

In the white oak soils, the fine sand is a substitute for iron and clay, absorbing, with great power, moisture, and whatever other fertilizing matter may be in the atmosphere, and retaining it until the wants of the plant require its use. The sand thus performs a vicarious action to iron and clay; it is a substitute for them in giving compactness to the soil; it is a substitute for them in absorbing moisture, and the food which plants obtain from the atmosphere.

The power of charcoal to absorb various gasses, is well known, a power derived exclusively from its mechanical texture, as shown by its great number of fine pores; and when we consider the fine state of division in which the sand exists in these soils, we readily see how a mass of it must present a very large surface for absorption, and how an almost infinite number of small spaces must exist between the grains of sand, giving it in a great degree the same properties as charcoal. For although this soil appears to form a solid mass, yet no grain of it is in perfect contact with any other grain. This is most satisfactorily demonstrated by placing a small lump of it under the field of a microscope, when the interstices, the spaces between each grain, are distinctly visible. Another advantage which this land possesses, is, that it more readily yields the mineral agents which it contains, to growing plants, all bodies (other things being equal,) being soluble in proportion to the fineness of their division. This is always acted on by those who wish to dissolve any substance of difficult solubility, by pulverizing it in a mortar. Now, in a soil, every grain of sand contains something of use to the plant, which can be more readily dissolved from fine, than from coarse particles. These soils are uniformly deficient in lime, but have enough of magnesia: they have potash and soda, as well as sulphates and phosphates, in fair proportion.

How does an acquaintance with their texture and composition teach us to improve them? What are the indications, and how are they to be fulfilled?

First,—These soils are level and retentive of moisture. They should then be drained THOROUGHLY with *surface* drains. No water should ever be allowed to rest on them. The fields should be ditched at least on two sides, with a wide deep ditch, into which a number of small surface drains should run, and one or two large drains through a field are no substitute for a large number of smaller drains. These latter are more effectual and more easily made. A plough run once or twice in the same furrow, aided by the hoe, will in most cases, make a very effectual drain. The manure from the bottom of these ditches will, in a few years, pay for them, even if they had no other use.

These soils are compact, and, therefore, do not require a great depth of soil in order to give firmness and stability to the roots of plants growing on them. They, also, very effectively retain moisture, thus affording it to crops in a dry season; when overlaying a white sub-soil, they can gain nothing of use from it, for these sub soils contain almost nothing that is useful to vegetation, and