

of the "history" I have promised you. Every plant has some place which it likes better than any other; some choose the side of the mountain, others the warm and sheltered valley; some the dry hill, others the wet meadow; and about this I shall speak before I finish my tale. So you must suppose now, that the seed has found its favourite place, and has just the kind and quantity of air and moisture, light and heat, that it wants, and that its husk or shell is bursting, whilst it soaks up the water round it:—What happens next? How is the "seed plant," which we saw so snugly wrapped up, and so well provided for; how is it changed into a *real plant*?

But first, perhaps, you wish to know how long it is, after the seed is planted, before the sprouting begins? That depends, first, upon whether it has enough of each of the four things I said in the last, were so necessary to it. Too much of any one of them, also, is as bad as not enough, in keeping it from beginning to grow. Most of those which are scattered in the autumn lie without thinking of putting forth root or bud till next spring. But when there is exactly what is wanted of those necessary things, then the sprouting happens sooner or later, according to the strength and toughness of the coverings of the seed. Some kinds begin to grow in a day or two; others wait as many weeks; and some are months or even years before they sprout. Farmers "steep" their grain before they sow it, that the husks being more easily burst, it may spring up the sooner; and the seeds of wall-fruit have not waited so long as usually they do, when their hard and thick shells have been softened before they were planted.

And this is the way in which the seed is turned into a plant. When the coverings are burst by the swelling of what is within them, that little "beak" (as I called it) is pushed out, and as soon as it has become long enough, it bends downwards, and in a short time, you see that there is a root going to

grow out of it; and then the bud begins to show itself, looking upwards; or the two "seed-leaves" are drawn out of the husk, with the bud between them, and they become the first *real* leaves of the plant. By this time the root has appeared, and has forced its way into the soil, and the "larder" begins to look as if some of the "provisions" were gone; and the leaves spread themselves out broader, and the root strikes deeper, and takes firmer hold, and the "provisions" are soon finished; and the *seedling* plant is complete.

There are two different ways, then, in which the little "seed-plant" begins to grow, after the root has shown itself. One is this: the two "seed-leaves," as you can see in the drawings, from (11) to (19),* which are short and thick, and most frequently white, when in the seed, and which had been growing till they took up almost all the room inside it, spread themselves out, and become green; and though they are almost always of a different shape from the proper leaves, they answer the same purpose, and it is sometimes a long while before they wither and fall. This is the way in which those seeds grow, in which the "little plant" has its "provisions" stored up separately; but some of those which have their "provisions" in their "seed-leaves" grow in the same manner.

There is one curious thing happens with seeds that grow so; they *come out of the ground* when they sprout. As soon as the root has taken hold of the soil, the young stem begins to stretch itself, before the "seed-leaves" have been able to throw off the husk; so this covering, with the leaves yet in it, is pushed up by the growing stem, as far out of the earth as it was buried in it. If you have grown "mustard and cress," or kidney beans, for yourself, you must have noticed this.

In those drawings of the seeds, the "little plant" seemed to be *in*, but not *joined* to, the store of food laid up for it; and it is not very well known how

See page. 36, 37, 38.