance by fermentation, respiration and combustion, is absorbed and decomposed by the leaves of plants, which retain the carbon and give off the oxygen, and constitutes a large portion of the woody matter of plants. The causes which produce it, sometimes, in confined situations, give it in such excess as to render it prejudicial to animals; but the free access of atmospheric air soon restores the equilibrium. It constitutes the proper food of plants. Thus animals and vegetables are mutually benefited, through the wise provisions of the Creator, by their proximity to each other—plants giving off oxygen, necessary to animals—and animals giving off carbonic acid gas, the pabulum of vegetable life.

Water also exists in the atmosphere in the form of an elastic fluid. This fluid is found to form, at the temperature of 50° Fahrenheit, about one-fiftieth of the volume of the atmosphere, in the dryest time in summer, and is increased with the increase of temperature—heat accelerating evaporation from the earth's surface. When the temperature of the air is diminished, the aqueous fluid is condensed, and appears in the atmosphere in the form of vapor, or clouds, and is copiously deposited, in summer, in the form of dew. This water is retained principally in the lower regions of the atmosphere. It is so slightly united with the other elements of the atmosphere, that a change of temperature produces a change in its proportions; whilst nitrogen, oxygen and carbonic acid preserve, always, nearly the same relative proportions.

"Independently of those bodies which essentially constitute the atmosphere," says Chaptal, "there are mingled in it the exhalations constantly arising from the earth; these are again disengaged from the air, and precipitated, as soon as the heat or any other cause which occasioned their ascension, ceases to act upon them. These exhalations modify the properties of the air, [by the carbonic acid, &c. disengaged from animal and vegetable matters in a state of putrefaction] and affect its purity. The oxygen and the water of the atmosphere become impregnated with the particles of the exhalations which are deposited with them upon the surfaces of other bodies, where they remain in contact, or enter into combination, with them. The origin and dissemination of many maladies may be traced to this source; the germ of them is carried through the air by the aqueous fluid. And for the same reason it is, that intermittent fevers are endemic in those situations, where large quantities of animal and vegetable matter are undergoing decomposition, as upon the borders of ponds and marshes; and that the miasm, which arises from numerous animal remains, in a state of decomposition, becomes a fruitful source of disease. It is for the same reason also dangerous, under some circumstances to breathe the evening air; the aqueous fluid contained in it is loaded with the noxious principles which the heat of the sun, during the day, had caused to ascend into the atmosphere. The disagreeable odor, conveyed to us in mists, is owing to the power of the aqueous fluid in transmitting the exhalations arising from the earth. The manner in which the air conveys to us the perfume of plants, and the odor which it contracts from the exhalations of bodies in a state of decomposition, indicate clearly its influence in producing maladies, and still more plainly its power of propagating those that are outrageous."

We shall not, at present, speak of the other matters which commingle in the atmosphere, as light, heat and electricity—but proceed to the improvement, and the application to rural affairs, of the facts already established.

WE MAY PROFIT BY THESE TRUTHS,

1. *In selecting sites for our dwellings*—taking care to have them remote from marshes, ponds and stagnant waters, which vitiate, by the exhalations they give, the atmosphere we breathe, and generate disease. The air in a small close room soon becomes vitiated by respiration and combustion, particularly if crowded or heated by a close stove.

2. *In the structure of our dwellings*—in constructing ample apartments, open to ventilation, and in avoiding such as are low, moist, or inaccessible to the direct and healthful influence of the atmospheric air.

3. *In improving our domestic habits*—in improving cleanliness, an ancient, if not a modern virtue;—in avoiding the deleterious influence of the night air, especially in autumn;—in well ventilating our apartments when the weather is favorable, particularly early in summer mornings, when the air is pure and salubrious;—in graduating the temperature of our rooms, which should not be suffered to rise above 64° of Fahrenheit;—in avoiding hot sleeping apartments, in which the temperature often varies from 40 to 50 degrees, between the hours of going to bed and the hour of rising, a transition too trying for the most robust constitution;—in abandoning the use of foot-stoves, which transform our wives and daughters into delicate green house plants, poison the air they respire, and beguile them into indolent and inactive habits, as detrimental to their health as it is to their usefulness;—and in inducing our females to go warmly and tidily clad, even to the ball room and *soiree*. How many human constitutions are ruined, in our cities, by indulgence in habits which these truths teach us to reform.

4. *In multiplying shade trees about our dwellings*, which serve to purify the air, abate the fever of summer heats, by carrying off a portion of the caloric with the moisture they exhale, and which are withal an embellishment and an evidence of good taste.

5. *In the construction of our stables and cattle sheds*—Farm stock, except perhaps the hog, are as sensitive to good air and cleanliness

as man ; and the same precautions which go to secure the health of the latter, are essentially requisite to promote the well being of the former. Hence the importance of having clean and well ventilated stables and sheds, of removing the dung so that it does not undergo fermentation in their yards, and of giving them wholsome exercise.

6. *In the planting of our seeds.* The atmosphere being essential to germination, all seeds should be deposited in the soil within its reach—they should be put just so low as will barely secure about them moisture enough to assist their germination. We have reason to think, that small seeds are often deposited too low ; and that even if they germinate, the food which the cotylidons affords, and which is their only support till the seminal leaves are developed, is not sufficient to carry the plant to the earth's surface, where the leaves can alone exercise their office.

7. *In the management of our field and garden crops.* The earths have a strong affinity for water, when pulverent and loose, but comparatively little when compact or crusted. In the former case they act like the sponge, transmitting the dews which fall upon them, and the food of plants with which they are impregnated, to the roots of vegetables. But where the earth is compact, or become encrusted by alternate rains and sunshine, the dews do not penetrate, but are dissippated by the first rays of the morning sun. Hence the best preventive against the evils of drought, is the frequent stirring of the surface, and keeping it constantly permeable to atmospheric air, and the vegetable nutrition with which it abounds. We remember a remarkable illustration of the utility of frequently stirring the surface of cultivated lands, detailed by Curwen, a distinguished British agriculturist. He prepared a field of stiff forbidding land, and planted it with cabbages. His neighbors all declared he would get no crop ; but he put a horse and cultivator into it, and subjected it to almost constant stirring during the growing season. The result was, he gathered an immense crop, some of the cabbages weighing over 50 lbs. each. The farmer may derive great benefit from this practice in the culture of drilled and hoed crops, provided he does not go so deep as to cut the roots of his plants, or throw his manure to the surface. And,

Lastly, we may profit from the facts we have detailed, *in the management of our manure*, the basis of fertility to our soils. The whole of the matter of dead plants and of animals, is susceptible of being transmuted into the matter of living plants, by the ordinary processes of nature ; and it is capable, however solid it may seem, of being reduced to liquid or gaseous forms. Indeed, it proceeds to take these forms immediately, on its losing its vitality, as soon as it comes in contact with air, heat and water, the great agents of decomposition. The moment manures begin to ferment, the waste of vegetable food begins ; carbonic acid gas is disengaged, and is scattered by the winds ; the oxygen of the atmosphere, uniting with the hydrogen of the mass, forms water, which settles into the ground, or is carried off by rains ; and the mass is reduced in volume, and when fermentation has exhausted its force, it has lost one-half of its fertilizing properties. If the fermentation takes place in the dung yard, or upon the field, this half is lost to all useful purposes for the farm. If it takes place in the soil, the earth imbibes it, and the plants growing thereon are fed and nourished by it—the grasses and liquids are converted into the solid matter of the growing crop.

We have thus endeavored briefly, though we fear but imperfectly, to illustrate some few of the benefits which may result to the farmer from an acquaintance with physical science. We may renew the subject hereafter.

NOTES ON FARMING.

FROM OUR MEMORANDUM BOOK.

Breeding.—It is laid down by Cline, and sanctioned by practised breeders, that any improvement of form by crossing, must depend entirely on the selecting a well formed female, larger in size than the usual proportion between females and males. Let the male be rather small with good points. *Sinclair, p.* 61. The Hollanders manage upon this principle, and seldom employ a bull when over two or three years old. A cross of a merino buck with a Liecester ewe, in the course of four or five generations, will produce fleeces rivalling in fineness Spanish fleeces (?)—*Sinclair, p.* 14.

Growth of Trees.—A plantation in Norfolk, Eng. 30 years old, gave the following dimensions, five feet from the ground :—Scotch firs 39 inches in circumference, larch 36, beach 32, alder 32, ash 21, oak and chesut 28.—*Marshall.* The inhabitants of our old settlements will learn from this, when it is time to begin to plant timber trees for their children. The present forests of Great Britain have been all planted by the hand of man.

Planting.—"A landholder," says Cato, "should apply himself to planting of his fields while in youth, but he ought to think long before he builds. He ought not to *think* about planting, but he ought to *do* it. When he is about thirty-six years of age he may build, provided his fields are planted."

The fact with us seems to be, that we do not find time to plant when we are young, and when we are old we consider it too late—for we are unwilling to sow where we are not likely to reap the harvest. We should at least *preserve*, if we will not *plant.*

Fellenbergh's School of Agriculture.—Two only of the pupils have left Hoffwyl for a place, says Simond, before the end of their time ; and one of them, with M. de Fellenbergh's leave, is become manager of the immense estate of Count Aboffy in Hungary, and has doubled its proceeds by the improved methods of husbandry he has introduced. This young man, whose name is Maderly, was a beggar boy, and not particularly distinguished at school. Another directs a school established near Zurich. M. Fellenbergh has besides a number of pupils of the higher classes, some of whom belong to the first families in Germany, Russia and Switzerland. They live *en famille* with their master, and are instructed by the different tutors, in the theory and practice of agriculture, and in the arts and sciences on which it is founded.

Carrots are sown in Flanders, in the spring, upon winter and spring grain,—and give a crop after the grain is harvested.—*Sinclair.* We have little doubt but the practice, upon deep ameliorated soils, would answer tolerably well here, as the carrot makes most of its growth after midsummer, when the grain is harvested.

Milk.—To divest this, and butter, from the taste of turnips, cabbage, wild onions, or other offensive plants, on which the cows have fed, put a quart of boiling water into each pailful of milk, when it comes from the cow.—*Marshall.* We have tried, and found it successful. The principle of flavor is volatile, and the heat of the water dissipates it.

Yard Racks.—A friend from Orange has given us a drawing of a convenient and economical rack, to be used in cattle yards, if cattle must be fed there, in extensive use in that county. It consists of four scantling or other posts, six feet long, connected together by slats, strips of boards six feet in length, and supported by diagonal braces extending from the top of one post to the bottom of the frame —the whole forming a six feet square. The slats are carried so high as to permit animals to reach the bottom over them—and it is advisable to floor the bottom. In these the straw or hay is put for the stock. The advantages which it offers are two—it prevents the fodder getting under the cattle's feet, and thereby being wasted —and it in a measure prevents the weak animals being driven from their food by the strong—four being accommodated at each rack without interfering. The number of racks can be graduated to the stock.

Agricultural Associations.—Dr. Brewster, in speaking of the British Board of Agriculture, which has been so eminently useful in advancing the improvement of British agriculture, enumerates the following among the advantages which resulted from its establishment.

"Two advantages among many may be mentioned: 1st. A great number of new men were brought forward by the board, whose names would probably otherwise never have been heard of; and those being chiefly practical people, who were professionally concerned in firm management, agriculture, by their endeavors, was rescued from the hands of theorists, and a revolution of no small extent accomplished in rural affairs. 2dly. Before the board was instituted, the bond of connection among agriculturists was slender, and served few useful purposes. *Each trusted to his own information, and knew little more about the practice of conterminous districts, than those of China, or the most distant country.* The establishment of the board removed at once all these evils and difficulties. A common fortress, erected for the benefit of all agriculturists, and to which each might resort for advice and protection, was immediately recognized. It made farmers, who resided in the most distant quarters of the kingdom, acquainted with one another, and caused a rapid dissemination of knowledge among the whole profession. The art of agriculture was brought into fashion; old practices were amended; new ones introduced, and a degree of exertion manifested which had never before been exemplified in this island."

Pudney's Patent Horse-Rake.—We have seen a model of this rake, and, so far as we can judge from mere observation, we think it superior to any we have before seen. It not only revolves, but when it turns it gathers the hay again immediately at the base of the winrow which it makes. Mr. Pudney resides at Stamford, Delaware county.

Manual Labor Schools seem to be multiplying in every part of our country. They will have a most salutary influence in invigorating the constitution of the pupils, mostly intended for the ministry, and in diminishing the expense of a literary education. But let it be borne in mind, they are not agricultural schools. Agriculture, we believe is not *taught* in them, as a science or an art, but merely *practised* as a healthful exercise, and on the score of economy. What we want is, schools in which the theory and practice of agriculture shall constitute the paramount study of pupils destined to follow it in manhood. We want to combine with the economy and healthful exercise of the manual labor schools, the *instruction* in husbandry which is calculated to make good farmers and good citizens.

Transplanting.—We publish an excellent article upon this subject, in this number, from the pen of Mr. Downing, of Newburgh. It goes to explain the principles, the why and the wherefore—the science of the practice which it recommends. This feature should mark all our agricultural writings. It teaches the head as well as the hands. We commend it to the notice of our Poughkeepsie readers, where we lately observed hundreds nay we believe thousands, of limbless maples, planted to ornament the high-ways and by-ways; and we were told, that to give these poles a more comely appearanco, pains had been taken, by at least one planter, to rasp off the scattering buds which protruded from the naked bole, the remaining germs of vegetable life.

Common Schools.—A general sentiment seems to prevail, that something efficient ought to be done to raise the character and usefulness of our common schools. Societies have been formed in several towns, in furtherance of this object. The impulse comes from the right quarter—from the people. The legislative provisions, as regards pecuniary aid, are already ample; and were they doubled, they would benefit but little, without a more hearty co-operation in the districts. Self-dependence goes a great way here, as in most other matters. If we depend upon the legislature, or upon others, to do for us, it remains undone, or but badly done. But if we resolutely resolve to do *our* duties, they are likely to be well done. Call not upon Hercules till you have put your own shoulder to the wheel. The work of improvement is begun, and we hope every one will give an impetus to its motion. It needs it.

Agricultural Fairs.—Our exchange papers from Ohio, are filled with the proceedings—the addresses, premiums, &c. delivered at their agricultural fairs; an agricultural society, we believe, having been organized in each of the fifty odd counties of that state, *fostered by the patronage of the legislature.* To us, the subject is one of deep interest, and indicates in our young sister, a healthful advancement in improvement. But New-York, who prides herself for her liberality and enterprise in almost every sort of improvement, is yet pausing in doubt, whether her agriculture deserves any extraneous aid.

Publications on the Silk Culture.—In addition to the three periodicals, devoted to the silk business, which we have noticed, as having been commenced the present year, there have been published three volumes, or pamphlets, professing to describe the whole process of raising the mulberry tree, rearing the silk worms and reeling the silk. One is published by W. G. Comstock, Hartford, comprises 100 pages, and is sold for fifty cents; another by Russell and Odiorn, Boston, written by W. Kenrick; and the third, by Sinclair and Moore, Baltimore. We should think either of them an important guide for a beginner—though we have not had the opportunity of examining any of them.

Our correspondents have enabled us greatly to enrich our present number. The communication of Mr. Allen, on farm buildings, and the management of farm stock, is of deep interest to every farmer, and the opinions it expresses tally generally with our own. We are not, however, prepared fully to concur with him on the propriety of *stabling* neat cattle—for the reason that it is apt to make them too sensitive to cold when turned out, and that they have not all the benefits of fresh air which they require. Our practice is to tie them in sheds, open on the south or east, and closed on the north and west, to give them a clean littered berth, and to feed in mangers. The number on the Emigrant Merino sheep, will tend to dissipate any errors that may have arisen on this head, to reconcile us to the Saxon branch of the family, and to induce us to endeavor to improve them in hardiness and size, as we ought to do all our farm stock. The other communications will also be found to be interesting.

Irrigation.—We have refrained from recommending this branch of improvement, because our climate does not require it, and because it is too expensive for our scale of husbandry. Irrigation is essential in southern climates, as Egypt, Italy, Spain, &c. where rain seldom falls in summer, and where the heat is great and unremitting. With us, drains are far more essential to take off the excess of water than to flood our lands. Systematic irrigation is very expensive, requiring the surface to be perfectly graduated, so that the water may be completely taken off, as well as spread over the surface, at pleasure.

Household Affairs.

Every house-wife knows how to make *herb*-tea. The herbs are put into a cup or dish, hot water turned upon them, and they are suffered to *steep*—why not to *boil?* Because a large portion of their medicinal virtues, and particularly the principal of flavor the most volatile property they contain, is dissipated by boiling, and the virtues of the tea lost. In the processes of boiling and fermentation, the natural flavor, and aroma of the choicest vegetable productions are dissipated or changed. Yet though every woman knows how to make herb tea, few seem to know how to make *green* or *black* tea, or *coffee;* or knowing, do not reduce their knowledge to practice. A mistaken economy, to *get all the strength,* induces them generally to *boil* the latter *well,* and often the former; and the consequence is, that instead of a grateful refreshing beverage, they give us a dull, acrid or insipid substitute, retaining nothing pleasant but the color and heat. The aroma, which gives to the liquor its value, and which should be recognized by the nose as well as the palate, is gone—*with the steam*—and with it much of the flavor. They not only *boil out* the strength, but they *waste* it. Now without intending to infringe upon the prerogatives of the good wife, we *do* advise, that she will make her green and black, as she does her herb tea, *without boiling;* and that she will only *leach* her coffee, by putting it, when recently burnt, and fresh ground, into a strainer, fitted to the top of her coffee pot, and turning upon it as much boiling water as would suffice in the old mode. We can assure our fair readers, from reason as well as experience, that this *is* the best way, not only to gratify the taste, but to promote economy. Less tea and coffee are required in the steeping and leaching, than in the boiling process, and the beverage obtained by the mode recommended is more tonic, exhilerating and pleasant.

CORRESPONDENCE.

FARM BUILDINGS AND THE CONSUMPTION OF FODDER.

Among all the deficiencies which exist in the perfect management of our farms, I am sensible that none are more prominent than that of proper buildings. Not that I would advocate expensive or large buildings, but those of ample size and convenience for all the *legitimate* uses of the farm, and of such shape and construction as shall conform to strictly economical calculations.

For instance, I would not build an expensive *stone* barn on my farm, when one of wood, equally good for all ordinary purposes, can be erected for a sum not greater than two or three years' interest on the cost of the stone one; because a well under-pinned wooden building, where extraordinary warmth and tightness are not required, will endure at least fifty years, and need shingling no oftener than a stone building. So of stables, sheds, outhouses, &c. But not so of dwellings.

The desire of warmth with which human beings are sheltered, forms a prominent part of the comfort and usefulness of life, and therefore, all dwellings should be built of the best materials, and constructed in the warmest manner compatible with the ability of the owner. I have much doubt whether the occupant of an open, badly built house, does not pay three times the annual interest of its cost, in the extra fuel and labor consumed to keep its inmates comfortable; and among no class of people have I found so great an inattention to these very important matters, as among our moderate farmers; and when the annual losses by disease, exposure, extra labor of obtaining and preparing fuel, and of time in various ways, all arising from a cold and comfortless house, are taken into consideration, I am thoroughly satisfied, that a great portion of the profits of a whole family's industry, are annually lost by the wretched houses they occupy.

The great fault committed by most farmers in their buildings, is in the great size of their dwellings. Many who build, calculate to do it *within themselves;* or they get out their own timber, draw their own saw logs to the mill, if there be one near them; quarry and haul their own stone, &c. &c. and so manage as to hire but a portion of their mechanic work, turning in their own labor and that of their sons and hired men, if they have them, to assist in its erection. This is as it should be; but the difficulty is that they often plan too largely, calculating on finishing off only a small portion of the house *at present*, and to do off the rest at some future opportunity of more leisure and convenience. But these future opportunities of leisure and convenience rarely occur, and so much more capital is often expended in the inclosing of a large dwelling than had been anticipated, or is at all useful to the family, that it remains forever unfinished, and a cold comfortless receptacle for them, when a snug, warm and delightful dwelling could be entirely finished, with every requisite comfort for a numerous family, at the cost of the unfinished shell! How painfully true is this fact in numberless instances.

This fatal error oftentimes extends itself to the outer buildings of the farm, alike prejudicial to all descriptions of stock kept upon it, and of most serious account in the year's results of its products. Fortunately there is so little intricacy or science needed in the construction of farm buildings, that even the least skilful may erect comfortable and necessary shelters for all his domestic animals, and materials abound so plentifully in our country, that they are every where to be found. It is better even, in my estimation, for a farmer to sell a small portion of his land, to accommodate the remainder with proper buildings, if he cannot do it otherwise, for he is actually richer in the end to do so; as for the most of them, the produce on an equal number of those acres would be annually wasted for the want of them, besides all the discomfort, misery, and suffering caused by exposure to the inclemency of the seasons. This may be unpleasant argument to those who are intent upon nothing but increasing the extent of their farms, regardless of the comforts and profits of their stock. Yet such, were they to pause in their acquisitions, and by the erection of necessary buildings on their farms, secure more effectually its products, would in a short time accumulate much more rapidly than before. I name these facts with more emphasis, because I am well assured by my observations throughout the country, that the want of necessary and proper buildings is the greatest drawback our farmers experience in the profits of their labor.

Of what avail is it that I reap fifty bushels of wheat, or an hundred bushels of corn to the acre, and lose one-third of it for want of shelter, or waste in feeding? Unless I can secure my crop, my profit in growing it is of small account. If I cut fifty tons of hay, and, by exposure in stacks to the weather, only forty of it can be eaten by the cattle, and one-quarter part of that even is trampled under foot, I had better have had only thirty tons of good hay in my barn, and even then my stock would have consumed five tons less by being warmly housed for the winter. This is a view of the case which I think must strike every thinking mind, and will apply itself to every kind of domestic animal on the farm. To my mind it has been most strikingly presented by a year's experience, and I am of opinion that the difference in the consumption of food for the domestic stock of a farm, taking in all the losses incident to the forage itself by want of housing, &c. is at least *thirty* per cent, compared with the most economical method of expending it; and in some cases even *forty* or *fifty!* I am aware that this calculation will strike the reader with surprise, and by many it will not be believed; but to such I only say, try it, and he will become satisfied of its truth.

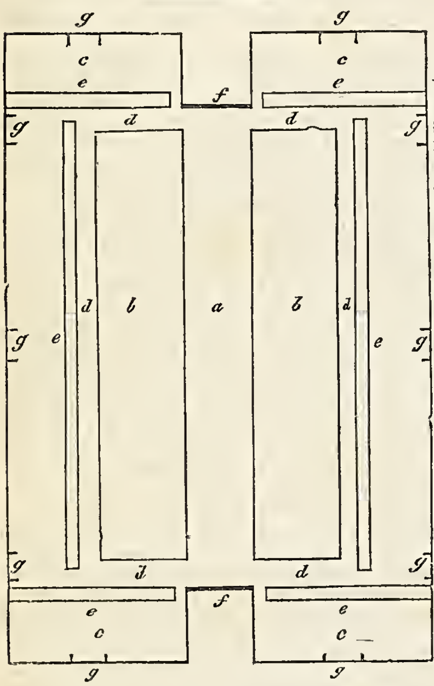
In the spring of 1834, the management of a large tract of land coming under my charge, portions of which had for years been most miserably mangled by a horde of squatters, who had cut, haggled, and worked the land after their own fashion, although abundantly productive by nature, I found it in a most miserable condition, requiring immediate care and attention. Numerous wretched log cabins were scattered over it with bark roofs; an occasional shed for cattle, with a parcel of old rails thrown over the top, and on them the remains of an old stack bottom, where their hay, stalks, or straw had been stored, were all the buildings or conveniences to be found on the premises. Three or four of these little squads or settlements had been made on different parts of the territory, and each one comprised within its compass from one to two hundred acres of this partially cleared, girdled and dilapidated improvement. Having got rid of the squatters, and selected one of these settlements most conveniently located for immediate operations, and taken the best cabin, well situated and convenient for a dwelling, I put into it a good family, fit to manage the place, built an addition to it also of logs, put on a good shingled roof, and with a hundred or two dollars expense, made a very comfortable affair of it. With sufficient help on the place, the fences were straightened and put into line, the old bouks, (*bocks,*) brush fences, logs, &c. &c. cleared up and tolerable crops got in. Having come into the place about the middle of April, it was too late in the season to make rapid advances, but in the course of the summer perhaps 30 acres of oats, 5 or 6 of corn, and as many of potatoes, were cultivated and yielded a tolerable crop. A dozen acres of wheat were also sown in the fall, and perhaps 70 or 80 acres of land worked into tolerable shape for another season. Yet we had no barns nor the means of building any during that year; one wretched log stable, which stood near the house, was all that we had for shelter to any of our animals, and with that we shifted to get along. Our hay, of which we had some 60 or 70 tons cut from a distant clearing, our oats, corn, fodder, &c. &c. were all stacked out in the open air. Winter came upon us. With a few thousand feet of boards and the aid of crotches and poles, we made some sheds and mangers for our cattle, of which we had a large stock, composed of oxen and cows, and erected some racks in the yard to feed them in. By these means we got through the winter after the fashion. Our cattle had enough to eat, and during the cold weather looked tolerably well; but as the cold rain and snow storms of March and April came on, they grew poor in spite of all we could do. Food enough to keep in high condition double their number, if well housed, was given them, but all to little purpose. The storms wet the fodder in the stacks, the cattle trampled it into the mud under their feet, and with all the care given them, which was a great deal, I am fully satisfied that at least 25 per cent of the food given them was entirely lost!

