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"Truth, Justice, Freedom, here shall find a home."

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AGRICULTURE.

AGRICULTURAL CHEMISTRY.

Humus Manure.—*Humus* is valuable chiefly on account of the earths and salts which it contains: that made by the decomposition of plants containing much silica, as the grasses and some of the grains, is best adapted to the production of such plants. Humus is applicable in most cases where barn manure would be used, especially on clay land which is too hard and compact.

Charcoal, or carbon, although a vegetable manure, is not properly included in either of the three classes above named. It is obtained by burning wood and various other plants, and is found in large quantities in the earth under the name of fossil, or mineral coal: it is also thrown out among the cinders of forges and founderies. "The action of charcoal," says Mr. Lucas, "consists principally in its preserving the parts of plants with which it is in contact, whether they be roots, branches, leaves or pieces of leaves, unchanged in their vital power for a long time, so that the plant obtains time to develop the organs which are necessary for its further support and propagation."—Charcoal yields, during its decomposition, a large amount of carbon to plants; "it exercises likewise a favorable influence by decomposing and absorbing the matters thrown out by the roots, so as to keep the soil free from the putrifying substances which often cause the death of the spongiole." Charcoal is, on all accounts, a cheap and efficacious manure: the finer it is pulverized before its application the quicker and more powerful its effects are felt upon plants.

Ashes Manure.—*Ashes* from the various kinds of wood and coal, and from the straw of various plants are of great value as a solvent of silica and other earthy parts of the soil; and as a fertilizer itself. According to Liebig, the ashes of beech wood possess the most value for this purpose. All kinds of ashes owe most of their virtues to the salts and earths which they furnish to the roots of plants. Ashes are applicable to all soils which contain sour humus, or which have been exhausted, by repeated crops of cereals, (white straw grains,) of their silicates; they are serviceable on grass lands, young grain and potatoes. The quantity to be applied must of course depend upon the condition of the soil: from two to ten bushels to an acre are often used; those of full strength are much more valuable than leached, (lixiviated,) ashes. The potash of the ashes unites with the silica of the soil and forms silicate of potash.

Tillage.—"Applied to arable land, the stirring and preparing the surface of the soil, so as to render it fit for the vegetation of seeds; its object, also, is the destruction of noxious weeds.

"The whole art of cultivation consists in tillage and manuring, and the profits of the husbandman depends on the perfection of the tillage and the economy of labour in producing the effect. A defect in tillage will cause a great deficiency in the crops in ordinary years. To insure good crops, the soil should be in such a state that the rains and dews may readily be diffused through it, without giving it a wet appearance, or evaporating too rapidly. It requires great knowledge and experience to give any particular soil the exact portion of tillage which is suited to it. A fine garden tilth, as it is called, is the most perfect for light soils which have been long cultivated and manured: when they can be brought to such a state, that after continued rains the surface dries without forming a crust, and crumbles of its own accord, the tillage has been good; and the deeper this soil is stirred the more it will produce: but where clay abounds in the soil, which in dry weather can be readily pulverized by crushing the dry clods, and be reduced to the finest powder, too much tillage may do more harm than good. The fine clay is soon converted into mud at the surface by the least rain, because it is not sufficiently porous to let the water through it; it dries into a hard crust, which effectually precludes the access of air, and consequently stops the vegetation of the seed. It is only by abundant manuring with organic matter that this natural tendency in clays to cohere can be overcome; and until this is effected, it is best to stir clay soils as deep as possible by means of sub-soil ploughs, but they should not be pulverized so that the water cannot run down between the lumps and clods, and especially the surface should be left in such a state of roughness that heavy rains cannot cover it with a coat of mud. The clods which are left on the surface imbibe the moisture more gradually, and, in drying, fall to pieces, by which the young plants are invigorated, and, as it were moulded up. This is particularly the case in winter after a frost, as all clay land farmers are well aware. It is very easily ascertained whether a soil will bare much tillage or not. It is only necessary to try some of it in a large pot or box; make the surface very fine by breaking the clods, then water it abundantly, and let it dry in the sun; if a crust is formed in drying, that soil will not bear too much harrowing or pulverizing, and should be left in a moderately rough state, after sowing or drilling the seed; but if, after it dries, the surface is loose and porous, then the finer the tillage the better the seed will vegetate. The whole depends on the ready admission of air or its exclusions. When grass seeds are sown, the surface should be well pulverized; but this cannot be safely done if the soil is apt to run together when much rain falls soon after the seed is sown. Some plants, like beans, will force their way through a very hard surface: but small seeds are too weak to do so, and their growth is entirely stopped by the least crust on the surface. Besides the preparatory tillage of the soil before sowing the seed, there is great advantage in the stirring it as the plants are growing. On this depends all the merit of the row culture for every kind of plant, especially those which have esculent roots or extensive foliage, and which are chiefly cultivated for the sustenance of cattle. The effect of deep tillage is here most remarkable. If rows of turnips or cabbages be sown at such a distance that a small plow or other stirring instrument can be used between them, and the intervals be stirred more or less, and at different depths, it will be found that the deeper and more frequent the tillage, until the foliage covers the whole interval, or the bulbs swell to a great size, the heavier and more abundant the produce will be. It is worth while to try the experiment; sow Swedish turnips or mangel wortzel in rows three feet apart: let some of the rows be merely kept clear of weeds by surface hoeing, and the plants be thinned out to the distance of a foot apart: let other intervals be stirred to different depths; some three inches, some six inches, and some nine inches or more. The result will be, that the first rows will appear to have been sown much too far from each other, not half the ground being covered with the foliage of the plants: the others will be covered more and more as the tillage has been deeper, and the last will completely cover the whole intervals.—The roots or bulbs will be in exact proportion to the richness of the foliage, and the weight of the deeply tilled rows will far exceed that of any others, while the first will, by comparison, appear a poor and scanty crop, however clear of weeds the surface may have been kept. The soil best suited for this experiment is a good, light loam on a dry or well-drained subsoil; for stagnant moisture under any soil will chill the fibres and check the growth of the plants, however dry the surface may be. It was this which led Tull, the father of drill husbandry, to the conclusion that tillage was all that the soil required to maintain perpetual fertility. He carried his conclusion too far; but we shall not be wide of the truth, if we assert that with proper tillage the soil will be gradually improved, and a much smaller quantity of manure occasionally added to recruit the waste produced by vegetation will render the soil much more fertile than it would be with much manure and less tillage: and as tillage can be increased by mechanical contrivances where labourers are scarce, whereas the supply of manure must generally be limited, it follows that, as a general rule, the land should be well and deeply tilled, due attention being paid to the nature of the soil, and its property of retaining or transmitting moisture. Very loose sands should not be much stirred until they are consolidated by the admixture of marl, clay, peat, or well-rotted dung; but in all cases the manure should be mixed as intimately as possible with the soil, and as deep as the tillage has gone, not including the stirring of the subsoil; for the roots will always penetrate thus far, and find the nourishment which they require. Those plants which throw out roots from the bottom of the stem, as wheat, barley, and oats, require the surface to be most pulverized and enriched to allow these roots to spread; a spring tillage is therefore highly advantageous, which can only be given when the seed has been deposited in rows by drilling, or in patches by dibbling. This last method is found to give much finer crops, from the circumstance that the hoe not only loosens the earth between the rows, but also between the different patches of the growing corn, by which the coronal roots are strengthened, and the tillering of the stems so much encouraged, that it is not uncommon to see twenty, thirty, or more strong stems, all bearing fine ears, arising from one tuft of plants, the produce of one or more seeds, whose roots are matted together and send out fibres in every direction. The crowding of several plants does not prevent their growth, provided the fibres can spread around in a rich, mellow soil, well pulverized, and admitting the air and moisture readily.

