

FIGURE 17. Structure of a dicotyledonous angiosperm seed.

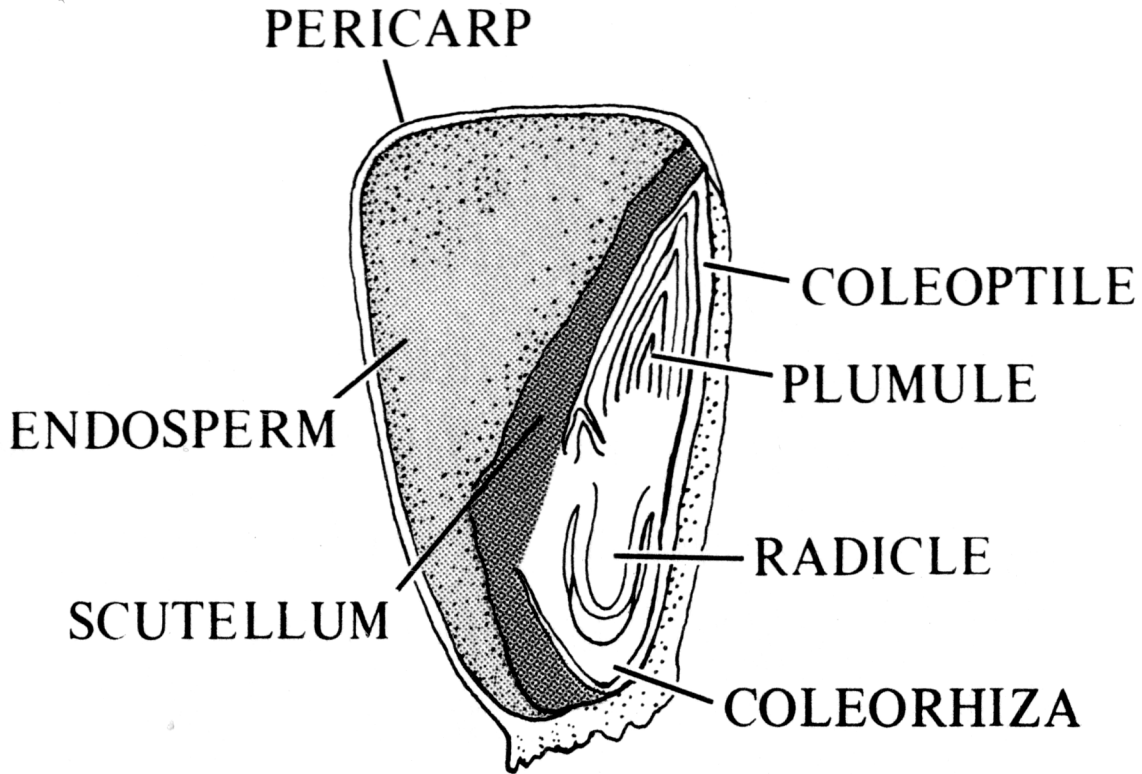


FIGURE 18. Structure of a monocotyledonous angiosperm seed.