And yet this was better and more economical feeding than one-half the stock of our country get on the average! It may be a bold and sweeping remark, but it is nevertheless a *true* one, and would every farmer make the experiments who thus practises, he would fully test its correctness. We had great labor to perform, and therefore submitted to the loss and inconvenience accruing to this mode of management. During the winter, we cleared up more of this *slashed* ground, enclosed it, drew off its wood and timber, and last spring had perhaps 200 acres of pasture, mowing and plough land ready for use. We were now ready to build a barn, and after the spring crops had been put in, proceeded to erect one proper for the uses of the farm. It was soon built, covered and inclosed, and by haying and harvest time was ready for use. It was placed on a central and convenient spot for the farm, which is a large one, and although this barn is 100 feet long, by 50 feet wide, and 18 feet posts, with leantos for stables on each side of it, with a floor 14 feet wide lengthwise through the centre, more room will soon be required. It was a matter of much wonder and inquiry by my neighbors who saw the barn, of what possible use it could be, supposing it a most extravagant building, although for the size, a very cheap one. Yet when we had cut and stored our hay, oats, and wheat, the barn was crammed full to the roof, on the floor and all. We housed every thing; all was put in, in perfect order and good condition. Ample room is there made to tie up every animal to be fed, and not a lock of hay or a spoonful of grain need be lost. The manure is all saved, and in a convenient situation to be carried out, and a degree of economy, comfort, and satisfaction experienced in spending the food to the stock, that amply compensates for all the extra expense. The hay and grain it contains is more than 150 tons, enabling us to feed out every bundle of straw and coarse fodder, which is in most cases altogether lost or only used for manure: a plan of this barn is annexed.

There are so many collateral subjects connected with the barn and other outbuildings of a farm, that it is hardly possible to give an essay on this subject without discussing the different methods and economy of feeding stock, with the preparation of the food, preservation of manures, &c. &c. But as the *principle* of feeding is the same in all kinds of neat cattle and horses, it will apply to all cases. In the first place, I hold that there is no straw, corn, fodder or grass cut on a farm, with the exception perhaps of the straw of peas, beans and buckwheat, but what may be consumed as *food;* therefore all reasonable pains should be taken to secure them in good order and have them well stored, and sheltered for winter food. How many thousand tons of valuable wheat straw have I annually seen in our wheat counties thrown out from the thrashing mills, and piled up year after year to rot and taint the atmosphere with its offensiveness, when it might all be made into the best of food for cattle, by being housed and chopped with trifling labor! It appears with many farmers to be a matter of no sort of consequence *who* feeds the stock, or *how* they are fed, provided they are only fed at all; not considering that there is equal economy in spending the food as in securing it. Look at the season of haying and harvest among our farmers. What preparation for toil and incessant labor, increase of help, high wages, &c. &c. Up by day-break in the morning, and at work, and no rest till dark. It is the extraordinary season of the farmer, when every thing is sacrificed, even the Sabbath oftentimes, to toil, and no cessation till it is all over. But when the winter comes on, this invaluable food, collected at so much cost and toil, is expended with a heedlessness and prodigality unaccountable to any rational or thinking mind. This indeed may seem foreign from the subject of which I am treating, but it is too nearly allied to it to be lost or overlooked.

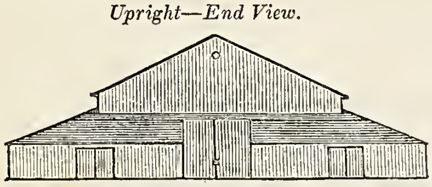
My own method of feeding is to cut *every* kind of straw, and even the coarse marsh or meadow hay, in the cutting box, and mix it with a light portion of shorts, bran or oatmeal, just enough for the cattle and horses to eat it. In this way they consume every thing. Nothing is lost; for what they leave is taken from the mangers and mixed over again with the new mess. It is the exclusive business of one man to cut the food, clean the stables, and feed the cattle; and if he needs assistance, he has it. By this means he becomes acquainted with the appetite and health of each animal, a matter altogether important. If they be out of health, or need extra nursing or attention, he knows it and provides for them. A change of food is occasionally given, and by this operation all is relished and eaten perfectly clean. We now feed about 40 yoke of oxen, 8 or 10 horses, a dozen cows, some sheep and young stock, all in this manner, though not all in one building, without any waste at all. Every thing is saved. Every animal is tied up in its place excepting the sheep, and each has its own portion without fear or molestation. I well know that they consume less food per head by thirty per cent than they did during the last winter, when they were fed nearly, if not quite equal to, the ordinary method practised throughout the country. Our oxen I am satisfied perform more labor, the cows yield more milk, and all the animals consume less food by being thus housed and attended. But to the plan of the barn. It is here given.

Ground Plan.

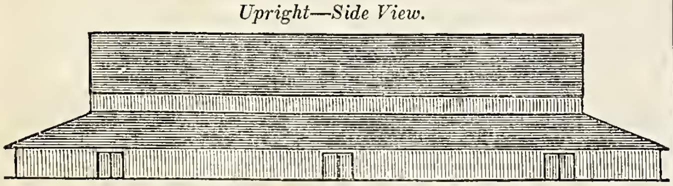


Explanation.
a. Barn floor, 14 feet wide.
b. b. Bays for hay and grain, 18 feet wide and 92 feet long.
c. c. Stables for cattle and horses, 13 feet wide in the clear.
d. d. Passages to stables, 4 feet wide.
e. e. Mangers for feeding, 2½ feet wide.
f. f. Great doors, 14 feet wide.
g. g. Stable doors, 5 feet wide, double.
Length of barn, 100 feet.
Width of barn, 50 feet.
Posts of do. 18 do.
Pitch of roof, 12½ do.
Height of leanto posts, 7 feet.
Pitch of stable roof, 8 feet.
Length of side leantos, 100 feet.
Length of end leantos, 38 feet.

Upright—End View.



Upright—Side View.



The barn is framed as if to stand alone, omitting the lower girt at the ends on each side of the large doors. The leantos are then framed on to the barn in the simplest manner—the passage being *round* the main body of the barn, excepting at the ends, where the passage is *in* the main barn, and the leantos there only 16 feet wide, and the manger is fitted up to the main barn. Only one passage is made to go into the short stables at the ends. Stalls are made 7½ feet wide and boarded between, and each ox or cow is tied next to the partition side of the stall, which prevents their getting together, and saves much room. The doors are sufficiently wide to drive in a pair of oxen yoked, and large spikes are driven in the plates all round the stables to hang harness, yokes and chains upon.

The bottoms of the mangers are raised ten inches from the floor, and laid double. The sides of the stable are also battened with thin boards inside, which makes them perfectly tight and warm; windows, with sliding shutters are made in the sides, to throw out the manure.

Girts run parallel with the main floor in the posts, across which are laid poles, nine feet above the floor, on which hay or grain can be piled up to the peak.

This barn will hold 200 tons of hay and 46 yoke of oxen, or 100 cows or horses. If only ordinary stock is kept, the *long* leantos need be only 18 feet wide, and the *short* ones 14 feet. Granaries can be partitioned off from the bays or stables as may be convenient. If a thrashing machine is used, a part of the stable can accommodate it. Its whole expense, finished complete, is about $1,500.

On this model, barns of any size may be built, and I am well satisfied that, according to the room required, it is altogether the *cheapest* in cost and simplest in construction of any plan I have seen. If a less proportion of stable room be needed, it may be omitted where convenient.

The passages round the ends of the bays and in front of the mangers, are for feeding the cattle, every thing being put in front of them. The passages are wide enough to carry hay, and when the bay is partially fed out, the hay may be thrown directly into the passages.

I would on no account, store hay or other material over the cattle, under the stable roofs, although there is considerable room, as I am satisfied from experience, that there is none too much space left for ventilation.

The floors are lined with thin refuse boards, excepting a part of the stables, it being my wish that *nothing be lost.*

This barn is placed on level ground, having no side hill convenient on which to place it. I would prefer, if possible, a sloping piece of ground, and make an ample cellar beneath it, to receive the manure, preserve roots, &c. &c. It will add to the expenses of building, but greatly to the convenience and economy of the farm.

This, it is true, is on a larger scale than is needed for an ordinary farm; yet many farms require as much and a larger quantity of barn room. If every thing be saved and housed that can be profitably expended in the feeding of stock, much more shelter is required than is supposed. If the farm be small, the size of the barn should be graduated to its wants. This plan has been closely examined by many farmers of great experience, and pronounced to be the best they have seen. The utmost possible economy of room is made for packing the hay and grain, and the stables are mere leantos, made of light frame, attached to the sides and ends of the main building. If wood covering for either the sides or roof of boards and shingles are not to be obtained, they may be made of thatch. The bodies of the building may even be laid up of logs and covered with slabs, so that they be well chinked and comfortable. It is true that there is some waste room over the cattle in the stables, but no more than is wanted for ventilation and to pass off the respired air, which is deleterious to their health. The letting in of fresh air in cold and stormy weather, through the sides of the building, gives them colds and diseases, to which they are as liable as the human family. But even if only sheds are wanted, I am satisfied that they are better to be attached to the sides of the barn in the way these stables are, than in any other, being more convenient, and allowing the stock to be fed in them with greater economy. The stables attached to this barn being for the accommodation of working cattle mostly, are wider than need be for an ordinary stock, and may be made narrower. But amongst all other plans, I have found none which combine the requisites of cheapness, economy of feeding, and storage like this. It has withal an appearance of snugness and comfort about it that greatly embellishes the farm.

If sheds are wanted in addition, they can be attached to the stables and run off in either direction, and accommodated with racks or mangers as may be required. But every domestic animal on the farm should be fed at the barn, with the exception of sheep, which require, if kept in large numbers, a different and separate course of management. The custom of stacking hay or grain in the fields is at best a bad one, and if resorted to, it should be removed to the main barn as soon as the cutting season is over, or there is room in the barn to receive it. Small moveable barns are frequently built to store it in, and from them feed to cattle during the winter; but this in the best of weather is accompanied with waste, particularly in the manure, which is valuable even on the best of soils. It is besides much less labor to carry the hay either on sleds or wheels to the barn and then feed it to the stock, than to go daily two or three times to fodder it out. So much has been said and written on the wasteful method of feeding at stacks, that at this time it is almost superfluous to mention it.

As to the other ordinary outbuildings to the farm, it is only material that they be conveniently and economically built. No farm house should however remain without a swill house, with a large cauldron set in brick, an ample wood house, wagon and tool house, corn-crib, &c. near by. As to the dwelling, it is a matter of fancy with many, and to those who have the ability, provided they make it comfortable and convenient, it matters little what is the shape, size or style of it. Still there is a model that I consider cheaper and more convenient than almost any other, and for those landholders and farmers who build for the accommodation of their tenants, I consider it a most excellent one to follow. I am about building one on a farm of my own for the manager to live in, sufficiently capacious to accommodate his own family and half a dozen hired men. Its whole expense will not exceed a thousand or twelve hundred dollars, and if opportunity offers, I may send you the plan in some future communication.

Most truly and respectfully yours, L. F. ALLEN.

Buffalo, December 5, 1835.

SHEEP HUSBANDRY—No. III.

THE EMIGRANT MERINO.

There does not appear to be among those who write and converse on the Saxony and Merino sheep, a distinct and definite understanding of the subject. By most people they are regarded as distinct races of sheep; and designated by many imaginary distinctions.

To whatever region the Spanish Merino has emigrated, he is to be identified with the original, like the greyhound. Thence arises the inquiry, where has he been preserved in the greatest purity? held in the highest estimation and cultivated with the most care? in Saxony, France, or America? And when we talk about *old fashioned merino sheep*, it must at the same time be understood, that one variety of the parent stock is four times as valuable as others, and that this necessarily influences the emigrant, and determines his value. Then comes the consideration of individual peculiarity and excellence, which forms the basis of improvement, and the preservation of his purity.

The first emigration of the Spanish merino with which we have any acquaintance, was to Saxony; whose history has been partially narrated in the first No.

The second was to France, in both instances under circumstances of sovereign, or state patronage. This second I shall furnish principally from a transcript of the writings of others.

"When France became a manufacturing, as well as an agricultural nation, it was perceived how great an injury she sustained by being dependent on foreigners for all the fine wool which she employed, and it was well understood how great would be the advantages which she would derive from the production of it within herself.

"This subject occupied the serious attention of Colbert, whom nothing escaped which might tend to the advantage and greatness of his country—he projected a change in the system which prevailed. Succeeding ministers attemptod without effect to put his designs in execution.

"It was not until the year 1766, that Daniel Charles de Trudaine, an able minister, employed the surest means of succeeding, and thus freeing the kingdom from the tribute which it paid to procure fine wool. After his death, his place was supplied by his son, who followed the plan laid down by him. Daniel Charles de Trudaine had addressed himself, not to cultivators of land, whom narrow views and prejudices are too apt to deter from adopting whatever they have not seen practised by their forefathers, but to Daubenton, an able naturalist, who instantly perceived the possibility of what was proposed, and proved it by satisfactory experiments."

"It having been ascertained by a variety of experiments patronized by the administration, and conducted by enlightened agriculturists, that the merino sheep might be acclimated in France without any change in their wool; application was made by Lewis sixteenth to the king of Spain for permission to export from thence a number of merinos. This was not only granted, but orders were given by the Spanish monarch that they should be selected from the finest flocks in Spain. In the year 1786 four hundred rams and ewes arrived in France under the care of Spanish shepherds. Fortunately for France, the improvement in sheep, begun under Lewis the sixteenth, was continued through the revolution, in which almost every other useful institution was involved in ruin. A committee of agriculture was formed in the convention, and under their protection the amelioration of the merino flocks happily progressed." From this originated the celebrated Rambouilet flock. From this, the writer says a number of rams and ewes are annually sold, after the finest are picked out to keep up the original stock. And notwithstanding the annual sales from the national flocks, the price of rams is daily increasing."

So particular have the governments of Saxony and France been, to preserve these flocks from degenerating, and to effect every possible improvement, that they have at different times sent experienced shepherds into Spain, to select from their choice flocks superior individual rams, for which, in some instances, they have paid enormous prices, to preserve the necessary change without breeding in and in.

In such high consideration was this subject held by the successive administrations of the French government, that a commission was issued to the institute, to appoint a committee to prepare a treatise on sheep; which was executed, and distributed gratuitously, with that characteristic liberality of the great nation, which has done so much in science, and in arousing the dormant energies of the human mind, to a positive exaltation of character.

Mr. Gilbert, a member of the French national institute, in describing the Rambouilet flock, says, "but which certainly does not yield in any circumstance to the most beautiful, in point of size, form and strength; or in fineness, length, softness, strength, and abundance of fleece. The manufacturers and dealers in wool, who came in numbers, to Rambouilet this year (1796) to purchase, unanimously agreed to this fact, at the very time that they were combining to keep down the price." He further states, that the average weight of the fleeces of the bucks, when washed and scoured, exclusive of tags and belly wool, was six pounds. In this country, for the market, we do not scour; only wash, and roll up the whole fleece. The amount of fleece is very much dependent on feed. He says, "the comparison I have made with the most scrupulous attenteon between this wool, and the highest priced, of that drawn from Spain, authorizes me to declare that of Rambouilet superior."

The Electoral flock of Saxony, and the Rambouilet flock of France, are of the same rank and degree—selected improved merino. How is it then, when Saxony wool takes the precedence of Spanish wool in the market, that Rambouilet does not come in competition with Saxony? Spain and Saxony are pre-eminently fine wool growing regions; but neither of them extensively manufacturing; they grow for exportation. France, on the other hand, grows prime wool, which is consumed by her own unrivalled machinery.

In the third instance, he crossed the Atlantic for the new world, and landed on our shore. Here he was greeted with an enthusiasm bordering on distraction, and which can now hardly be realized. In the year 1802, the Hon. Robert R. Livingston of this state, with a discriminating patriotism meriting national reminiscence and gratitude, sent from Spain two couple of select Spanish merino sheep, the first ever brought to this country.* Subsequently by himself, Col. Humphrey, General Derby, Consul Jarvis and others, the country was supplied with merino sheep.

Manufactories were now established, and the production of fine wool promised to be a lucrative business. But these prospects were soon dissipated, and upset, by the versatility of our own government. And the choice merino buck fell from the exalted sale of $1,400, to the degraded estimate of 2 or 3 dollars. In the year 1813, I paid $150 for a Paulaur buck, and $100 each, for six ewes. In the year 1827, I bought the remnants of some choice Escurial flocks, which had formerly been purchased at $200 each, for $2.50 each. And such was the depressed price of wool, that I purchased in the year 1826, cash payment at auction, a package of full blood merino wool, at 25 cts. per lb. and after keeping it two months, I sold it on a credit of 90 days, for 24 cts. per pound.

This extreme vascillation of public sentiment, prostrated the whole interest. Many individuals were involved in total ruin; and small proprietors abandoned the concern. A few, relying on the sufficiency of their own pecuniary resources, on the intrinsic worth of the animal, the estimate of the whole civilized world, for centuries, of its value, only awaited a more protracted exit. From all this, it is plain that there was almost an entire abandonment of the merino in this country.

The result of scientific investigation is, that a conclusion cannot be come at without the whole sheet of facts, embracing the subject in all its connexions.

The establishment of facts by experiments involves almost infinite nicety; requiring the whole amount of human discrimination—unshakled by subsisting theories, preconceived notions, and pride of popularity. An opinion is a mere nullity, separated from the considerations necessary for its formation. And the experience of every day exhibits the imperfection and fallacy of experiments and opinions. Not only the preceding narrative, but the most scrupulous investigation, will concur in the establishment of the subsequent statement.

The Spanish merino has hitherto furnished the best material for the fabrication of fine woollen clothing; and as a natural consequence and matter of fact, has rendered all Europe tributary to her production.

This sheep being transported to Saxony and France, and there received as an acquisition, its peculiar character duly appreciated, nursed with care, preserved in its purity, proved in its excellence—must stand pre-eminent.

Sheep are a defenceless and delicate animal, the prey of wolves and dogs, and subjects of disease; therefore in a domesticated state, requiring the protecting and fostering care of man. And in following the destinies of their itinerant master, are necessarily subjects of acclimation.

The Spanish merinos, with their gradations, have passed this ordeal in our country. The Saxony merino have not in point of time been allowed the same courtesy and indulgence.

Who then, permit me to ask, who, in defiance of the light of science, and the experience of the world for a century, will be disposed to retrograde? Now what shall we do with this chimney corner and barn yard phrase, "*old fashioned merino!*" I am as fond of antiquity as any one else, but I am unwilling to indulge this taste, at the sacrifice of a distinctive perception of things. F.

Wool, the coat of the sheep, will be the subject of the next No.

* We beg leave here to state, that the *first* Spanish sheep were sent to this country in 1801, by M. Delessert, of Paris, one only of which, Don Pedro, figured in the first volume of the Cultivator, page 183, lived to reach land. Don Pedro was kept some time in Ulster county, and afterwards by Mr. Dupont, in the state of Delaware.

P. S. Permit me to commend the letter of Leonard Jarvis Esq. in the last Cultivator, written with much ability and great fairness. It is from such sources that we are to take information. For scientific examination and investigation cannot be profitably prosecuted in an obstinate and controversial way.

"But man we find the only creature
Who, led by folly, combats nature,
Who, when she loudly cries, forbear—
With obstinacy fixes there." *Swift.*

N. B. Tessier was misprinted Fessier in the last Cultivator.

RUTA BAGA—CABBAGE.

Hyde-Park, Dec. 15, 1835.

J. Buel, Esq.—Dear Sir—In consequence of my communicating, from my limited knowledge of agriculture, my different views on that important subject, from so enlightened an agriculturist as *Lorain*, in his condemning the ridging mode of cultivation, I take the liberty of forwarding to you the result of the crops of Ruta Baga, and Field Cabbage, (Drum Heads,) cultivated for the use of young stock during winter, by E. Holbrook, Esq. Hyde-Park, on the four furrow ridge system of cultivation, applicable to *his soil.* 742½ bushels per acre, of superior fine turnips, weighing 66 pounds per bushel, 24½ tons and 5 pounds per acre. The seed was sown on the 21st of June; the ridges were hoed only twice; the furrows kept clean by the horse hoe. Although there was very little rain fell from the time of sowing till they were pulled, the largest turnips were found upon the centre of the ridges, a great portion of which measured two feet in circumference. The cabbage, very superior, were planted upon the same system; the plants were set out 2½ feet by 2 feet, containing 8929 plants per acre, producing cabbages, a considerable number of them weighing 16 pounds per cabbage: the whole being well headed, upon a very moderate calculation, will average six pounds per cabbage, making the produce 26⅞ tons and 74 pounds per acre. This statement can be testified by respectable and impartial persons. The enlightened professors of agriculture say that the ridging system originated in barbarism, and that the level and very superficial cultivation is the enlightened mode. We are not partial to any mode, but that which will, (according to the quality of the soil,) enable us to obtain the greatest crop with the least expense, and leave the soil in the best position during winter, for a succeeding crop. We solicit the favor, (for the benefit of agriculture,) from those agriculturists who practise the level and superficial mode of cultivation, to communicate through your valuable publication, (the Cultivator,) the result of their practice, with a description of the soil so cultivated.

Yours with great respect, THOS. MIDFORD.

SHORT HORNED CATTLE.

Hartford, Ct. Dec. 13th, 1835.

Judge Buel—I take the liberty of enclosing to you a copy of a letter just received from Mr. Whitaker, the celebrated breeder of Durham Cattle in England.

It is in reply to an order I sent him for the *best* one year old Durham short horned bull he could procure. The breeders of this country will be gratified to learn the estimation and increased value of the best Durham cattle in England, where purity of blood and excellence of pedigree are so highly appreciated.

It will be perceived with regret, that George Coates, Esq. for many years a distinguished breeder of Short Horns, and the keeper of the Herd Book, died Oct. 20th. He had nearly arranged the pedigrees for the second Supplement to the Herd Book, and his son has now undertaken to carry it through the press.

Those gentlemen in this country who are subscribers, will probably receive their copies early in the spring, and it will give additional value to their herds, if their pedigrees have been forwarded in time for publication. Very respectfully, JOHN A. TAINTOR.

"*Burley, near Otley, Yorkshire, Oct.* 24, 1835.

