

Kingdom Plantae- now Viridiplantae

- **Eukaryotic, multicellular,
photoautotrophs, cell walls made of
cellulose**

Kingdom Plantae

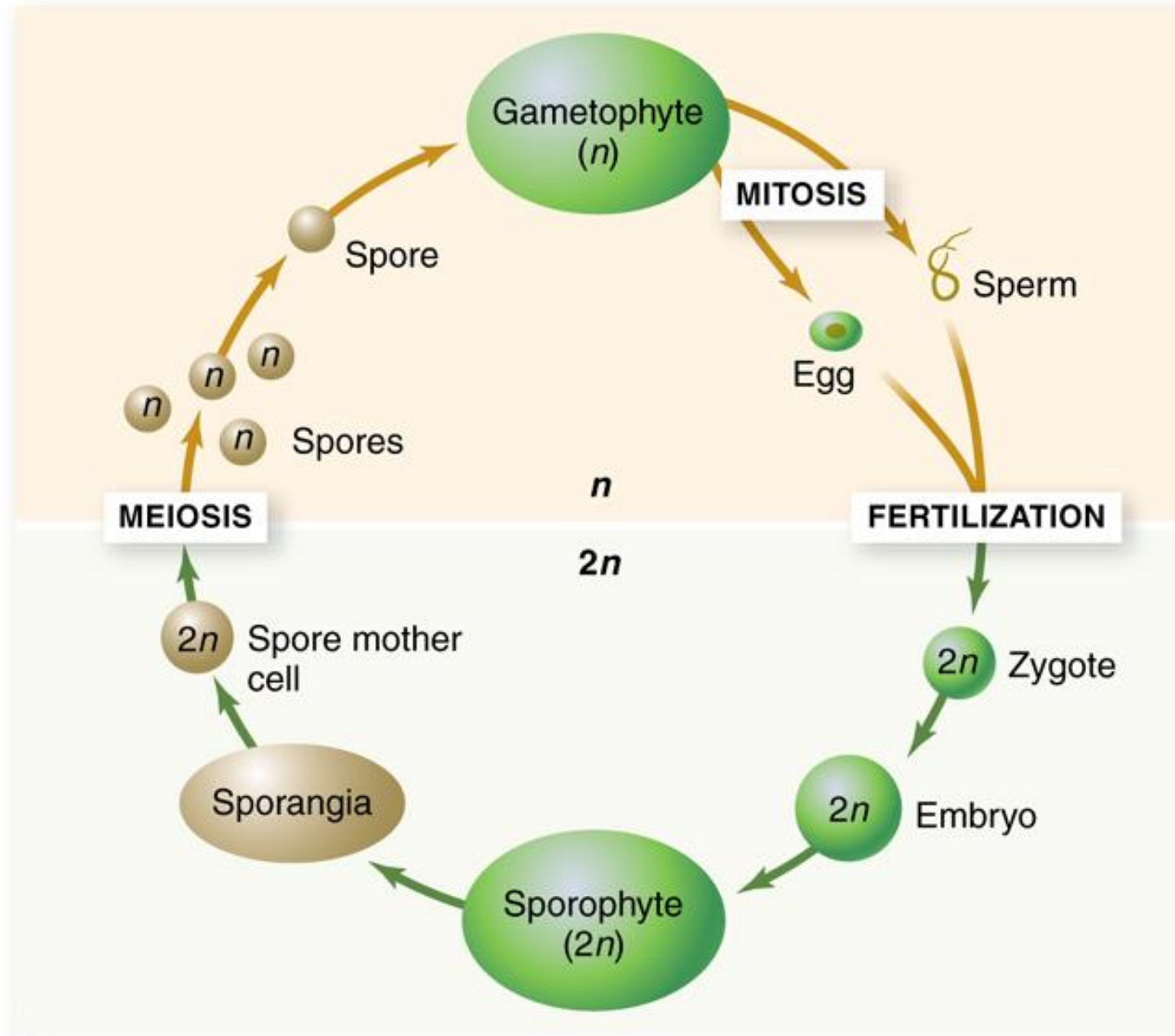
- was terrestrial
- new Viridiplantae kingdom includes green algae, which are aquatic

Adaptations for Living on Land

- **Roots and shoots**
- **Waxy cuticle**
- **Stomata**
- **Some plants have: tracheids (xylem and phloem) pollen, seeds**

Haplodiplontic Life Cycle: Alternation of Generations

- multicellular haploid gametophytes and multicellular diploid sporophytes take turns producing each other



