

bark-bearing trees and bushes (except conifers), and most of the herbs of temperate climates except the grasses, sedges, rushes, lily tribes, and orchids. The flower-parts are usually in fives or multiples of five, the leaves mostly netted-veined, the bark or rind distinct, and the stem often bearing a pith at the center. The monocotyledons usually have the flower-parts in threes or multiples of three, the leaves long and parallel-veined, the bark not separable, and the stem without a central pith.

Every seed is *provided with food* to support the germinating plant. Commonly this food is starch. The food may be stored *in the cotyledons*, as in bean, pea, squash; or *outside the cotyledons*, as in castor bean, pine, Indian corn. When the food is outside or around the embryo, it is usually called **endosperm**.

**Seed-coats; Markings on Seed.** — The embryo and endosperm are inclosed within a covering made of two or more layers and known as the **seed-coats**.

Over the point of the caulicle is a minute hole or a thin place in the coats known as the **micropyle**. This is the point at which the pollen-tube entered the forming ovule and through which the caulicle breaks in germination. The micropyle is shown at *M* in Fig. 16. The scar where the seed broke from its funiculus (or stalk that attached it to its pod) is named the **hilum**. It occupies a third of the length of the bean in Fig. 16. The hilum and micropyle are always present in seeds, but they are not always close together. In many cases it is difficult to identify the micropyle in the dormant seed, but its location is at once shown by the protruding caulicle as germination begins. Opposite the micropyle in the bean (at the other end of the hilum) is an elevation known as the **raphe**.

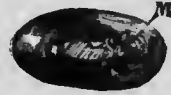


FIG. 16. — EXTERNAL PARTS OF BEAN.