"My Dear Sir—I beg to acknowledge the receipt of your letter of the 27th ult I have little doubt of meeting with a superior yearling bull before next May. I have none of a proper age at present, of my own, but I have two well bred cows to calve, to a bull for which I offered 200 guineas; one, of high pedigree, (and the only one of my old family,) to calve about the end of this month; the other is also of good blood and long pedigree, to calve in January. I sent seven bulls and females to New-York, for the State of Ohio, last July; and should I get one for you, I hope it will not have to compete with any of those bulls. I offered 200 guineas for the bull alluded to above, (bred by me, and sold at my sale in September, 1833, for 124 guineas,) but could not prevail on the gentleman to sell. There have been two gentlemen from Kentucky, offering great prices, without buying any thing. Their inquiries were confined to a few small breeders only. I hope to be able to purchase one of the best young bulls for 100 guineas, and perhaps less, as you allow sufficient time to look round. When I made my sale, it was with the intention of abandoning breeding for the public altogether. but many of my friends would not allow me to follow my own inclination, but solicited me to make purchases for them, also urging me to keep a few good animals myself, believing, I suppose, from my long experience, that my judgment was better than their own; and I have so far complied with their wishes, as to select many good ones for them and myself. But I shall not be induced again to let bulls to the public, which is attended with great expense and great mortification, the finest animals in my fold having been let out, and returned mere skeletons. You can, if you please, give me a draft on some house in Liverpool. The greatest risk will be in the transit of the bull from Liverpool to New-York. I sent a man with those shipped in July, and he delivered them, he says, in as good order as when they were put on board. But this would be too expensive for one animal, I would therefore suggest the prudence of your speaking to a Captain in whom you can depend, for care and proper attention.

"Mr. Coates, the publisher of the Herd Book, died on the 20 inst., but his son promises the second Supplement shall be out soon after the end of this year, and he is quite competent to the work.

"As soon as I have the pleasure of hearing from you again, I will conclude the purchase of a bull, and place him in my fold. Allow me, if you please, to select one as much under and above one year old as you can, because I may find a superior bull, either under or above your limits, which I should hesitate to buy without your permission. It is usual, I understand, for the shipper to pay for a stand for the animal, provisions, &c. for the passage, and which will cost about £14, and the freight to New-York 25 or $30, and perhaps something more if a man has to serve him. This you will of course take into your consideration, when you hand a credit in Liverpool.

"It is said one of the gentlemen from Kentucky offered 300 guineas for an aged bull, but I hope to be able to send you a young one of the first quality, for about 100 guineas.

"I am with great respect, dear sir, yours truly,
"J. WHITAKER.

"To John A. Taintor, Hartford, Conn."

FACTS WORTH KNOWING.

Mr. Buel—Sir—In conversation with a gentleman from Saratoga county. a few days since, he communicated to me the following information, which I deem of sufficient importance to occupy a small place in your Cultivator.

He said a neighbor of his, who has a flock of sheep, has lost, by death, twenty-seven out of thirty lambs, and he could not account for the cause. The first symptoms of disease are a drooping, running at the eyes, weakness in the back and loins, and losing the use of their hinder legs, &c.

A person recommended the use of Lobelia, (*Indian Tobacco*,) which he tried by turning a few of his lambs into a field where this plant was found in abundance. It was soon found by the lambs, which they ate freely, nipping it quite close to the ground. In a few days a perceptible difference was manifested, and they became remarkably lively, playing and gambolling about the field as though nothing had ever been the matter with them.

Having proved so salutary and beneficial to the few, he turned in the remainder, which had the same effect, and all became healthy and thrifty sheep.

In order to be certain, and to test the effect and efficacy of the plant more particularly, some of the dried Lobelia was given to some others in the same situation, and produced the same effect.

I have been induced to offer the above for publication, believing that such information should not be withheld from the public.

Yours, &c. CALEB N. BEMENT.

Albany, December, 1835.

MADDER.

West-Winfield, Nov. 24, 1835.

J. Buel—Sir—Since my communication to you, which you saw fit to publish in the Cultivator last August, I have thought best to send you some further statements in regard to the madder crop, which I consider of consequence to those not acquainted with its cultivation. As I am informed that some have entertained doubts as to the quantity per acre which I considered a fair crop, I will state, that the piece referred to was less than an acre, but yielded at the rate of 5,760 lbs. per acre. This fall I harvested a small piece, which I purchased on the ground, that yielded at the rate of 8,000 lbs. per acre. This was cultivated in the usual way in hills, with no more than ordinary attention. I consider 5,000 lbs. to be only a middling crop. A much greater quantity of madder can be raised on an acre by being planted in beds, as I described in my former letter, than in the old method of planting in hills. The reasons are these. In hills, the roots are confined and have not a chance to spread. In beds, the tops can be covered with earth, and these become roots, which send forth other tops, and innumerable small roots from the joints of the tops which are covered up, and these form in the beds a compact mass of roots, by the time the crop is ready to harvest. It will be understood from my former communication on this subject, that the operation of covering the tops is to be repeated several times. I would here mention, that the last covering should not be omitted later than the first of September, as there will then be time for the tops to send forth shoots ready to come up early in the spring. In this way the whole growth of the top is saved, and converted into roots. The madder which I planted last spring in beds, promises better than any I have before seen.

When land is selected for madder that needs manuring, the best plan for preparing, is to plough it in small lands, the width that the beds are calculated to be, from centre to centre. In the middle of these the manure should be dropped just as wide as the beds are to be, and covered deeply with a plough—six furrows are usually enough. If more manure is needed, it can be carried between the beds and there dropped. Fourteen feet from centre to centre is none too wide for the beds. They should occupy about five when they are first planted, but soon spread to six or seven.

Roots that are designed for planting should be kept as much as possible from the air; and if they are buried during winter, they should be covered with dirt without straw. Freezing does not hurt them if they are not exposed to the atmosphere while they are thawing.

I have lately made a purchase of all Mr. R. Bronson's seed, and can supply those wishing to plant next spring, to the amount of 300 bushels. Prices the same as stated in the August number of the Cultivator, second volume. Yours, very respectfully,

HERBERT WOODBERRY.

REAL ESTATE AS AN INVESTMENT.

Perhaps at no period of our history, as in the last year, has there been so great a demand for money, or greater facilities for obtaining it.—Every means that man's ingenuity could devise, have been tried to make it as speedily and abundantly productive as possible; and whilst a few have succeeded to a certain extent, others have been unsuccessful. Upon the whole, there has been an over-exertion for great profits, and in many cases, where they have been made, it has been at the expense of truth, good example and honesty. Stock-jobbing, or buying and selling public stocks, has been carried, in this country, to an inordinate extent; and the frequent fluctuations in price admonish us, that there are dealers in the article who have little to lose, and who use every art to circumvent those that are disposed to buy, and have money to spare. Upon the whole, it is an unsafe business for a moneyed man to engage in, although some kinds may be profitable for capitalists to hold. Bank stock, other than that which has been most sold this last year by the brokers, has been profitable, and not so fluctuating in price as the rail-road stocks, and their real value has been better ascertained. I presume, as an average, they have divided the last year at least ten per cent, and they probably will, in future, have still more enlarged dividends, if their discounts are not curtailed, or their numbers multiplied at the ensuing session of the Legislature.

The rate of interest on bonds and mortgages, being settled by law, has been unaffected by the general spirit of speculation and activity which has manifested itself in all kinds of business, and is still considered by capitalists a profitable, and, with common prudence, is, always a safe investment. It is true, the rate of interest is not so high as the profits that have been realized in many cases from holding stock; but from the nature of the security, which in your own judgment is ample—retaining that security in your own hands—subject to your own oversight, and under your own control, mortgages are a safe and beneficial investment, both for debtor and creditor. Still, for an active man, an investment of money in real estate, where the products are taken instead of interest, and where, by good management, the farm is rendered more productive, is, all things considered, probably the best investment of money he can make. As a security, it partakes of the nature of a mortgage, while as a property, it is subject to his immediate control. The question may be asked, can he realize the legal interest from the products? I answer, at this time of day, with the advance of the art, it must be miserable farming indeed that will not do that. If I should rate the products of farming at ten per cent, upon the present price of land, after deducting all expenses, I am satisfied, from my own experience, and that of my neighbors, it will not be putting it too high. Were this a proper place, I could give many instances in which these profits have been nearly doubled; but it is not necessary at this time to substantiate this statement by facts—these, if necessary, can be subsequently made—yet, thus far, we have only a part of the profits. Who ever heard of a man buying and selling a farm at the same or a lessened price? It is so well understood that the seller is to have more than he gave, that is has almost become a settled principle in the purchase of real estate. This per centage is sometimes very high, but in almost all eases, it adds materially to the profits of the investment. Besides, it is correct in principle; a tract of land under judicious eulture, must be enhanced in value at least five per cent per annum,* and the purchaser of eourse can afford to pay more for it, at each successive sale. We adopt this as a general rule, to be varied, however, as the peculiar circumstances of each case may determine. I think it must be conceded as an established fact, that nine-tenths of all our property has been derived from this source alone, the increased and increasing value of real estate. Neither is this value fictitious, as culture gives large products, which in turn induce and enable us to pay more for the soil. A.

* Our correspondent's remarks will hold good in regard to all well cultivated districts; but upon many, the light of agricultural improvement has hardly yet dawned—the old system of depletion is still going on, and the soil depreciating in fertility and value.—*Conductor*.

Chemistry applied to Agriculture.

From Chaptal's Chemistry applied to Agriculture.

INFLUENCE OF HEAT AND LIGHT UPON VEGETATION.

The changes of temperature experienced by the atmosphere in the course of a year, are so great, as to cause some liquids to pass alternately either to the solid or aeriform state, and some solid bodies to become liquid. The natural effect of heat upon these bodies is, by dilating them, to weaken the force of cohesion which unites their molecules, and, by facilitating the action of chemical affinity, to enable them to enter into combination with foreign bodies. Thus heat renders the juices of plants more fluid, and facilitates their circulation through the cells and capillary vessels; and by giving activity to the suckers of roots, enables them to draw from the earth the juices necessary for their nourishment.

Above a certain temperature, heat, by promoting evaporation, causes the juices of plants to become thickened and dried in their organs, and thus vegetation is arrested, and life suspended. This effect always takes place during great heats, when neither rain, dew, nor irrigation, can sufficiently repair the loss occasioned by evaporation. This effect would be more frequent, if provident nature did not employ means to moderate the action of heat.

The first of these means is the transpiration of the vegetables themselves, which cannot take place without carrying off a large portion of heat, and thus preserving the transpiring body at a temperature below that of the air. The second means is found in the organization of the leaves, which are the only parts of a plant where transpiration take plaee. That surface of leaves which is exposed to the direct rays of the sun, is covered by a thick epidermis, which resists the calorific rays. In herbaceous plants, as in the stalks of grasses, this covering is composed principally of silex. In other plants it is analogous to resin, wax, gum or honey; whilst the epidermis, which covers the opposite sides of the leaves, is fine and transparent. It is by this, that transpiration and the absorption of nourishment from the atmosphere are carried on. If we should reverse the order of things, and present the under surface of a leaf to the rays of the sun, we should very soon see that it would make great efforts to resume its natural position.

When a plant is dead, or rather, when an annual plant has fulfilled its destiny, giving assurance of its reproduction by the formation of its fruit, the action of heat and of the other chemical agents is no longer modified by any of the causes of which I have just spoken, and the plant receives their impression in an absolute and unmodified manner. When the temperature of the atmosphere sinks below a certain point, the fluids in plants become condensed, the movement of the juices is retarded, the activity of their organs languishes, and is at length suspended, until restored by the return of heat. The action of the atmosphere upon plants, when deprived of its due proportion of heat, is, however, modified by the emission or disengagement of caloric, which is always given out when liquids are condensed, or solids contracted; and this occasions the temperature of plants, during the winter, to be always a little higher than that of the atmosphere.

It sometimes happens that the temperature of the atmosphere sinks so low, as to produce fatal effects upon plants by freezing their sap, and thus occasioning their death. This effect does not always depend upon the intensity or degree of cold to which they are exposed, but upon particular circumstances. I have seen olive trees resist a temperature of 22°.2 Fahrenheit, and perish from that of 23°.6, because in the last case the snow, which had collected upon the branches of the trees during a night, was dissolved the following day by the heat of the sun, and the wet tree was exposed during the succeeding night to the action of 23°.6. There is nothing more dangerous for corn and grasses, than those frosts which follow immediately after a thaw, because the still wet plants, not being deeply rooted in the ground pulverized by the frost, have no means of defending themselves from the effects of the eold.

Though the action of light upon vegetation does not appear to be so important as that of the other fluids of which I have spoken, it is not, in reality, less so. Plants which are raised in the shade, or in darkness, are nearly or quite without colour, perfume, taste, or the firmness of texture of those that are exposed to the direct rays of the sun; and if the luminous fluid does not combine with the organs of plants, we cannot deny that it is a powerful auxiliary in their combinations.

When we reflect upon the influence which the atmosphere exercises over vegetation, and over the principal operations which are earried on in rural establishments, such as fermentations, the preparation of various productions, and the decomposition of some substances, in order to apply them to particular purposes; we are astonished at finding nowhere any of the simple and unexpensive instruments which announce its changes every moment.

I do not propose that delicate or complicated instruments should be provided; but I wish to find on every farm an hygrometer, to ascertain the humidity of the atmosphere, a thermometer to indicate the changes of temperature, and a barometer to determine the weight of the atmosphere. This last instrument would be particularly valuable, as predicting the changes of the weather; the rising of the mercury announces the return of dry weather, and its sinking warns us of rain and storms. We can regard these variations but as signs; but they are signs much more certain than those which country people derive from the changes of the moon.

PROPERTIES OF MOULD.

Land owes its fertility mostly, if not wholly, to the presence, in a greater or less abundance, of principles analogous to those constituting mould. These principles are furnished by manures, and by the decomposition of plants; but each harvest causes a diminution of them, a part being washed away by rains, and a part absorbed by the crops which are raised; thus the soil is deprived by degrees of its nutritive qualities, till at length nothing remains but an earthy residuum, deprived of its nourishing juices, and completely barren; it is to restore its fertitity that land must be manured afresh, after having yielded several crops.

Dews—*Suggestions to render them beneficial to vegetation.*

The aqueous vapors suspended in the air begin to be condensed and precipitated at sunset, and with them is deposited the greatest part of the emanations which have risen from the earth during the day; these exhalations, though beneficial to vegetation, are almost always injurious to man, and it is not without reason that he fears and shuns the night damps. In southern climates, where the heat of the sun is more intense, and rains less frequent than in northern, vegetation is supported by the dews, which are very abundant. In order that the dews of night may produce their best effects upon vegetation, it is necessary that the soil should unite certain qualities, which it does not always possess.

When the soil is hard and compact, and forms by the action of the air an impenetrable crust, the dew is deposited upon its surface, and evaporated by the rays of the sun, without having moistened the roots of the plants, or softened the earth around them; so that of the organs that serve to convey nourishment to the plants, the leaves are the only ones benefitted by the dew, while the roots, which are the principal vehicles of nutriment when the plant is fully developed, are not in any degree benefitted by it. It is necessary, in such cases, that the soil should be softened, lightened and divided, so that the air may convey the water with which it is charged, to the roots of the plants, and to every part of the earth surrounding them, to a certain depth; then the plant can imbibe, through all its pores, the reviving moisture; and that which is received by its roots is more lasting than that which it absorbs in any other way, because the roots being sheltered from the direct rays of the sun, evaporation takes place less rapidly, and the moisture is retained, whilst the leaves are speedily dried by the heat. Besides, that earth which is most easily affected by the dews, yields most readily to the action of roots, whether it be to fix the plant firmly by their extension, or to draw from the soil its nutritive properties.

This explains, in a natural manner, the origin of a custom observed by all agriculturists, and of which all acknowledge the advantage.—When vegetables, such as peas, beans, potatoes, and other roots, are sowed in furrows at equal distances from each other, the soil in the invals is howed, or dug, with the utmost care, and thus rendered light, soft, and permeable to the air, whilst at the same time weeds, which would be hurtful to the cultivated plants, by depriving them of nourishment afforded by the ground, are destroyed, and the soil rendered more fit to receive the rain, and convey it to the roots. I do not deny that these benefits are real, but I hold them to be secondary, and subordinate to the advantage derived from opening access to the air, and permitting it to deposite its dews upon the roots, and upon the earth in contact with them.

I have uniformly observed the effect of this method to be equally speedy and favorable in the cultivation of beet roots, and I have never employed any other, to restore their vegetation to its freshness when it becomes yellowish-and drooping; in three or four hours it will become of a beautiful green, and the leaves spread themselves out, although no rain may have fallen; and this often when the soil had not contained a single weed. I have observed the same effect produced upon the other culinary roots.

Elements of Practical Agriculture,

By David Low, Professor of Agriculture, &c.

DISEASES OF SHEEP.

The diseases of these valuable creatures are sometimes of a very formidable nature, and baffle all the means of remedy which are known to us. Of these diseases the most dreaded is *rot*, which often extends over whole districts of country.

It is known that this disease is favored or produced by a humid state of the soil and atmosphere. It is in wet seasons that it prevails the most, and is the most fatal. By draining land the tendency to it is lessened or taken away. Often sheep are rotted by pasturing on the wet parts of the farm, whereas if kept from these parts they remain free from disease. Nay, a single sheep that has a disposition to pick up its food in moist places will die, while the others will not be affected.

The animal affected does not all at once show symptoms of disease; for sometimes it remains a considerable time in apparent health, and long after it has been removed from the place of infection, droops and dies. Sheep are every year purchased in seeming health, and yet after a time they are found to be affected. A moist and even luxuriant autumn is dreaded above all things by the owner of sheep; for the seeds of infection are then often spread to appear in the following spring, or after the lapse of a longer period.

The signs of rottenness in sheep are familiar to all shepherds. The animal becomes emaciated, its eye becomes dull and glassy, a black purging generally takes place, the wool on being pulled comes readily away from the skin, the breath becomes fetid, and the urine is small in quantity and high coloured. As the disease proceeds, the skin is marked with spots, and the emaciation increases continually, until the sheep dies. In short, the term rot expresses truly the state of the animal. The disease proceeds with various degrees of rapidity; sometimes it attacks the entire flock suddenly, and sometimes its progress is gradual, and it affects only a given number of individuals. Graziers often avail themselves of the period of the animals beginning to decline to rid themselves of an infected stock. During the first period of being tainted, the sheep have frequently a strong tendency to feed, and if killed in time the flesh may not be perceptibly affected.

In all cases of rot the disease is accompanied by a morbid state of the liver. During the progress of it, the fluke, a small animal, *Fasciola hepatica*, appears on the parts connected with the liver and the gall-bladder. At first the number of these creatures is small, but as the disease advances they increase, and before death are generally very numerous. In the last stage of this disease they have extended to the stomach and other parts.

Frequently the disease terminates favorably, the inflammatory action going off without destroying the parts. But even in this case, the taint is rarely removed, and years afterwards, when the animal has been fattened and killed, the liver has been found to be diseased, the flukes being in great numbers.

The best preventive of rot is to render the soil dry; hence on all sheep pastures, the importance of draining. But should the disease, in spite of all precautions, appear, then we should, without loss of time, remove the sheep to a drier pasture, and supply them liberally with proper food. It is only, however, in the early stages of the disease, that a change of food will usually avail. If the disease has proceeded to a considerable extent, even though it should not have evinced itself by any great change in the external appearance of the flock, the animals will often perish hourly amidst the most wholesome food with which they can be supplied.

Of all the medicines that have been proposed for this fatal disease, salt alone is that whose virtue has been established by any satisfactory testimony. The beneficial effect of salt in the prevention and even cure of rot, has been confirmed by the observation of farmers in this and other countries.

Salt indeed will not in all cases prevent or cure the disease; for sometimes the tendency to it from particular causes is too strong to be counteracted, and, when it has once attacked the flock, too violent in its progress to be arrested. But though salt is not a specific, it is the best means of remedy with which we are acquainted.

If salt be placed near the animals in troughs or on flat stones, they will eagerly lick it, and when disease threatens them, it may be given to them in any quantity in which they will consume it; for it is then seen that they are obeying a natural instinct in having a recourse to the remedy; and in a wet season when disease may be apprehended, no one should grudge the trouble of so cheap and simple a precaution.

Much has been written upon the subject of this disease, but all that has been written has nearly left us where we were with regard to the remedy. It had been long known that wetness of the soil, however produced, gave rise to rot; that the best preventive was pasturing on dry ground and giving sufficient food, and that the best remedy where disease appeared was a change of pasture. To these results of old experience is to be added, the using of salt.

Besides the rot properly so termed, sheep are subject to inflammatory putrid fevers, which occasionally seem to be epidemic; and these are sometimes termed rot. Another disease to which the term rot is applied, is called the hunger-rot. This arises from the want of sufficient food, which produces an unhealthy state of the viscera, leanness, and death. In this disease the wool falls off, and hence it is sometimes called the pelt-rot.

Another disease, arising from a different cause than the rot, but like it ending in emaciation, and the death of the animal, is provincially termed *pining*. This disease is accompanied by a costive state of the animal, whereas the rot is never accompanied by costiveness; and in the rot the liver is always affected, while in the pining the liver is sound.

This disease seems to arise from the want of exercise, and from the animals feeding on very dry pastures. Before the extensive draining of the pasture-lands, where it is now found, the disease was unknown. The rot was then common; but with the draining of the lands the rot disappeared, and this new disease took its place. The former practice of management in the districts where the disease now prevails, was to keep the sheep in flocks which were moved about along their allotted range of pastures. They are now, under a more approved system of management, suffered to spread over a large extent of pasture; and thus they are not obliged to take exercise, but are allowed to feed more on a given spot of ground.

A change of place and food is the preventive or the remedy; and if a change of food is resorted to in time, it is generally sufficient to arrest the progress of the disease. Even a removal to a fresh heath will sometimes accomplish the purpose, but the proper and effectual remedy in all cases is a change to a more rich and succulent pasture. The disease is sometimes very fatal, destroying entire flocks like a pestilence.

The braxy is similar to some of the diseases mentioned in its violence and effects; but it arises from different causes, and affects the animal in a different manner. Under the general term braxy, several diseases or rather varieties of the same disease seem to be included. But in all cases when the bodies are opened they exhibit marks of inflammation.

The progress of this disease is so sudden and violent, that even if we possessed a remedy, it would generally be too late to apply it. Of the remedies employed, bleeding seems to be that which the nature of the disease points out. This disease seems generally to be caused by bad food, and the most efficient preventive is known to be good feeding. Turnips or other succulent roots given to young sheep feeding on natural pastures are always beneficial; and it is to be observed that in proportion as the treatment of sheep in a country has improved, this dangerous malady has diminished.

Diarrhœa and dysentery are likewise diseases of sheep. Diarrhœa is frequently produced by too sudden a growth of grass in spring, and it most frequently affects young sheep. It may be generally cured by removing the animals to drier pasture; and a little corn may be always given with good effects. Dysentery is a more serious disease, and is often very destructive. It is believed to be infectious, though upon very questionable grounds.

Sheep are liable to various cutaneous diseases. The principal of these is termed scab; and it is indicated by extreme itching and eruptions of the skin. When introduced into a flock it may be attended with very serious effects, unless checked by efficient remedies.

The most common remedy for the disease is sulphur mixed with some unctuous substance to fix it on the skin. One of the best recipes perhaps is a decoction of tobacco and spirits of turpentine, with the addition of a little soft soap and sulphur vivum. The decoction of tobacco may be obtained by boiling the tobacco in brine or salt water. The liquid when prepared is applied from a vessel like a teapot with a spout, or from a bottle with a quill passed through the cork. A person lays the wool back in lines so as to expose the sksn, and pours out the liquid along the lines upon the skin. But when the distemper is very violent, a mercurial preparation may be required. This is now to be obtained in apothecaries' shops, under the name of sheep-ointment. It is made in balls, and when used it is dissolved in oil, and applied to the skin of the animal.

Sometimes infected sheep will find their way into the best managed flocks; but every care must be taken to keep the disease from breaking out, or to cure it as quickly as possible when it appears. The infection of a diseased flock is left behind it upon the hedges and pasture-fields, and therefore precaution is to be used before a fresh flock is turned into fields where infected sheep had been recently feeding.

Another disease of sheep is the foot-rot, which is an inflammation of the foot, followed by an ulceration and destruction of the hoof. The disease chiefly prevails in wet seasons, or in soft grounds. It is a very painful disease, causing the entire lameness and loss of condition of the animal. Certain grounds are noted for communicating the foot-rot; and as it appears amongst the pasturing stock season after reason, such grounds are commonly said to be infected with the foot-rot. The opinion that it is of a highly infectious nature is almost universal amongst farmers and shepherds. But however circumstances may seem to favour this opinion, it is more consistent with the effects observed to regard it as connected with the state of the pasture-grounds.

