

the only exception to this, is where loose light porous soils occur, which are of but small extent; here magnesian lime is the proper variety.

As to the nutrient substances, phosphate of lime, either in the form of bone dust, Columbian or Mexican guano, should be applied, as the quantity in any of these soils is not sufficient for the *practical* wants of such a series of crops as the texture of the soil could produce if aided by this manure. Wherever the wheat is liable to fall, and of this farmers themselves are the best judges, there common salt should be sown as before directed. Plaster should be applied to the clover crop and to none other.

SLATE SOILS.—We now come to another, a different, and a distinct formation, namely, the slate soils in the eastern section of the county. These soils differ very much in their productiveness; this is not so much owing to their constituents as to the *condition in which they exist, the extent to which the underlying slates have become disintegrated, and the depths of soil.* Where the slates lie very near the surface, where they form in their undecomposed state a large proportion of the soil, the land is barren and unproductive—where the soil is deep, this depth arising either from deep plowing or from alluvial deposits, it is *always* productive; this teaches us a lesson how to improve the soils which are barren. Make them as deep as possible by cultivation, and decompose the coarse fragments of slate as much as possible by agents which can do this, which are lime and green crops turned under and intermixed with the soil.

The rocks from which all these soils are composed, with the exception to be mentioned in this eastern section of the county, are either blue slate, red slate, talc slate or chlorite slate. The composition of these slates is but slightly different, the brighter color of the yellow and red slates being owing to the presence of iron in a higher degree of oxydation than in the black or blue slates; moreover, all of these are so much intermixed and so closely allied to each other, that it would be useless to go into their separate composition, to determine the composition of the soil which they formed, and to show the means of its improvement. Fortunately this is not a matter of much practical importance, and we shall speak of the slate lands under one head, and make such practical deductions from their composition and from *all other* facts connected with them, as may best lead to a rational system for their improvement. We find in that section of the county of which I am now speaking, an admixture of all these slates. I do not profess to describe the various soils which result from these various combinations, and it would be useless were I able to do so, since the productiveness of soils depends on their mechan-