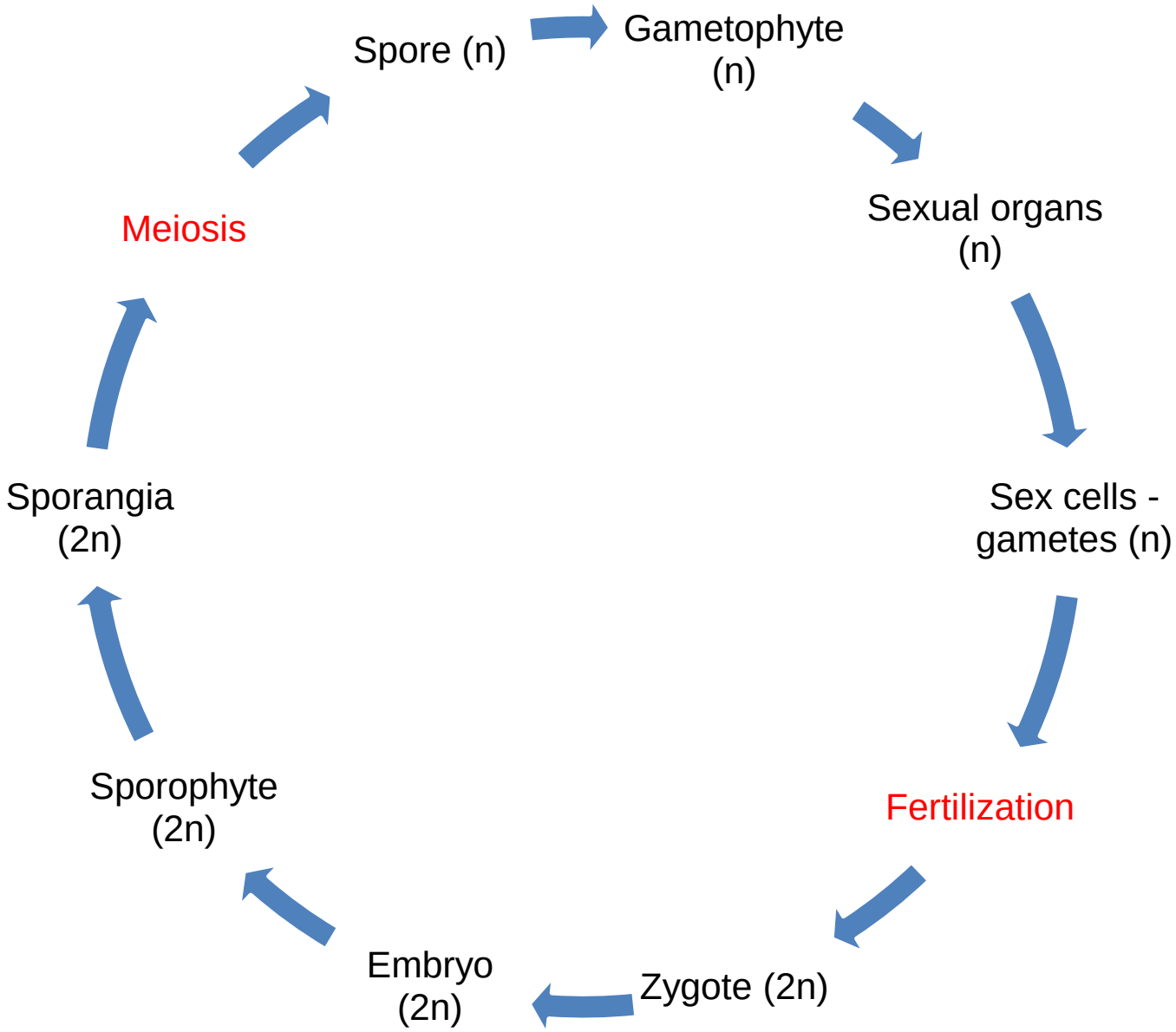
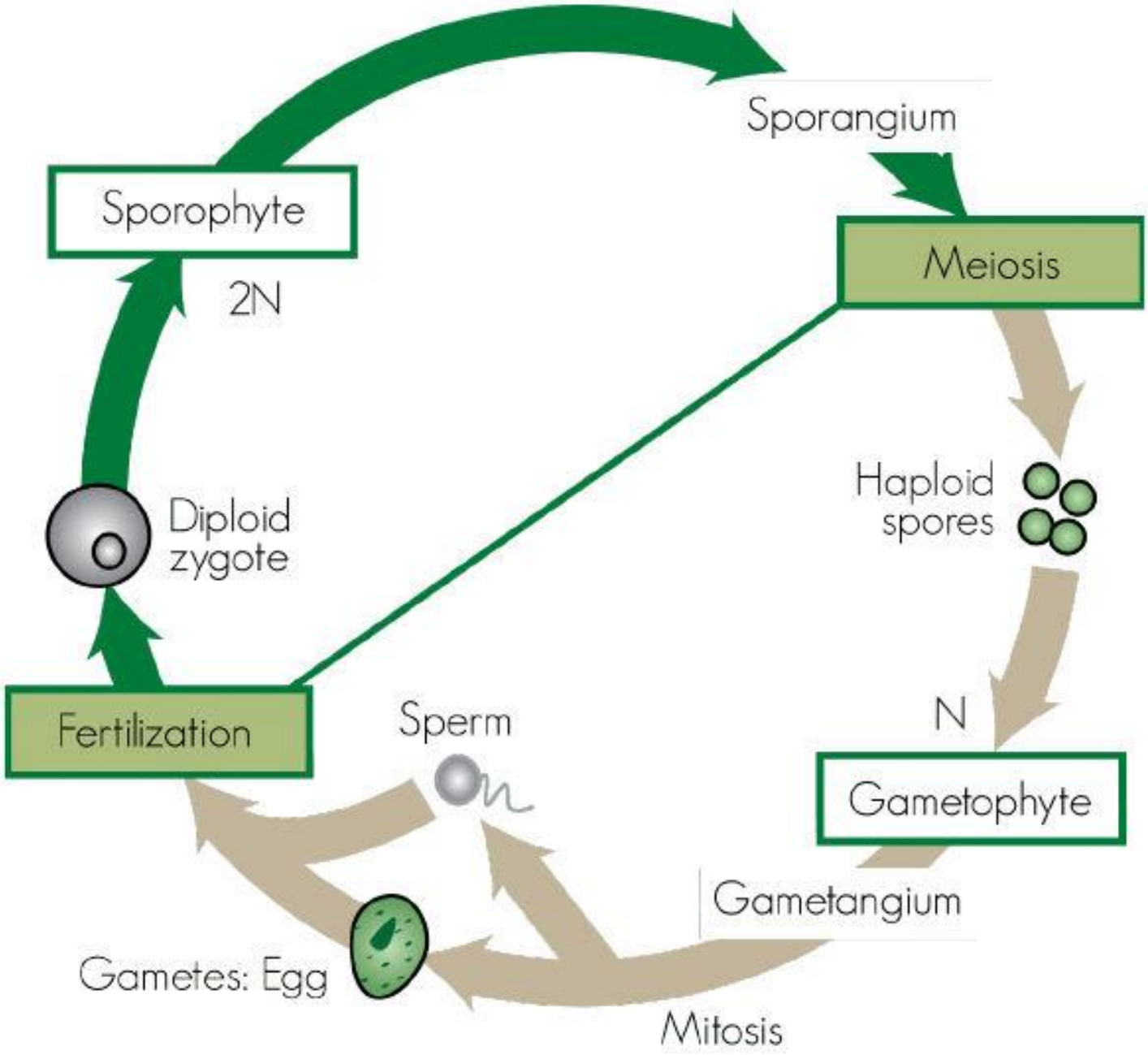
Lesson 3

Divisions Lycopodióphyta, Equisetophyta, Polypodióphyta

Life cycle of higher plants




Sporangium
Sporophyte
Meiosis
2N
Haploid
spores
Diploid
zygote
N
Fertilization
Sperm
Gametophyte
Gametangium
Gametes: Egg
Mitosis

Divisio - LYCOPODIOPHYTA

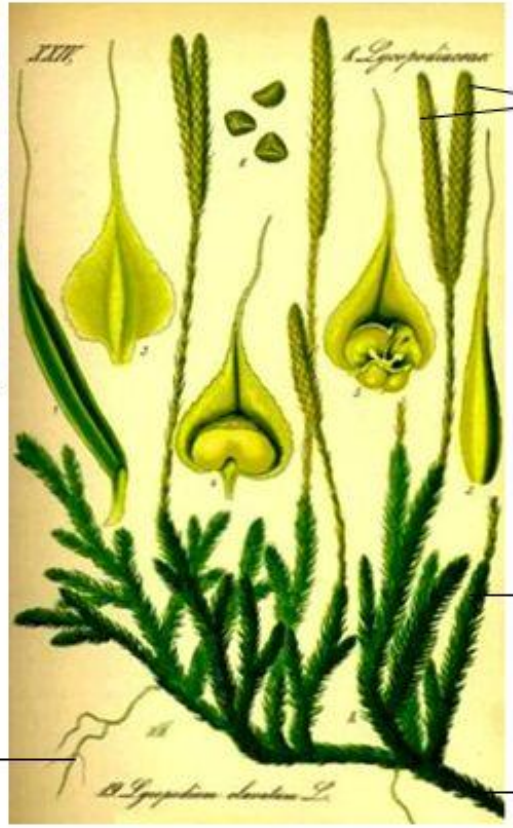
Phylum Lycopodiophyta

Genus *Lycopodium*

What is the name of the leaves on this plants?

Microphylls

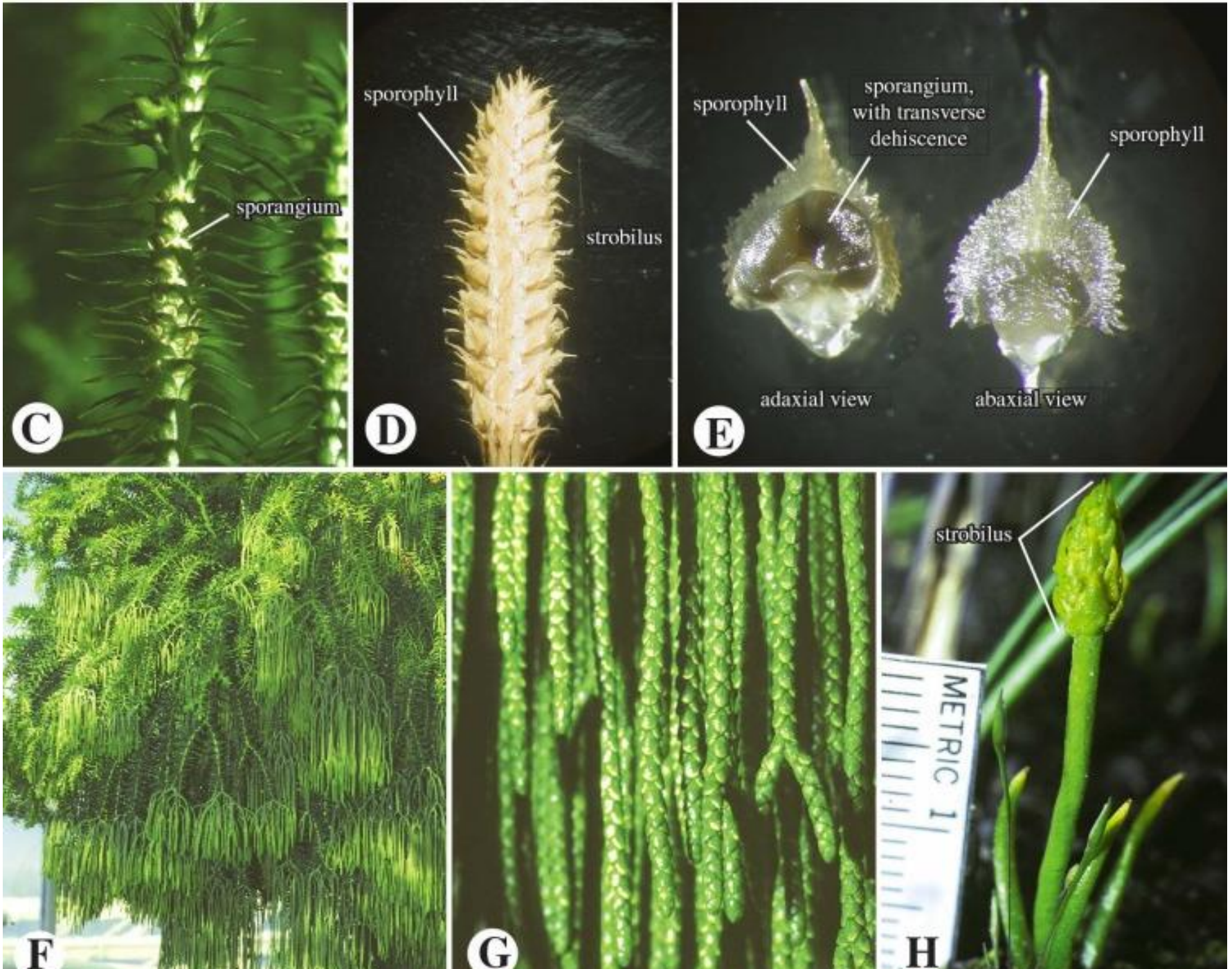
Label in the picture below.