Defining Plants

The kingdom **Viridiplantae** includes land plants and green algae

- Red and brown algae are excluded

All green plants arose from a single species of freshwater algae

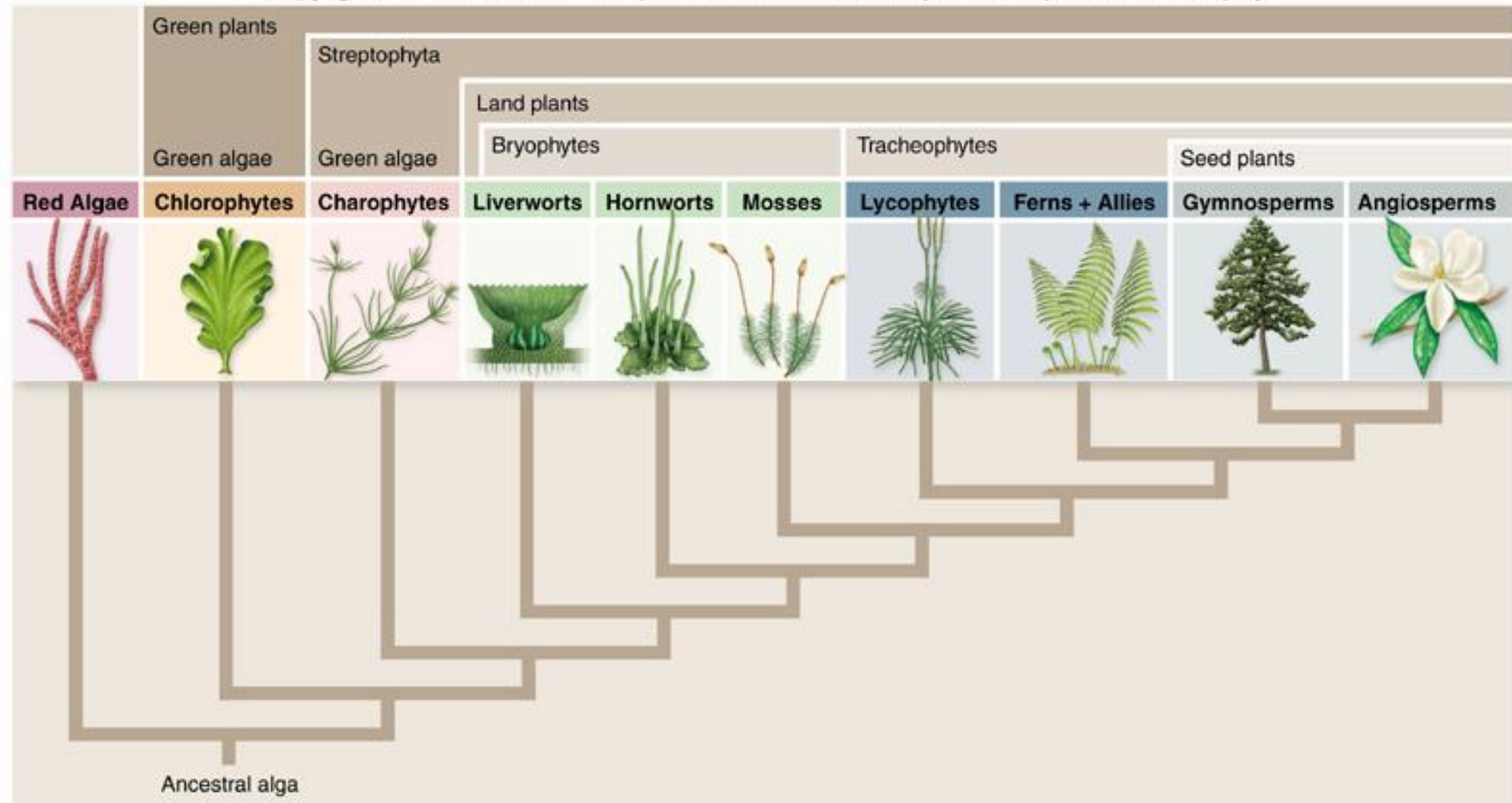
The green algae split into two major clades

- Chlorophytes** – Never made it to land

- Charophytes** – Did!

