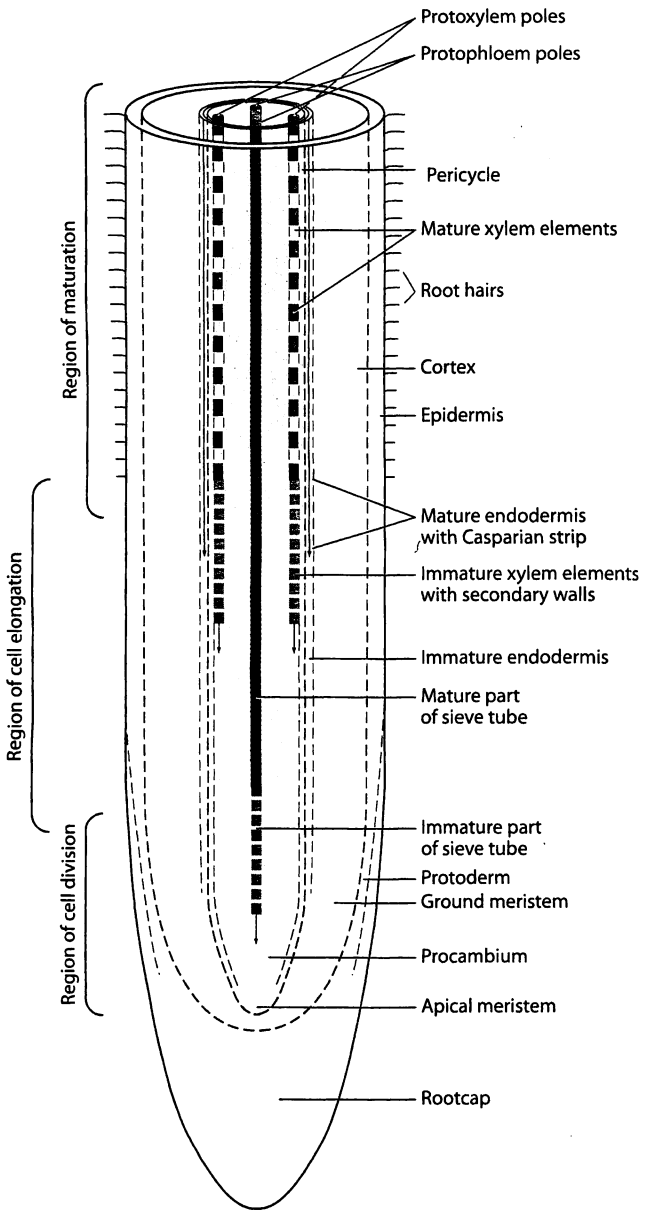
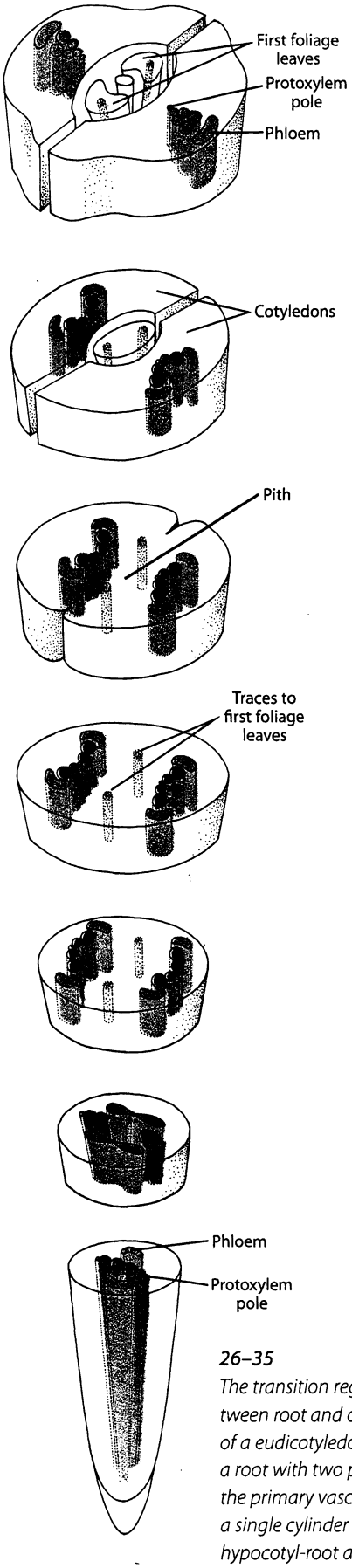


25–8

Diagram illustrating early stages in the primary development of a root tip. The region of cell division extends for a considerable distance behind the apical meristem. These cell divisions overlap with cell elongation and enlargement and also with cell maturation, or differentiation. At various distances from the apical meristem, cells enlarge and develop as specific cell types according to their position in the root. The three primary meristems—protoderm, ground meristem, and procambium—are delimited close to the apical meristem. Elements of the protophloem sieve tubes mature before (nearer to the apical meristem) the protoxylem elements. The endodermis matures (with Casparian strip) in advance of the protoxylem and the development of root hairs.



26–35

The transition region—the connection between root and cotyledons—in the seedling of a eudicotyledon with a diarch root, that is, a root with two protoxylem poles. In the root, the primary vascular system is represented by a single cylinder of vascular tissue. In the hypocotyl-root axis, the vascular system branches and diverges into the cotyledons, and the xylem and phloem become reoriented along the hypocotyl-root axis.

Biology of Plants, *Raven, Evert & Eichhorn*, Freeman & Worth 1999.