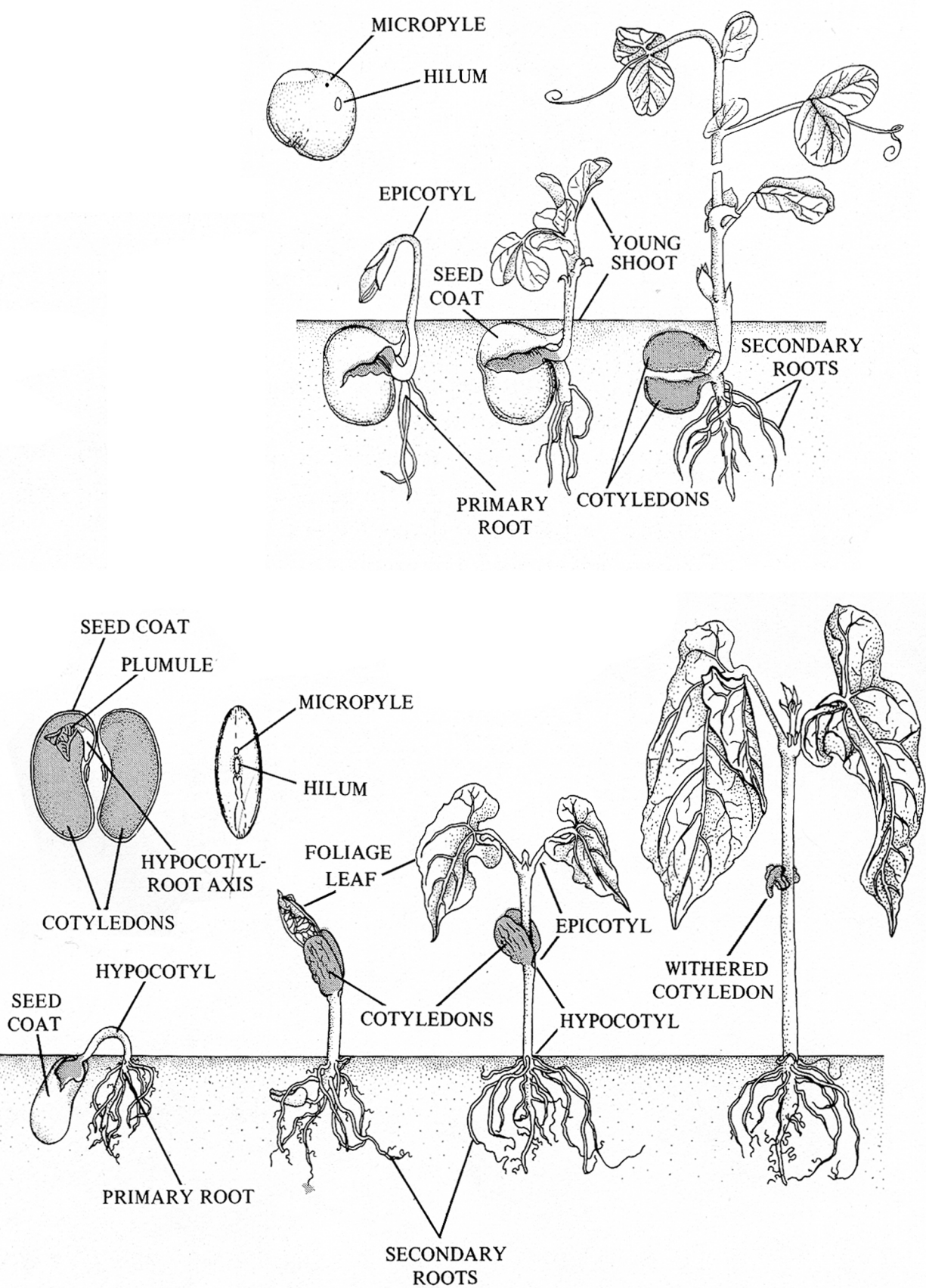


FIGURE 19. Germination of dicotyledonous angiosperm seeds. The garden bean (*Phaseolus vulgaris*) is an example of epigenous emergence. Elongation of the hypocotyl forms the hook and cotyledons emerge above the soil (bottom). The pea (*Pisum sativum*) is an example of hypogenous emergence. Elongation of the epicotyl forms the hook and the cotyledons remain below ground after emergence.

