

sheath, *c*, *m*; the epicotyl has grown to *p*; the first plumule-leaf is at *o*.

In studying corn or other fruits or seeds, the pupil should note how the seeds are arranged, as on the cob. Count the rows on a corn cob. Odd or even in number? Always the same number? The silk is the style: find where it was attached to the kernel. Did the ear have any coverings? Explain. Describe colors and markings of kernels of corn; and of peas, beans, castor bean.



FIG. 28. — GERMINATION IS COMPLETE.

p, top of epicotyl; *o*, plumule-leaf;
m, roots; *c*, lower roots.

Gymnosperms. — The seeds in the pine cone, not being inclosed in a seed-vessel, readily fall out when the cone dries and the scales separate. Hence it is difficult to find cones with seeds in them after autumn has passed (Fig. 29). The cedar is also a gymnosperm.

Remove a scale from a pine cone and draw it and the seeds as they lie in place on the upper side of the scale.

Examine the seed, preferably with a magnifying glass. Is there a hilum? The micropyle is at the bottom or little end of the seed. Toss a seed upward into the air. Why does it fall so slowly? Can you explain the peculiar whirling motion by the shape of the wing? Repeat the ex-