Although painful, and destructive to the good condition of the animal, this disease is not absolutely fatal, except under entire neglect, in which case the animal becomes unable to seek his food, crawls upon his knees, and, worn away by exhaustion, perishes. But if early attention be paid, the disease admits of remedy. In the first place, let all the infected part of the hoof be pared away, and the ulcerous matter removed, and then let the foot be washed with soap and hot water, and let the surface be dressed with some caustic, of which the best is muriate of antimony. In incipient cases, by simply paring the hoof and cleansing it with soap and water, and then dipping it in boiled tar, the progress of the disease will be arrested.

The next disease to be mentioned is of frequent occurrence. This is hydatids, staggers, or water-in-the-head, as it is frequently termed. The cause of this disease is in an animal, *Tœnias globulus*, which finds its way into the brain, where it enlarges in size, and which, if not removed, ultimately destroys the animal. This creature resembles a round vesicle filled with water, and hence it was long supposed to be water, and the disease, in consequence, termed water-in-the-head. The hydatids, though found chiefly in the brain of sheep, is found also in other parts of the body, as the liver and spleen.

When the hydatids is in the brain, the animal affected shows great symptoms of distress; he leans his head to one side, mopes by himself, continues turning round, and finally dies. The remedy for this disease is to reach the hydatids, and to extract it, or merely to perforate it in such a manner as to destroy its vitality. When it is situated at the surface of the brain, the part feels soft, and it is easy to reach it by a common awl or gimlet, or by a species of rude trepanning, which may be done by a common pen-knife. A little circular portion of the skull is to be cut, and raised up like a lid, a portion of the skull being left for this purpose. The hydatids being exposed, is to be pulled out by pincers, and the fluid absorbed by a sponge. The skull is then to be replaced, and dressed with common tar put upon a piece of soft leather.

When the hydatids is situated in the ventricle of the brain, it may be reached by a wire thrust up the nostrils. Some shepherds are very dextrous at this operation, and rarely fail in effecting a cure.

Sheep are liable to the attacks of various animals. One of these, a species of aphis, termed the sheep-louse, is very common, and chiefly prevails where the sheep are in an unhealthy condition. It is of a flat form, and attaching itself to the throat and other parts, occasions much irritation. Tar, turpentine, or tobacco liquor, are the substances chiefly used to destroy this animal, and any simple mercurial preparation is effectual.

But the most pernicious enemy that attacks sheep is the common sheep-maggot, the larvæ of a species of flesh-fly. The fly having deposited her eggs on the skin of the sheep, the larvæ are hatched in great numbers, and grow with amazing quickness. They commonly appear about the root of the tail, or wherever filth has allowed the fly to attach her eggs, and thence they spread over the entire body, consuming the skin, and eating into the flesh. The sheep, when attacked, manifest a strong sense of suffering. They frequently run with violence, until at length overpowered and exhausted, they lie down and perish.

It is in the moist and warm seasons of the year that the sheep-maggot is chiefly produced. Constant vigilance is then demanded on the part of the shepherd, so that all foulness of the wool shall be clipt away; and the sheep must be daily inspected, lest this dangerous enemy establish itself. The maggot is effectually destroyed by a solution of corrosive sublimate, and in its early stages by less potent applications, as by urine and lime.

We must remember that the sheep, in his domesticated state, is yielded up to the care of man; his natural instincts are blunted, and he is unfitted to use those means of preservation which in his wild state he might possess. He is the prey of a multitude of enemies, against which he has no defence; and the more artificial his condition is, the more is he dependent on our care.

Miscellaneous.

From the New-York Farmer.

NOTES ON TRANSPLANTING.

"The functions of the root are to fix plants in the earth, and to absorb nourishment from it. This absorption takes place almost exclusively by the extremities, which consist of a lax coating of cellular tubes, lying on a concentric layer of woody fibres, in the midst of which is placed a bundle of ducts." —*Professor Lindley.*

We wish to call the attention of *some* horticulturists to the facts stated in the above paragraph, not as something new, but as a fact not generally known, or if known, is neither heeded nor acted upon. It has doubtless been observed by every vegetable physiologist who has called into his minute investigations the assistance of the microscope, how beautifully the *extremities* of the small fibrous roots are adapted to the introsusception of the food of the plant. Almost every common planter attaches an importance to these fibrous roots, but yet not that importance which they so eminently deserve. It is the common opinion of such planters, that the absorption of vegetable food takes place throughout the *whole surface* of that portion of the plant which is usually termed the root; and provided they retain a certain *quantum* of that necessary member, it is with many apparently a matter of indifference, which particular part is lost, mutilated, or remains whole. Persons engaged in these operations, should impress upon their minds the fact that it is only the *extremities* of the roots of plants that serve the purpose of collecting and assimilating the material which is so necessary to the support of the branches, and that the larger parts of the roots only serve as channels through which this support is carried to the branches.

In transplanting, we would lay it down as a maxim, that neither root nor branch should be mutilated. It is remarkable that persons of considerable experience act in direct opposition to this rule, and do not give the subject sufficient reflection to convince themselves of its truth. No one has a doubt of success when he is transplanting a young tree, and the very reason of that success is the fact that he transplants the tree *entire*. It is a common remark, when speaking of trees of a certain size, that they are too *large* to be transplanted. We do not speak of such as are too large on account of their unwieldiness and bulk, but simply such as the experience of these planters has convinced them that they cannot transplant with safety. Why are they too large? Is the plant or tree subject to any other natural laws? Certainly not; and he does not succeed so well—the operation does not proceed with such sureties of success, solely because it is not conducted in the same manner. The whole course, for some inexplicable reasons, best known to the planter himself, is conducted upon entirely different principles. In the first case, the subject is small—the plant is entire—not a root or branch is amputated. But let him transplant a *large tree*, and the routine is quite different: half at least of the roots are cut off, either as a matter of convenience or from principle; the extremities of the roots are often utterly disregarded, being either severed entirely, or so much bruised and lacerated as to be incapacitated from performing the services for which nature intended them. One would think that to any reasonable person such a destruction of the essential organs of the plant would quite suffice. Not so with our transplanter. He has reduced the *root; ergo*, he must reduce the *top*. Accordingly, he takes his knife in hand and cuts off at least one-half of the branches and consequently their accompanying leaves—he reduces the top to goodly proportions, and elegantly removes every branch which has the misfortune to displease his fastidious eye. "Leaves," say the vegetable physiologists, "serve to elaborate the sap—they expose it to the light and air, and cause it to undergo peculiar chemical changes before it is fitted to enter into the permanent composition of the plant; they are therefore essential organs." This is indeed a different view of the case from that presented to you by many transplanters. "Leaves and branches," say they, "serve to consume a portion of the sap; each leaf and each branch draws away a portion of nourishment from the other, *therefore*, if I cut half of the branches away, will not the remaining branches receive double the portion of sustenance they otherwise would?" Admirable logic! Every one knows the analogy which exists between vegetable and animal life. But would any person in his senses think of cutting off a child's arm because it had had the misfortune to lose its foot? Would any one think of amputating one leg of a beast in order that the others might receive more nourishment?

Nature, when left to herself, produces no more organs than are necessary for the proper existence of her subjects. It is obvious, therefore, that the removal by art of any considerable portion of those requisites cannot but be attended by a consequent diminution, for the time, of the vital powers. How necessary, then, does it appear to a reflecting person, that when so important an era in the life of a vegetable as the forcible transplanting of its whole body takes place, that every essential member of that body should be preserved entire. If the roots, leaves, and branches of a tree are *essential* to the thriving condition of that tree whilst standing in a robust state in its native site, are not these organs still more essential to enable it to recover the shock of being transplanted. The planter above referred to, will, in fact, tell you this himself. Ask him which of the two trees transplanted—the small one, with its limits and roots entire, or the larger one, with his system of decapitation upon it—which of them was afterwards the most thriving. He will tell you without hesitation that the first grew luxuriantly at once, and that the latter was perhaps several years in *recovering*. "But," says he, "this is owing to the greater age of the larger one." Not at all; recent experiments have proved conclusively that trees of almost any size may, by attending to the principles here pointed out, be transplanted with safety, and continue in a state of high luxuriance and health; and I confess that it is a strong proof of the influence of habit and custom, that persons of considerable experience, with the facts before their eyes, still go on in the old way.

I have been induced to these remarks principally from witnessing the recent transplantation of forest trees throughout the country. In this case, indeed, the system is carried to the utmost of its limits. Mutilation and decapitation are the grand principles of its professors; the beautiful *trees* which *were*, after reduction into the *bare poles* which *are*, both in their appearance and success, such excellent examples of the good *taste* and sound *principles* of the proprietors, that no correct horticulturist can view them without feeling sentiments of horror for the former and pity for the latter. A. J. DOWNING.

Newburgh, N. Y. Feb. 1835.

Rule for determining the weight of hay.—Hay in the field rick, says Low, weighs somewhat better than 112 lbs. the cubic yard; after being compressed in the stack, it weighs from 140 to 180 lbs. and when old 200 lbs.

Young Men's Department.

FROM A FATHER TO HIS SON—No. 4.

POLITICS.

Your personal happiness is intimately interwoven with the welfare of your country. You are one of the *guardians* of that welfare. The high *privileges* which our constitutions confer on us, exceeding those of any agricultural people in the world, imposes a solemn *obligation*, to endeavor to preserve those constitutions in their spirit and purity. Power is ever corrupting, whatever name be inscribed on its banner. It is the innate propensity of man to grasp and abuse it; and the vigilance of a free people must be as unceasing as the flux and reflux of the tide, to counteract and restrain this frail propensity. Seek then to make yourself acquainted with the principles of your government, with the duties of its officers, and the personal rights and responsibilities of a freeman, that you may be capable of rendering justice to all, and particularly to the commonwealth.

But though I would have you to be a politician, and an intelligent one, I would dislike to see you a political zealot. Parties are salutary in a free government—so is fire in our dwellings; but both become terrible scourges when they get beyond our control. One destroys towns, the other subverts good order in society, and leads to anarchy. It is the office of prudence to abate their violence, and to restrain them within salutary bounds. The great body of the American people have a common interest and a common object; and we should not witness so much of violence and ill-natured abuse, but for the chesnuts which the drones, too lazy to gather from the bur, are endeavoring to snatch from the public basket. The rogues! they get the people by the ears, about straws, that they may the more readily bear off the spoils. Like boys scrambling for coppers, however, while some are enabled to stuff their pockets, some are less fortunate, while others get nothing but bruised knuckles.

Wear not the collar of *party*. The term is synonymous with men—who change. Give your fealty to principles, which do not change. The greatest tyrants have commenced their career as champions of freedom; but truth and justice have remained the same in every age. A party is no longer entitled to your support, than it continues to be guided by principles which first won your support. By assenting to its errors, you invite new impositions, which human passions, unrestrained, are ever disposed to indulge in. How well this is illustrated in parental government. Many a boy is ruined through the impunity which seemingly applauds his first transgression.

Become not a medicant upon public charity. *Ask not* for *office;* and if tendered, take it not for the gain, but as a duty. He that wants industry or talent to provide for himself—will bring neither to the performance of public duties. He who *depends* upon political office, unless unfitted by age or misfortune to provide for himself, surrenders a valuable franchise—the right of opinion. He depends upon the caprice of fickle men, whose creed he must follow as a requital for the boon he receives. I do not apply this remark to the higher officers of government; and I admit there are many exceptions to its application in the subordinate departments. It *is* true, however, that in most cases, compliance with the rule is expected and rendered. This servile dependence upon the favor of power blights and withers the most ennobling faculties of our nature. Shun it as the enemy of your happiness; and if you are called upon to discharge a public trust, do it fearlessly, *for the good of the whole*, preferring the consciousness of having done *right*, to that of having promoted the views of a *party*. The free exercise of our judgment, in relation to public men and public measures, is the distinctive and ennobling characteristic of a freeman; and he who surrenders or prostitutes this right, to gratify his cupidity—from a servile fear of giving offence, or a mercenary hope of reward—would sell his country for an office—he ceases to be a freeman. Like the chamelion, he takes the hue of whatever object that for the time administers to his wants.

In your political, as in your private affairs, permit not the officious interference of others to lure you to do what your judgment disapproves; and while you are thus tenacious of your own opinions, seek not, under false pretences, to mislead your neighbor. Waste not your time at political meetings. They are generally got up by the interested and the indolent—the office seeker and the parysite. These meetings, if often frequented, lead to bad habits, and too frequently associate you with bad company; take you from your business and your family, and inflame passions which are at war at once with your quiet and prosperity in life. Look about you, and take warning from the condition of meddling officious politicians, who neglect their own to take care of the public concerns.

I subjoin, for your instruction as well as amusement, the soliloquy and plea of a *noisy* politician, whose prototype may be found in almost every town and village.

"Peter Brush was in a dilapidated condition—out at elbows, out at knees, out of pockets, and out of spirits, and out in the street—an 'out and outer' in every respect He sat upon the curbstone, leaning his head upon his hand, his elbow being placed upon a stepping stone. Mr. Brush had for some time been silent, absorbed in deep thought, which he relieved at intervals by spitting through his teeth, forlornly into the gutter. At length, heaving a deep sigh, he spoke.

"They used to tell me—put not your trust in princes—and I hav'nt. None of'em never wanted to borrow nothing of me, and I never see any of them to borrow nothing of them. Princes! pooh! put not your trust in politicianers! them's my sentiments. There's no two mediums about that. Hav'nt I been serving my country these five years, like a patriot; going to meetings and huzzaing my daylights out, and getting as blue as blazes; hav'nt I blocked the windows, got licked fifty times, carried I don't know how many black eyes and broken noses, for the good of the commonwealth, and the purity of our illegal rights, and all for what? Why for nix. If any good has come out of it, the country has put the whole of it in her pocket, and swindled me out of my earnings. I can't get no office! Republics *is* ungrateful! I did'nt want no reward for my services. I only wanted to be took care of, and have nothing to do; and I've only got half nothing to do! Being took care of was the main thing. Republics is ungrateful, I'm swaggered if they ain't!"

"Come with me," said Charley, helping him along. "I'll take care of you. But what made you a politicianer—hav'nt you got a trade?"

"Trade! yes; but what's a trade, when a feller's got a soul—a whole soul? Trade! I loved my country, and I wanted an office—I did'nt care what, if it was fat and easy. I wanted to take care of my country, and I wanted my country to take care of me. Head-work is the trade I'm made for—talking, that's my line. Talking in the oyster cellars—in the bar-rooms, any where. I can talk all day, only stopping for meals, and to wet my whistle. But parties is all alike. I've been on all sides—tried'em and I know—none of 'em gave me any thing, and I've a great mind to knock off and call it half a day."

Pleasures and advantages to be derived from the study of Natural History.

"Natural history, though it holds out no splendid reward to those who pursue its studies, will not fail to supply its fair proportion of contributions to the general welfare. Natural philosophy has furnished its light-houses and life-boats for the ocean, its lightning rods and steam-engines for the land, and its safety-lamp for those who explore the regions below. Chemistry has supplied its bleaching inventions and its medicines, not to speak of the more questionable blessings of dry bone soup, linen rag sugar, and saw-dust bread. Natural history, though it seems to content itself with simple descriptions of nature, forbearing to investigate its laws or the action of its powers upon each other, will continually unfold new productions and properties in all its departments; new uses for animals, vegetables, and minerals, and ways in which they can be applied to the benefit of man. It will teach men to employ nature against itself, and to neutralize many of its evils, shewing how it furnishes the antidote as well as the bane; shewing, in fact, that it never puts difficulties in the way of man, without some corresponding advantage which it rests with them to discover. Of course it will exact something in return; it will require men to look round them with observing eyes, and to pay at least sufficient attention to nature, to know how to estimate the blessings which it bestows. But, for all this it will abundantly reward him; it will make him happy, by affording something to fill up the vacancy of his mind and his heart. If the mind ever rests, its calm is not clear, transparent repose, but corrupt and unhealthy stagnation, and this is a danger to which men are exposed much oftener than they know. We are unconscious of our inaction of mind, because revery is taken for thought; a man never looks so profoundly intellectual as when he is thinking of nothing. A solitary walk,—a seat by the evening fire, are said to be favorable to thought, when sometimes, on such occasions, not a thought passes through the mind for hours; thought being the action, not the dreamy repose of the mind. Now when this science changes the thoughtless into observers; when it teaches them to look with interest upon the insect, whose instinct is so perfect and sure in all its operations; when it makes them see beauty in the frail loveliness of the flower, which now they crush beneath their feet; when it leads them to examine the rich plumage, or listen to the song of the bird, instead of destroying it with wanton cruelty, it renders them a service which cannot be over-estimated; it opens fountains of enjoyment for them, which will never cease to flow.

In this point of view, we have no doubt that these studies might be employed as an efficient instrument of moral reform. For it cannot be questioned, that most men are driven to their lawless indulgence, not by their love of it,—not by the strength of the temptation,—but by the horrors of a vacant mind, which induce them to seek this relief from themselves. The force and resistlessness of the temptation consist, not in its own attraction, but in the unhappiness of a mind preying upon itself, which eagerly catches at any means of relief for the moment, without thinking of the consequences. It is in such vacant and unguarded hours, that the evil spirit of sensual indulgence attracts and secures its victims. Now those pursuits, which furnish an excitement to the mind, will arm it against such fascination, by keeping it in that action, which is as essential to virtue as it was to eloquence in the opinion of the great master of the art. Moral reforms are apt to resemble those of political parties, which remove one set of evils by substituting another; but whoever supplies subjects of engaging intellectual interest to the minds of men, goes to the root of the evil, while others are hewing at the branches, which spring again as fast as they are cut away.—*North American Review for October.*

THE CULTIVATOR—FEB. 1836.

TO IMPROVE THE SOIL AND THE MIND.

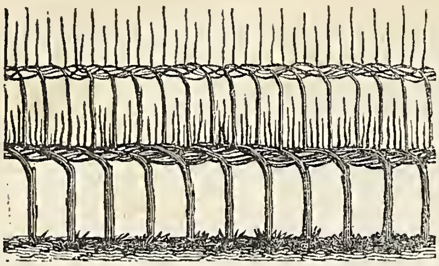
COMMON SCHOOL LIBRARIES.

The utility of common school libraries, in promoting the best interests of society, is manifest to every man who knows the advantages of acquired knowledge. But as a portion of the community are hardly supposed to appreciate this advantage, it is doubtful whether the law which provides for the establishment of these libraries, will not remain, to a great extent, a dead letter. Those who cannot read, or do not read, must be incompetent judges of the pleasures and advantages which books afford. Where libraries have been established, they promise the happiest effects, in inducing a taste for reading, not only among the children of the schools, but among their parents, and consequently are converting to usefulness, much time which was wont to be spent in indolence, if not in vice. If then these libraries are calculated to benefit the children which have access to them, and to increase the measure of public knowledge, virtue and happiness, why not make their provision mandatory? There are a great many people in the community, who would not, if the matter was left to their option, expend their money in repairing the public roads, or in maintaining common schools at all; yet the law compels them to do it, because the public good requires it. And would not the public good be subserved, also, by the intellectual and moral culture of the rising generation, who are soon to be the masters of the land?

We have noticed, in our late readings, two instances, where men who became distinguished for literary acquirements, dated the commencement for reading, and the abquisition of knowlege, to the accidental perusal of Robinson Crusoe. Cobbett, who wrote more perhaps than any man now living, and who is *now*, on the score of talents, compared to Pitt, by someof the British reviewers, ascribed a like influence to his early perusal of the Tale of a Tub. The predominant passion of youth is curiosity. If we can blend useful knowledge with the gratification of this predominating passion, we bend the twig as the tree should grow—we plant seeds which, like the acorn, may spring up, and spread branches far and wide, to refresh and beautify the land. The nursery and the school are particularly adapted to this species of training. If the habit of reading is postponed to manhood, or is only enforced as a *task*, the mind either does not imbibe a relish for it, or rejects it with disgust. But if the habit is acquired in youth, as it generally will be where opportunity is offered of acquiring it voluntarily, it becomes a companion in manhood, and a solace in old age. At present, the opportunities for reading, to the young, are extremely limited in most parts of our state. There are few social libraries, and very few bookstores except in the cities and villages. The meagre supply of other than school books and bibles, which reaches the interior, principally passes through pedlers and chapmen, and are of doubtful character. It certainly becomes the guardians of the public weal, to take these matters under their special cognizance, and to see that the young mind is furnished with food adapted to its capacities, and calculated to promote its health and usefulness.

A series of well written numbers, ascribed to a late superintendent, has lately appeared in the public journals, showing the necessity of a reform in the management of common schools, and recommending that their supervision, together with the selection of school books, should be confided to the care of a competent superintendent, who should devote his whole time to the matter. The suggestion is worthy of legislative consideration. No branch of the administration is more important to the future welfare of the state, than that which has cognizance of the education of youth. It would present great advantages on the score of economy, if the superintendent should be also authorized to *buy* for the schools, as the works selected might be stereotyped, and bought, at wholesale, 20 to 50 per cent. below retail prices, and charged to the districts at cost, and given in lieu of their equivalent value of school moneys. And there certainly would be no impropriety in providing by law, either that each distract *shall* provide school libraries, or that a part of the appropriations for schools shall consist of books, to be selected by a superintendent, to constitute one. We verily think that a portion of the public school moneys could not be better appropriated.

HEDGES.



We give above a representation of a section of a three thorned locust hedge, (*Gleditschia triacanthos*) which has been twice laid, showing the manner in which this operation is performed. The way we manage these hedges is, to manure well a strip of ground, where it is intended to plant a hedge, at least eight or ten feet wide, plough it deep, and crop it with potatoes. When the potatoes are off, we draw a line, either in the fall or spring, and dig a sufficient trench, on the line of the intended fence, a spade deep, with a perpendicular edge on the line side, and throw the earth on the opposite side. The plants are sized and then planted at ten inches apart upon the line. The ground is kept free from weeds two or three summers, by one or two hoeings in a season. When the plants are, upon an average, an inch to an inch and an half in diameter, we proceed to lay them as follows: The plants are first divested of their principal side shoots. They are then all, except a strong one at an interval of a foot, (and this applies to the second and third, rather than to the first laying,) bent and laid horizontal in the line of the fence, and at the required height, say twelve inches from the ground, and if necessary tied down with osier willows. Two men then proceed to wattle the remaining plants. Standing at the end of the hedge, one bends down the plant, and without cutting, to a horizontal position, the other opening the intervening tops, so that the laid top alternates to the right and left. The next plant is laid in the same way, binding the first, except that where the first passes to the right this passes to the left of the standing plants. In this way they proceed till the whole is laid. In two years the hedge will have attained a sufficient growth, if well taken care of, to admit of being laid a second time, and in two years more a third time, when it should stand four and an half or five feet high, and after which it should be only clipped like an ordinary hedge. The elm grows well with the locust in the hedge, and is peculiarly well adapted for laying and wattling, the tops and branches continue to grow in whatever direction they are laid. The seed of the elm may be collected in the last ten days of May, in this latitude, and if immediately sown, will produce plants from six to eighteen inches high the same season. The objection to the locust and elm is, that they are liable to become trees, instead of shrubs. The same objection lays against the beach, and yet this is extensively used upon the European continent as a material for live fences. It is thick planting, laying and clipping, that reduces forest trees to dwarfs. The locust should be laid in spring or autumn, when there are no leaves upon the plants. By preserving a horizontal direction in the laid wood, and elevating a little the tops, the whole, or the greater part, continues to grow, and the longer it grows the stronger it grows.

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Hedges are clipped either with the shears or bill-hook. The latter is generally preferred. It is represented at fig. 3. It may weigh about six pounds; the cutting part is about twelve to fifteen inches, with a socket above in which to insert the handle. In using this implement, the hedger stands with his right hand to the hedge, and cuts upwards with a back stroke with his right hand. The stroke must in all cases be made obliquely upwards, and not downwards; for the effect of the latter method would be to shatter the lower part of the stem. The hedger passes on both sides, and gives to the hedge a uniform height, and symmetry of shape, with great despatch. The hedge-spade, (fig. 2,) has a blade five inches, and a handle three and an half feet long, and is employed in weeding and clearing the hedge.

We have expressed an opinion unfavorable to the buckthorn (*Rhamnus catharticus*) as a material for live fences, which we now cheerfully retract, having seen beautiful and efficient hedges composed of this plant, in the grounds of E. Henry Derby, Esq. of Salem, Mass. The plants are not laid, but first headed down and afterwards clipped. From its fine appearance we have been induced to procure plants to commence a hedge of it ourselves.