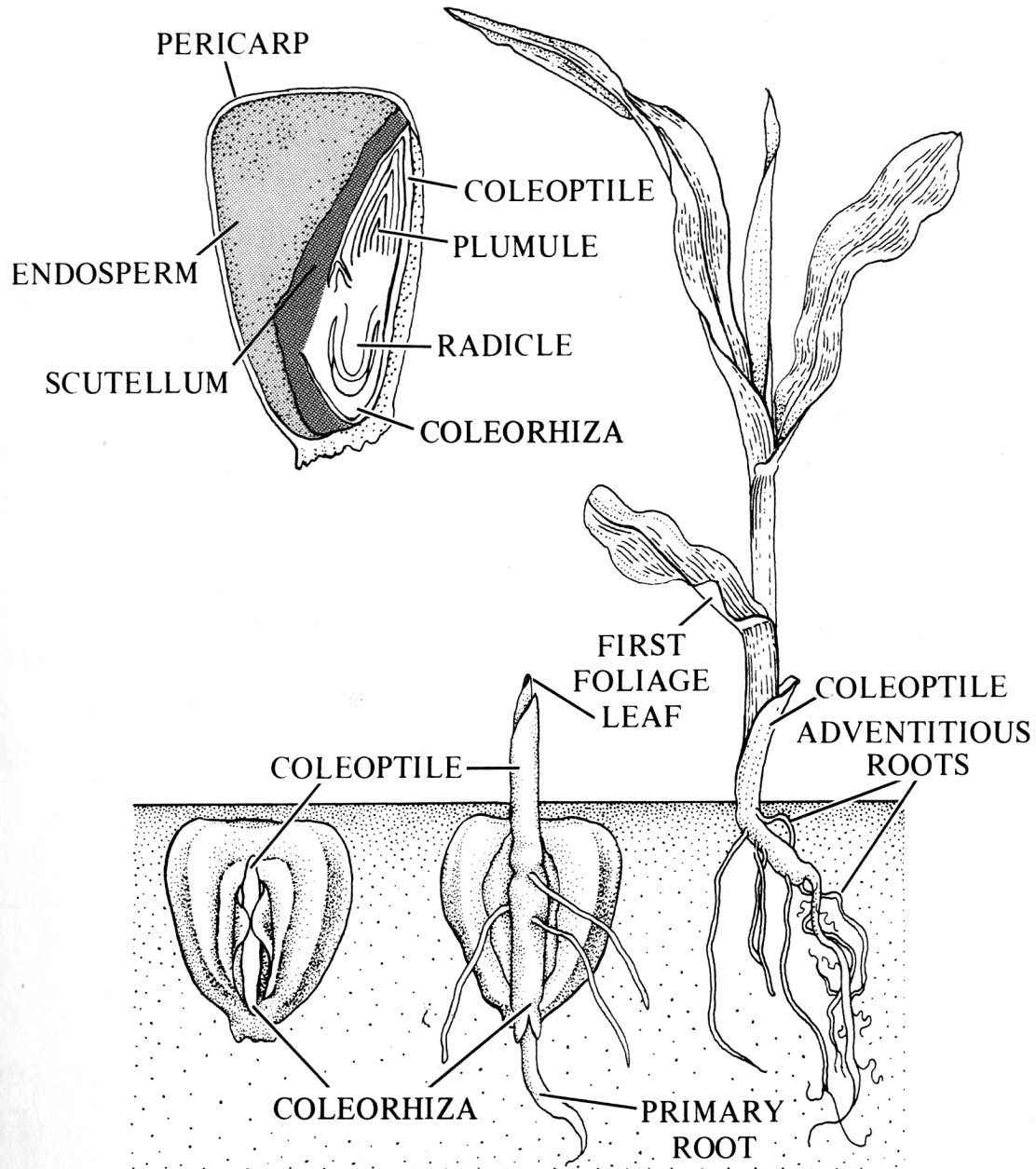


FIGURE 20. Germination and emergence of a monocotyledonous angiosperm seed. Corn (*Zea mays*) is an example of hypogenous emergence in a monocot. The plant emerges from the soil directly by elongation of the mesocotyl or first internode. No hook is formed and the plumule and radicle are protected by the coleoptile and coleorhiza, respectively.