Defining Plants

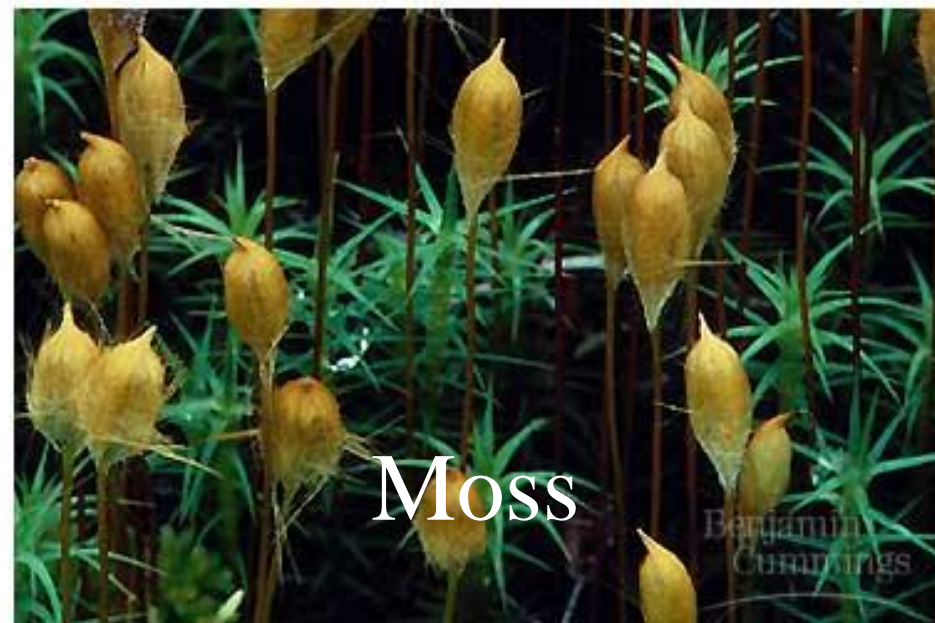
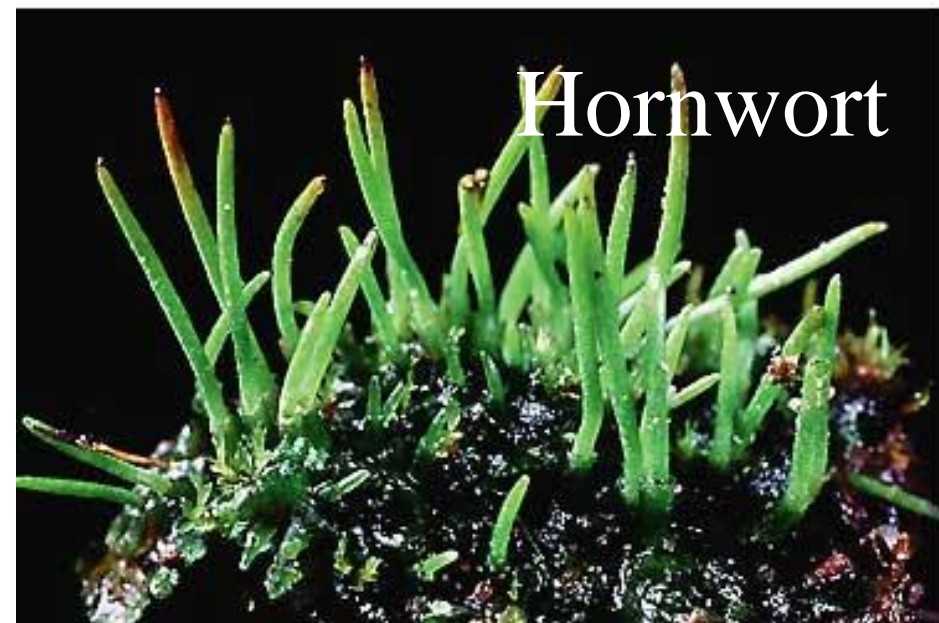
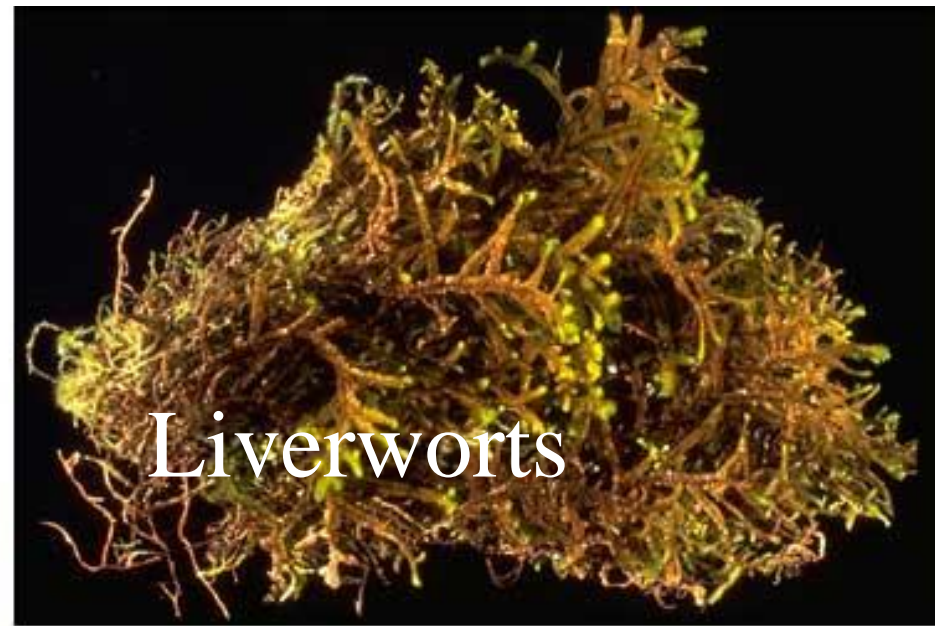