"As a perfect tillage requires much labor and minute attention, and in many situations where the farms are large, laborers cannot be procured at moderate wages, nor can they always be depended upon to perform the work with sufficient care, mechanical ingenuity has been taxed to invent implements of tillage by which it may be more perfectly accomplished, and at a smaller expense, by using the power of horses instead of that of men, and making implements which will till a considerable breadth at once, and thus save time.

(To be Continued.)

PROTESTANT CORNER.

ROMAN CATHOLICS AND LIBERTY.

We are far from denying that there are multitudes of Roman Catholics in Europe and America who are the fast friends of liberty, but while granting this we must affirm that it is because they rise above their system, and in so far cast off the yoke which would enslave them. The editor of the *Freeman's Journal* is a neophyte of the Roman Catholic Church, receiving its dogmas without reserve or questioning, and following them out consistently in his paper. We wish he had a million intelligent Protestant readers;—they would have a capital opportunity to see what Popery is, both essentially and in its developments. In that paper liberty has no friend,—despotism its most devoted champion, and on grounds of strict Romanism. In the Journal of June 16th, we find a characteristic welcome of Russian intervention. The editor looks on "the grim step of the autocrat," and says, "Let him forward in the name of God!" "His presence has become necessary. There is a portion of the community" in Europe, "and one of fearful activity, that is incurable. Till they are swept off the face of the earth, Europe cannot know peace." Thus he speaks of the struggles and strugglers for liberty who are upheaving the old oppressions which have become intolerable,—"vipers too pestiferous and disgusting to be longer endured in Society." "The proclamations of the Emperor Nicholas," he says, "is moderate in temper, and just in its principles and conclusions!!" Such is the language of a Catholic print in America, true to its politico-religious dogmas. As a small specimen of the reaction in Europe which the Journal desires, the reader's attention is called to the following, from a respectable English newspaper.—

SEIZURE OF BIBLES AND TESTAMENTS BY THE GOVERNMENT OF TUSCANY.

For some time past Protestant works have been printed at Florence; at last it was determined to print an edition of the Scriptures also in the Italian language. During the time of the republic the work was allowed to go on without interruption. When the reaction took place, about a month ago, and a Provincial Government was set up in the name of the Grand Duke, an English gentleman, and one zealous for the cause of Christ, who had taken the chief care of the printing, called upon the Marquis Capponi, one of the heads of that government, informed him of what was going on, and asked whether it met the approval of the Government: on which the Marquis assured him that the Government fully approved of the printing and circulating of the Word of God, and wished him all success in the undertaking, declaring at the same time that he spoke in the name of the Government. The work went forward without interruption till last week, when suddenly a gen d'arme presented himself at the printing office and binder's with authority from the commissary of police to seize the entire edition. This gentleman's house was also searched, and all the Bibles and Testaments printed in Florence were carried off. He immediately made application to the Marquis Capponi, who acknowledged that all he had formerly said was perfectly true, that the civil government highly approved of the circulation of the Bible, but that they could not interfere with the spiritual authorities.—*N. Y. Rec.*