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From the Albany Cultivator.

TREATMENT OF SANDY SOIL—USE OF CLAY, &c.

Circumstances have particularly attracted my attention to the nature and cultivation of sandy soils. I am satisfied by observation and experience, that a very false and mistaken system of tillage has been adopted upon these lands, and that there prevails an inadequate appreciation of their value and productiveness. The preliminary processes, by which they are in popular language subdued, and adapted to profitable culture, are somewhat tedious and expensive.

The leaves, foliage, and other deciduous particles, that fall from the pine trees which ordinarily occupy these lands in their primitive state, must be first destroyed. These substances are most noxious and destructive to vegetation, and scarcely no useful plant can be cultivated while they exist to any extent upon the surface of the soil. This work should be, and usually is effectually accomplished by the burning, which succeeds the first clearing. A fire that burns over the whole surface, successfully purges the soil from this obnoxious influence.—Where the earth by this process is well prepared for the drag, a valuable crop of rye or oats may be obtained, which will prove an ample remuneration for the subsequent labor and expenses to which I shall refer. If the burning has not effected this result, the farmer must be contented with light crops, and scanty and coarse grasses, until the decay of the roots and stumps, (which is rapid process with the pines,) enable him to accomplish the object by the plough and hoe. The first clearing is succeeded by a growth of sweet fern, brakes, and other worthless plants, by which every valuable vegetable is choked, and ultimately extirpated. This vegetation we term the sour growth. It is only eradicated by repeated, close, and careful ploughing and dragging, or what is more efficient still, by the thorough use of the hoe.—Sheep and cattle pastured upon the land have no effect upon this noxious vegetation. They all reject it, and refuse to brouse it. Any effort to successfully cultivate with grain or grass the soil in its presence will lead to idle expense, and incur certain disappointment. Until freed from those substances, the land cannot even advantageously be laid down to pasture. Two, and often three efficient ploughings are necessary to produce this result. It is not requisite, however, that the ploughings should occupy an equal number of years. Repeated use of the plough is often highly advantageous in the same season.

Nor is the labor and expense of these ploughings without beneficial consequence in other respects. The process, if performed at the proper period, at each recurrence, turns under and covers a rank growth of green and juicy vegetable matter, which rapidly decaying, yields to the soil a most fertilising manure. This vegetable substance, when decomposed, becomes incorporated with the sand, imparting new and improved qualites to the land, and forming, by the combination, a new element of soil. A farmer ignorant of these facts, or disregarding them, may be impatient under this protracted system, and in prematurely forcing the land often incurs a loss of his toil and money, and will impute to the soil a failure chargeable to his own improvidence.

When, by these operations, the land is sufficiently ameliorated, and relieved from this "sourceness," it should be well seeded, principally with clover. In this condition it is formed for successful tillage. White clover is indigenous to the soil, and springing up spontaneously, yields a rich and beautiful profusion of herbage. A heavy and vigorous turf is thus formed. The land is then adapted to the profitable culture of almost every crop. A tenacious sward, ploughed under, gives to the soil a firmness and consistency, that adapts it to the application of manures, and renders their effect more powerful and permanent. The decaying turf constitutes a basis, upon which such appliances as plaster, ashes, and lime will vigorously act, and produce large crops of corn, potatoes, or the smaller grains.

My observation has confirmed the opinion, that, by a judicious rotation in culture, sandy soils may be continued, without the application of manures, in a constantly progressive state of improvement. Instead of exhausting, tillage tends to its amelioration. The most successful system in my experience is this. Turn over a clover lev, plant upon it, with plaster, after a sufficient harrowing, but without disturbing the sward. The second year carefully seed with clover and herd grass. Let it remain for two or three seasons in grass, and then again pursue the same practice. If permitted to remain too long in grass, the land becomes gradually infested with a wild and worthless vegetation.