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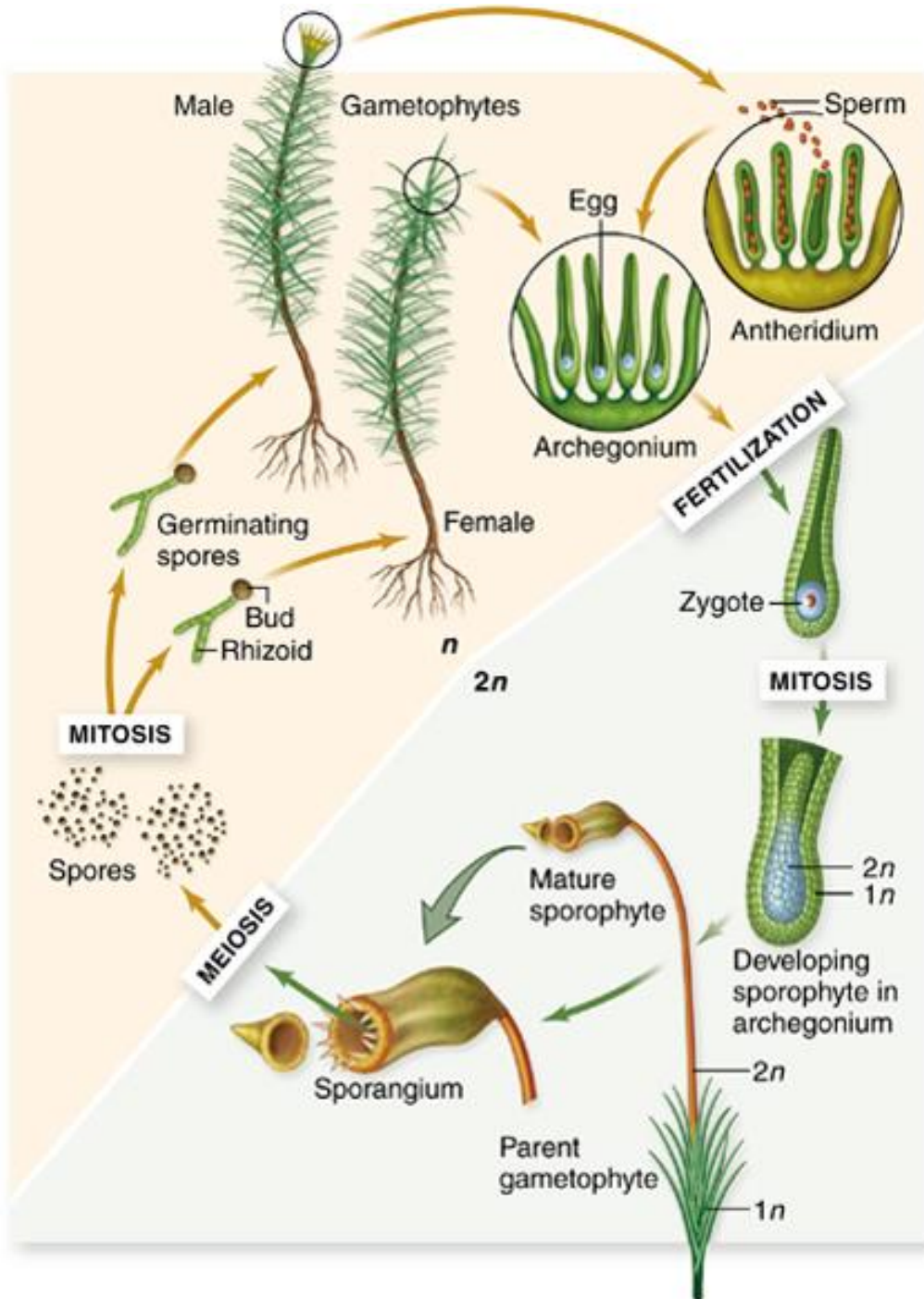
Moss





