

bottom of the drain and about seven feet above it. This being done, Dr. Manly Miles, in his excellent little work on "Land Draining,"\* gives the following directions, than which the author can suggest no better:

"The ditch having been dug to within eight or ten inches of the bottom, and the line properly adjusted over the middle of the ditch, two men may begin the work of finishing the excavation and laying the tiles, which we will suppose are for a four-inch main, beginning at the outlet. A level-headed boy, or the proprietor as superintendent if he does not prefer to lay the tiles himself, will facilitate the work by managing the measuring rod, and performing any other service that may be required, from time to time, outside the ditch.

"One of the men standing in the ditch, with his face towards the outlet, with the six-inch draining spade slices off the earth, or loosens it to nearly the required depth, moving backwards as the work progresses, while the tile-layer stands facing him and throws out the loose earth with a shovel scoop, or the draining scoop, Figure 17, as may be most convenient. When the excavation has been finished for a distance of three or four feet, the tile-layer planes a groove in the bottom of the ditch with the draining scoop, to the required grade, as gauged with the measuring rod, and lays two or three tiles in it with their ends closely in contact, and covers them with five or six inches of earth, on which he then stands, packing it around the tiles as he proceeds with his work. The next section of the ditch is then prepared for three or four tiles by a repetition of the process of excavation—planing a groove for the tiles—laying them and covering with earth, to form a platform on which the tile layer advances, and the same routine is again repeated.

"By following this system, it will be seen that the feet of the workmen are not within eight or ten inches of the bottom of the ditch, the man with the draining spade standing on the earth to be excavated, and the tile-layer on his underdrained platform, as represented in Figure 19, is exempt from the annoyances of mud and water that are usually associated with the work of draining. If the bottom of the ditch is soft, and water is running over it, the man with the draining spade will be standing in mud, which will interfere with his efficiency and the general progress of the work. This can, however, be obviated in a very simple way, that more than repays the extra trouble it involves. A one and one-half or two-inch pine plank about six feet long, and a little narrower than the bottom of the ditch, is laid down for him to stand on. Near the upper end of the plank a hole should be bored, in which a small rope is tied, its free end being thrown over the edge of the ditch to keep it out of the mud. With this the plank can be pulled back from time to time, as may be required."

#### COST OF TILE DRAINS.

Of course, no exact figures can be given to show the cost of laying underdrains, since the expense will vary with the cost of labor, the difficulties of digging, the size of tiles used and other items.

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