This is formed by a union of the funiculus, or seed-stalk, with the seed-coats, and through it food was transferred for the development of the seed, but it is now functionless.

Seeds differ wonderfully in size, shape, color, and other characteristics. They also vary in longevity. These characteristics are *peculiar to the species or kind.* Some seeds maintain life only a few weeks or even days, whereas others will "keep" for ten or twenty years. In special cases, seeds have retained vitality longer than this limit, but the stories that live seeds, several thousand years old, have been taken from the wrappings of mummies are unfounded.

Germination. — The embryo is not dead; it is only dormant. *When supplied with moisture, warmth, and oxygen (air), it awakes and grows: this growth is* **germination.** The embryo lives for a time on the stored food, but gradually the plantlet secures a foothold in the soil and gathers food for itself. *When the plantlet is finally able to shift for itself, germination is complete.*

Early Stages of Seedling. — The germinating seed first *absorbs water, and swells.* The starchy matters gradually become soluble. The seed-coats are ruptured, the caulicle and plumule emerge. During this process the seed *respires freely, throwing off carbon dioxid* (CO_2).

The caulicle usually elongates, and from its lower end roots are emitted. The elongating caulicle is known as the **hypocotyl** ("below the cotyledons"). That is, the hypocotyl is that part of the stem of the plantlet lying between the roots and the cotyledon. *The general direction of the young hypocotyl, or emerging caulicle, is downwards.* As soon as roots form, it becomes fixed and its subsequent growth tends to raise the cotyledons above the ground, as in the bean. When cotyledons rise into the