I will briefly suggest some of the reasons upon which I found my estimate of the advantages of cultivating sandy soils. They may be tilled with an immense saving of labor and expense. A team can plough in the same time two acres, with less labor and wear, than one acre of stiff or hard land. An equal economy of time and toil will be observed in every subsequent process, in the tillage of the crop. This is the case when the work is performed by manual labor, The difference in the relative expense of cultivation is greatly enhanced in favor of the sandy soil by the use of labor-saving machines. In forming a judgment on this subject, this fact should be regarded as of most prominent consequence, for these lands are admirably adapted to the use of the corn planter, horse hoe, and cultivator. Grain grown upon sandy soil is proverbially well ripened, and heavy in weight. Potatoes raised on it are uniformly, I believe exempt from disease, and always of the choisest quality. It is less affected by draught than many other varieties of land. I impute this fact to its being peculiarly pervious to moisture, from its loose and detached particles, which renders it readily affected by the slight showers and copious dews of summer.—It is well calculated for pasturage. The delicate white clover, which I have described as a natural product of this land, affords the richest and most nutritious pasture. Sheep will thrive and grow fat on a sandy pasture, where a casual observer would doubt that they could find the most scanty sustenance. Sand is ready for cultivation as soon as the frost is out, and crops are growing upon it when heavier lands still lie unprepared for the plough.

Permit me for a few moments to occupy your columns in exhibiting a fact or two, which illustrates the advantage of combining clay and sand, and throw, I think, some light on the great question of the nature and causes of the potato rot. I planted in the year 1847, a ten acre field of sandy land to corn, with no application of manure except plaster and ashes, in the hill and upon the plant. Nearly the whole fied yielded me a rich harvest.—About 20 years before, my father had spread 40 loads of clay on three fourths of an acre, from the first appearance of the shoots to the harvest, the difference in the aspect of the crops was so marked and peculiar, as to attract universal observation, and constant inquiry as to the cause. The plants throughout the season presented a higher and better color, a more luxuriant growth, and, in the end a much heavier yield than any other section of the lot. The strength of any other manure would long before have been exhausted, or its effect lost by leeching or evaporation. The clay combining with the sand had constituted a new and distinct soil, improved over both its components in fertility, and permanent in its character.

On one side of the field of corn I planted two rows of potatoes, perhaps a hundred rods in length. When dug, they proved sound, and free from disease, except across the piece where the clay had been deposited. Here the rot exhibited itself, and had seriously affected the crop. The seed was precisely similar, and the earth in every particular the same, except as it had been changed or modified by the incorporation of the clay with the sand. Can philosophy form any other deduction from these facts, than the conclusion of common sense, that the clay caused the development of the disease, in that portion of the crop. It may have caused the development of the disease.

W. C. W.

Port Kent, January, 1849.

Note.—Although potatoes have generally suffered less from the rot on sandy soils than those of a tenacious character, they have not been wholly exempt in the former case. As to the quality of potatoes produced on sandy soil, we think they are not usually as good as those grown on a friable loam.—EDS.

From the Boston Cultivator.

GOD BLESS THE PLOUGH.

"Who are the truly great?
Minions of pomp and state,
Who the knee bow?
Give us hard hands and free,
Cultivators of field and tree,
Best friends of liberty—
God save the plough!"
MRS. SIGOURNEY.

Then to the fields ye brave!
Yours be the world to save
From our life's foe;—
Want, with its ruthless train,
Flies from the cultured plain;
Toil ye with might and main—
God bless the plough!

Now lay the furrow deep,
On vale or hill-side steep—
In hope ye sow.
Trusting that mother earth,
Give to the seed its birth,
Sing ye in strains of mirth,—
God bless the plough!

Then, when the harvest comes,
Plenty through our loved homes,
Joy shall bestow.
Loud shout the reaper-train,
While o'er the fertile plain,
Rich waves the golden grain—
God bless the plough!

Wreaths for our yeomanry,
Green as the Victor's be—
Toil crown's their brow.
Their's is the noblest deed—
Their's be the brightest meed,
While they their calling heed—
God bless the plough!

LIVINIA S. WESTON.

From the Boston Cultivator.

CAREON, AND CARBONIC ACID GAS.

There is a well-known substance called charcoal, and it is also well known how it is made. Wood subjected to the action of heat, in a nearly closed vessel, or covered with earth so as mostly to exclude the air for a certain length of time, is converted into charcoal, or carbon, which means the same thing. The carbon existed in the wood, though not exactly in the form of charcoal, in combination with water and other gasses; by subjecting the wood to the heat, the water and gaseous matters are driven off, and nought is left but the carbon (in the form of charcoal), with a little earthy matter, which is left in the form of ash, after burning the coal in the open air.