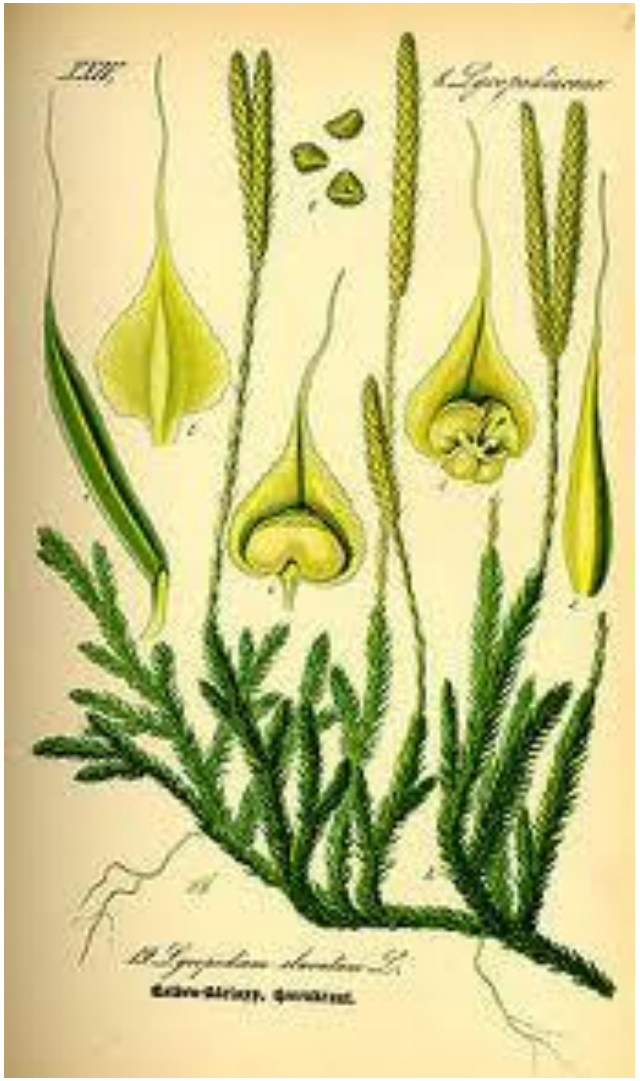
A) Strobili
B) Microphylls
C) Rhizome
D) Roots

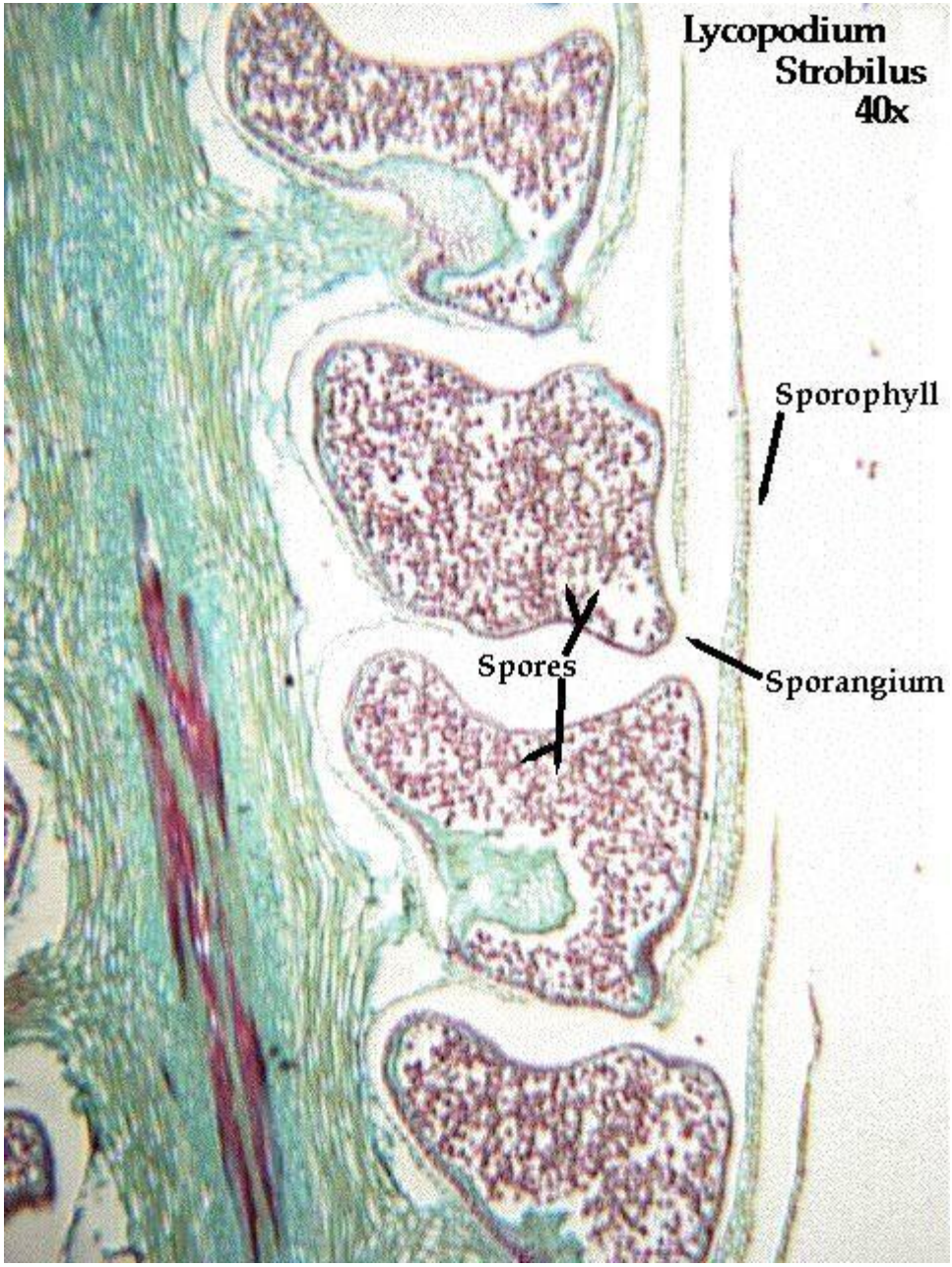
In A),B),C)&D) Which structure is photosynthetic?

Microphylls


sporangium
C
sporophyll
strobilus
D
sporophyll
sporangium, with transverse dehiscence
sporophyll
adaxial view
abaxial view
E
F
G
strobilus
METRIC 1
H

