

solid matter cannot enter into a plant so long as it retains its solid form; but it may be received when it has become a liquid, by being dissolved in water, or when it has taken the form of gas. It may therefore be taken as a rule, that the inorganic matter in plants is obtained only from those portions of the soil which are soluble, or capable of becoming soluble. There are, however, two bodies—carbonic acid and ammonia—which are of necessity associated not only with the inorganic bodies, but are also present with the organic group. They are, moreover, to a certain extent exceptional, for plants not only receive these—and water—with the soluble matters obtained from the soil, but they also receive them from the stores existing in the atmosphere.

CHAPTER III.

FERTILITY OF THE SOIL.

36. In addition to the physical and chemical classification of soils, we have another point of character which is distinctly recognized and determined by the cultivation of the land, viz., the fertility or barrenness of the soil. We can explain by physical and chemical investigations, the causes which influence the productive powers of land, and in many cases these researches indicate the means whereby those powers may be increased or maintained. In the first place, a clear distinction must be drawn between those portions of the soil which are capable of yielding nourishment to vegetation, and those which cannot do so. A soil may contain large supplies of every ingredient which a crop requires, and may still be unable to yield them to the plant. The great truth must be fully realized, that it is