Nonvascular Plants

- **aka Nontracheophytes or Bryophytes**
- **Still rely on water**
 - Swimming sperm & no transport system
- **gametophyte dominant**



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Figure 29.0 Ferns





Figure 29.21 Pteridophytes: club "moss" (top left), whisk fern (top right), horsetail (bottom left), fern (bottom right)



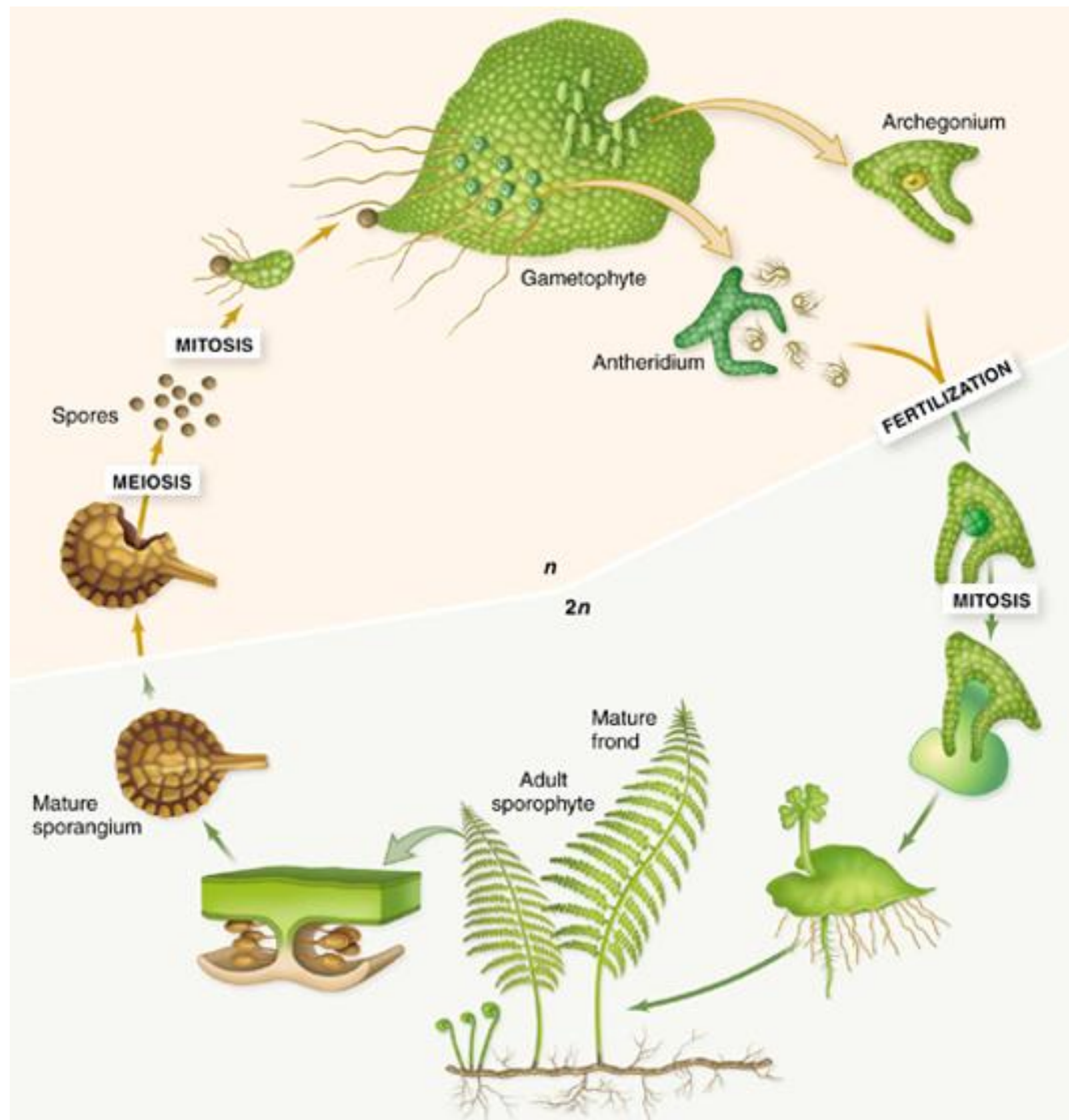