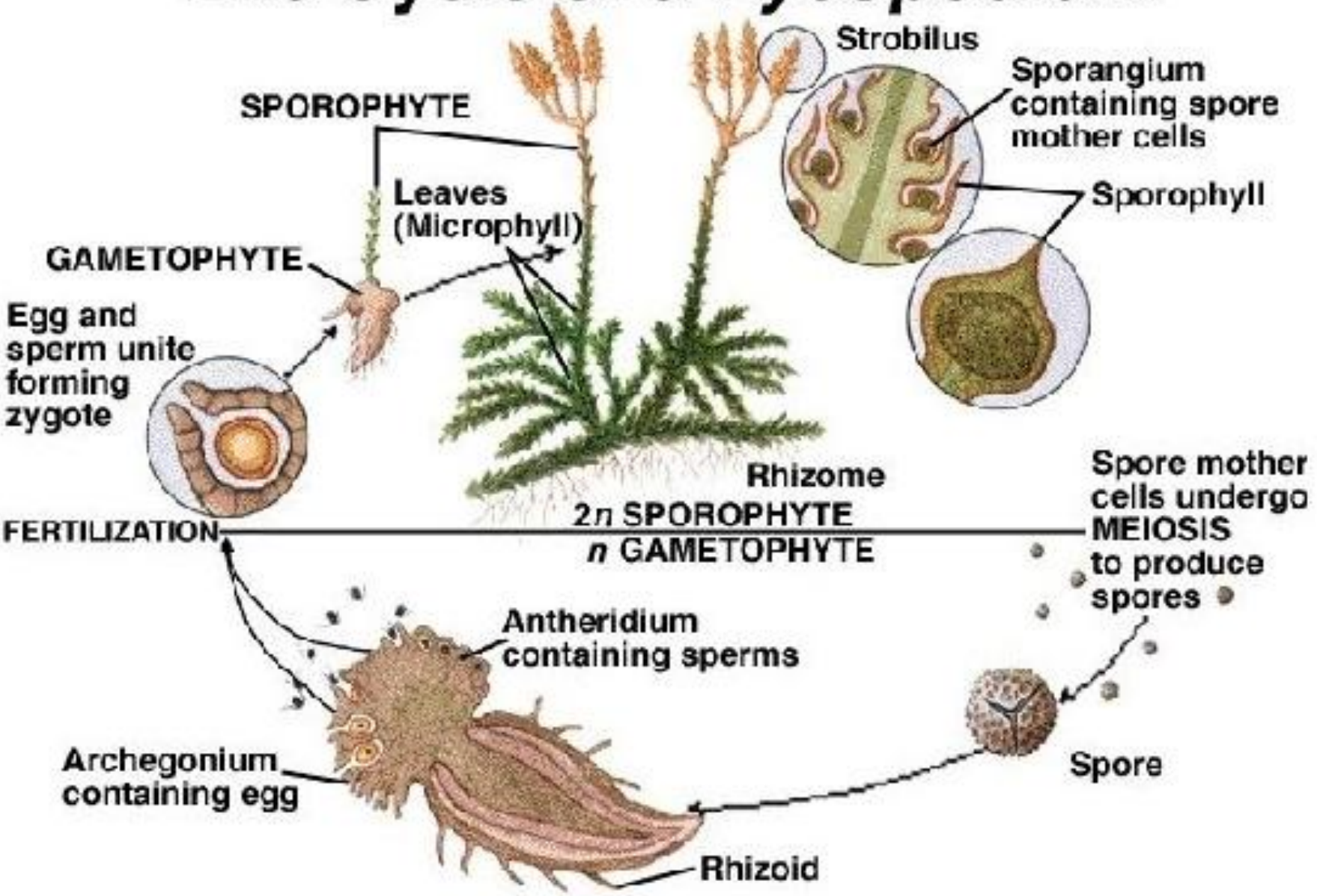
Lycopodium clavatum



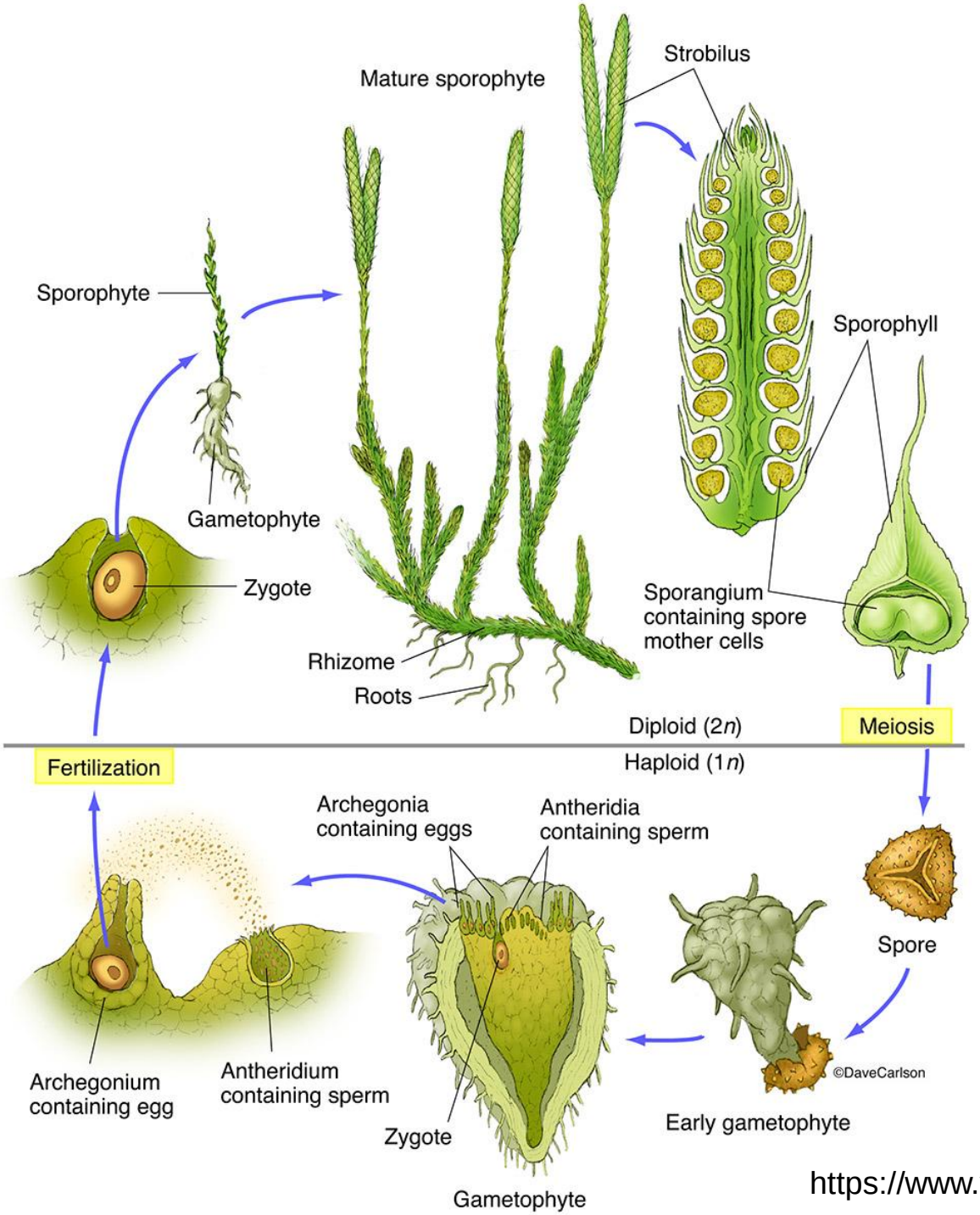

Lycopodium
Strobilus
40x
Sporophyll
Spores
Sporangium

Spores of Lycopodium

Life Cycle of a *Lycopodium*

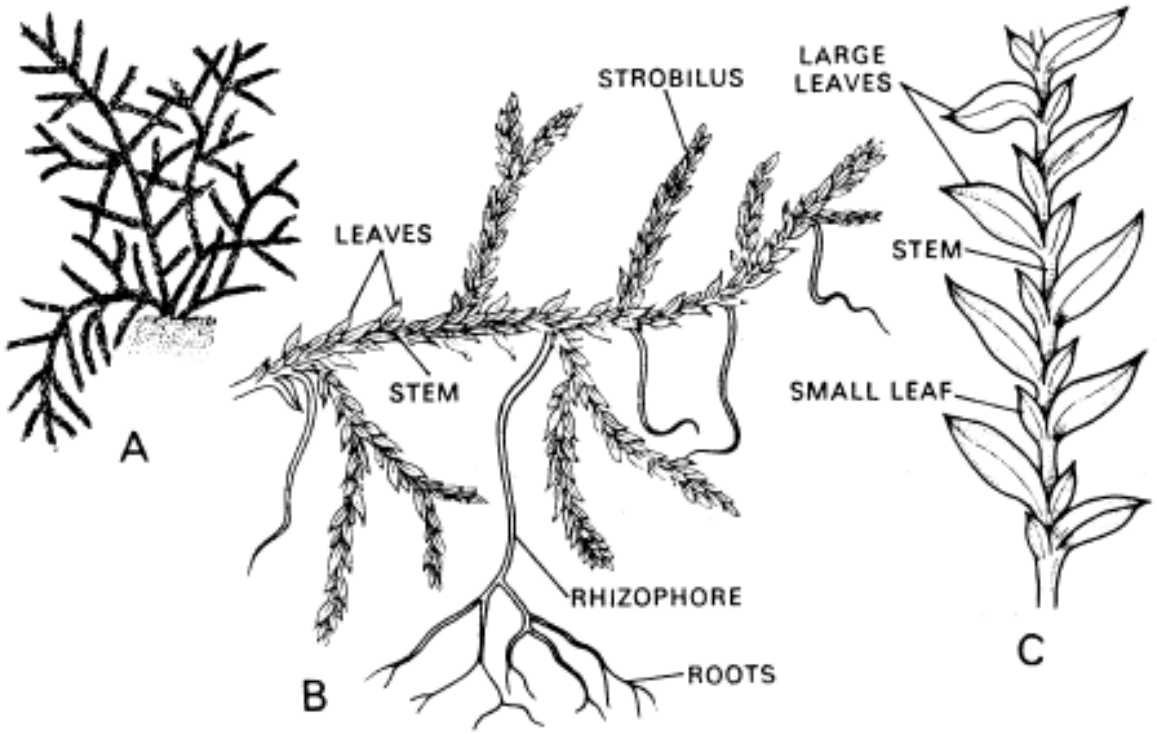


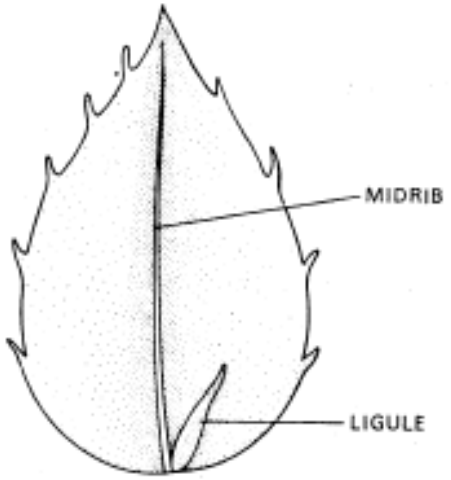
Life cycle of lycopodium



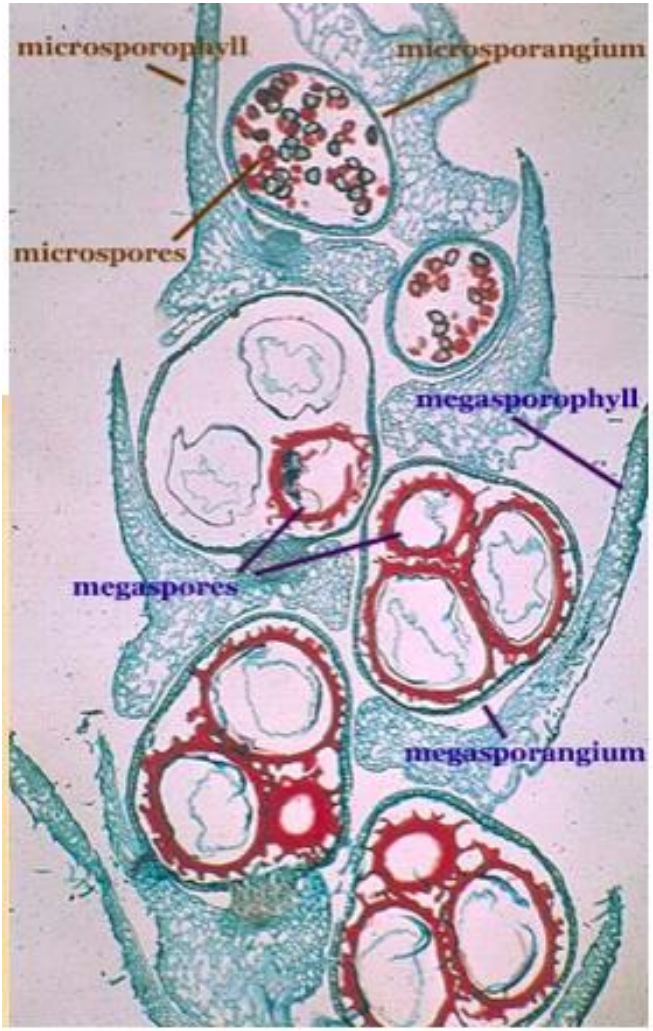
https://www.youtube.com/watch?v=7E3vHgUX0Bs

