

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 into 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 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 overlying 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 some things in a condition that are injurious. How, then, should they be cultivated? Notwithstanding it is so fashionable to advocate deep ploughing; notwithstanding it is always insisted on by agricultural writers, speakers, and essayists, yet I must advise all to beware of it, on these lands, unless they have a red clay sub-soil. The only rational rules for ploughing, are short and plain. They are, to turn up a sufficient depth of soil to give a firm support to the plant, enough to retain moisture for its use, and never to go deeper, when those ends are obtained, unless the sub-soil be better than the surface soil. If it be worse, you injure, and cannot improve by deep ploughing.

If the sub-soil be better, then, and then only can you gain by deep ploughing. Reason and common sense alike tell us that, if you join a worse with a better soil, the compound will be inferior