

bed to high water mark, and very soon after the rain had ceased the stream would have run dry. There would be no springs at all.

If the ground in the same valley were still non-porous, but planted with a vegetation of grass, bushes and woods, then at least part of the falling shower would be caught by the plants and would evaporate. The total leaf surface of grasses and herbs of the pasture and of natural meadows that can catch and hold moisture is small; they can therefore not hold so much water on their stems and leaves as bushes, and especially as trees or whole forests. After many examinations it is found that the trees of a forest, according to the species of tree and the density of the forest, will hold back twenty to forty per cent. of the rainfall, so that it never reaches the ground but evaporates and increases the humidity of the air.

The covering of plants has still another influence. Stems, trunks and the leaves on the ground form obstacles to the water that is trying to flow away on the surface. Thus the surface flow is hindered. The water from the higher slopes reaches the stream beds later, high water is not so great because the supply of water is spread over a far longer period.

If we have to do with a natural valley, we have to take into consideration the fact that the ground is more or less loose and porous and therefore allows part of the rainfall to soak in. The volume of water which is not withheld by the vegetation divides itself into the water that runs away over the surface and the water that soaks into the ground. High water and floods are caused chiefly by the water flowing away on the surface. So the looser and more porous the ground of the valley, the more rainwater will soak into the earth and the danger of floods be diminished. What happens to the water that sinks into the ground? Part of it remains in the surface soil and clings to the capillary pores as though in a sponge. It is therefore called captive water, or capillary water. Another part of the water that sinks into the earth is drawn down by gravitation through larger pores and channels into the lower layers of the ground. This water is called "sinking" water, or gravitation water. The captive or capillary water that remains in the higher layers of the earth partly evaporates directly in dry weather, and is partly used and given off by the plants. This water, therefore, never flows away. It enriches the air by its moisture and helps to make sufficient dew. The "sinking" water in the lower layers of the ground moves only very slowly through the earth. It is in a measure treasured up. It emerges according to the circumstances either at the end of some hours, days or even months into the streams. The gravitation water, therefore, does in the end flow away, but