Selaginella

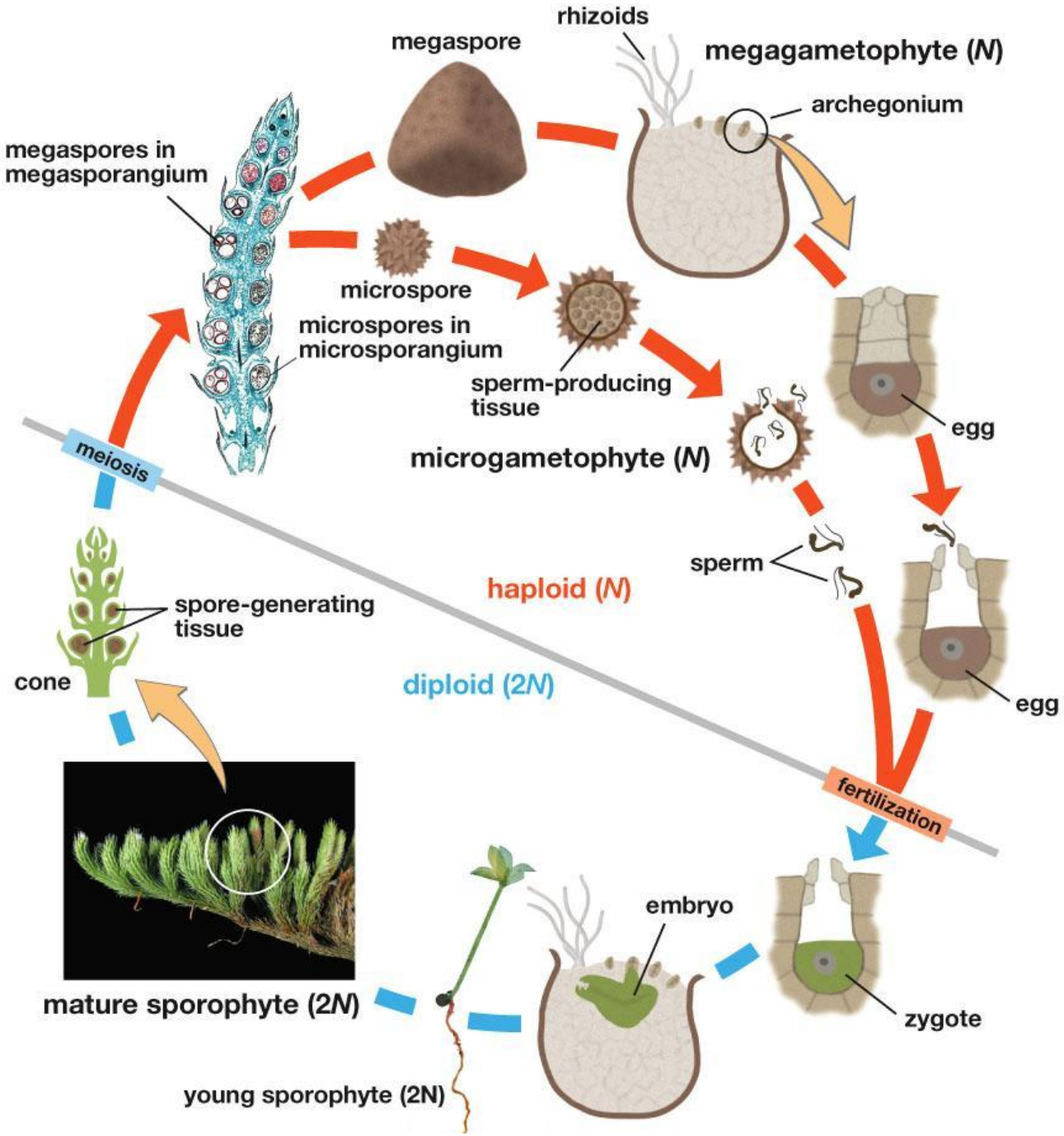




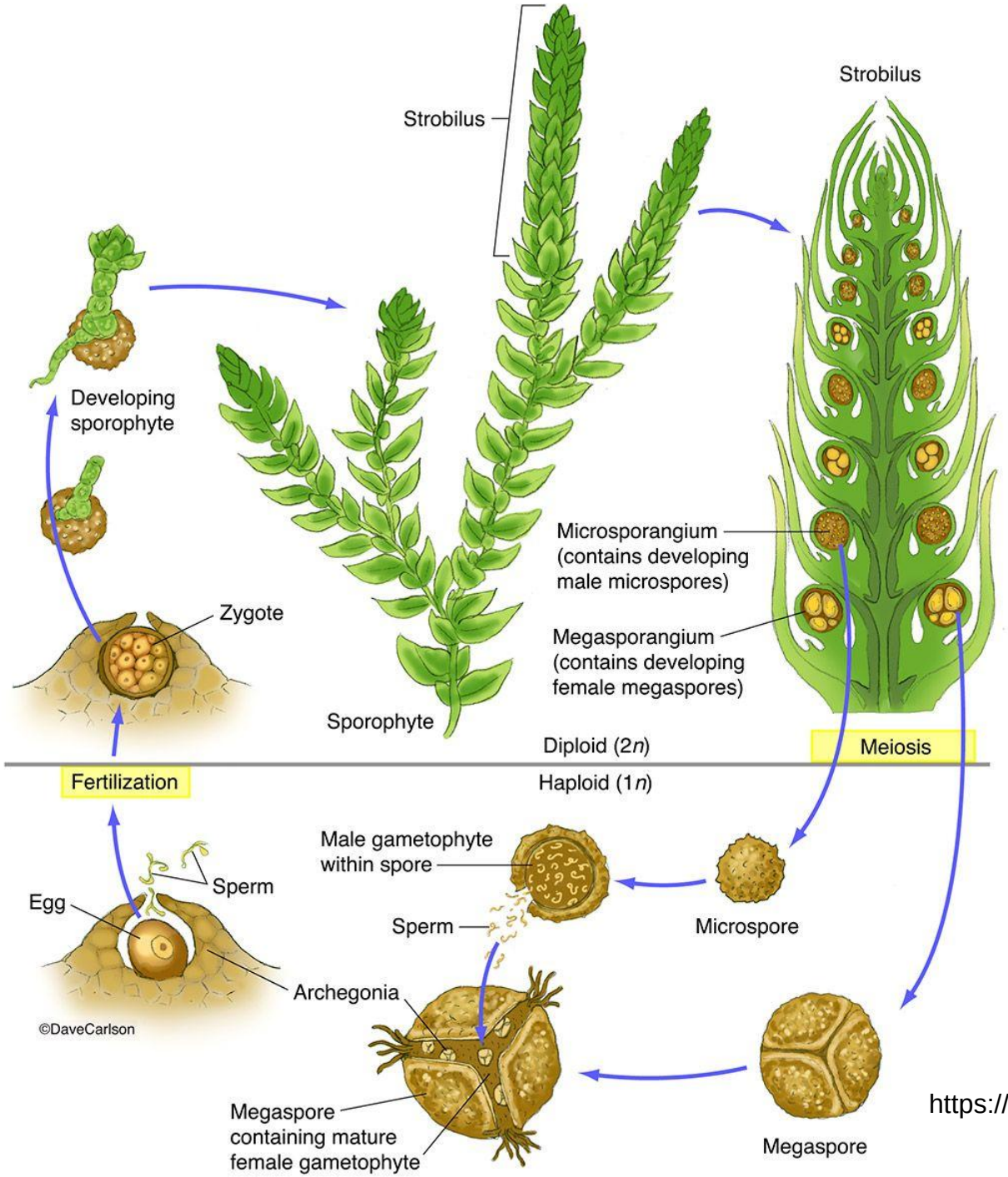
Selaginella—**Adaxial sur-**


microsporophyll
microsporangium
microspores
megasporophyll
megaspores
megasporangium

Life cycle of selaginella

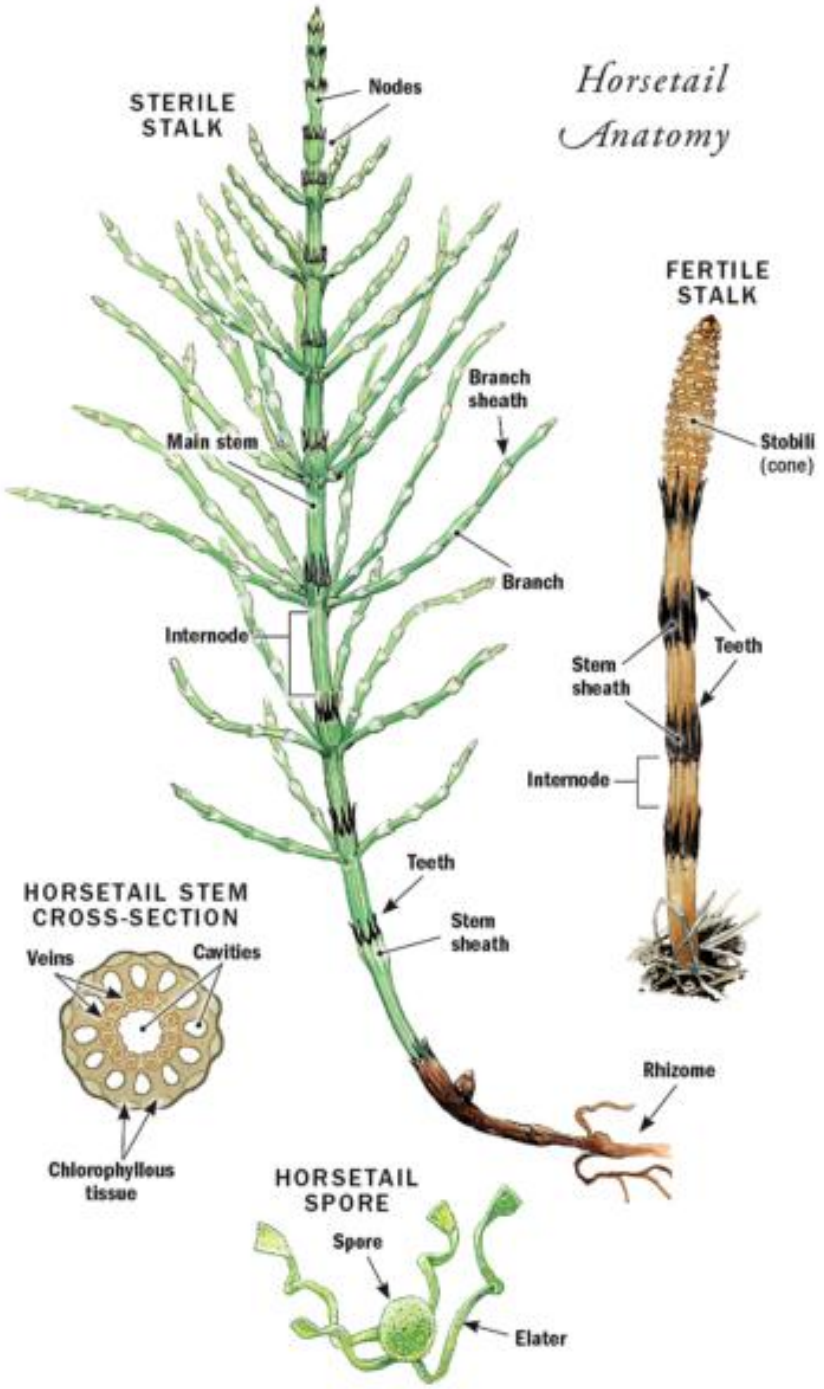


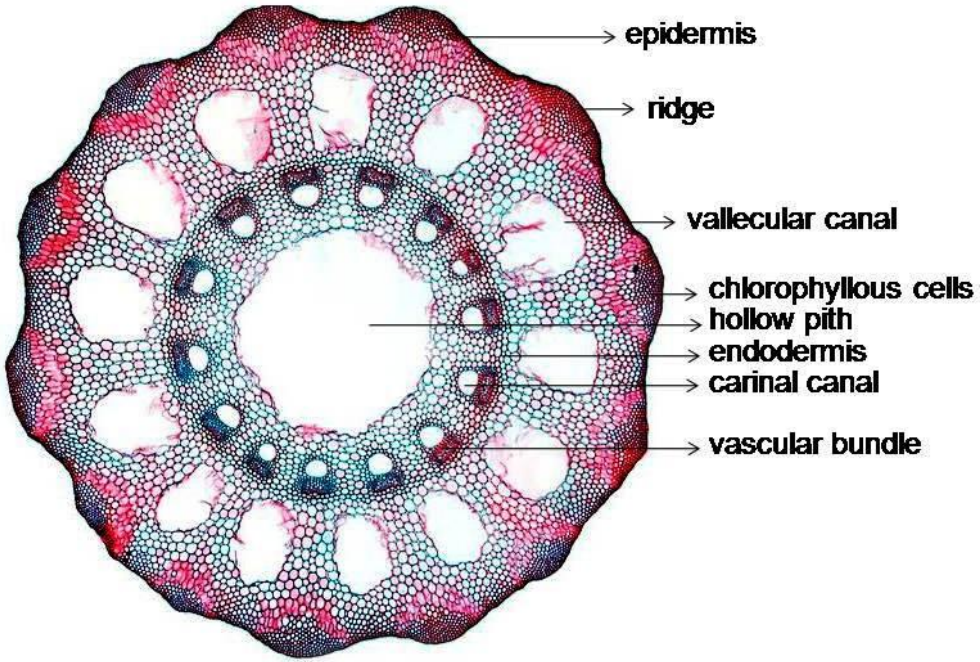
Life cycle of selaginella



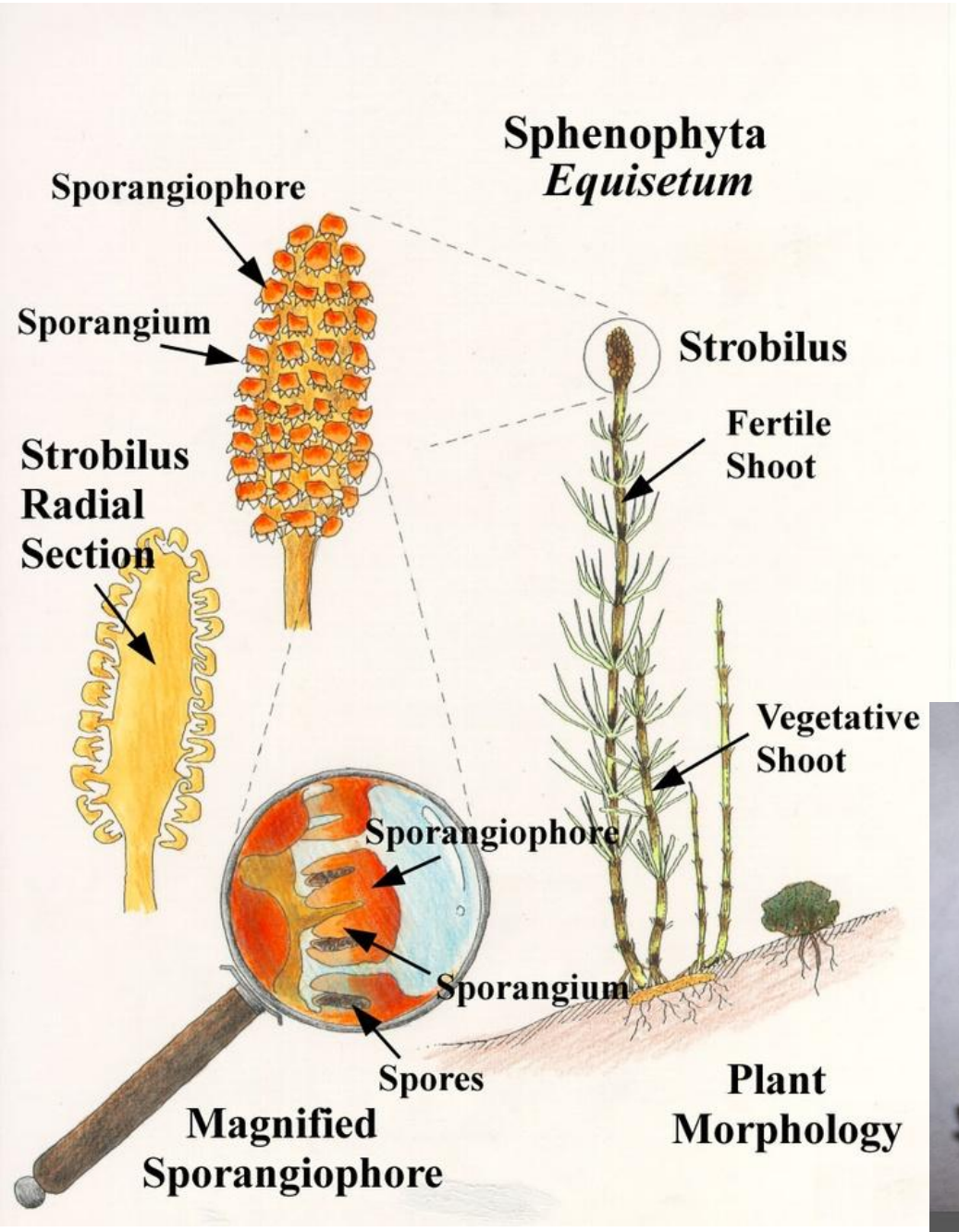
https://www.youtube.com/watch?v=BTXkh34BmZs