MANURES.

There is one fact in regard to the economy of manures, which we have before noticed, and to which would again call the attention of our readers, viz., that the portion of dung which escapes in the form of gas, while fermentation is going on, is the proper food of plants, *while they are developing their stems and leaves—and that it is prejudicial to plants when maturing their seeds*—seeds being the object of culture. Hence we reasoned, that unfermented dung should not be applied to crops which matured their seeds at midsummer, when the heat is intense, and when the dung is consequently in its most violent state of fermentation, but to the crops which mature their seeds or roots in autumn, after the fermentation has abated or subsided. To give an illustration familiar to every observing farmer: If unfermented manure is applied to wheat, rye, oats or barley, in any considerable quantity, there will be a great flush of straw, particularly where the dung may have been laid in piles, often covered with rust, and the grain will be small in quantity, and inferior in quality —while from a too luxuriant growth the straw is apt to lodge. The cause of this is, a too great abundance of gaseous food, "which forces it rather to leaf than to corn," and a prolonged growth of straw, at the season of maturing the seed, when the supply of food should be moderate. The same cause produces none of these evils upon autumn ripening crops. The gases arising from fermentation at midsummer, increase the volume and vigor of the stalk, and fit it to produce and sustain a heavier burthen; and the supply is diminished, and probably changed in its quality, by fermentation becoming exhausted, before the season of maturity. The corn and potato fields are therefore the best stercoraries for the deposite and prepartion of manures for the grain crop. These are the principles upon which we have based our recommendations and our practice, of applying manure in an unfermented state always to autumn-ripening and hoed crops.

We have used unfermented manure with good advantage for ruta baga, in some seasons, and to the prejudice of the crop in other seasons. If there is heat and moisture to induce a prompt and rapid fermentation of the manure, its application is highly beneficial; but if the fermentation is retarded, or prevented, for the want of these agents, the manure is sometimes prejudicial to the product. We have also used unfermented manure for garden crops which mature in autumn, as the onion, beet, parsnip, cabbage, &c. with good success.

Silk Culture.—Those who intend to commence this business the ensuing season, should now provide themselves with mulberry seed. An ounce of seed will produce two to three thousand plants. Directions for sowing it, and for managing the plants in nursery, will be found at page 50 of this volume. Those who have the trees, should provide themselves with the eggs of the worm. Both the mulberry seed and the eggs of the worm, may be had at the seed stores. We shall not forget our promise to give timely directions for the subsequent management.

ANSWERS TO QUERIES.

Marl.—A specimen sent to us from Orange, by Mr. Van Duzer, has been analyzed, agreeable to request; the result of which is, that it contains too much clay, and too little carbonate of lime, to make it a profitable application on any but very sandy soils—where the argillaceous will benefit as well as the calcareous matter which it contains.

Potash as a manure.—Mr. R. R. Schenck inquires, what quantity of water must be applied to a given quantity of potash, as a top-dressing to grass lands? We have no experience, nor any data, that will enable us to answer the question; indeed, we doubt the economy of the application, while our farms abound with animal and vegetable matters which may be usefully employed as manure, and which are too often lost for want of care and attention. In using potash, however, we would recommend that trials be made of the solution of different degrees of strength, from that of a pound of alkali to two gallons to a pound to ten gallons of water.

Fall Ploughing.—A correspondent in Maryland asks for our opinion on the propriety of fall ploughing for corn, without indicating his soil or its condition. The question does not admit of a specific answer. If the soil be stiff, or is covered with an old sod, fall ploughing is beneficial; ploughing exposes it to the mellowing influences of the winter, and a partial decomposition of the sod takes place in time to benefit the young corn. If the soil is sandy, and particularly if a clover ley, we would not advise ploughing till immediately preceding the time of planting, that all the green vegetable matter may be turned under for the crop. In either case we recommend that manure be spread before the ground is ploughed; and that if cross-ploughing is necessary in the spring, it be superficial, so as to leave the manure and vegetable matter of the sod still covered by the earth.

In regard to millet, this crop has its advantages and its disadvantages; but on the whole we deem it a profitable one. It exhausts the ground, and leaves it foul. It yields as much seed as wheat or rye; and upon this we have fattened hogs with advantage before the corn crop was gathered. It also affords a good burthen of forage, say ordinarily two tons to the acre, which cattle eat tolerably well, and which would be more serviceable if cut for them. This crop may be sown in May, June, or early in July; but instead of requiring three pecks of seed to the acre, as suggested by Mr. Seitz, four quarts, we think, suffices. It is sown broadcast, and will do well on any soil adapted to Indian corn. We are inclined to think it would do best sown in drills, with a drill-barrow, with intervals of two feet, when the crop might be tilled and cleaned with the cultivator and hoe.

Profitable Farming.—We give to-day another illustration of the productiveness of our pine lands, when under good management, in a communication from Samuel T. Vary. His improved lands have afforded him a nett profit of about thirteen dollars an acre, notwithstanding that his wheat and corn crops were seriously diminished by the grain and wire worms. If our farmers can all do as well as this in the old settled counties, we doubt whether they are likely to improve their condition by removing to Michigan or Illinois. We invite the reader's attention also to the interesting experiments of Mr. Miller and Messrs. Huntingtons.

Manual Labor Schools—Have frequently been the subjects of our commendation. They are calculated to give health and hardiness of constitution, blessings that cannot be too highly prized; and materially to lessen the expense of education. They afford, also, practical instructions in agriculture and horticulture. The Hudson River Seminary is of this description. It is under the care of the Rev. D. M. Smith. It has accommodations for 128 pupils, besides a large school room, and has attached to it an excellent farm of 200 acres. It is estimated that all the expenses of a pupil, including board, tuition, &c. will not exceed $75 per annum. This school is designed to fit young men for college, or for the business and duties of life.

Force of Prejudice.—The prejudice of our farmers against new implements, new modes of culture, and what they are pleased to call book farming, brings to mind an historical fact, strongly illustrative of the unreasonableness of vulgar prejudice. Walter Blith observes, that "it was not many years since the famous city of London petitioned the parliament of England against two nuisances, and these were Newcastle coals, in regard to their stench, &c. and hops, in regard they would spoyle the taste of drink, and endanger the people." These two nuisances have since become almost indispensable necessaries to the good people of London. And it will be found, that what the illiterate and bigoted farmer rejects as useless, will soon be found necessary to successful farming.

Importance of Education to the Farmer.—We particularly commend to the notice of readers of all classes, the excellent remarks of the Rev. H. Colman, copied into this number of the Cultivator, from the New-York Farmer, on the importance of education to the agriculturist. They are not only interesting to the farmer, but to the statesman and all others, who are interested in the future character and prosperity of our country.

NOTES ON FARMING.

FROM OUR MEMORANDUM BOOK.

Roots.—The roots of many plants will creep aside to avoid bad earth, or to approach good.—*Buffon.* Darwin says, roots put out no absorbent vessels where they are not stimulated by proper juices; and that they elongate only where they find proper nutriment.—*Phy.* 17. Where the soil is rich and mellow, the roots of most plants are longer than the stems. Mr. Thurell traced the fibres of the roots of wheat five feet deep, on the side of a marl pit; also the root of a turnip, drawn by hand, two feet and a half in length. The importance of extended roots and of tilling the ground, to the vigor and productiveness of a plant, may be evidenced in our tillage fields, where the outside rows, or outer border of grain, is generally inferior, because the roots cannot so freely extend into the adjoining grass grounds, and because the ground is often less perfectly tilled. Cobbet has given a forcible illustration in this matter: several rows of turnips were drilled one foot apart, along side of a ridge, which was ploughed and harrowed, when the turnips ought to have been hoed, but which were not hoed at all. The third row of turnips from the fresh ploughed ridge were double the size of the rows beyond it; those of the second row were double the size of those in the third: and those in the first row were much larger than those in the second. This difference was imputed wholly to the influence of the fresh ploughed adjoining ridge; and this influence extended to the third row, so as to double its product, and consequently the roots of the turnips growing in the third row must have extended three feet to reach the ploughed ground. These facts admonish the farmer to plough *well,* and to use the cultivator freely among his hoed crops.

Norfolk course.—Norfolk is a sandy district, and, until the introduction of the turnip culture, was one of the least productive counties in England. That culture, and the improvements consequent upon its introduction, have rendered it one of the most productive. The course of crops is, 1. Turnips always with manure; 2. Barley or oats and grass seeds; 3. Grass two years; 4. Wheat or rye. Mr. Young thinks but *one* ploughing should be given to a two year's lay, in the fall, for winter grain, and but one in the spring for (with us) corn or potatoes.—*See Young's Norfolk, p.* 62. The only variation which modern improvement has made in the Norfolk course, is to sow, in some cases, peas on the sod, and follow with wheat in autumn. The rotation is a judicious one on our sandy lands, where turnips are sufficiently cultivated; but as this culture is too limited in all cases, Indian corn may be advantageously substituted, or superadded, with manure, as the first crop in the course. Peas, as a fallow crop, to be followed by wheat, upon a two years lay, is preferable to a naked fallow.

Norfolk maxim.—Never take two crops of white corn (i. e. small grains, as wheat, rye, barley, oats, &c.) in succession.—*See as before p.* 364. Mr. Young thinks the pre-eminence of Norfolk husbandry is principally owing to a strict adherence of this maxim. This maxim should be amended so as to read, "never take two crops of *any kind* in succession," and the result will be found correspondingly beneficial.

Arable System.—Mr. Berckham asserted it as a fact, of which he had not the least doubt, that tillage, well managed, would support as much live stock, on the seeds, turnips and straw, as the same land would do all under grass; consequently the corn is all gain to the public, *I am certain it would,* adds Mr. Young. He spoke of pasture that would support two bullocks of 40 stone (560 lbs.) on the acre.—*Young's Norfolk, p.* 367. Reference was had to sandy lands, adapted to alternate husbandry; and we believe the remark will hold good here, where the lands are well managed, though the high price in manual labor may make some difference in the result.

Summer fallows were common thirty [now sixty] years ago in Norfolk; and seeds [grass] were then left three years. Now no such thing as summer fallows are known, and seeds are left but two years. The number of horses is lessened; ploughings are not so frequent; often but one for barley, and some trust to scarifying, and have succeeded well. Those and other improvements have increased the product one-fourth or one-third.—*Ib.* 367. It is a fault with some of our best farmers, who have adopted the alternating system, that they leave their grass too long, three, four, or five years, till the clovers, which are to impart fertility to the soil, have in a measure disappeared. The clover roots penetrate and break the soil, which is always loose and permeable while they are undergoing decomposition.

Marl is applied in Norfolk at the rate of from 8 to 100 loads per acre; if the less quantity, it is often repeated. Seventy loads per acre will last fifteen or sixteen years. This is said on the authority of Young.

Planting.—We have said that the forests of England have all been planted by the hand of man. To give an idea of the extent of these plantations, we state, that in twenty years, Mr. Coke planted 718 acres to forest trees of various kinds, with 2,123,000 plants. Mr. Bevan planted 96,000 trees.

Shrinkage of Grain.—Wheat, gathered ripe, lost in forty-nine days, nearly one tenth of its weight; barley, in forty days, lost one seventh of its weight. This was in September. In October wheat lost, in twenty-four days, 2 lbs. 1 oz. 15 dr. per bushel of 70 lbs. In January wheat lost, in thirty-one days, at the rate of 2 lbs. 15 dr. per bushel.—*George, Ess. vol.* 2, *p.* 117. Grain stacked till April, sustained a loss of nearly 35 per cent. *Farm. Mag.* XVIII. 26. Indian corn, gathered dry and shelled in October, had lost in May following, nearly seven per cent in measure.

Advantages of a light soil.—An open soil, if not too light in its own nature, will always produce plentiful crops. It readily receives the air, rains and dews, [and heat] into its bosom, and at the same time gives the roots of plants a free passage in quest of food. This is the true reason why land well tilled is so remarkably fruitful.—*George. Ess.* 1, *p.* 22.

SUMMER FALLOWS.

The writer of the article "Agriculture," in Brewster's Encyclopœdia, enumerates the following as the substance of the arguments urged against summer fallowing.

"1. Nature does not require any pause or rest, and the earth was evidently designed to yield a regular uninterrupted produce.

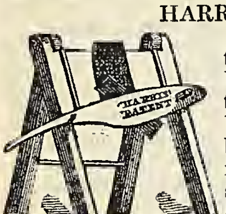
"2. As the productive quality of the earth never ceases, if corn is not sown, weeds will be produced; therefore it is our business to expel the unproductive plant, and to introduce others that are beneficial.

"3. That the idea of leaving land to rest is ridiculous; for, by keeping it clean, and by a judicious intermixture of crops, it may be managed like a garden, and sown from one generation to another.

"4. That fallows exhibit nothing but a conflict between the farmer and his weeds, in which the latter generally prevail; for at the best they are only half stifled, and never effectually killed."

Admitting most of these arguments to be correct, the writer insists on the necessity of summer fallows, in heavy or cold soils, and upon every variety incumbent on a close or retentive bottom. "No doubt," he adds, "a bare or naked fallow is not necessary upon light fine soils, because such may be worked in the months of May or June, and afterwards cultivated for turnips." Summer fallows, upon cold or stiff soils, it is contended, are indispensable as the only possible means of keeping them clean, i. e. of freeing them from weeds, especially from the roots of such as are perennial. As soils of the latter description are neither adapted to the growth of Indian corn or turnips, the best cleaning crops, and as potatoes are seldom cultivated on a scale sufficiently extensive to effect this object, we admit the conclusion is not unreasonable, viz: *that no soils adapted to the culture of Indian corn and turnips require to be summer fallowed; but that all stiff or cold soils, not adapted to the culture of these hoed crops, and that cannot be cleaned with a potato crop, are manifestly benefitted by an occasional summer fallowing.*

HARRIS'S CORN SHELLER,



Mann & Rice, of Troy, are the proprietors of this patent for the state of N. York. With it, one man will shell, as the proprietors allege, 50 or 60 bushels of corn per day. We have seen it work, and think it a valuable acquisition to the farmer who is not already provided with an implement of this sort. Its cheapness is a further recommendation; No. 1, being $4, and No. 2, $5. It is sold in Albany by Norman Francis, agent, State-street.

Sheep Husbandry has become a matter of much interests to our country. Wool already forms the great staple of many districts. The supply is not yet equal to the demand, and the demand is likely greatly to increase, as will undoubtedly the extent of our flocks. We have frequently intimated, that our best sheep lands have as yet been but partially occupied: that these consist of the hilly and stony districts upon the head waters of our great streams; that in these districts, illy adapted to tillage husbandry, wool may be grown much cheaper, and the flocks suffer much less from disease, than in districts which are flat and more fertile. With the view of promoting the interest of the wool grower, we shall devote a portion of several numbers of the Cultivator to this subject, and give such pictoral illustrations as may serve to render the matter interesting and useful. We commence the subject to-day; and shall hereafter speak of the value and uses of the pelt; of the nature and offices of the yolk; object and mode of salving; of the fibre and properties of wool; of wool stapling; of the influence of temperature; of pastures; of trueness, soundness and softness, as essential properties in the fleece; of elasticity, color, and grades of fineness; and of many other matters interesting to the growers and manufacturers of wool.

CORRESPONDENCE.

January 11, 1836.

Dear Sir—I read last evening Gov. Marcy's message, and this morning your last Cultivator. The former I consider excellent, with some exceptions; the latter decidedly the best number you have given to the public. It has less of the conjectural than any other which I have read. It has more physical science. By physical science, I mean the revelation of the laws of God. I think you are wrong in your remarks on irrigation. There is an immense loss in not saving the washings of roads. This is one chapter of irrigation. The price of hay at present would fully justify great outlays for irrigation, as practised in England. Your first article is excellent, as far as it goes; but if the writer had read Puvis' essay on lime, in the October and November numbers of Ruffin's Farmers' Register, [which will be published in the March and April numbers of the Cultivator] his reflections would have been nearer up to the time in which we live. We do not understand physical science in the U. States. It is far better understood and applied to the arts in France. Lime has fed wheat lands, and wheat has fed man for 5000 years, and it is time the debt was acknowledged. The farmers in the Mohawk valley could afford to pay you half a million of dollars for teaching them the use of lime.

I thank you for your little space to common schools. Why should not the rising generation be taught the meaning of scientific terms of daily application through life? It would be perfectly easy and practicable. We all neglect our duty to the young. How easy it would be to teach every boy in this state, that portion of chemistry and geology, which is applicable to agriculture.

The results of our school libraries are most cheering indeed. The books are not stolen, nor injured, and are regularly returned, and what is more important, the books are read. These boys, when they become men, will understand your last Cultivator, which is more than can now be said of some of their fathers—but which every farmer *ought* to be able to understand. W.

Kinderhook, Dec. 18*th*, 1835.

Dear Sir—In compliance with your request, I send you the annexed statement of the products of my farm, and their sales, for the year 1835. This is simply the account of the marketable products. I have reserved enough of the several kinds for the consumption of my family the ensuing season, which are not included in this statement. My farm consists of 173 acres, of which 145 are under cultivation; the remainder is in wood. The soil is sand and fine gravel, sand and loam, and sand and clay. Portions are well adapted for grain, and again other portions for pasture and hay. I have not lived on the farm sufficiently long fully to understand and elicit its capacities, as for a number of years I have cultivated high and rocky land, where the farmer's principal profit was made from the products of the dairy. My oats were a full crop, so were my potatoes; but first the wire worm or something else, and next, the early frosts lessened my corn crop, I think, one-half; and one of my pieces of wheat was somewhat injured by the grain worm. The cultivation for my farm was done almost exclusively by myself and sons. The expenses of my family and farm, that is, money paid out, is $383.75, and this amount must be deducted from the gross sum stated as the income for the year. I will not pretend that I have raised more from the same quantity of land, perhaps not as much as many of my neighbors; if I did, their evidences of thrift and good farming would not bear me out in any such pretension.

Products and Sales of the Farm for 1835.

12 Calves,	$37 89
196 lbs Butter, at 20 cts.	39 20
1542 lbs Cheese, at 8 cts.	123 36
30 Lambs, at 15*s*,	56 25
850 bushels of Oats, at 52 cts.	442 00
375 bush. Potatoes, at 2*s*,	93 75
20 tons of Hay, at $15 per ton,	300 00
72 bushels of Onions, at 4*s*,	36 00
500 bush. Corn, at 6*s* 9*d*,	421 88
220 bush. Wheat, at 12*s*,	330 00
4 Cows Beef,	69 00
2 Oxen and 2 Steers,	130 00
7 Shoats,	17 00
1440 lbs Pork, at 7 cts.	100 80
22 Wethers, at $4 each,	88 00
	$2,285 13
Deduct money paid out,	383 75
	$1,901 38

I say nothing of the labor, as we have drawn our living from the farm.
I remain your friend, &c. SAMUEL T. VARY.
Dr. J. P. Beekman.

Pittsford, Monroe Co. Jan. 9th, 1836.

Mr. Buel—Dear Sir—Being unwilling to hide my light under a bushel, however humble it may be, when thousands of others are shining so bright around me, illuminating my path and rendering my labors more easy, more productive, and more pleasant, I have taken the liberty of forwarding for your disposal, an account of my past season's agricultural labors, so far as they are connected with the cultivation of the corn, the carrot and the ruta baga crops.

Under the influence of a strong disposition to innovate upon old theories and practices, and to mark out a new and untrodden path, where there appears to be room for improvement; with no reverence for usages whose merits are founded upon mere antiquity, I have commenced the agricultural life, prepared to think and to act for myself. With such a disposition, and knowing, as every man of reflection must know, that there is a great degree of ignorance on agricultural science in our country, you may well imagine that I see many things among our hard working and well deserving farmers, that most emphatically require a thorough and radical change—that there is a vast amount of labor, of hard, back-aching labor, which from improper application, produces not its suitable reward—and that there are many acres of fine productive soil, which by improper management are not made to yield a return of simple interest upon their cost.

I will acquaint you with my experiment upon the cultivation of a field of corn, of three and one-third acres. The land was of the kind here denominated the oak timbered land; a strong, loam soil, with a clay bottom. It had been three years down, after wheat, without seeding, and had been previously worked pretty close. In May, I carted on about thirty loads of rotted manure upon two acres of the poorest part of the land, and the rest was without manure. I then ploughed it very carefully, being particular to turn the sward *all* under. I then dragged it twice with the harrow across the furrows, and then with a hand-marker having seven trails, I marked out for the rows, three feet six inches one way, by one foot nine inches the other. The ground by this time had, owing to the drought, become very dry. It was now the 19th of May; I intendod to have planted by the 12th, by which I should have avoided the bad effects of the drought. I soaked my corn, and rolled it in plaster; it was of the twelve rowed kind; I put from five to eight kernels in a hill, and covered with moist earth. The corn came up unevenly, some not till three or four weeks after planting. On the 2d June, I put on thirty-five bushels per acre of leached ashes. On the 11th, ploughed out the corn with the cultivator, and hoed, throwing a little fresh earth around each hill, first thinning it out to four of the best spears in each hill. It came forward now very fast. On the 23d, went through the second time with the cultivator, but owing to a press of other business, did not hoe it. July 2d, used the cultivator the third time, and hoed the second, throwing a little fresh earth in each hill. This was all the labor bestowed in the tillage of the corn; it now presented a most healthy and thriving appearance, and almost completely shaded the ground. At this period my neighbors began to prophecy the result of my experiment, and with no very flattering terms. Without a single exception, they told me I would have but little corn, and that that little would be poor, as it grew too thick, and was too much shaded. With this array of prophetic judgment, from old and young, against me, I almost began to doubt the wisdom of my experiment, and to repent having wandered from the footsteps of my fathers. Some advised me to cut out every other row, but as I had begun the experiment, I thought it proper to carry it through. The corn grew rapidly, grew strong, and maintained its healthy colour. On the 3d of October, after an unusually cold and unfavorable season, with frost every month, and one particularly on the fourth of August which materially injured the corn crop, and one on the 16th September, which put a stop to its growth, I cut up my corn by the roots and stouted it off the field, and left it till the 10th of November, when I completed the husking, and stored into my grainery *three hundred and twenty-two* bushels of ears of good corn, besides sixty of soft or pig corn; being at the rate of about fifty bushels of corn per acre. Besides the corn, I had double the usual quantity of stalks, which in this season of scarcity, I have found very valuable.

I will now inform you of the carrot crop. Early in the spring I carted eight loads of long manure on to one-eighth of an acre of tolerable rich bottom land, deep and loose, and ploughed it under; and on the 12th of May put the seed in the ground by hand, in drills fourteen inches apart. The seed did not come up well, there being frequent vacancies of from one to ten feet in length. In the course of the season the carrots were hoed twice and wed three times by hand. On the 29th October I harvested the crop, which turned out *two hundred and ten* bushels of carrots, at the rate of 1680 bushels per acre. The whole cost of tillage and harvesting was $14, including interest on land at $50 per acre; the value of crop at two shillings per bushel, $52.50, from which deducting cost, leaves a balance of $38.50 nett gain from one-eighth of an acre. I have no doubt that had the seed come up uniformly over the field, I should have had 250 bushels, which would have been 2000 bushels per acre.

Adjoining the carrot field, and of the same kind of land, and prepared in the same way, I had one-tenth of an acre devoted to the culture of the ruta baga. The ground was made perfectly level, and on the 26th June the seed was sown in drills from eighteen to twenty inches apart, and came up well, as the weather was very favorable. On the first hoeing they were thinned to twelve inches apart. They were hoed but twice; and on the 12th November I harvested *one hundred and twenty-two* bushels; being at the rate of 1,220 bushels per acre. Value of crop at eighteen pence per bushel, $22.87; tillage and harvesting, $6.25, leaving a balance of $16.62 nett gain from one-tenth of an acre.

With regard to the carrots, they were not thinned, but left to grow as they came from the seed; but the looseness of the soil allowed them to spread, and they grew to a very great size; some measuring 17½ inches in circumference, by 30 inches in length, weighing 7½ lbs. The largest turnip measured 25 inches in circumference, and weighed 11lbs; very few weighing less than 5 and 6.

I would respectfully solicit the attention of your correspondent, Thos. Midford, to the account of Ruta Baga culture, as exhibiting the result of the level system, which he considers the least enlightened and the least productive. Respectfully yours,
EDWARD MILLER.