When fire is applied to coal in a forge, or grate, the combustion is kept up by the oxygen of the air. The coal is burned, or dissolved in oxygen gas; it is, in fact, as much dissolved in oxygen gas as salt is when mixed in water and made into brine. There is this difference, however; the salt is then in a liquid form, and the union of salt and water is only a mechanical mixture. The burned coarcoal is only in a gaseous state, and, with the oxygen, has formed a chemical union, in the exact proportions of six parts of carbon to sixteen of oxygen, and it is then known as carbonic acid gas. All the parts of every thing, either vegetable or animal, that can be converted into charcoal, were primarily derived from the carbonic acid of the air. Whether vegetable matter is burned in a fire, or consumed by the more slow process of natural decay—by fermentation, decomposition, or the rotting process—the final result is the same; the carbon is, by these processes, again converted into carbonic acid gas, and mingles with the atmosphere (about 1-2500th part of the atmosphere is composed of this gas), from whence it is ready to be again worked up by the efficient action of vegetable and animal chemistry, into wood, hay, grain, tallow, flesh, &c. &c.

Some persons may feel a little skeptical upon this point; they cannot readily comprehend how a stick of wood, after having been burned in the fire, and converted into air, 'into thin air,' can be made to again assume the form and substance of the oak tree, or any other vegetable or animal production. Nevertheless, it is a plain matter of fact, and no more wonderful than hundreds of other facts that we can and do daily take cognizance of, and in illustration of which we will give a few instances. All know that if dissolved salt or brine is put into a kettle over the fire, and boiled till the water is evaporated, the salt will re-appear in its former state; in this way, a liquid is changed into a solid; but in this case there is no chemical change—the salt and water were simply in a state of mechanical mixture. If pure copper is placed in a glass vessel, with nitric acid, the copper will be wholly dissolved, and of course invisible; if the acid is then evaporated over a fire, and brought to a red heat, the copper re-appears in the form of black oxyde of copper; that, dissolved in hydrochloric acid, again becomes invisible. If plates of clean iron are immersed in the acid, certain chemical changes follow; the iron will attract the dissolved particles of copper, and soon there will be a coating of pure metallic copper formed all over the surfaces of the iron plates; this process will go on until the the last particle of copper has become solidified, and assumed its original qualities, and it will also be found that it has neither lost nor gained anything by the processes.

The shell of an egg is mostly composed of lime, but a fowl cannot generate lime to form its shell. It must obtain it from some outward source. If a hen is shut up, so that she cannot obtain lime, she may occasionally lay an egg, but it will have no shell upon it. But if bits of old lime mortar, or sea shells are are thrown within her reach, instinct prompts her to daily swallow some of them, and the bits of lime or shells will be instantly dissolved in her stomach; and then by the laws of animal chemistry and chrystallization, the dissolved particles of lime will re-arrange themselves, and form the outer coating or shell of the egg, and no other substance but lime, in some of its various forms can be used for the formation of the shell of an egg. So, too, there is no other *substance* in nature but carbon from which can be made those parts of the vegetable and animal creation which can be converted into charcoal; and the carbon can be taken up and assimilated by the plant, and converted into solid carbonaceous matter only in the form of carbonic acid; and the *carbon* of the acid cannot directly, in any way, contribute to the growth or condition of animals, or serve the purposes of respiration and combustion, only, as it has been previously prepared for these purposes by the more efficient agency of vegetable chemistry. In a future number we may attempt to tell something of the process by which the dissolved carbon, that is floating in the air, is worked up into wood, hay, grain, beef, tallow, tallow, starch, &c., &c.

An exchange paper gives the following hints for Emigrants to California.

Remember, that to a hungry man, a good potato is worth all the California 'carets.'

That all the gold in the country, if it cannot purchase happines is of no value.

That there are men who, if they owned all California, were it all gold, would not be satisfied with it.

That all the gold is not in California—and if California were all gold it would not be worth as much as (Quaker Bottom) for supplying the real wants of mankind.