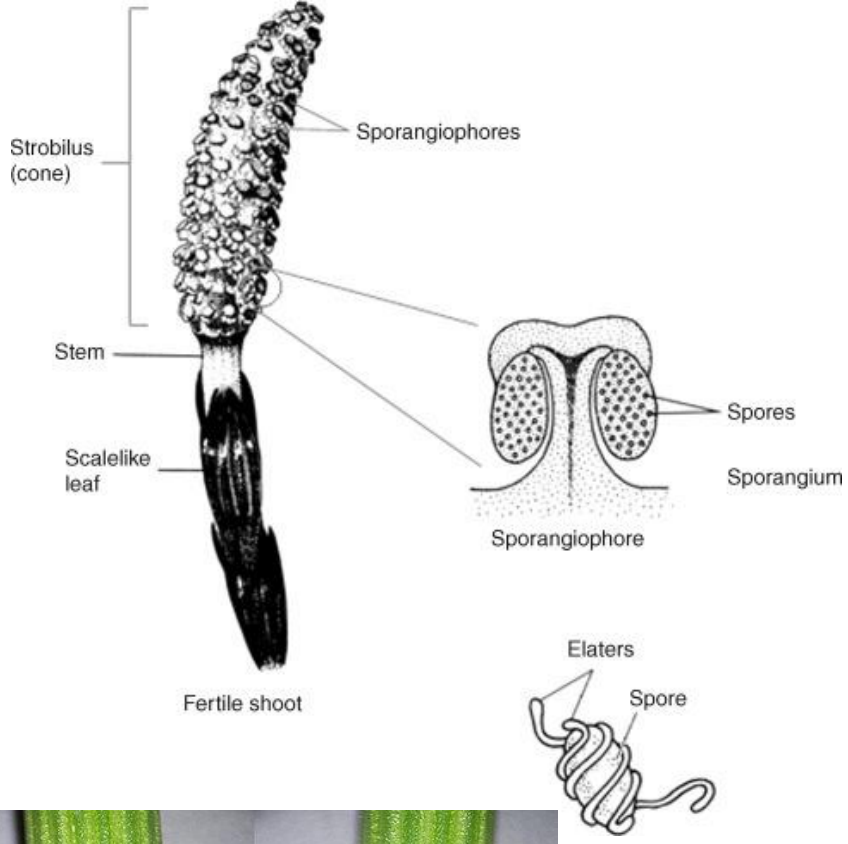
Divisio Equisetophyta

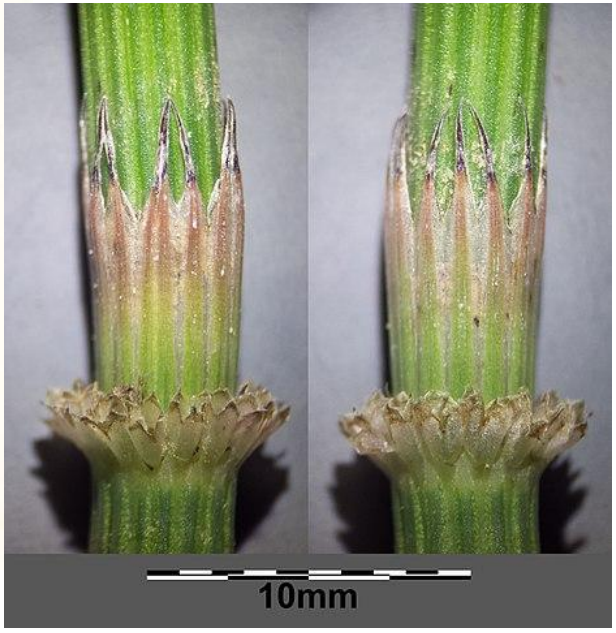


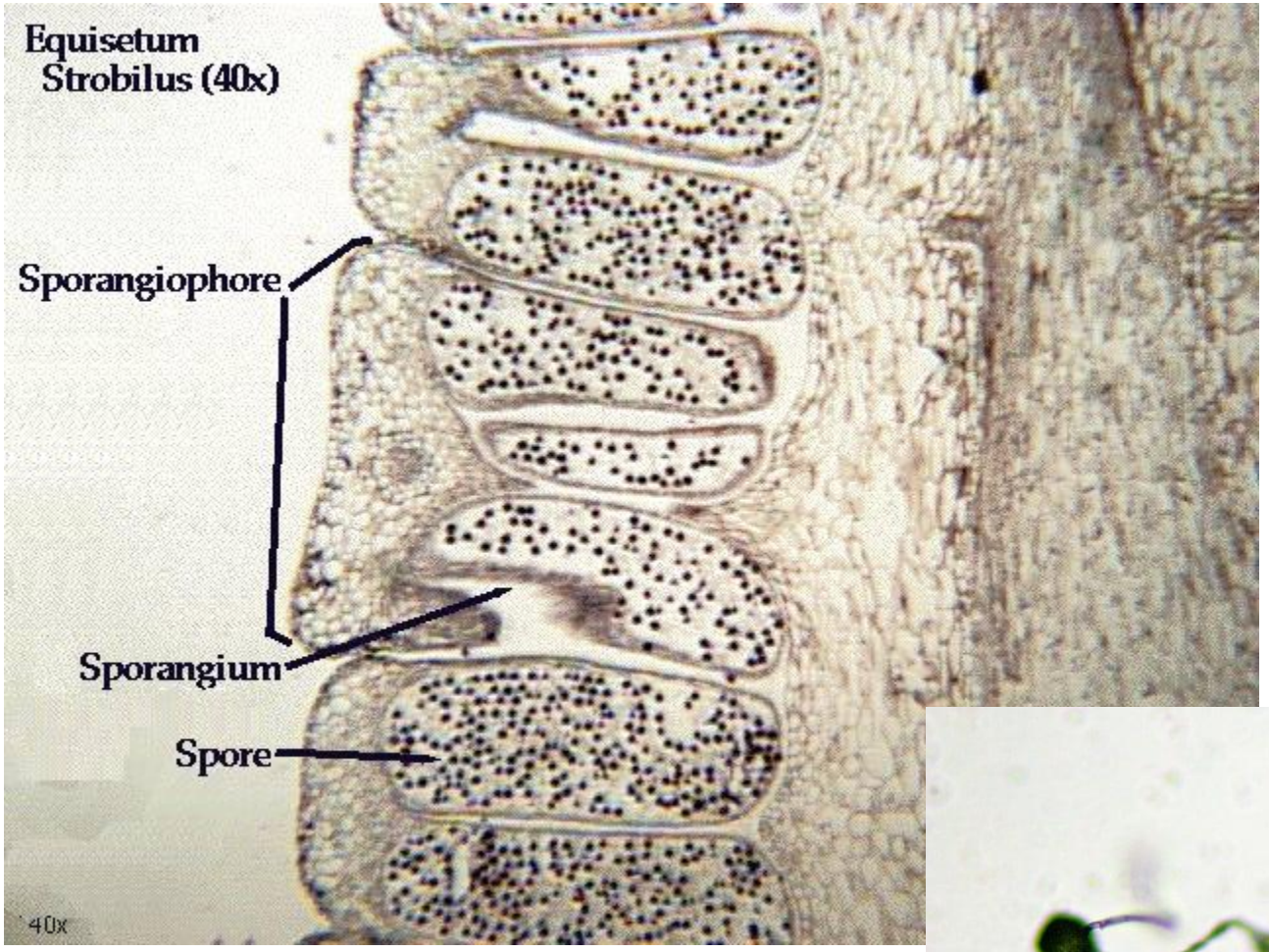


https://www.youtube.com/watch?v=Oj6SI_OT85A


Sphenophyta
Equisetum
Sporangiophore
Sporangium
Strobilus
Fertile Shoot
Strobilus Radial Section
Vegetative Shoot
Sporangiophore
Sporangium
Spores
Magnified Sporangiophore
Plant Morphology


Strobilus (cone)
Sporangiophores
Stem
Scalelike leaf
Spores
Sporangium
Sporangiophore
Fertile shoot
Elaters
Spore