Canaan Centre, Dec. 18th, 1835.

Sir—I have been much interested with the perusal of what has been published in the Cultivator, as to the best breeds of sheep, and as my views are different from some of your correspondents, I will, with your permission, submit some of them to the consideration of those interested, through the medium of your paper. I refer to the interest taken to procure heavy fleeced merinos, and I believe the moving cause was the publicatiou on Pauluar merinos, representing them beyond their fair value. Connected with that, is the fault of running too much to short staple Saxony; making the fleeces too light for our climate with the care ordinarily bestowed on flocks; or not making the care equal to their wants. The unprecedented loss of lambs last spring, had also a tendency to increase the excitement, and has been charged principally to the feeble constitutions of the Saxons; not making allowance for the severe drought the season before, which prevented the growth of after feed, and necessarily impoverished all flocks on farms fully stocked; nor for a winter unusually cold and long; nor for a stormy backward spring; nor for the scarcity of hay; all of which tended to facilitate the loss of lambs, and discourage many who had just commenced with improved Saxony bucks. But I said that heavy merinos had been represented to be better than they really are, which I believe to be the case, in the estimate value of their wool, though I have known it sold for sixty cents per pound; still that does not alter the intrinsic value of the article. The sale of different lots of wool to different purchasers, is no criterion whereby to judge of the value of such lots; as some purchasers may not be judges, or may pay higher for wool of the same quality.

As far as I have been acquainted with the sales of Pauluar merino wool, they have been made to speculators, as manufacturers acquainted with the article will not buy it except at reduced prices; and for the simple reason that it wastes very much in cleansing, and to that fact I can attest from experience, having had bucks after being washed, shear 7½ lbs. which in cleansing would be reduced to 4 lbs; but as the speculator sells in large quantities, he probably passes it off without loss; still some one is cheated, and the article remains the same, subject to waste and harshness from cleansing. If we were always to have a market as good as at present, and speculators as plenty, the controversy would be at an end; but if not, it is the interest of the wool grower to produce an article that will suit the manufacturer, and will stand competition. It is acknowledged by all that Pauluar merinos are much coarser than Saxons, and I believe the difference in fineness to be twenty-five per cent, which is the difference in the estimated prices heretofore made in the Cultivator; and the difference in weight in favor of merinos is made to over balance the Saxony in value. It is likewise acknowledged that merinos have a far greater proportion of yolk; the question then arises, what does that difference in weight consist of? a considerable part of it must be yolk, and of course is lost in cleansing; leaving in my opinion not more than 3¼ lbs. to a 4 lb, merino fleece. This will materially alter the estimate heretofore made. The above is, I believe, allowing less difference than any well informed manufacturer would make. The fact that Pauluar merinos have long since been discarded, and are bred in their native country only on plains, where better breeds will not flourish, and which is probably the cause of their wool being so greasy, should be a sufficient reason to induce wool growers to pause, before they adopt them as the most profitable, as it is undeniable, that after speculation subsides, intrinsic worth must be the standard of valuation.

As wool growing may well be termed a science, and as it is in its infancy in this country, and will require many years to bring it to any degree of perfection, I believe a middle course between the short staple Saxons and the heavy merinos may be pursued to manifest advantage; and my opinion is founded on practice. I would recommend crossing long staple Saxony bucks on Escurial merinos, thereby retaining in a great measure the fineness of the Saxony, and improving the weight of fleece sufficiently to stand our winters with ordinary care. Such a course may be pursued, so as to obtain a flock two-thirds ewes and one-third lambs, that will yield an average of three pounds per head, and will bring within three or four cents in a pound as much as light fleeced Saxons. Such an article will in my opinion, when the value of the two are fairly tested, bring fifty cents a fleece more than an average of Pauluar merinos; besides being a fine good article, not subject to waste, or unsaleable when the market is well supplied.

If instead of advancing in the science, we retrograde, we shall never accomplish what all would desire, an improvement. If we reject the experience and practice of other countries, where wool growing has arrived to a great degree of perfection, and has been an important business for ages, we shall, when too late, I fear, deprecate our folly.

Yours respectfully, DANIEL S. CURTIS.

JUDGE BUEL—Sir—Seeing the result of some experiments of yours in the last Cultivator, we feel that we are not alone in failures. We are in the habit of adopting some new plan of agriculture almost every year: endeavoring always to improve our land and at the same time to increase our crops. In some instances I think we have been successful; in others the result of experiments remains to be proved. We wish at this time merely to state the exact product of a small piece of land of ours, lying near Connecticut river, containing one acre and five-eighths; the expense of raising, value of the crop, &c.

The land in question, we planted last year with Indian corn, sugar beet, and ruta baga; manured with about twenty loads of dung to the acre, and ploughed it under. The corn, (a little more than an acre) produced 160 bushels of ears. The sugar beet was a middling crop; and the ruta baga was almost an entire failure, owing probably to too early sowing and green manure.

Last spring we ploughed the ground as soon as it was dry enough; mixed one bushel of tea wheat with two bushels of oats for the whole piece, sowed it dry, I think, (though we commonly soak and roll it in lime,) harrowed well, then sowed 15 lbs. cloverseed and rolled with a heavy roller. The crop grew full five feet high, and before harvest, was almost entirely blown down with high winds, so that we were obliged to pick it up with sickles. Last week we threshed with a machine, and cleaned 98½ bushels of excellent grain. This will sell readily at 84 cents per bushel, which amounts to $82.74.

The expense of the crop, including threshing, was by accurate estimation $22.00, leaving for clear profit $60.74, besides the straw, which would probably sell for twelve or fifteen dollars.

We have never raised so heavy a crop of spring grain before, and attribute this in some measure to the roller, having never made use of one till this year. In October, when the clover was fully grown, we ploughed it under; which with the stubble, we think will be sufficient manure for a good crop of corn next year.

If the above statements are of any value, they are at your service,

T. P. HUNTINGTON,
Hadley, Mass, Dec. 28, 1835. T. G. HUNTINGTON.

Hyde Park, Jan. 16, 1836.

J. BUEL, Esq.—DEAR SIR—On the 1st of Jan. last, I communicated to you the result of my experiment on fattening hogs with apple pomace, &c. As I am confident your agricultural publication (the Cultivator) is well calculated to promote and improve the agriculturist, and being anxious that the cultivators of this productive soil may be found with the front ranks of improvement, I am willing to contribute my feeble help for its promotion, and forward you the result of my experience in fattening hogs this season with the same sort of material, apple pomace. On the 10th of Oct. I shut up to fatten, for E. Holbrook, Esq. Hyde Park, 20 swine, viz. 10 about fifteen months old, two China hogs, a boar and a sow, and eight shoats pigged in the beginning of June last. The whole, when shut up, were only in middling store order, in consequence of the scarcity of feed, the cows producing very little wash from the dairy, and the scanty crop of apples we experienced this season, and given them nothing during summer but a small orchard containing one and an half acres of land, (with the premature apples which fell) in which is a pond of water, that is very essential to hogs, to which, under the powerful influence of the sun, they will resort for their comforts. The above were divided into three lots and closely confined; we proceeded to fatten them by steaming 4 bushels of small potatoes, 12 bushels of apple pomace, 4 bushels of pumpkins, and 1 cwt. of buckwheat cornel, adding a little salt; the whole incorporated well together while hot from the steamer with a wooden pounder, and allowing fermentation to take place before feeding it away, (without the aid of the dairy wash which was given to the store pigs, &c.) supplying them with plenty of charcoal and pure water. On feeding the first steamer of the compound, I perceived more than ordinary moisture on their litter, which was occasioned by urine; my knowledge of animal nature convinced me that more than an ordinary flow would weaken the system and retard the progress of fattening. I attributed this cause to the steamed pumpkins acting as a diuretic, stimulating the kidneys and increasing the evacuation of urine. In the next steamer I substituted 4 bushels of ruta baga for the pumpkins, which had the desired effect. This experiment has convinced me that this mixture affords a greater mass of nutritive material prepared for the action of the stomach, and producing pork more rapidly than any combination of food I ever made use of. Using up all our pomace, and having a greater quantity of soft corn than usual, we commenced giving it to the hogs, but instead of improving their condition, they fell off, and we were under the necessity of procuring two loads of apple pomace from our neighbors, and commenced steaming and feeding again with the same good effect, until eight days before they were killed, during which latter period they were fed with sound corn, and slaughtered on the 1st of Dec. The expense of fattening, and the product of pork are as follows:—

		DR.
32 bush. of small potatoes, at 2s,		$8 00
32 bush. ruta baga, including pumpkins, at 2s,		8 00
10 bush. soft corn, at 4s,		5 00
10 cwt. buckwheat, at $1 cwt.,		10 00
20 bush. sound corn, at 6s, 6d,		16 25
CR.		$47 25
By 40 cwt, pork, at $7½ per cwt.	300 00	
Deduct expense,	47 25	
Balance,	$252 75	

Yours with respect, THOS. MIDFORD.

Watervliet, Dec. 28th, 1835.

FRIEND BUEL—Noticing in the December No. of the Cultivator some queries and answers respecting the Yellow Locust, I have concluded to place the following facts at your disposal. About 28 years ago I first sowed yellow locust seeds for a gentlemen with whom I wrought in the town of Claverack, Columbia county. Seventeen years ago I sowed the same kind of seed on the farm on which I now live. On both occasions, the seed was sown about the time of planting corn, I think, but not to sow before the ground is warm. The most thrifty of those sown where I now live, were transplanted the next spring after sowing, and the rest in the course of the three following years. They were planted on the east and west sides of a field, close to the fence. Some were planted 2 feet apart, some 4 and some 7. They have suffered much from the borer; where planted closest, some were entirely destroyed by the worm. Three years since, those planted on the east, being the last planted, were cut down and used for posts. They made from 2 to 4 posts a piece. Those now standing will make from 3 to 8 posts a piece. My method of preparing the seed was the following:—Cover the seed with boiling hot ley, made by putting a few ashes into the water while heating. Let it remain in the ley one minute, then pour the seed and ley into a cullender and instantly throw on to it a pail full of cold water. Roll in plaster, and sow in drills. Not one seed in a hundred fails to germinate. In rich soils, some of them will rise 3 or 4 feet the first year. The three thorn locust is much slower in its growth, but wholly exempt from the depredations of the borer. I have had one tree of the three thorn growing in my garden 12 years. The ground has been ploughed every year, yet I have never seen a sprout.

Can you, or any of your correspondents, tell whether the timber be as valuable as the yellow locust? There is a very thrifty growth of sprouts where the yellow locusts were cut down for posts.

Yours respectfully, A WATERVLIET FARMER.

Note by the Conductor.—The three thorned locust is a *Gleditschia*, a genus of plants resembling the locust only in its foliage. It *does not* afford good timber, nor send up sprouts from its roots.

THE PLASTER REGION OF THE WEST.

It is a subject of much importance to ascertain the extent or probable productiveness of the quarries of Gypsum, or Plaster of Paris, which are found in various parts of western New-York. Those who may possess more geographical or geological information in relation to this mineral, would confer a favor and a benefit by communicating its localities, both in this state and elsewhere in the United States. Already in this section of the state its value as manure is highly appreciated, and its use becoming very general. Its consumption, however, is increasing so rapidly, that it becomes a question of some magnitude to the agricultural part of the community, what is the extent of the supply on which we may calculate for the future of this mineral. Some few remarks on this subject I now propose making, which I hope may elicit some more valuable communication from others. Quarries of plaster, or sulphate of lime, are to be found in various parts of the state west of Utica. In Madison and Onondaga counties, the stone is of a light grey colour. In these counties there are many plaster mills. My information from these counties is imperfect, but I should suppose that exclusive of what is sent to the east in the stone, and sent to Canada, (probably 10,000 tons,) the *consumption* in those counties for home purposes, cannot fall short of 7,000 tons per annum. In Cayuga county there are extensive quarries, from which, I am informed, not less than 15,000 tons per annum are dug, much of which is sent to Pennsylvania. The plaster stone here is of a dark blue colour. It is usually sold on the banks of Cayuga lake in the stone, for $1.25 and $1.50 per ton. In Pennsylvania it is worth about $6 per ton, and the cost of getting it there and vending it, varies from $2.50 to $3.50 per ton. At the mills in Cayuga and Tompkins counties, it is sold, when ground, for $2 and $3 per ton. In Seneca county, on the Seneca river, there are extensive quarries of plaster which have only recently been opened. This plaster is of a light grey colour. It is sold at the mills on this river, for $3 per ton, when ground. The quarries on this river are said to be inexhaustable, as veins have been discovered of the plaster rock, extending half a mile from the river Much plaster is sent from this river near Seneca Falls, and likewise from Cayuga county, to the country above the Seneca lake, and there ground for use in the counties south and south-west. It is sold, when ground, in Tioga and Steuben counties, for $5 and $6 per ton. The consumption of the country around and above Seneca lake, cannot be less than six or eight thousand tons per annum. In the county of Ontario and town of Phelps, there are many quarries of gypsum. There is ground and sold in this town probably 6,000 tons annually; price $3 per ton. A very considerable income is afforded by these plaster beds to their owners. The proprietor of a single bed in Cayuga county, it is said, was offered and refused $80,000 for the bed on his farm.

I have not heard of gypsum being found at any great extent in this state, west of Ontario. Upon Grand river, in Upper Canada, it is said to abound. I have seen in Sandusky county Ohio, quarries of the species called alabaster, very beautiful, and white as Parian marble.

The consumption in this part of the state has been estimated for the few past years, to increase one-third annually. When the sleighing is good, farmers are known to come for it from the distance of seventy or eighty miles. As the intelligence of our farmers increases, and as their exhausted lands require aid, the demand for this valuable manure will augment. It is fortunate that in our great wheat growing region, there is at hand so cheap and so useful a mineral. It is not doubted now by well informed farmers, that by sowing plaster and clover seed annually, an annual crop of wheat shall be produced, without any dimunition of yield. The instances are too numerous to admit of the facts being controverted.

Seneca Falls, Dec. 28th, 1835. S. J. B.

I transplanted last winter, in February, about fifty white pines; thirty of which are now flourishing. I am satisfied that the depth of winter is the best season for transplanting all evergreens; you may then take them up while the earth is frozen to their roots, and avoid bruising or injuring a single fibre. I have uniformly failed before in removing pines at all other seasons. S. J. B.

Conductor's Note.—To facilitate this mode of transplanting, which we commend, when the plants are at hand, go with a spade, *before the ground is frozen*, and cut the roots, and open the ground, at the required distance from the bole or stem, and when the ball of earth which encloses the plant is frozen, it may be taken up without trouble, and removed on a sled or wagon. Holes for their reception should also be dug before the ground is frozen.

SILK CULTURE.

Mr. Buel—We are happy to find you are not weary of well doing, and each succeeding number of your very interesting paper affords us something new, and brings full conviction of its usefulness by the statements of facts reduced to practice, without which "nothing can be perfect." Had we been favored with such a publication fifty years ago, and continued to the present time, we no doubt, should have arrived at greater perfection in all the variety of mechanism and farming, together with all the minute affairs of employment, which are inseparably connected with the business of life and convenience. Less prejudices, fewer objections, giving up our traditions to, and the incredulity which still remains on the minds of many would have had existence! "But better late than never." The prospect is good, your paper is highly valued and will be liberally supported on the ground you proceed, and for one, I am of opinion you will add much to its interest in giving a few remarks on the cultivation of the mulberry and silk business. I had given up presenting myself to you on the subject, until *Agricola* came forward in your last number, which gave me a desire to assist him a little; or, should I not be able to help, I hope I may not hinder; and as it is possible many will commence rearing the worms the coming season, who may be unacquainted with the process, to those I would offer a few hints from my own experience, (small as it is;) I find its advantage over all theory. I have raised a few silk worms two seasons, which both hatched on the 22, 3d and 4th of May, and from a few small leaves of a number of plants set in the garden where they came forward soonest, I kept them alive till kindly supplied occasionally from two miles distance, and notwithstanding the severe frosts and drouth during spring and summer before last, they prospered well, and my silk was called beautiful, of which I send you a sample. I advise those who would avoid unnecessary labor in dressing off the tables, that attention is necessary for their health and quality of silk. 1st. To observe they are several days in all getting out, and if we take pains to place all of the 1st day's, 2d and 3d, &c. by themselves on different places, we shall know which will moult first, and all in course will be of equal age, in each parcel, over which I erect materials for their winding after the fourth moulting. I bestowed much less labor on 1200 of this summer, than those of last of 600, in consequence of a machine invented by my boy, of some thin slips of boards fastened at each corner, and studded with short points or pegs, half an inch apart, crossing it with twine sufficiently tight to bear up the worms when grown, and I placed my fresh leaves on this thread riddle; they immediately come up from their wilted rubbish, and are nice in a short time; the offal then is soon cleared if none are set for skinning; if so, they must remain quiet, and will need no food till some time after they are out of their old dress. This simple machine saved me more than half in keeping them clean, and properly separated, for as soon as they are up on the new leaves, then carefully move the frame on a clean place. But after all my care I missed my figure to my sorrow, for I had procured a large quantity of leaves in a wet day, and I did not get them dry enough, which proved fatal to about 200 full grown worms; or, I cannot account for their loss so sudden, as they prospered well through all the change our climate is subject to. I must own I was surprised to see them prosper on so few leaves, and those from shrubbery; they differ greatly from those raised in my father's house in Connecticut, years ago. I remember they were white and short, and the cocoons were an orange colour; but these are black and brown, and some of a clay white; the last colour are those I raised the summer past, whose silk is not so clear and brilliant as that I made from the darkest colour summer before last, but I am not able to say which will be the best to raise; it remains for some better informed than myself to decide; but this I am fully convinced of, that the native black mulberry will not only support the worms, but will make handsome cocoons, as it was proved to a demonstration, by a family in this town, who had no other food. I had enough of the kind to last mine a week, on which they fed well, and many would desert the white Italian, so tender and fresh, for those large, thick, rough leaves of the native tree; but I do not test the silk until it is reeled. But all I have seen here of the kind of cocoons are of a light straw colour, and long and pointed at one or both ends, and the worms long and very ordinary. Having spun my subject thus, I ought to begin to apologize, and leave before I weary the Editor's patience; but if he will bear with me a little longer I will just mention to those who have silk to reel, spin and twist, to be sure to keep it wet during the different processes, as it helps to connect the fibres, and makes it more firm and smooth; and had we the simple French reel and *doblair* in our houses, we could reel it for a foreign market, or elsewhere, and then should we lay a foundation for future prosperity, which De Homegue speaks of in his essay, where he in his enthusiasm says, America might be what France now is, in point of wealth, that no devastation by sea or land can impoverish her, for he found our advantages over the old countries in the quantity as well as quality, having reeled on his superb French reel eight pounds of our cocoons, which made as much as twelve pounds of Italian or French. And now, Mr. Editor, permit me to give you my humble opinion, and you may give it to whom you please, that twenty years rolling round will present these United States a beautiful silk growing and manufacturing country. I risk no more in saying it than the prophet Evans, who foretold twenty years ago how our canals, our railroads, and swift flying steamers, should send our friends from north to south, from east to west. It is done. The world jeered him; they scoffed at a Fulton, at a Clinton—they may do the same now. No matter, it harms nothing; only let our enterprising men lend a hand; the work is half done; they will accomplish it, and I shall be happy to see others prosper. I expect nothing more than my labor for my pains. I wish not to reach beyond the limits of domestic concerns, and would be as willing to do without silk as any one, but since we will try to wear it, let the ladies be willing to raise it at home, that we may save a million of money, bread stuff, &c. which is sent to other climes for this one luxury. I hope to be informed, through your paper, how the *filosille*, or floss, is best manufactured. Small as my subject may appear, we must have nothing lost, for like the thousands of small streams that enter at last into the vast ocean, so may all the tributaries jointly meet at length in one complicated whole, and in the end prove a blessing to the poor, enhance the prosperity of all classes some way or other, throughout our country, as well as it has those of other climes. Yours, respectfully,

Greenfield, Nov. 22, 1835. G. B. W.

MINOR'S PATENT PUMP.

Mr. Buel—A very superior and cheap article of the above description, was sent me last fall, by the manufacturers, Messrs. H. Warren & Co. Jordan, Onondaga county, which I placed in a cistern in my yard, the operation of which I have been more pleased with than any other lift pump I have ever seen in use. It is very light and easily removed; the wearing or operating parts of them being of cast iron, and the composition with which the wooden pipe or tube is saturated, renders them durable, and obviates the evils so often charged on leaden pipes as being injurious to health.

The pump is intended to stand on the platform of the well or cistern, even with the surface of the ground; the part exposed is beautifully turned and painted. About two feet below the base, and above the working box, is a small metallic tube, which lets off the water and prevents it from freezing.

The one I have, stands on a curb eighteen inches above the platform or top of the cistern, and is partially protected by straw, &c. and it has been frozen but once, and that was in the extreme cold weather in December last: since then it has remained free and works well.

The advantages of these pumps are, the very low price at which they are afforded, their durability, perfect operation, and protection against frost.

In a printed advertisement, furnished me with the pump, I find certificates and recommendations from thirty persons, who have them in operation. CALEB N. BEMENT.

MERINO SHEEP.

To the Editor of the Cultivator,

Sir—As a practical farmer, I offer you a few remarks on the subject of sheep, and though I may not have as many finished sentences and rounded periods as some of your correspondents, yet I hope my communication may not, on that account, be discarded. I am an old fashioned man, and inclined to old fashions, unless I am convinced that a new fashion is preferable.

In the recent discussion in the Cultivator, on the subject of fine wooled sheep, reference has been made to "old fashioned merino." The term appears not to have been well received by some, and has drawn forth the denunciation of a "barn yard phrase." For one, sir, I should be glad to see more of such farmer like expressions, in place of the wordy, theoretical remarks, with which some of our agricultural writings abound. Who ever thought of restricting the farmer in the use of words when talking of his cattle, sheep, or hogs?

An affectation of refinement in these things is, in my view, worse than ignorance.

For years I have been a sheep breeder, and the term "old fashion merinos," conveys to me a "distinctive perception" of an animal, and a particular family of animals, which existed in this country, soon after their general introduction from Spain. They are now rarely to be found. If another name is more desirable, let them be called the American merino, for in truth, they were first bred in this country by crossing the different flocks which were imported from Spain. I will instance a flock within my own knowledge. The person who commenced the flock was interested in the original importation, and therefore had an opportunity to select individuals in reference to a particular object. He did so, having in view a farmer's sheep that should give quantity with as fair quality as could be obtained; the little choice bore the marks and brands of five different Spanish flocks. They were crossed as was judged best; their lambs were by no means uniform in their appearance or value; but in a course of years, with the original object steadily in view, there came a race of sheep having the general appearance of the Paulaur, the fineness of the Escurial, and the close woolled qualities of the other flocks. The had also the large size of the Nigretti.

The sheep from this little beginning, were scattered far and near, with a high reputation. In 1826, the clip of that and the previous year, was sold at fifty cents per pound: with that exception it never sold as low. The same course of breeding has, I dare say, been followed by others with like success. It is, I presume, sheep of this description and character, that some one, with strict regard to truth, has called "old fashion merinos," and homely as the name is, I like it, for it reminds me of times when our sheep gave us four or four and a half pounds of wool, whereas they now only give us two or two and a half. My neighbor farmers on all sides, fearless of "retrograding," are striving to regain their merinos. One of them has a flock of merinos, which he keeps at a stack, without shelter during the whole winter. In the severe storm of the early part of this week, I saw them entirely exposed to the weather, yet not one appeared to heed it. They were in fine condition, and their close fleeces and well woolled heads and legs, assured me they could endure any extremity of weather. There was nothing in their appearance very "chimney corner" like, I can assure you.

It is a mistaken idea, that all breeds of sheep will thrive well in all countries. It is a fact, that delicate constitutioned sheep cannot live in England, and that even of the merino there is but one small flock. The importation of Saxony sheep has never been attempted, except for re-shipment to New South Wales, Of the many thousands of merinos imported into England on the invasion of Spain, scarce a trace can be found. The only pure merinos I could find in that country, a short time ago, were the property of a gentleman near London, kept with exceeding care and attention. He succeeded, it is true; but what did it prove? Why, that an exotic may be grown in a green house. Why then are paper statements made calculated to mislead the farmers, when experience has shown us, that to succeed in wool growing, we must breed a race of sheep suited to the climate.

