

the wide space between house and barn was wet and muddy, while in several places there were great puddles of water, around which they had to pick their way. These low places had always been an annoyance to Uncle Benny, as every rain converted them into ponds, which stood sometimes for weeks before drying up. They were so directly in the path to almost everything, that one had to navigate a long way round to avoid them; yet, though an admitted nuisance, no one undertook to fill them up.

When the party got fairly in among these puddles, the old man stopped, and told them he would teach them something worth knowing. Bidding Joe bring him a spade and hoe, he led the boys to a small puddle which lay lower on the sloping ground than any other, and in a few minutes opened a trench or gutter leading from it toward an adjoining lowland. The water immediately flowed away from the puddle through the gutter, until it fell to the level of the latter. He then deepened the gutter, and more water was discharged, and repeated the operation until the puddle was quite empty.

He then directed Joe to open a gutter between the puddle thus emptied and a larger one close by then to connect a third with the second, until, by means of hoe and spade, he had the whole series of puddles communicating with each other, those on the high ground discharging their contents into that first emptied, as it lay lower than the others. When the work was completed, there was a lively rush of water down, through the gutter first cut, into the meadow.

"Now boys," said Uncle Benny, "this is what is called drainage,—surface drainage,—the making of water move off from a spot where it is a nuisance, thus converting a wet place into a dry one. You see how useful it is on this little piece of ground, because in a few days the bottom of these ponds will become so dry that you can walk over them, instead of having to go round them; and if Mr. Spangler would only have them filled up, and make the whole surface level, the water would run off of itself, and all these gutters could be filled up, leaving the yard dry and firm. These gutters are called open or surface drains, because they are open at the top; but when you make a channel deep enough to put in a wooden trunk, or brush, or stones, or line of tiles, for the water to flow through, and then cover up the whole so that one can walk or drive over it, it is called an under-drain, because it is under the surface of the ground."

"But does draining do any good?" inquired Joe.

"Why," replied Uncle Benny, "it is impossible to farm profitably without drainage of some kind; and the more thoroughly the land is drained of its su-

perfluous water, the surer and better will be the crops. I suppose that not one of you likes to have wet feet. Well, it is the same thing with the roots and grains and grasses that farmers cultivate,—they don't like wet feet. You know the corn didn't grow at all in that low place in our cornfield this season; that was because the water stood there from one rain to another,—the corn had too much of it. You also saw how few and small were the potatoes in that part of the patch that runs close down to the swamp. Water is indispensable to the growth of plants, but none will bear an excessive supply, except those that grow in swamps and low places only. Many of these even can be killed by keeping the swamp flooded for a few weeks; though they can bear a great deal, yet it is possible to give even them too much. Our farms, even on the uplands, abound in low places, which catch and hold too much of the heavy rains for the health of the plants we cultivate. The surplus must be got rid of, and there is no other way to do that than by ditching and draining. Under-draining is always best. Let a plant have as much water as it needs, and it will grow to profit; but give it too much, and it will grow up weak and spindling. You saw that in our cornfield. There are some plants, as I said before, that grow only in wet places; but you must know that such are seldom useful to us as food, either for man or beast. Nobody goes harvesting after spatter-docks or cat-tail. This farm is full of low, wet places, which could be drained for a very little money, and the profits from one or two crops from the reclaimed land would pay back the whole expenses. Indeed, there is hardly one farm in a thousand that would not be greatly benefited by being thoroughly underdrained. But as these puddles are nearly empty, come over to the barn-yard,—they will be dry enough to-morrow."

Uncle Benny led the way into a great enclosure that was quite full of manure. It lay on a piece of sloping ground adjoining the road, in full view of every person who might happen to drive by. It was not an agreeable sight to look at even on a bright summer day; and just now, when a heavy rain had fallen, it was particularly unpleasant. In addition to the rain, it had received a copious supply of water from the roofs of all the barns and sheds that surrounded it. Not one of them was furnished with a gutter to catch and carry off the water to some place outside the barn-yard, but all that fell upon them ran off into the manure. Of course the whole mass was saturated with water. Indeed, it was not much better than a great pond, a sort of floating bog, yet not great enough to retain the great volume of water thus conducted into it from the overhanging roofs. There was not a dry spot for the cows to stand upon, and the place