10mm


Equisetum
Strobilus (40x)
Sporangiophore
Sporangium
Spore
40x

Life cycle of equisetum

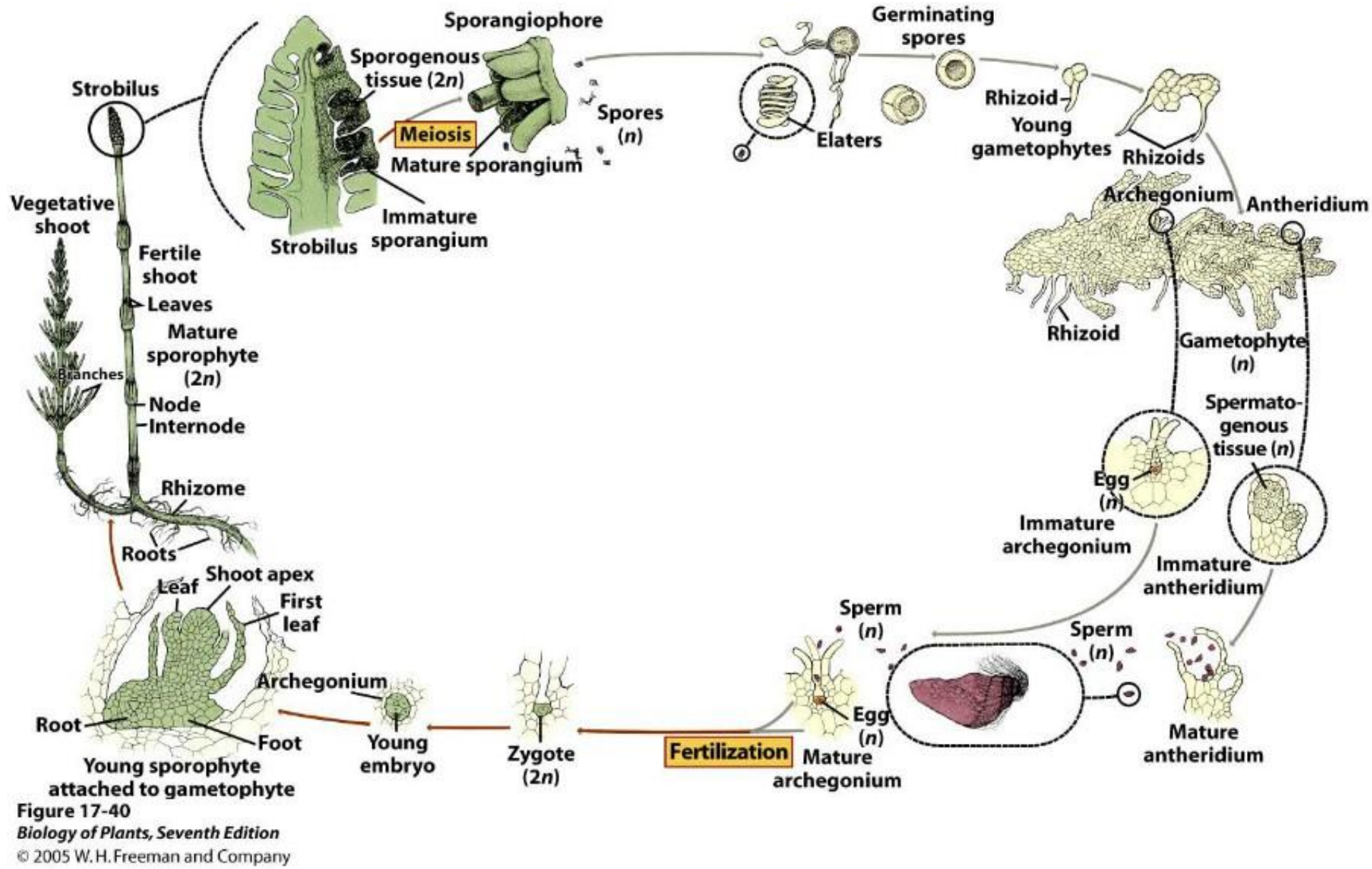
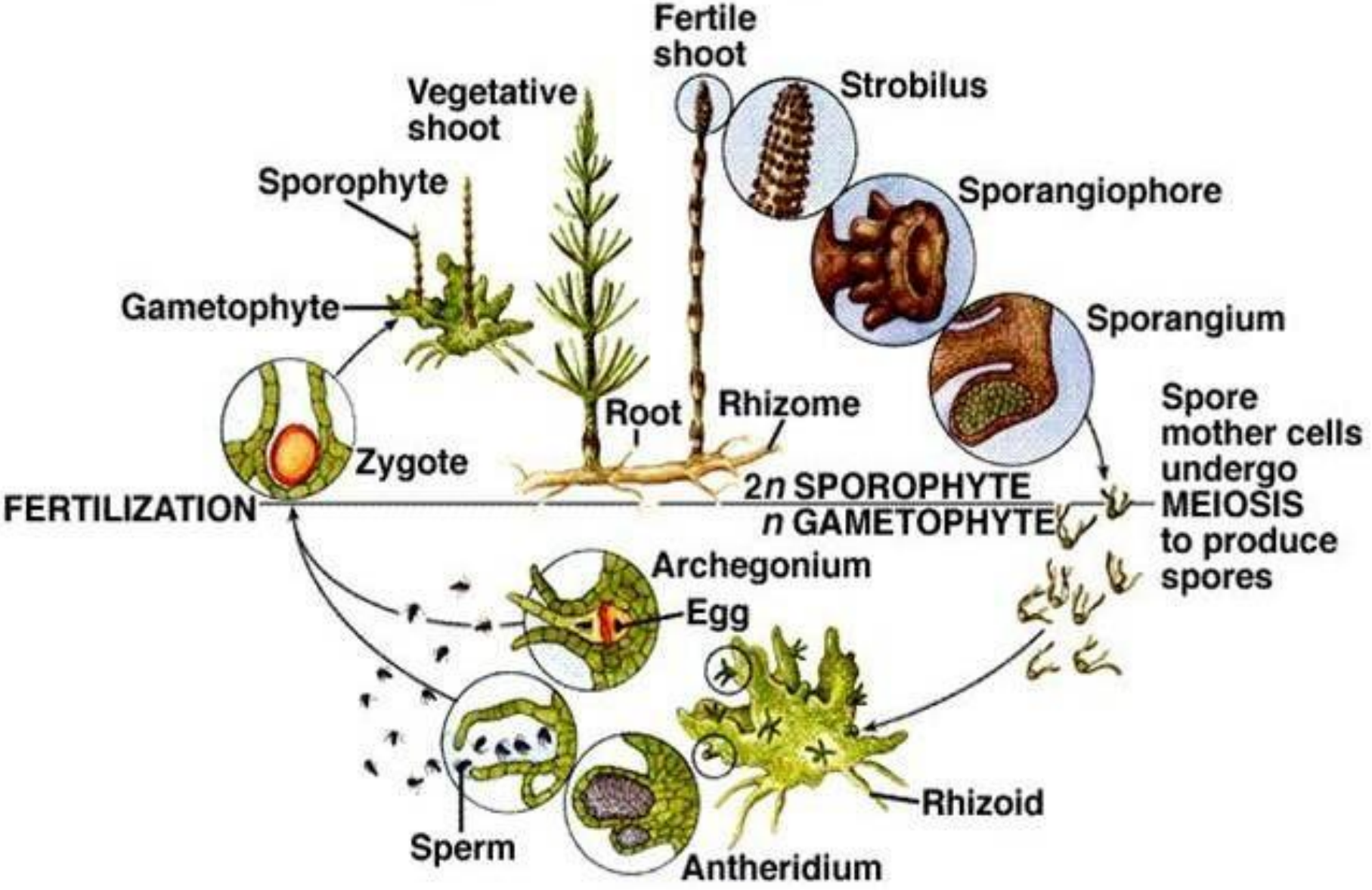


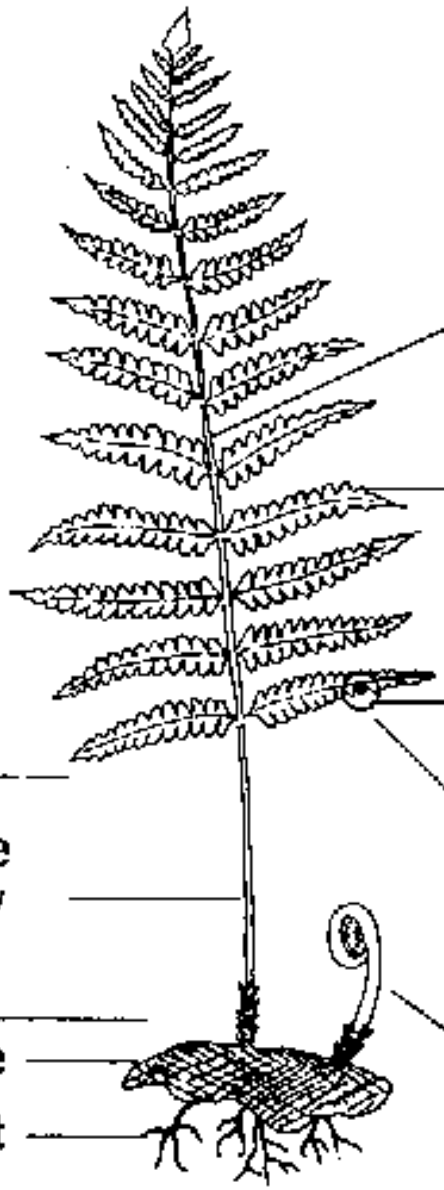
Figure 17-40
Biology of Plants, Seventh Edition

Life Cycle of *Equisetum*



Divisio Polypodiophyta

Parts of a Fern



Frond
The whole fern leaf; blade and stalk.

Blade
The expanded, leafy part of the frond.

Axis – rachis
The stalk within the blade.

Pinna – leaflet
A primary division of the blade.

Pinnule – subleaflet
A division of the pinna.

Pinnules can be divided into lobes.

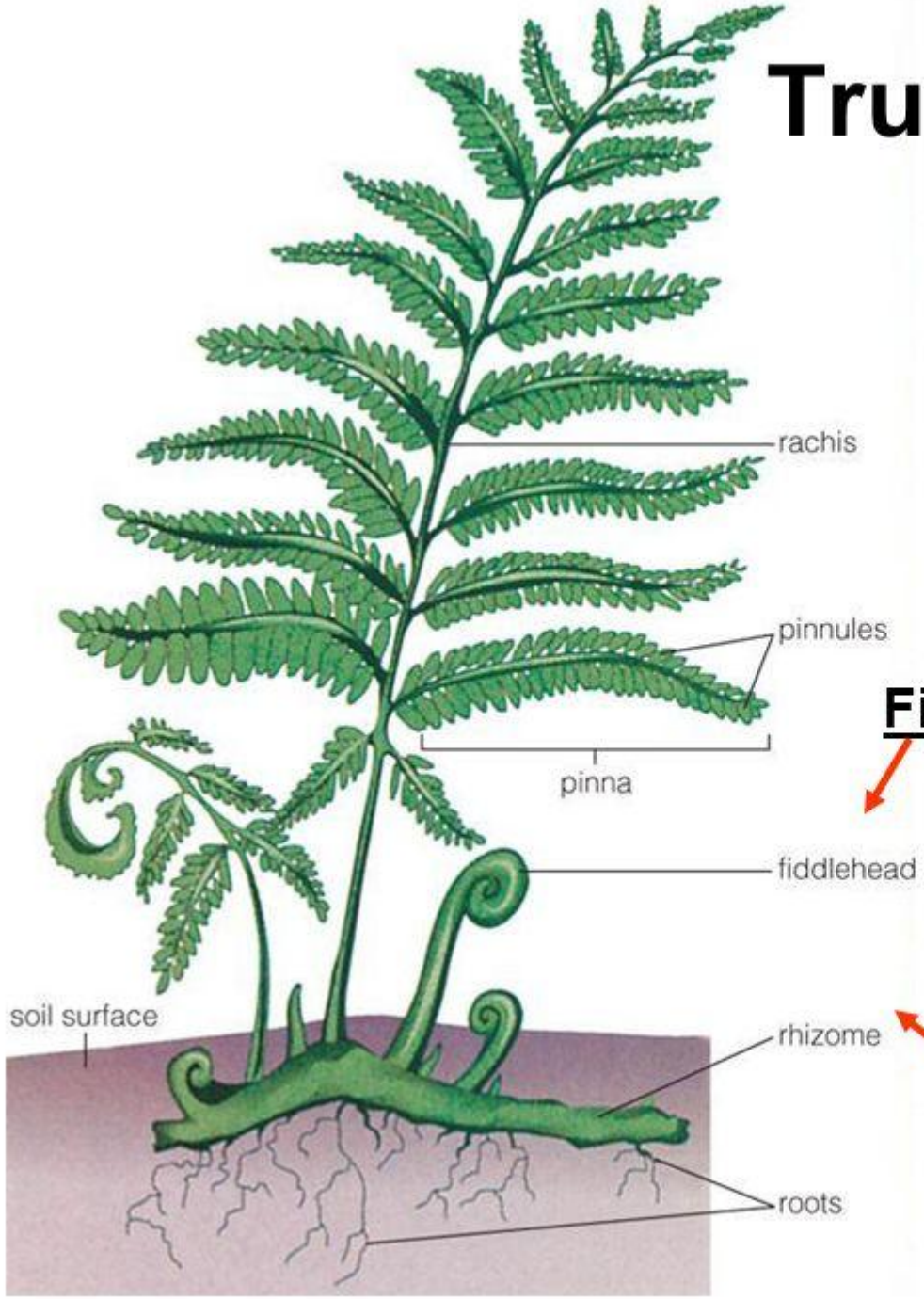
Stalk – Stipe
The stalk below the blade.

Rhizome

Root

Fiddlehead (Crozier)
An uncurling frond.

True Fern Structure

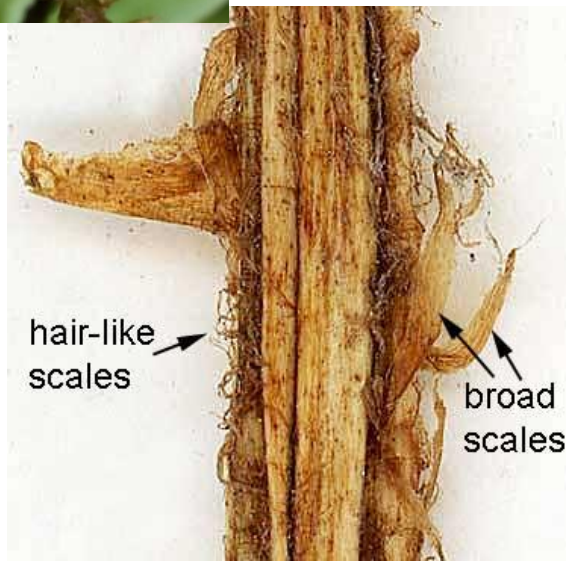


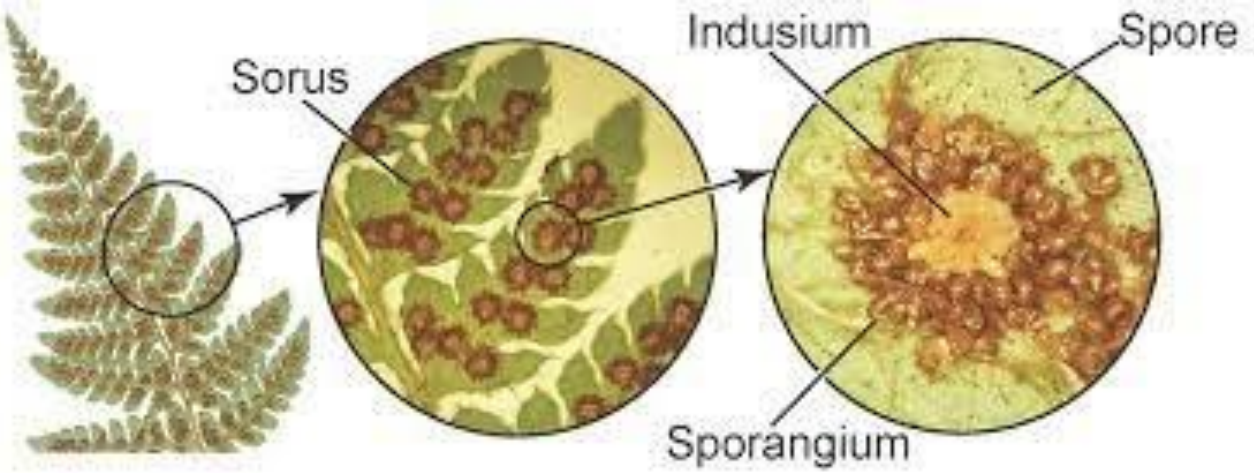
Know the parts of the frond (fern leaf) →rachis, pinna, pinnules.