Seedless Vascular Plants

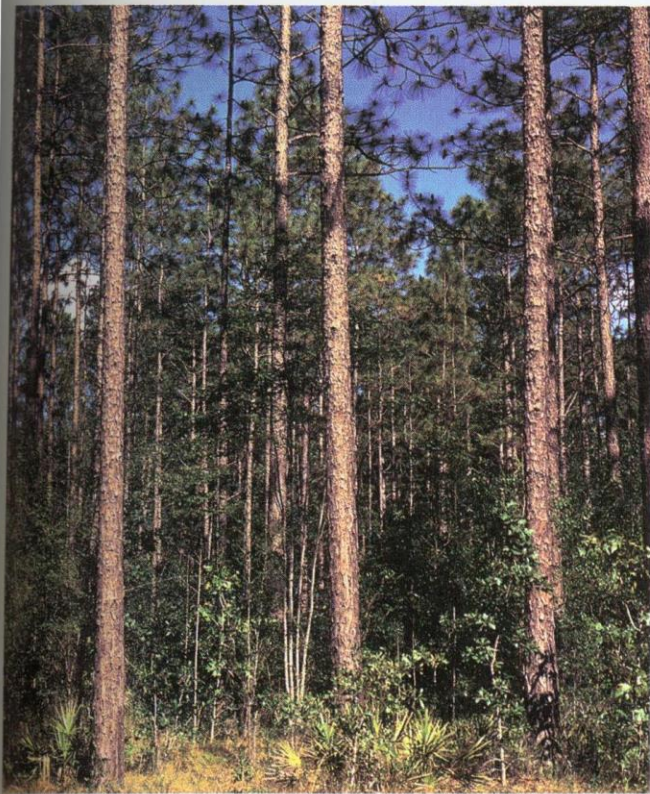
- Pteridophytes: ferns and their relatives
- Vascular tissue
 - Transports water & nutrients and provides support
- flagellated sperm
- **Sporophyte** is dominant

Tightly Coiled Fern



Uncoiling Fern

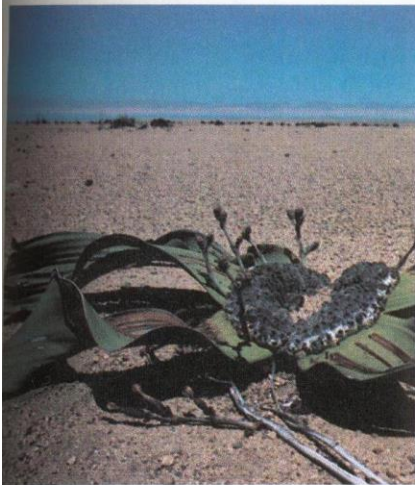




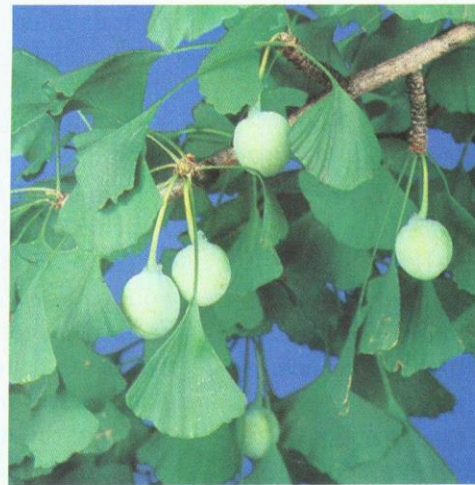
(a)



(b)



(c)



(d)

