

dant reason to admire and be grateful for the wise and bountiful provisions which nature has made for meeting these contingencies.

The multiplication of the species by buds, or *Gemmiparous reproduction*, is exemplified on the largest scale in the vegetable creation. Almost every point of the surface of a plant appears to be capable of giving rise to a new shoot, which, when fully developed, exactly resembles the parent stock, and may, therefore, be regarded as a separate organic being. The origin of buds is wholly beyond the sphere of our observation; for they arise from portions of matter too minute to be cognizable to our organs, with every assistance which the most powerful microscopes can supply. These imperceptible atoms, from which organic beings take their rise, are called *germs*.

Vegetable germs are of two kinds; those which produce *stems*, and those which produce *roots*; and although both may be evolved from every part of the plant, the former are usually developed at the *axillæ* of the leaves; that is, at the angles of their junction with the stem; and also at the extremities of the fibres of the stems; their development being determined by the accumulation of nourishment around them. They first produce *buds*, which expanding, and putting forth roots, assume the form of shoots; and the successive accumulation of shoots, which remain attached to the parent plant,* and to each other, is what constitutes a tree. What are called knots in wood are the result of germs, which, in consequence of the accumulation of nourishment around them, are developed to a certain extent, and then

* In some rare instances the shoots are removed to a distance from the parent plant, by a natural process: this occurs in some creeping plants, which propagate themselves by the horizontal extension of their branches on the ground, where they dip, and strike out new roots, giving rise to stems independent of the original plant. This also sometimes happens in the case of tuberous roots, as the potato, which contain a number of germs, surrounded by nutritive matter, ready to be developed when circumstances are favourable. These portions are called *eyes*; and each of them, when planted separately, are readily evolved, and give rise to an individual plant.