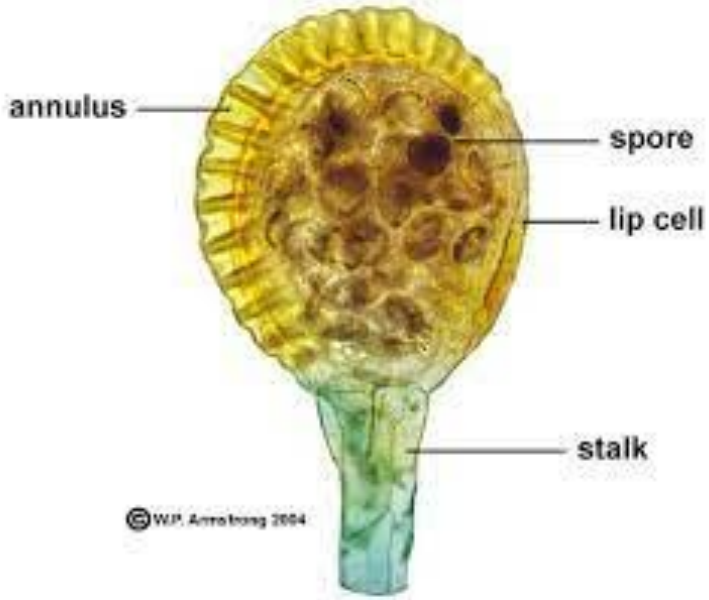
<u>Fiddlehead</u> - young tightly coiled fern fronds (leaves).

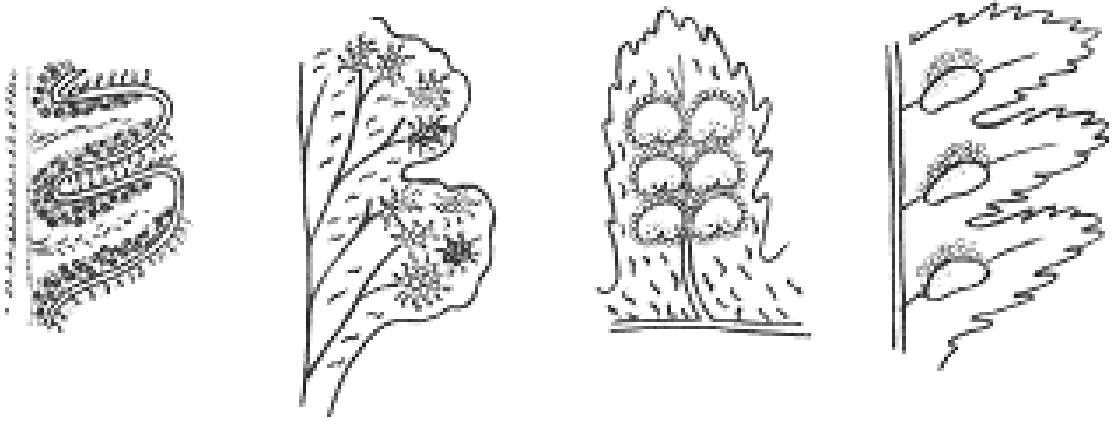
Stems are underground and fronds (leaves) are above ground. Remember, rhizomes are underground stems.

- **Fronds first tightly coiled (fiddleheads)**
  - **leaf development known as circinate vernation**
- **Uncoil due to differential growth on top and bottom.**

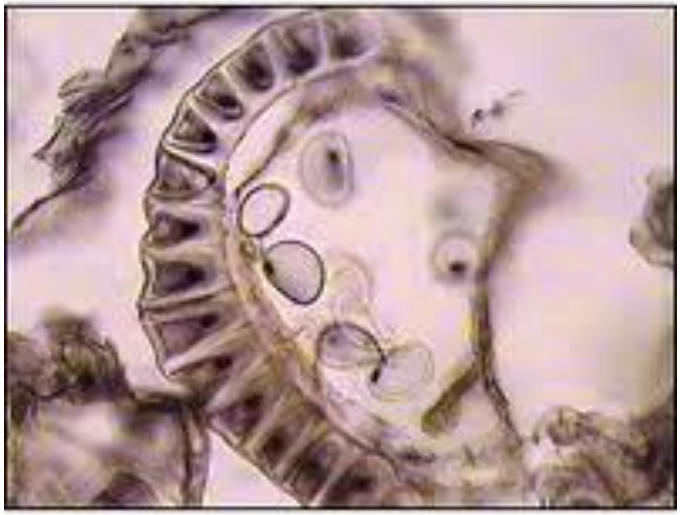

hair-like
scales
broad
scales


Sorus
Indusium
Spore
Sporangium

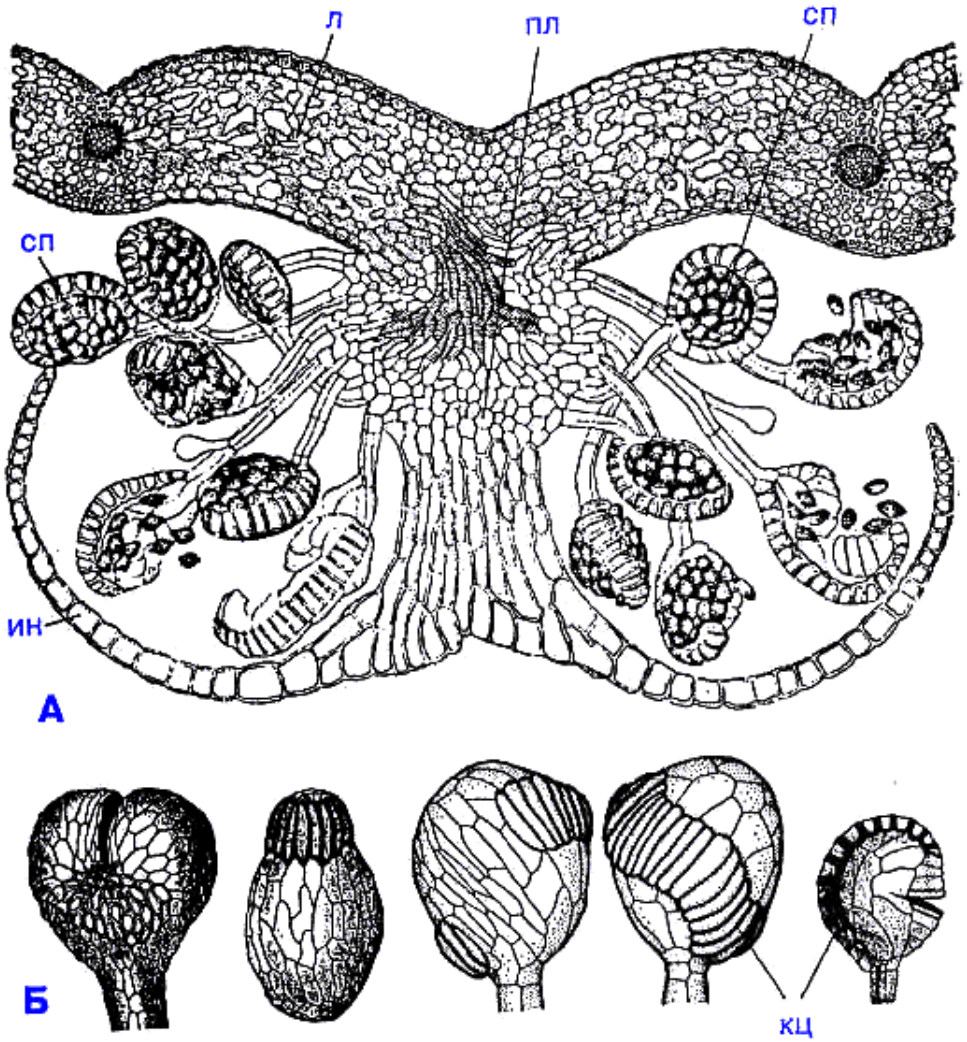

annulus
spore
lip cell
stalk
©W.P. Armstrong 2004

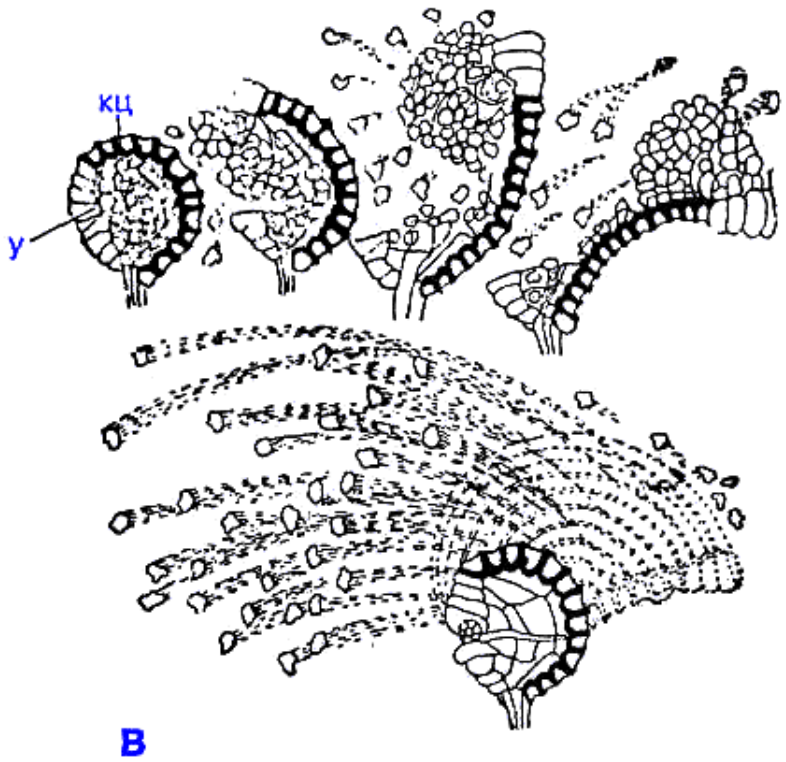


Arrangement of sporangia and sporules of ferns
1 - sporangia of Pteridium; 2 - sporangia of Woodsia; 3 - sporangia with a coverlet of Dryopteris; 4 - sporangia found in genera Asplenium, Athyrium, Polypodium.