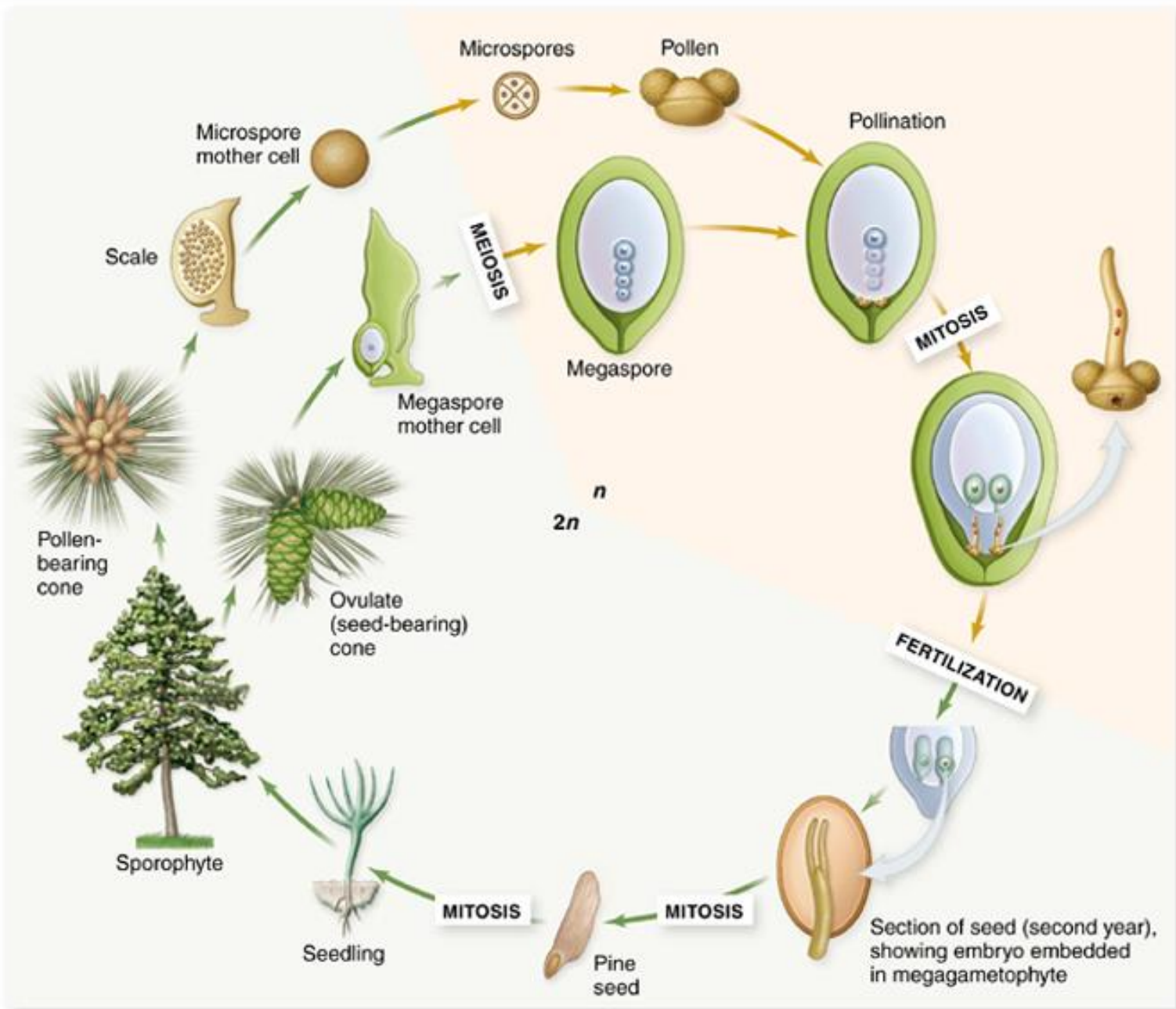
FIGURE 33.17
Representatives of the four
phyla of gymnosperms with
living members. (a) Slash
 pines, *Pinus palustris*, in Florida,
 representative of the
 Coniferophyta, the largest
 phylum of gymnosperms.
 (b) An African cycad,
Encephalartos ferox.
 (c) *Welwitschia mirabilis*, one
 of the three genera of
 Gnetophytes. (d) Maidenhair
 tree, *Ginkgo biloba*, the only
 living representative of the
 phylum Ginkgophyta.

Gymnosperms – Seeded Plants

- Conifers (pine, spruce, etc)
- Pollen
 - to transfer sperm
- Seed
 - embryo & food source in a protective coat

Gymnosperms – Seeded Plants

- Gametophyte stage further reduced...
- Male gametophyte –the pollen grain
- Female gametophyte - inside ovule



Angiosperms – Flowering Plants

- Flower
 - The reproductive structure of angiosperms

Angiosperms include:

- Eudicots** (about 175,000 species)
 - Trees, shrubs, snapdragons, peas, other
- Monocots** (about 65,000 species)
 - Grasses, lilies, palms, irises, others

