

As a result of this practice, there is also a gradual increase in the depth of the soil, as the finer and more soluble particles of the richer materials above are constantly working down and enriching the loosened earth below; and in time this becomes good soil, which in proportion to its depth increases the area from which the roots derive their nutriment. So manifest are the advantages which have followed the use of subsoil ploughs, that they have been extensively introduced of late years among the indispensable tools of the better class of agriculturists.

When the subsoil is loose and leechy, consisting of an excess of sand or gravel, thereby allowing the too ready escape of moisture and the soluble portions of manures, the subsoil plough is not only unnecessary, but positively injurious. In this case the surface soil should be somewhat deepened by the addition of vegetable manures, so as to afford greater depth through which they must settle before they can get beyond the reach of the roots; and the supply of moisture is thereby much augmented. It is better however to keep lands of this character in wood, or permanent pasture. They are at best ungrateful soils, and make a poor return for the labor and manure bestowed upon them.

If there be a diversity in the character of the sub and surface soil, one being inclined to sand and gravel, and the other marl or clay, a great improvement will be secured by allowing the plough to reach so far down as to bring up and incorporate with the soil some of the ingredients which it is wanting. This admixture is also of remarkable benefit in old or long cultivated soils, which have become deficient in inorganic matters in their texture.

The effect of long continued cultivation, besides causing what is essential to the earthy part of plants, is to break down the coarser particles of soil, by the mechanical action of the plough, harrow, &c., and in a much more rapid degree, the chemical combinations which cultivation and manuring produce. A few years suffice to exhibit striking examples in the formation and composition of rocks and stones. Stalactites, various specimens of limestone, indurated sandstone and breccias or padding stones formed in favorable circumstances, almost unobscure to our eye; while some limestones, shales, sandstones, &c., break down in large masses annually, and the combined effect of moisture, heat and

rost. The same changes on a smaller scale, are constantly going forward in the soil, and much more rapidly while under cultivation. The general tendency of these surface changes is towards pulverization. The particles forming the soil from the insupportable mite of dust, to the large pebbles, and even stones and rocks, are continually broken up by the combined action of the roots and the constituents of soils, by which new elements of vegetable food are developed and become available, and in form so minute, as to be imbibed by the spongioles of the roots, and by the absorbent vessels, they are afterwards in their appropriate places in the plant. Where this action has been going on for a long period, a manifestly beneficial effect has immediately followed from bringing up and mixing with the superficial earth, portions of the subsoil which have never before been subject to cultivation.

A subsoil which is permeable to water, is sometimes imperceptibly beneficial to vegetation, not only by allowing the latent moisture to ascend and yield a necessary supply to the plants, but a moisture frequently charged with lime and various saline matters, which the capillary attraction brings from remote depths below the surface. It is probably from this cause, that some soils produce crops far beyond the yield which might be reasonably looked for from the fertilizing materials actually contained in them. This operation is rapidly going forward during the heat of summer. The water thus charged with saline matters ascends and evaporates at and below the surface, leaving them diffused throughout the soil. After long continued dry weather a thin white coating of these salts is frequently discerned on the ground.

Where rain seldom or never falls, this result is noticeable in numerous and sometimes extensive beds of quiescent (not shifting) sand. Deposits at times occur several inches in thickness. Such are the impure muriate of soda and other salts in the arid deserts of California; in the northern parts of Oregon; the bitrates found in India, Egypt, Peru and various parts of the world. —Allen's Am. Ag.

*Hard Biscuit.*—One quart of flour, and half a tea-spoonful of salt; four great spoonfuls of butter rubbed into two thirds of the flour; wet it up with milk till a dough; roll it out again and again, sprinkling on the reserved flour till all is used; cut into round cakes, and bake in a quick oven on buttered tins.