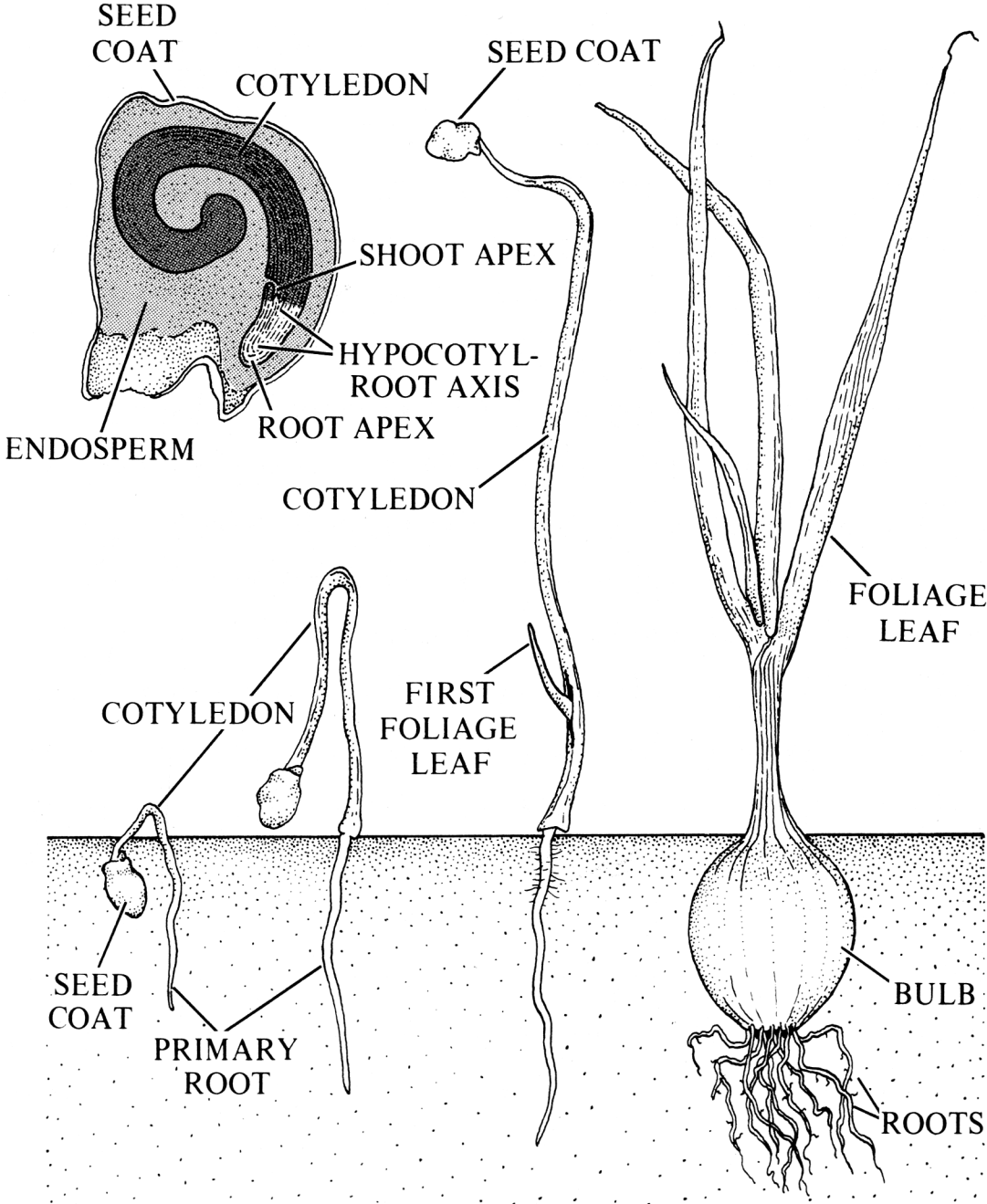


FIGURE 21. Germination and emergence of a monocotyledonous angiosperm seed. Onion (*Allium cepa*) is an example of epigenous emergence in a monocot. The cotyledon itself elongates to form a hook for emergence. The shoot apex is protected during emergence by the seed coat itself.