

unusually deep trench, when he was very much plagued with water. He happened to force a crow-bar four feet through the bottom of the trench, with a view of ascertaining the nature of the subsoil, and on pulling it out, was surprised to find the water gush up from below. From this was derived his system of draining water-bearing sub-strata by tapping or boring, which in certain situations is the most economical plan for the escape of the water; but it has been found altogether inapplicable to land which consists to a great depth of absorbent earths, and in other cases very much of the practice of Elkington has been superseded by the later methods of deep draining. At present the general adoption of a rather uniform depth of four feet draining, which has been found in most cases advantageous, has originated an impression which should be removed, being perhaps a stumbling block in the minds of some against the favorable consideration of the subject, namely, that the advocates of Tile draining would drain all lands in the same manner and for the same purpose. We will speak first of the Lands. All lands certainly do not require draining. This is a matter which entirely depends upon the nature and shape of the different sub-strata.

Lands may be classified in two ways, sandy or clayey, and level or rolling, or sloping. I will first dispose of those which may not require any of this treatment.

Let us take a porous soil of moderate depth, composed in some cases of sand, in others of light loam or clay, of perhaps a rather stony nature, underlaid by a bed of gravel. If this gravel rests upon a bed, which follows the slope of the surface, or falls independently of the slope of the surface, so as to allow the water to run away through the gravel, such lands will require little or no attention in this respect. All that such soils require will be judicious tillage and manuring. As they are well open to the atmosphere, and easily tilled and entered by the roots of all plants, so their fertile qualities are more easily and entirely drawn out and exhausted from them than from heavier soils, and when this has once been done, a greater expense will be necessary to restore those qualities from sources foreign to the soil itself. It is the penetrable nature of these soils, so easily yielding up their fertilizing substances to plants growing upon them, that leads many to suppose that these substances are washed down by the rains deep into the soil out of reach of the roots, which are the mouths and feeders of vegetation. This is a mistake I think easily corrected by an examination of the water which escapes from the outfalls of underdrains, which will be found perfectly clear and pure even after very heavy rains when the volume of water discharged is very great, and in all such permeable and friable soils a very slight investigation proves that the roots of plants will penetrate an almost incredible distance, attracted, as it were, by the food necessary for their growth. This very tendency has occasionally caused great difficulty in draining. It is well known that there is no better or richer fertilizer than living spring water. This lies at the bottom of the principle of irrigation, and it has occurred where spring water has been led underground through common tiles, that the roots of crops planted in the field, through which this water has been conducted, have penetrated through the intervening soil, found their way into the fresh running water, spread through the pipes and effectually stopped them up. An instance of this has already occurred within my own experience. In the autumn of 1858 a three-inch horse shoe tile drain was laid down through a low springy piece of land. Being done during my absence, the man failed to follow my directions, and made the drain only about 20 inches deep. This, of course, partially dried the ground, and a constant stream of water was discharged from the mouth. Last autumn, a year after, I had the drain taken up, and laid down again four feet deep, when from the low gravelly subsoil I have drawn off a very large flow of water. Within a few feet of this drain a willow tree is growing, and when the workmen got up the old drain to about thirty-five feet from the tree, they found the whole pipe filled with fibrous roots, which had grown all