to that better soil. If, on the other hand, the sub-soil is better than that which overlies it, then should it be turned up with the plough, because the sum of the two will be better than the surface soil.

Such being the case, you should plough shallow in these white oak soils, and never turn up the *white* clay upon which they rest. The particular depth of ploughing will vary slightly in different soils of this class, and I have never seen any that required more than five inches; most frequently three or four inches are sufficient. This depth is sufficient to support the roots of the plants, sufficient to retain enough of moisture, and there is inferior soil underneath, which would deteriorate the quality of the surface soils.

Where there exists a sub-soil of mottled or marble clay, the same rules are to be observed as regards the depth of tillage. Upon the red or yellow clay sub-soils the practice should be different, as these may with advantage be turned up, never more, however, than one inch for each rotation, which may be repeated until the depth of tillage reaches to six or eight inches. These rules are founded on the nature of the sub-soil, and its influence on vegetation.

The iron in the red and yellow clays is in the state of peroxide, that is, it is in its highest degree of rust, and can receive no more oxygen. Iron, in this condition, absorbs ammonia, (a very fertilizing constituent of the atmosphere,) and retains it until required by the growing plant. But the advantage does not stop here. The color of soils has an important influence on their productiveness. Those which are dark colored, absorb and retain heat better than those of a lighter hue. Seed, in the former, sprout quicker, and plants grow more rapidly than in the latter. So by mixing a red or yellow clay with these white soils, you will cause the crop to take an earlier start, to grow more rapidly and arrive at maturity sooner, than if a contrary practice was adopted. These clays, too, uniformly contain some lime, in which the surface soils are deficient.

We come now to speak of the best means of improving the soils under consideration, by manures, that is, by the addition of those substances in which they are deficient: deficiency or absence being always the test of manure. However valuable any thing may be in itself, it is no manure when applied where it already exists in proper form, and in sufficient quantities. From what has been said of the composition of these soils, the rationale of their improvement is plain, cheap and certain. They are only deficient in lime: Then it should be applied to them in the purest form,—oyster shell lime is the lime for these soils, because, in reference to them, it contains less impurities than any other kind of lime. If Wrightsville, New York, or Schuylkill lime, be applied, much less of manure for the same amount of money and labor is given to the soil, than if oyster shell lime be used.