In my county we have paid dearly for our speculating, experimental propensity, and the remains of our merino are now departing. A drover informs me, that he has during the past season, driven to a distant part of the country, and sold 4,000 sheep, and that he is unable to supply the demands at home for merinos.

It is an established principle, that private interest and speculation must give way to public good. Very respectfully, yours, A. B.

January 8, 1836.

Mr. Buel,—Sir—Permit me to make the following statement in answer to an article in the November number of the Cultivator, over the signature of R.

The mistake that I made in my figures, and of which I was not aware till I saw it in the publication, was wholly unintentional, and was so obvious that I thought every reader would have come to the conclusion, without laying the stress upon it that R. does. I am, however, perfectly willing to be corrected in this as well as in any other mistake.

As I took the price current of the Cultivator (May number) for my guide to make up the valuation, and for the different qualities, but which was far *below* the actual value of my own wool, I beg leave to state, that instead of 80 cents as quoted from the Cultivator, its actual value was 110 cents per pound last summer. The account, therefore, as compared to R's merinos, will stand thus:

My grown Saxons, 2¾ lb. per head, at 110 cents,...............	\$3 02½
R's merinos, 4½ per head, at 60 cents.........................	2 70
Leaving a balance in favor of my Saxons, of	32½

My actual clip of 2 lbs. 6½ oz. consisted of 85 fleeces from lambs, 65 from grown ewes suckling lambs, 45 yearling ewes suckling lambs (with the exception of 8 dry ewes,) and 5 from bucks from one to three years old. Every one practically acquainted with sheep, knows that ewes, especially young ewes suckling lambs, do not shear as much as dry sheep, and I think if I had as many wethers as I have ewes, that I should shear three pounds of wool on an average, per head. I rate therefore my grown sheep at 2¾ lb. of wool, well washed on the sheep's back, per head, and I think it will rather overrun than fall short of it.

As it regards the claims of earlier maturity of the merinos over the Saxons, I will not pretend to decide, but it is questionable in my mind whether the fact is so. With great respect, your ob't. serv't.

A. D. GROVE.

Hoosick, near Buskirk's Bridge P. O. Jan. 6, 1836.

POLICERATE SHEEP.

Mr. Buel,—Sir—Having in my possession a variety of sheep, which are not very common in this country, I have procured a likeness of the oldest buck, engraved by Mr. Hall, of this city, who I think has done himself great credit in the execution.

I obtained three bucks and nine ewes, in October last, from a farmer in Bethlehem, who procured the buck figured above, some five or six years since, from which he bred several bucks with four horns. The breed was originally procured as I have been informed, from some emigrants. I esteem them more for their odd and singular appearance, than for any intrinsic value they appear to possess.

The specimen represented above,* is remarkable only for his horns. The upright ones measure from the base twenty-two inches.

Buffon says, "One of the curious modifications produced by cultivation in the domesticated sheep consists in the augmentation of the number of its horns; two, three, or even four supplementary appendages of this description being occasionally procured in addition to the usual number. Under these circumstances, the additional usually occupy the upper and forepart of the head, and are of a more slender shape and take a more upright direction than the others, thus approaching in character to those of the goat's, while the true horns retain more or less of the spiral curve that distinguish those of the sheep. There exists a strong tendency to the hereditary propagation of its monstrosity, which is extremely frequent in the Asiatic races, but is also met with in a breed that is common in the north of Europe, and is said to have been originally derived from Iceland and Fetoe Island. In the latter case it is unconnected with any other anomoly; but in the flocks of the nomad hordes of Tartary it is usually combined with the enlargement of the tail and adjacent parts, by the disposition of fat frequently to an enormous extent."

In the islands of the Archipelago, and chiefly in the island of Candia, there is a breed of sheep of which Bellon has given the figure and description, under the name of *Strepscierus*. This sheep is of the make of our common sheep; it is, like that, clothed with wool, and only differs from it by the horns, which are larger and rise upwards, but are twisted into spirals. The distance between the horns of the ewe enlarges towards their tops; those of the ram are parallel. This animal which is commonly called the Wallachian sheep, is frequently in Austria and Hungary, where its name is Zacke.

The more cold districts of Iceland and Russia afford a *many horned breed* of sheep of mostly from four to seven or eight; having a coat of dark brown coloured hairy wool, weighing about four pounds, and covering an inferior quality of short soft fur.

In Cyprus many of the sheep are policerate, (having more than two horns.) They all spring from the frontal bones, the crest of which is elevated in a peculiar manner, in order to form their base. The central horns are usually straight, or somewhat devaricating—occasionally they are spiral; the lateral ones assume almost every possible variety of curve. A cut representing one of the most frequent appearance of the Cyprus

* The cut referred to has been destroyed or lost.

four horned sheep, is figured in the "*Library of Useful Knowledge—Farmers' Series.*" CALEB N. BEMENT.
Albany, Jan. 1836.

Mr. Buel—Sir—Having had considerable experience in the culture of the ruta baga, and some in the mangel wurzel crops, I enclose to you some remarks that have not passed under my eye of late in any agricultural paper.

First, the seed should be raised from the smoothest and fairest roots, having the smallest and shortest necks, for in looking over the fields in various parts of the country, there will be found an essential difference in this respect when grown to maturity.

2d. It is common at the harvest to top them at the bottom of the neck. Such should not be the practice when designed for seed, save the main stem; neither should the seed be raised near any cabbage or kale, and vice versa, neither should the cabbage be allowed to seed by the side of the ruta baga, as both belong to one family, and both will degenerate: the ruta baga will have long large necks, and the root rough and sprangled. So also will the beet gender with the mangel wurzel, and both degenerate. The farmer, if wise will raise his own seed, or buy only of those on whom he can confide as selling the genuine seed.

The great dairy farmers in this section are waking up to their interest in this cultnre, and I have no doubt that the period is nigh, when the ruta baga will entirely supersede the growth of potatoes as a feed for sheep, cattle and horses; for one acre of rich land will produce on an average thrice as many tons of ruta baga, and will not cost in the planting, seed, tilling and harvesting more than one-tbird as much as does the potato acre, and is not as cold a feed in winter as the potato. On a four acre lot of ruta baga, the best acre last season yielded more than 20 tons, which will do much for 6 cows the winter on a short allowance of dry fodder, even if it were good straw. Our ruta baga plants of the first and second planting were entirely destroyed, immediately after tbey came out of the ground, by the little black insect resembling a flea. The third planting (about the middle of June) seemed to be hopeless for a while. Some have tried ashes and lime to good effect, as the plant comes out of the ground. Robin's drill barrow *has* on my farm the last season, been worth thrice its cost (15 dollars.) An acre of ruta baga, onions, mulberry seed, or corn, can be planted in 4 hours, and it would require more time and precision than any one would have patience to bestow, to do it as well on smooth land in any length of time. Mr. Bement, of Albany, is well acquainted with this labor saving machine, and will doubtless keep them for sale. Mr. Robins, of Copenhagen, Lewis county, is the patentee, and Daniel T. Buck, of Lowville of that county, the proprietor of this state. Green sward well turned over in the spring, and repeatedly harrowed lightly, is well adapted to growing ruta baga.

It seems to me, sir, that our common practical farmers might often call on the literary and scientific agriculturists for a solution of many problems connected with their pursuits to acceptance and great profit. And I do so in relation to the expediency of taking up the stone pavement in Broadway in New-York, and substituting wooden blocks of 1½ or 2 feet long, set end-ways. Will they be durable? Will the earth upon them shut the pores of the wood and become so impervious as to exclude the air, that they will not decay? If so—we too in the interior can substitute wooden blocks for stone; and we have yet some roads to make, over which stands a sufficient growth of timber, and that in wet mucky swampy land, where I should think wooden blocks would be more durable than in Broadway. I learn that this improvement (if it be such) is from the Russian practice of road making. An article on the philosophy and principles connected therewith, I am sure would be read with much interest by the subscribers for your valuable paper. With much respect, I am yours,
EPHRAIM PERKINS.
South Trenton, Oneida Co. Jan. 15, 1836.

I concur with Mr. Perkins in the above. Yours truly,
S. Trenton, Jan. 18, 1836. M. A. POWELL.

Montgomery Co. N. Y. Jan. 20, 1836.

IMPROVED PLAN FOR SETTING GATE AND FENCE POSTS.—WATER LIME AS A SUBSTITUE FOR PAINT, AND FOR TOPPING OUT CHIMNIES, AND PLASTERING WALLS OF HUOSES.

J. Buel, Esq.—Sir—Being desirous of giving publicity to any facts that may be of use to the community, I am induced to communicate the result of some experiments made with the above mentioned objects in view.

Something greatly desirable in setting gate posts is, to have them fixed in the ground with the greatest solidity and firmness, and at the same time have the part beneath the surface preserved from decay. This end may be obtained in this manner: The hole for receiving the post is dug of a sufficient width to allow a space all round the post of from eight to twelve inches, and of a depth of from two to three feet. The post, which should be of hard and well seasoned wood, and of a size that will not render it liable to bending, is placed in the hole, and supported in an upright position and the hole filled up with cobble stones, the largest of which would pass through a ring of five inches diameter. A thin mortar, or grout, is then formed ot two parts sand and one part water-lime, and being of a consistency to run freely, is poured on to the stones and entirely fills up the interstices between the stones, and in a few days firmly fixes the stones to each other and to the post, and the whole becomes as one solid piece of stone of the required shape to surround the post, without leaving space for the admission of water. This operation is the same with that in making cisterns of a certain kind recently invented and patented by a citizen of this state.

It will be observed that this manner of setting posts for farm gates dispenses with resorting to anchors and braces to give the required firmness. For setting fence posts this plan will perhaps be advisable only when of the best seasoned cedar, some of which, of the red species, are known to the undersigned to exist in a sound state at this time, that were taken from the stump in the year 1745.

As a cheap and valuable substitute for paint for outhouses the same article mentioned above has been used to a considerable extent in this vicinity, and with the most decided success. The ingredients are the most simple and easily procured, though one is of a nature that would not at first be considered as suitable for uses of this kind. To give greater adhesiveness to the cement, or water-lime, when it is to dry in the open air, *milk* that has had the greater part of the cream taken from it has been used. This and the cement are used instead of oil and white lead, or other paint. When a different colour from the natural, (a dusky white) is desired, a small proportion of common paint is added to give the colour. One peck of cement, which costs one shilling, and five pounds Spanish brown, costing about four times that amount, will form a paint, and of a very good colour, for an ordinary sized barn. This is for one coat, and for two about twice the quantities will be necessary. It forms a durable paint and effectually preserves the boards from decay. Cement in the vicinity of Albany costs about two dollars per barrel. The nearest manufactory is that of Messrs. J. Van Eps & Co., Amsterdam, whose cement is of the lightest colour, and therefore best fitted for paint.

Chimnies when laid up wholly with quick-lime, are subject to having the top bricks become loose and fall off by the crumbling of the mortar. This difficulty is avoided by the use of equal parts of quick-lime and cement. Mortar of the same kind may be used to advantage in plastering walls, or for a second coat after the first of quicklime has been roughened, when it will make an excellent hard finish. H. VAN EPS.

Cattle and Sheep Husbandry.

SHEEP.

Agriculturists have applied different names to the sheep according to its sex and age.

The male is called a *ram* or *tup*. While he is with the mother, he is denominated a *tup* or *ram-lamb*, a *heeder;* and in some parts of the west of England, a *pur-lamb*. From the time of his weaning, and until he is shorn, he has a variety of names: he is called a *hog*, a *hogget*, a *hoggaret*, a *lamb-hog*, a *tup-hog*, or a *teg;* and, if castrated, a *wether hog*. After shearing, when probably he is a year and a half old, he is called a *shearing*, a *shearling*, a *diamond* or *dinmont ram*, or *tup;* and a *shearing wether*, &c. when castrated. After the second shearing he is a *two-shear ram*, or *tup*, or *wether;* at the expiration of another year he is a *three-shear ram*, &c.; the name always taking its date from the time of shearing.

In many parts of the north of England and Scotland he is a *tup-lamb* after he is salved, and until he is shorn, and then a *tup-hog*, and after that, a *tup*, or if castrated, a *dinmont* or a *wedder*.

The female is a *ewe* or *gimmer lamb*, until weaned; and then a *gimmer hog*, or *ewe hog*, or *teg*, or *sheeder ewe*. After being shorn she is a *shearing ewe* or *gimmer*, sometimes a *theave*, or *double-toothed ewe*, or *teg;* and afterwards, a *two-shear*, or *three-shear*, or a *four* or *six-tooth ewe* or *theave*. In some of the northern districts, ewes that are barren, or that have weaned their lambs, are called *eild* or *yeld* ewes.

The age of sheep is not reckoned from the time that they are dropped, but from the first shearing, although the first year may thus include fifteen or sixteen months, and sometimes more.

When there is doubt about the age of a sheep, recourse is had to the teeth, for there is even more uncertainty about the horn in horned sheep, than there is in cattle; and ewes that have been early bred from, will always, according to the rings on the horn, appear a year older than others that, although of the same age, have been longer kept from the ram.

It has already been stated, that sheep have no teeth in the upper jaw, but the bars or ridges of the palate thicken as they approach the fore part of the mouth; there also the dense, fibrous, elastic matter of which they are constructed, becomes condensed, and forms a cushion or bed that covers the convex extremity of the upper jaw, and occupies the place of the upper incisor or cutting teeth, and partially discharges their function. The herbage is firmly held between the front teeth in the lower jaw and this pad, and thus partly bitten, and partly torn asunder. The nodding motion of the head of the sheep is a sufficient proof of this.

This animal is one of those especially destined to support man with his flesh; and that he may be able to do this with the least possible expenditure of food, and to extract the whole of the nutriment which the herbage contains, a provision common to all ruminants (as will hereafter be more fully explained) is made in the construction of the stomachs, and other parts of the digestive apparatus. As the first process by which the food is prepared for digestion, it is macerated for a considerable time in the paunch. The frequent and almost necessary consequence of the long continuance of the food in this stomach, exposed to the united influence of heat and moisture, will be the commencement of fermentation and decomposition, and the extrication of a considerable quantity of injurious gas. This often takes place, and many sheep are destroyed by the distension of the paunch caused by this extrication of gas. The process of fermentation and decomposition is accompanied by the presence or development of an acescent principle. It has been stated that an elastic pad occupies the place of teeth in the upper jaw; aud that it is by a half biting and half tearing action that the sheep gathers his food: the necessary consequence is, that some of the grass, of harder construction than the rest, docs not give way, but is torn up by the roots; a portion of the mould adheres to the roots, and is swallowed, and, all our soils containing more or less absorbent or calcareous earth, the acid is neutralized, and, as it were, removed, as rapidly as it is formed; except in some extreme cases, attributable almost entirely to the neglect or thoughtlessness of the proprietor of the sheep.

The teeth of the sheep are the same in number as in the mouth of the ox. There are eight incisor or cutting teeth in the fore part of the lower jaw, and six molars in each jaw above and below, and on either side.—The incisors are more admirably formed for the purpose of grazing than in the ox. The sheep bites closer than the ox; he was destined to live where the other would starve: he was designed in many places to follow the other, and to gather sufficient nourishment where the ox would be unable to crop a single blade. Two purposes are answered by this: all the nutriment that the land produces is gathered from it, and the pasture is made to produce more herbage than by any other means it could be forced to do. The sheep by his close bite not only loosens the roots of the grass, and disposes them to spread, but by cutting off the short suckers and sproutings—a wise provision of nature—causes the plant to throw out fresh, and more numerous, and stronger ones, and thus improves and increases the value of the crop. Nothing will more expeditiously or effectually make a thick permanent pasture than its being occasionally and closely eaten down by sheep.

In order to enable the sheep to bite thus close, the upper lip is deeply divided, and free from hair about the centre of it.

The stalks of the common herbage of the field, bitten thus closely as they are by the sheep, are harder and more fibrous than the portions that are divided and cropped by cattle; and not only so, but some breeds of sheep are destined to live, in part at least, on harder food than falls to the lot of cattle, as the different kinds of heath, or substances almost as difficult to be broken off as the branches of the heath. The incisor teeth are evidently formed for browsing on these dense productions of the soil, which would otherwise be altogether useless and lost. The part of the tooth above the gum is not only, as in other animals, covered with enamel to enable it to bear and to preserve a sharpened edge, but the enamel on the upper part rises from the bone of the tooth nearly a quarter of an inch, and, presenting a convex surface outwards, and a concave one within, forms a little scoop or gouge capable of wonderful execution. He who will take the trouble to compare together the incisor teeth of cattle and of sheep—both ruminants—both by means of the half-cutting and half-tearing action, having the stomach, in which the process of maceration is going forward, abundantly supplied with the absorbent or alkaline earth—the one, however, destined to crop little more than the summit of the grass, and the other to go almost close to the roots, and occasionally to browse on harder food—will have a not uninteresting illustration of the manner in which every part of every animal is adapted to the situation in which he is placed, and the destiny he is to fulfil. The pad also is firmer and denser than in cattle, yet sufficiently elastic, so that it is in no danger of injury from the sharp chisels below, while the interposed substance is cut through with the greatest ease.

The mouth of the lamb newly dropped, is either without incisor teeth, or it has two. The teeth rapidly succeed to each other, and before the animal is a month old he has the whole of the eight. They continue to grow with his growth, until he is about fourteen or sixteen months old. The accompanying cut, fig. 1, will give a fair representation of the mouth of a sheep at this age. Then, with the same previous process of diminution which was described in cattle, or carried to a still greater degree, the two central teeth are shed, and attain their full growth when the sheep is two years old. Fig. 2, gives a delineation of the mouth at this age.

In examining a flock of sheep, however, there will often be very considerable difference in the teeth of the hogs, or the one-shears; in some measure to be accounted for by a difference in the time of lambing, and likewise by the general health and vigor of the animal. There will also be a material difference in different flocks, attributable to the good or bad keep which they have had.

Fig. 1.

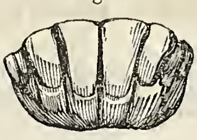


Fig. 3.

Fig. 6.

Fig. 2.

Fig. 4.

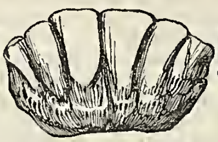


Fig. 5.

Those fed on good land, or otherwise well kept, will take the start of others that have been half-starved, and renew their teeth some months sooner than these. There are, however, exceptions to this; Mr. Price* says that a Romney Marsh teg was exhibited at the show fair at Ashford, weighing 15 stones,† and the largest ever shown there of that breed, and that had not one of his permanent broad teeth.

There are also irregularities in the times of renewing the teeth, not to be accounted for by either of these circumstances; in fact, not to be accounted for by any known circumstance relating to the breed or the keep of the sheep. The same author remarks, that he has known tups have four broad and permanent teeth, when, according to their age, they ought to have had but two.‡ Mr. Culley, in his excellent work on "Live Stock," says—"A friend of mine and an eminent breeder, Mr. Charge, of Cleasby a few years ago showed a shearing tup at Richmond, in Yorkshire, for the premium given by the Agricultural Society there, which had six broad teeth; in consequence of which the judges rejected his tup, although confessedly the best sheep, because they believed him to be more than a shearing: however, Mr. Charge afterwards proved to their satisfaction that his tup was no more than a yearling."§ Mr. Price, on the other hand, states that he "once saw a yearling wether, which became quite fat with only one tooth, that had worked a cavity in the upper jaw, the corresponding central tooth having been accidentally lost."

The want of improvement in sheep which is occasionally observed, and which cannot be accounted for by any deficiency or change of food, may sometimes be justly attributed to the tenderness of the mouth when the permanent teeth are protruding through the gums.

Between two and three years old the two next incisors are shed; and when the sheep is actually three years old the four central teeth are fully grown (see fig. 3): at four years old he has six teeth fully grown (see fig. 4): and at five years old all the teeth are perfectly developed (see fig. 6.) This is one year before the horse or the ox can be said to be full mouthed. The sheep is a much shorter lived animal than the horse, and does not often attain the usual age of the ox.

The careless examiner may sometimes be deceived with regard to the four-year-old mouth. He will see the teeth perfectly developed—no diminutive ones at the sides, and the mouth apparently full; and then, without giving himself the trouble of counting the teeth, he will conclude that the sheep is five years old. A process of displacement, as well as of diminution, has taken place here—the remaining outside milk teeth are not only shrunk to less than a fourth part of their original size, but the four-year-old teeth have grown before them and perfectly conceal them, unless the mouth is completely opened. Fig. 5 represents this deceptive appearance.

After the permanent teeth have all appeared and are fully grown, there is no criterion as to the age of the sheep. In most cases the teeth remain sound for one or two years, and then, at uncertain intervals, either on account of the hard work in which they have been employed, or from the natural effect of age, they begin to loosen and fall out; or, by reason of their natural slenderness, they are broken off. When favorite ewes that have been kept for breeding begin, at six or seven years old, to lose condition, their mouths should be carefully examined. If any of the teeth are loose they should be extracted, and a chance given to the animal to show how far, by browsing early and late, she may be able to make up for the diminished number of her incisors. It will not unfrequently happen that ewes with broken teeth, and some with all the incisors gone, will keep pace in condition with the best in the flock; but they must be well taken care of in the winter, and, indeed, nursed to an extent that would scarcely answer the farmer's purpose to adopt as a general rule, in order to prevent them from declining to such a degree as would make it very difficult aftwerards to fatten them for the butcher. It may certainly be taken as a general rule that when sheep become broken mouthed they begin to decline.

* Price on Sheep Grazing, &c. p. 84.

† The weights will all be calculated according to the new regulation of 14 lbs. to the stone.

‡ Price on Sheep Grazing, &c. p. 83. § Ib. 214.

It will probably appear, when the subjects of breeding and grazing are discussed, that it will be the most profitable course to fatten the ewes when they are five, or at most, six years old, and supply their places with the most likely shearing-ewes. When a sheep gets much older than this, it begins to decline in its wool, and certainly loses much of its propensity to fatten; while, in the usual system of sheep husbandry, the principal profit consists in early and quick fattening.

The natural age of sheep it is difficult to assign. They will usually live, and breed, and thrive tolerably well, until they are ten years old; but there are instances of their living and thriving to a much more protracted age. Lamerville speaks of a Spanish ram, thirteen years old, that died sound, and got lambs in his thirteenth year.* Mr. Moore of Winthorpe, had on his pastures in 1824 a ewe that yearned a pair of lambs when she was a shearling; had two pairs yearly for fifteen years, and in the last two years produced single lambs.† Mr. Culley has "heard of particular sheep living to nearly twenty years old—those which the mountain shepherds call *guide-sheep*, viz: old wethers kept on purpose to guide and direct the bleating flocks upon those unfrequented wilds."‡

The molar teeth or grinders of the sheep are well adapted for lacerating, and reducing almost to a pulp, the grassy or more hardened fibres which compose a great proportion of the food of the animal. They are not only surrounded by enamel, but columns of it sink deep into their substance and rise above the upper surface of them. The faces of these teeth are cut into a number of deep grooves running across them, from without, inwards, and the projecting parts of the teeth of the one jaw are received into the depressed grooves of those of the other.

The faces of the molars being also slanting, in a direction from without, inwards in the lower jaw, and from within, outwards in the upper one, and the projecting edges of the enamel being exceedingly sharp, it is almost impossible that, in the lateral grinding motion of the lower jaw in the act of rumination, and the slow and careful manner in which it is performed, many of the fibres can escape, or if they do, there is an after provision for reducing them, which will, in the proper place, be described.—*Library of Useful Knowledge, Farmers' Series.*

Miscellaneous.

WILL THE STATE PATRONIZE AGRICULTURE ?

Is a question often asked, but somewhat difficult to be answered. While capitalists and speculators can in a few hours, or days, make their hundreds and thousands of dollars, by the mere transfer of property, or on a rise of stocks, *they* will not care for the interests of agriculture, though it be the legitimate source of our wealth. While party politicians are looking to office for fame and fortune, *they* are not willing that agriculturists should share in the bounty of the state, though they be the great tax paying community. Yet we trust there are many, very many, who fall under neither of these appellations so far, as to render them regardless of the true interests of the state. The agricultural products of the state are believed to amount to fifty millions of dollars annually. Ten per cent, or five millions of this annual product, has been produced by improvements growing out of the legislative appropriations for agriculture in 1817. Our lands are susceptible, it is well known, of vast improvement in their product, and should the appropriation be made, which is contemplated in the following petition, we have not the least doubt but it would be a certain means, in five years, of adding ten per cent, or five millions of dollars, to the annual products of our agriculture; and that the revenues to the state, from the increase, would far more than remunerate the treasury for the expenditure.