Figure 31.3 A comparison of monocots and dicots

MONOCOTS

EMBRYOS



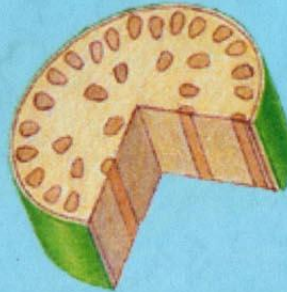
One
cotyledon

LEAF VENATION



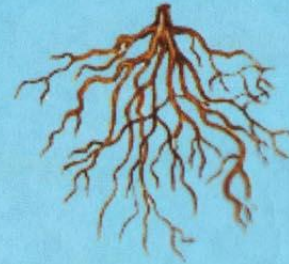
Veins usually parallel

STEMS



Vascular bundles
complexly
arranged

ROOTS



Fibrous
root
system

FLOWERS



Floral parts
usually in
multiples of three

DICOTS

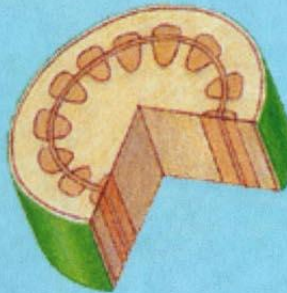
Two
cotyledons



Veins usually netlike



Vascular bundles
arranged in ring



Taproot
usually
present



Floral parts
usually in
multiples of
four or five



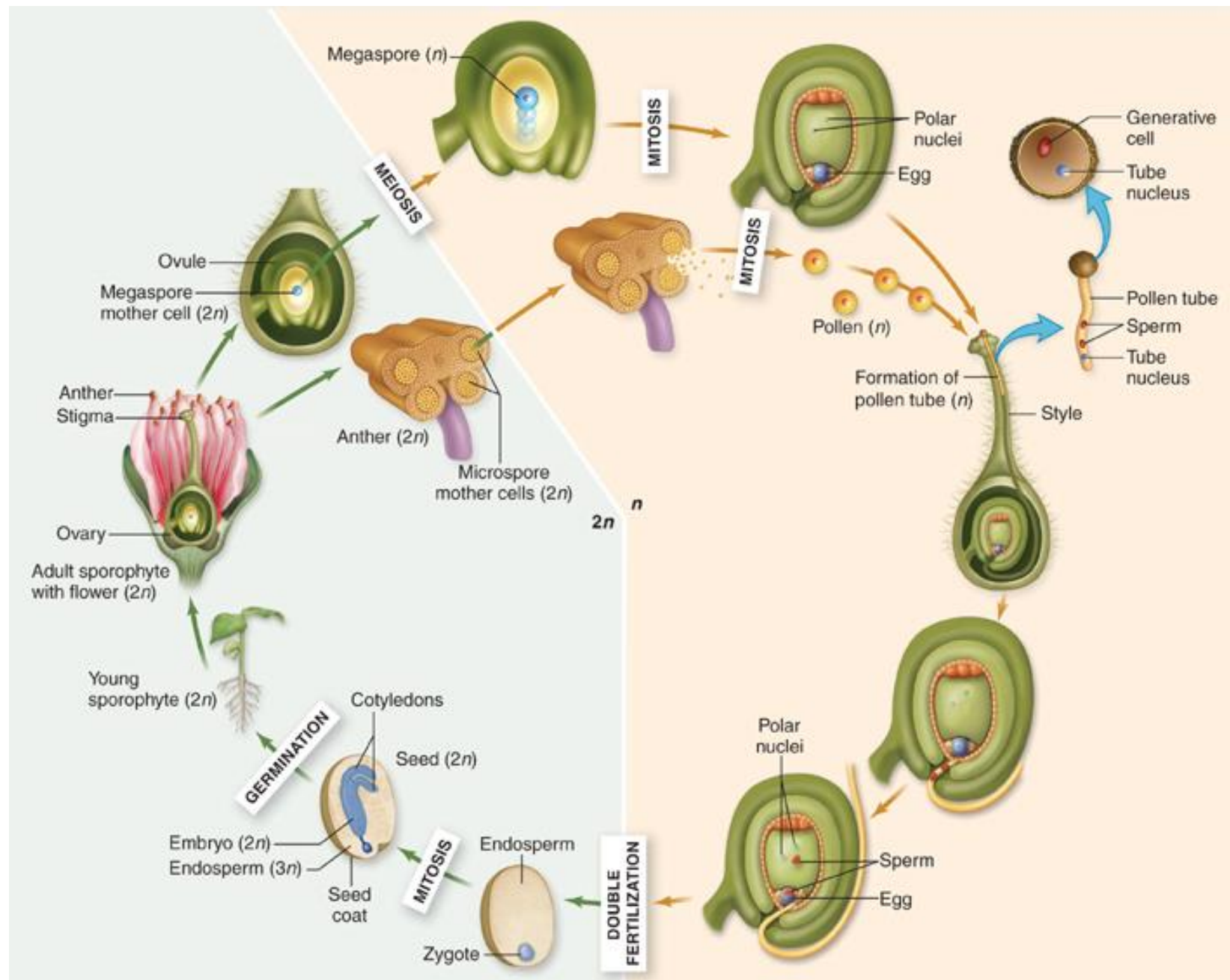


Figure 30.1 Three variations on gametophyte/sporophyte relationships