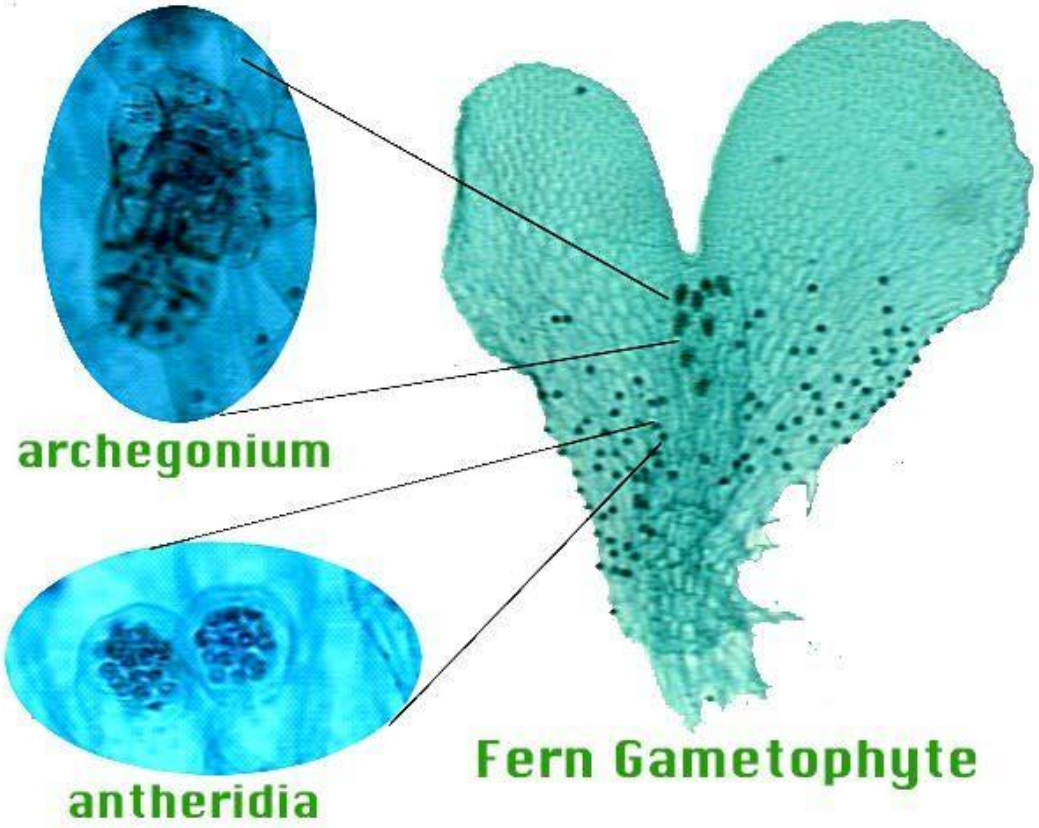


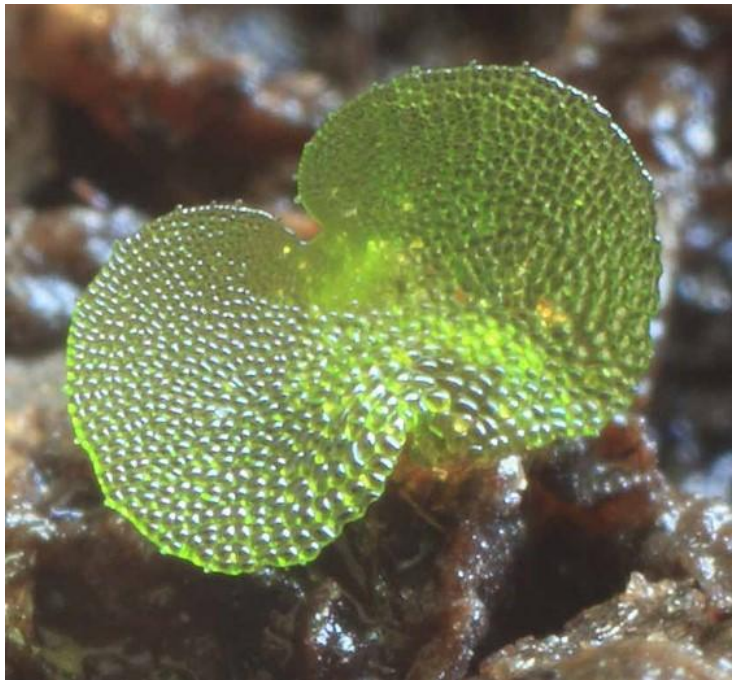
https://www.youtube.com/watch?v=mDlHGrRlNPE





Structure of soruses and sporangia of ferns:
А - cross section of the sporus of the male fern (Dryopteris filix-mas) ;
Б - diversity of sporangia;
В - opening of sporangia; л - leaf; пл - placenta; сп - sporangium; лц - ring; у - mouth; ин - indusium.

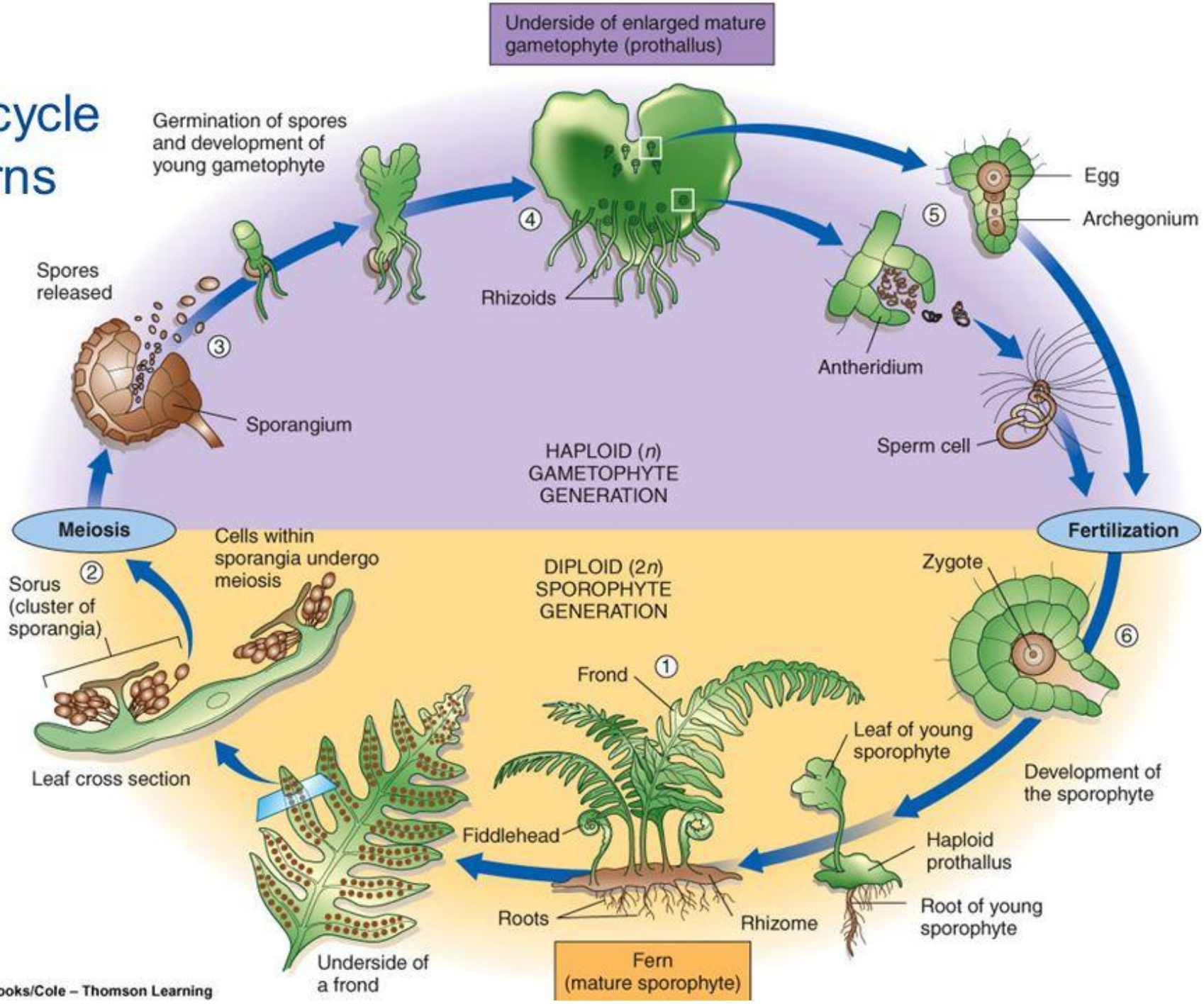




https://www.youtube.com/watch?v=2_bLHzIbl6c

https://www.youtube.com/watch?v=eZ40LDWt678

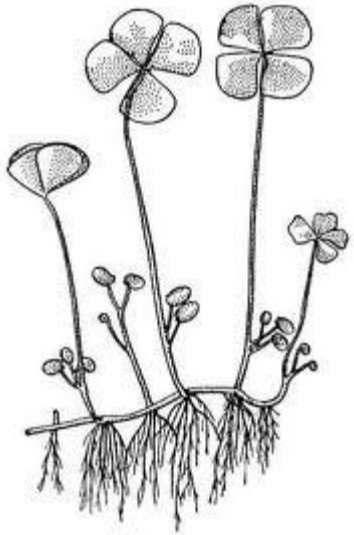
Life cycle of ferns



Разноспоровые папоротниковидные

Сальвиния
плавающая

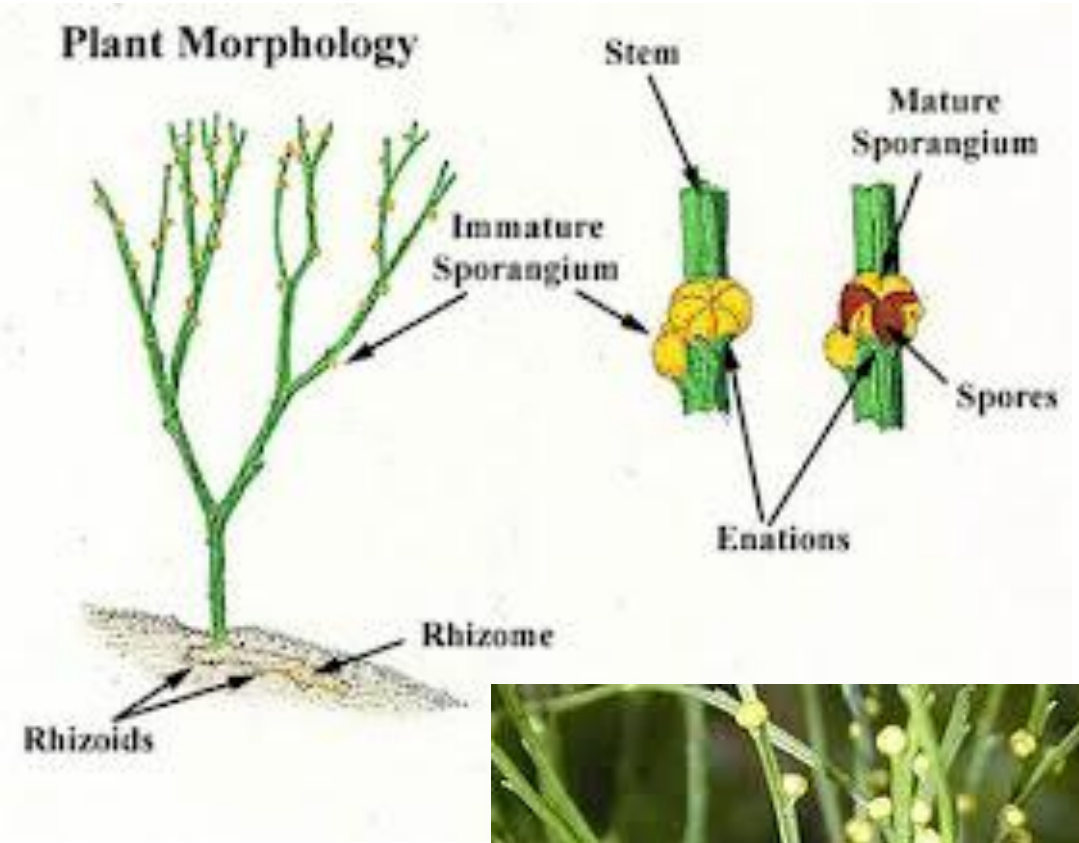
Марсилея
четырехлисточковая



LIFE CYCLE

1. Heterosporus
2. Keep sporangia in sporocarp→ covered by indusium
3. Sporocarp= 1.Megasporangia 2. Microsporangia
4. Megsporangia→ 8 microsporocytes--------(meiosis)-32 megaspores→ only one matures and viable→enlarges,fills the whole megasporangia
5. Both types develops plasmodial tapetum—solidifies– lobed body massulae above spore
6. No annulus.. Sporocarp wall degenerate– spores germinates

Psilotum nudum



Psilotum reproduction

Homosporous life cycle