The petition inserted below was drawn in 1832, by Jesse Hawley, Esq.—We republish it at this time, because we believe the plan it suggests in the main a good one, and with the view of bringing the subject before the public in time to form a topic for deliberation in the agricultural convention which is to meet on the 2d Monday in February.

PETITION TO THE LEGISLATURE.

To the Honorable the Legislature of the State of New-York, in Senate and Assembly convened:

We the subscribers, being mostly Farmers, residing in the County of
Humbly Represent:

That we should be highly gratified to see a State Agricultural Institution, forming an appendage of the magnificent system of Internal Improvement by which the State of New-York has signalized herself among her sister states in the American Confederacy;—to be constituted by a main State Society, with County Societies, as branches to the same; to be endowed with an annual appropriation of twenty-five thousand dollars from the State Treasury;—to be distributed among the several County Societies on the ratio of one hundred and fifty dollars to each Member of the Assembly;—to be expended in premiums for practical and experimental improvements in Agriculture, Horticulture and Manufactures; and the residue (being nearly six thousand dollars) appropriated for the funds of the State Society, to be expended in procuring choice, select, rare and useful Animals, Vegetables, Seeds, Implements, and Essays on Agriculture, for public distribution.

That the citizens of each County in the State be authorized and required to form a County Agricultural and Horticultural Society, organized with officers and committees, similar to the former Institution; that they draw their respective quotas of the public moneys, by the draft of their Presidents, certified and sealed by the County Clerk, on the Treasurer of the State Society;—that they add thereto, as far as may be, by private subscriptions and donations from patriotic citizens; but in order to obviate the senseless objections made to the former Societies, no competitor for premiums shall be required to pay initiation fees;—that the officers thereof shall distribute these moneys for premiums (after paying the necessary contingent expenses) on the best articles of Agriculture and Horticultural products; farm stock; experiments in farming and gardening; routine of crops; premium farms; and all the varieties of domestic household and shop manufactures;—that the Treasurer of the County Societies annually render an account of these applications of their moneys to the Treasurer of the State Society, and he, his accounts to the Legislature, or the Comptroller;—that the surplus funds of any one year, be carried to extend the list of premiums for the succeeding year;—that any county, failing to form and organize a Society, shall forfeit its quota of the state bounty, and the amount thereof shall be carried, cither to the disposable funds of the State Society;—or, to the next year's fund for distribution to the County Societies.

That the State Societies be composed of Delegates from the County Societies, either, by the President, ex-officio;—or by a proxy, to be elected, either at the annual meeting, or by the Board of Managers; and also of the Members of both Houses of the State Legislature, as the Members thereof;—that they annually convene at the Capitol in the City of Albany, on the first Tuesday of February, for the choice of their officers and the transaction of business;—and that any citizen of the State be eligible to its offices.

That the President, Corresponding Secretary, Recording Secretary, and the Treasurer of the State Society be allowed a moderate salary of $200 or $250 per annum, for their services; and that the like officers of the County Societies, together with the Managing Committee, and the Reviewing Committee for premium farms, be allowed from one to two dollars per day, for actual services rendered in making preparations for, and in superintending the public exhibitions, and other business concerns of the Society;—in order to reward labor and talent, ensure the due and diligent performance of the duties of their respective offices, and to give life and spirit to the Institution.

That the funds may not be left to the doubtful contingencies of individual subscriptions;—or town votes;—or supervisor's supplies;—but, made a certain, adequate and permanent appropriation for a period of twenty years, that a thorough and efficient experiment be made on the utility of Agricultural Societies, instead of the former incompetent and penurious trial of two years, only.

We present you with this outline as being our views of the best manner of organizing and sustaining such an Institution: and we confidently ask it of you:

Because, Agriculture, being the chief source of human sustenance, deserves equal encouragement from the public authorities with any other vocation of man in society;—but has hitherto been the most neglected:—

Because, from past experience we are convinced that the award of premiums, and the competition for them, is the best mode yet devised, both to stimulate and reward the exertions and enterprise of individuals in making practical experiments, to be collated into a body of science for general instruction:—

Because, from the like experience we find that no certain reliance can be reposed on voluntary subscriptions to obtain the funds for premiums:—

Because, the limited means and daily wants of our practical Farmers deny them the time and capital to make gratuitous experiments; and when so made by the few spirited and enterprising individuals, the result remains obscure, without general circulation for the public benefit:—

Because, the Farmers being the principal Tax-Payers of the State, deserve a portion of the public bounties for the encouragement and improvement of their vocation:—

Because, scientific and practical improvement in Agriculture are a common public benefit, as well as the education of our children; and like that, most assuredly deserves to be sustained with a systematic organization by statute law and state bounty:—

And because, were it encouraged and sustained by public bounties, we believe it could be made greatly to increase subsistence; multiply population; and enhance the value of our lands.

We humbly conceive that such an Agricultural Institution belongs to the grandeur of New-York, to adorn her present Civil, Literary and Social Institutions, and her system of Internal Improvements:—that while the experiment would cost the State Treasury half a million, yet nearly all, and probably more than than that amount would be returned, by the increase of Canal Tolls, from increased production; the taxable value of the Real Property in the State augmented probably more than twenty millions; and the market value of the farming lands in New-York, made to command better prices than those in the adjoining states, as is already the fact, along the northern boundary line of Pennsylvania. And that the project is a great statesman's measure. As in duty bound, et cetera.

* Lamerville on Sheep, p. 102.
† Farmer's Journal, May 3, 1824.
‡ Culley on Live Stock, p. 212.

THE HOP CULTURE.

The soil most favorable to the growth of hops, is a deep rich loam, pretty strongly inclining to clay, moist, but not wet; and the subsoil should be porous, so as not to retain the water which settles from the surface. The largest crops are grown in Britain upon a kind of slaty ground, where the understratum is rock. The most desirable situation for a hop plantation, is ground sloping gently towards the south and southwest, and screened by means of high grounds or forest trees, from the north and north-west. At the same time it should not be confined so as to prevent the free circulation of air, which is indispensably necessary to the well being of the hops, as not only conducing to the health and vigor of the plants, but as tending to prevent blight and mildew. The neighborhood of fenny or swampy grounds is unfavorable to the hop crop.

In preparing the soil previous to planting, considerable attention is necessary by fallowing, or otherwise, to destroy the weeds, and to reduce the soil to as pulverized a state as possible. The ploughing should be deep, the ridges made level, and the dung applied with a liberal hand.

The mode of planting is in rows, with intervals generally of six or eight feet. A good way is, after the ground is prepared, to draw furrows both ways across the field, at the intended distance of the hills, and to plant at the points of intersection. At eight feet apart, there will be 680 hills on an acre; at six feet 1,210. Planted in this way, the ground may be kept clean and worked by the harrow and cultivator.

The time of planting is generally in the spring, when the old plants are dressed and pruned, and from which cuttings and sets may be obtained.— Plantations may also be made in Oct. and Nov. Sometimes roots and sets are planted one year in the garden, to give them strength and vigor, and then removed to the plantation.

The plants of cuttings should each have two joints or eyes; from the one which is placed in the ground springs the root; and from the other the stalk, provincially the bind. They should be made from the most healthy and strong binds, being cut generally to the length of five or six inches. When the ground has been marked out, take out a spit or spade depth of earth where the furrows cross, loosen the earth below, and throw in half a bushel of fermented dung, or compost, or surface mould, into each hole; then replace so much of the earth taken out as to form a small hillock. Upon this put in, with a dibble, five or six sets, at intervals of six inches, inclining to the centre, where one of the plants may be placed.

An interval crop is generally taken the first summer, of beans, potatoes, or even corn, though the smaller the system of roots of the internal crop the better. It should be a hoed crop, in order that the ground be kept clean. The hops do not produce any thing the first year. The common cultivator may be used in cleaning the interval crop, the hop hills may be slightly earthed, and weeds destroyed.

The process of tilling, hoeing, and earthing up, is an annual operation, performed in the spring, and manure is applied once in three years. It is either laid on the hills of the hops, or in the rows, and buried with a shallow furrow. In June the operation of twisting is performed on such plants, planted in the spring, as are not expected to produce any crop that season; and consists in twisting the young vines into a bunch or knot, so as to induce a more vigorous growth of roots.

The yearly dressing of established hop plantations consists of what is provincially called picking. This operation is generally commenced as early as the season and soil will permit, in April, when the hills are spread out, in order to give opportunity to prune and dress the stalks.— The earth being then cleared away from the principal roots by an iron instrument called a picker, resembling a dung fork, but with more and lighter teeth, the remains of the former year's vines are cut off, together with the shoots which were not allowed to attach themselves to the poles the former season, and also any young suckers that may have sprung up about the edges of the hills; so that nothing is allowed to remain that is likely to injure the principal roots, or impede their shooting out strong vigorous vines at the proper season. After the roots are properly cleaned and pruned, the hills are again formed, with the addition of the manure, when applied.

Polling the hop is performed in April, when the shoots have risen two or three inches. The poles may be 12 to 15 feet in length, and sufficiently stout to resist the strength of the wind, when covered with the hop vines. They are fixed in the ground by making deep holes with an iron crow, and ramming the earth well round them after they are inserted in the holes. Two, three or four poles are placed at each hill, in such position as to leave the south side open to the meridian sun.

Tying the vines to the poles, is an important operation. It is performed as soon as the vines have grown sufficiently to require it, and repeated till they have attained a secure height. Two or three strong vines are selected for each pole, wound round, and tied loosely with withered rushes bass matting or other ligature. The remaining vines are then cut away.

Picking the crop is thus performed. Frames of wood are raised in the most convenient part of the plantation. These frames consist of four boards nailed to four upright posts, the whole frame being about 8 feet long, 3 feet wide and 3 feet high. Six, seven, or eight pickers, generally women or boys, are placed at the frame, three or four being at each side. The plants being cut through at the root, the poles are lifted up and laid upon the frame with the hops upon them. The pickers then can freely pick off the hops, which they drop upon a large cloth which is hung upon the frame with tenter hooks. When this cloth is full, the hops are emptied into a large sack and carried to the drying house, where they are kiln dried and bagged for market. The hop crop should be gathered *when it is ripe*, and before the autumnal frosts. For the criteria of ripeness, or the period when they are best fitted to gather, and directions for drying, we refer to the brewers' circular, at p. 83 of this volume.

The process of packing, is thus managed. In the floor of the room is a round hole, equal to the size of the mouth of the bag. The mouth of the bag is then fixed firmly to a strong hoop, which is made to rest on the edge of the hole. The bag is then let through the hole, suspended by the hoop, and the packer goes into it. Another person puts the hops into the bag in small quantities at a time, and the picker tramples them firmly down. When the bag is full, it is drawn up and the end is sewed. The hops are now ready for market. In the mean time the poles in the plantation have been stripped of the stems attached to them, and set up in stacks to await the following year. A hop plantation lasts from 10 to 15 years, when it must be renewed, the old roots dug up, and fresh sets planted, on another plat of ground.

The produce of the hop is variable. It varies from two to 20 hundred weight the acre—1,200 is perhaps about the medium. We have no data as to the cost of labor; but assuming the above medium, and that the average price is 20 cts. per lb. the produce of an acre will be worth $240, expenses to be deducted.

From the New-York Farmer.

THE IMPORTANCE OF EDUCATION TO FARMERS.

BY HENRY COLMAN.

The station in the community occupied by the agricultural class, is commanding and important. In every country of any considerable extent, they constitute the most numerous part of the population; and that upon which all others ultimately depend. The products of agriculture are the first form of wealth; and without the labors of the husbandman, every other occupation must cease. Where agriculture has been extensively carried on, and estates large, there the planter or landholder has generally held a high political estimation; and exercised all the influence to which he could justly aspire. In England, the nobles and barons, in Europe, the feudal lords and princes, and in our own country, the southern planters, have maintained a high rank, and wielded a powerful control in the affairs of the country. These individuals, however, scarcely deserved to be classed with the agricultural population, since, with some few occasional but most honorable exceptions, they have seldom taken any immediate interest in agriculture, properly so called, or entered into its details farther than to receive its rents; and then, we should be happy if truth did not compel us to add, have looked with disdain and scorn upon the actual tillers of the soil, those whose severe toil furnished them the means of subsistence, luxury, and wealth.

In our own country, in those parts of it where free labor only is known, and where, especially in New-England, the land is greatly subdivided into innumerable and comparatively very small freeholds, and the owners are themselves the actual cultivators of the soil; there the farmers, though not a degraded class, have yet failed to have that place in the public estimation, and that influence in the public concerns, to which, as a class, the part they perform, and the contributions they render to the public weal, entitle them. The professional man, the merchant, the trader, the tavern-keeper, the manufacturer, and the mechanic, take precedence of the farmer; and feel at liberty, unless he has about him the artificial insignia of some office, to look down upon him. To this law of rank, if so it may be called, the farmer, in general, submits without remonstrance or complaint, and consents to see even the shiftless, idle, and dissolute, who live only to consume the fruits of the earth, and take no share of the public burthens, and contribute not a whit to the substantial welfare or real improvement of the community, preferred before him.

Now, do we wish to excite in the farmers a foolish ambition? Do we desire to make them eager after distinctions, which have no substantial importance? Would we have them deserting the plough, quitting the honorable though humble occupations of their own domicils, and enter the arena of political strife, and engage in the idle struggles for precedence, notoriety, and display, which every where excite and agitate the community? Far from this. We think this would be alike injurious to their interest and comfort. We think farmers are almost always losers by every engagement or occupation disconnected with their proper pursuit, which necessarily carries them away from home. We do not mean occasional absences, in which a farmer may go abroad, to see, as Bakewell expresses it, " what his neighbors are about;" for in this way, he may get much valuable information, which otherwise he could not acquire; but we mean engagements, occupations, and absences, which necessarily divert his attention from the proper business of his farm. We have never known a farmer set up for a politician, or a jockey, either on the turf or in the market, or a man of pleasure, without his farm suffering for it. But what we desire is, that the occupation and profession of agriculture should be advanced to that degree of respectability, which should make it an object of desire instead of disdain, and give it that place in the public estimation, which its importance justly claims. We wish that manual labor should be considered honorable; and that the man who, by the sweat of his brow, develops the resources of our great nourishing mother, the earth, and, by toil and skill, extends these resources and doubles her products, for the subsistence and comfort of the animal creation, and thus multiplies indefinitely the capacity and means of happiness, should be regarded as among the truest benefactors of the community; as occupying one of the most honorable posts, and performing one of the most useful parts in the beneficent schemes of Divine Providence.

The next inquiry is, can this be done? We shall not undertake to say how fully or to what extent it may be accomplished; but we are happy in the belief that much has already been done, and still more may be effected, to render the profession of agriculture as respectable as, in a political view, it is useful, and, to a rational mind, engaging and delightful. What many of us feel to be matter of serious regret, and which results, in a considerable degree, from the false notions of which we have been speaking, is the fact that farmers' sons are in so small a proportion found willing to engage in the business of farming; but are crowding into the learned professions, already full to overflowing; pushing into every avenue of trade, with the impetuosity of a pent-up stream, and suddenly bursting the barriers of its enclosure; thirsting for political office or employment under any form, with an eagerness as impatient as that with which certain voracious expectants in the farm-yard gather round the trough at the call of the herdsman; forsaking the simple fare and the plain and humble occupations of the country, for the enervating, and too often pernicious luxuries and pleasures, and the exciting, harassing, and uncertain cares, may we not add, perilous games, of city and commercial life; exchanging the wholesome and free pursuits of agriculture, oftentimes at the certain risk of health and life, for some of the most unwholesome pursuits of the arts and manufactures, if so that in any way they can see a quicker return in cash for their labor; more often seeking to live by their wits than their hands; and, at the peril of peace, honor, and all good morals, plunging into the most extravagant and hazardous speculations.

Now, to be sure, the obvious and perhaps only cure for this evil would be to correct the moral sentiments of the community; to give to the young a truer standard of duty; more correct views of what is honorable; a juster sense of what they owe to society, and better notions of the true dignity and good of life. It would be well, if we could early make them feel that they were as much designed to labor as to live; that the industrious employment of their talents of every kind, is an obligation of the highest solemnity, and one which they cannot forego with impunity; that all labor which is useful, whatever may be the current estimation of it, is equally honorable; that a competency is far more favorable to comfort and virtue, than an excess; that exemption from care and labor is, in most cases, a curse rather than a blessing; that a sufficiency of the common comforts of life, with the means of meeting the ordinary claims of hospitality and beneficence, added to the gradual improvement of our condition as we advance in age, presents the situation of all others the most desirable and enviable in human life; that an inordinate avarice, with its ordinary concomitants of niggardliness, fraud, and inhumanity, is among the most debasing of all passions; that they who make undue haste to be rich are seldom innocent; that sudden acquisitions are always hazardous to virtue; that speculation is a game of hazard, in which men much oftener lose than win, and extraordinary gains are but too often made at the cost, if we may use the expression, of losses, for which no pecuniary success can ever furnish a compensation. These moral influences are likely to have but a very partial operation. Few are so fortunate in the situation in which they are early placed, so favored in their connexions, their parentage, their early advantages,—that these impressions become so deeply implanted in the seed-time of life, and so carefully watched over and strengthened by parental culture and example, as to control the decisions of youth, and fix their lasting impress upon the character. To most persons, indeed, these lessons come only as the fruit of their own mature experience, and so late in life that it is almost beyond our power to retrieve our early mistakes, and apply the dictates of wisdom to the regulation of our business and conduct.

But what these moral influences may fail to effect, we may hope will be ultimately accomplished by the power of education, operating in conjunction with them; we mean intellectual education—intellectual improvement. In this matter, we trust we shall be doing no injustice to the agricultural class, if we say they are very deficient; that they are very far below the point, in the scale of information which they ought to have reached, in this age of easy knowledge and unexampled progress. Taken as a body, are not the farmers, in respect to intellectual improvement, far behind the merchants and the mechanics? With professional men of course, we do not compare them. If farmers, then, would be respected as they ought, they must, by the improvement of their minds, establish their claims to this respect. They must not only cultivate their lands, but they must cultivate themselves. Putting moral character out of the question, for nothing is to be compared with this, what raises one man above another? Not animal strength; not political power; not mere cunning; not artificial arbitrary rank; but mind, knowledge, intellectual cultivation, true philosophy. This constitutes the only real nobility of human nature—the legitimate aristocracy of mankind, whose laurel honors are open to all who will deserve them, and with which no aristocracy of wealth, or power, or title, can ever come into competition.

We say, then, there is no class in the community so much interested in education as the farmers. They are the most numerous part of the population; they are in every respect the most important part of the population. We mean nothing invidious or disparaging to other pursuits or professions by these remarks, but *they* have more at stake in the country than any other class in the community. Professional men, merchants, and others, among the non-productive classes, may change their business pursuits, or residence, at pleasure; readily become naturalized to any situation in which they happen to be placed; carry their goods, talents, and capital with them; and soon take root wherever they chance to fall. No so with the farmer. His farm is immovable; he is a fixture to the soil; he cannot, if he would, separate himself from his country; and all his interests are involved in its welfare and condition. Floating capital, as it is termed, may play ten thousand pranks; expose itself at one time, and suddenly hide itself at another; now rise to the surface and basking in the sunshine, making the whole sea, as far as the eye can reach, appear like a bed of glittering diamonds; and then, at the first rising of the storm, when the threatening cloud is no bigger than a man's hand, at once sink to the bottom, and bury itself in its unsearchable concealments; at one time emerging from the waters long enough only to throw its dazzling rays into the eyes of the bewildered and enraptured beholder; and then, as it were, at the pleasure of the magician, who cries begone, it vanishes from his sight. It is far different with what is properly called real property—the farm, the capital of the farmer; that remains fixed and exposed, without the possibility of withdrawal, or concealment, or shelter, to all the changes of the political sky. All that he calls his own is fastened, by an inviolable chain, for weal or for woe, to the destines of his country. Are we wrong then in saying, the agricultural class are the most important part of our population? and can we, in respect to this class, possibly overrate the importance of education? To what class in the community is it so important that they should understand their rights; that they should have a just perception of the true interests of the country; and that they should be qualified for the intelligent discharge of their duties as citizens of the Republic, who must always have the deepest interest in its destinies and fortunes; and who, so long as our free constitutions are sustained, and the right of universal suffrage is continued, must have its government and condition within their control? Nothing can effect this much for them but education. This only can secure to them that respectable standing in the political community, to which they have a just claim, and enable them to exert properly and successfully the important influence which belongs to them. While the great body of the yeomanry remain an ignorant, and comparatively degraded class, the inevitable consequence of ignorance, there is in truth no adequate security for public liberty.

Education, in the next place, is most important to the farmers as matter of interest—I mean matters of interest and profit in their own art. I know very well the idle and senseless sneers, which are thrown out continually against what is called book farming, but they are scarcely worth noticing. I am not unaware, likewise, of the great importance of practical knowledge and personal experience in an art so practical as agriculture. Yet I have no hesitation in saying, that there is no art, which, for its improvement and success, owes more to science than this. I admit that some of our most successful farmers, in a pecuniary point of view, as well as some of our most enterprising merchants, have been men of very imperfect advantages, and limited information. But though they have been men of few of the public and ordinary advantages of education, yet such men have never, unless in some very extraordinary and accidental case, been other than what are called self-taught men; men of great natural shrewdness and intelligence, who have anxiously availed themselves of all the advantages within their reach, and obtained all the information in respect to their particular profession and art, which it was in their power to acquire. And have they not themselves invariably felt and lamented the want of education? And would not their labors have been more efficient, their improvements greater, their efforts made with superior success, if, to the native energy, and perseverance, and good judgment and skill, for which they have been remarkable, had been added the knowledge and information, which superior early advantages of education would have afforded them? But produce as many of these cases of extraordinary success on the part of uneducated men as can be found, and, on the other hand, of the ill success of merely theoretical men, literary book-farmers, who, without any previous practical knowledge, have undertaken to manage and cultivate a farm solely by information gathered from treatises of agriculture, (and yet I confess I have never known such instances,) yet if these cases of either kind were a thousand times as numerous as they are, would this overthrow the established principle of the universal value of knowledge? and if, in every other art, even the most humble, knowledge is so important, is the source of power, and an essential means of success in the great art of agriculture, involving so many relations to be regarded, so many operations to be performed, so many materials to operate upon, and so many instruments with which to operate, can we be guilty of the flagrant absurdity of supposing that here science is of no avail? much rather, is it not so obvious to any reasonable mind, as the light of the sun to any clear eye, that knowledge must be valuable and important every where, just in proportion to the greatness of the art to which it is to be applied, and the many subjects of action or use which that act involves?

(*To be continued.*)

The great objects of life, and the practicability of their attainment by all, are justly and beautifully portrayed in the following extract from *Dr. Channing*, the American Fenelon:

"The true cultivation of a human being consists in the development of great moral ideas; that is, the ideas of good, of duty, of right, of justice, of love, of self-sacrifice; of moral perfection as manifested in Christ, of happiness and immortality, of heaven. The elements or germs of these ideas, belong to every soul, constitute its essence, and are intended for endless expansion. These are the chief distinctions of our nature; they constitute our humanity. To unfold these, is the great work of our being. The light in which these ideas rise in the mind, the love which they awaken, and the force of the will with which they are brought to sway the outward and inward life,—here, and here only, are the measures of human cultivation. These views show us, that the highest culture is within the reach of the poor. It is not knowledge poured on us from abroad, but the development of the elementary principles of the soul itself, which constitutes the true growth of a human being. Undoubtedly, knowledge from abroad is essential to the awakening of these principles. But that, which conduces most to this end, is offered alike to rich and to poor. Society and experience, nature and revelation, our chief moral and religious teachers, and the great quickeners of the soul, do not open their schools to a few favorites, do not initiate a small caste into their mysteries, but are ordained by all to be lights and blessings to all."

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