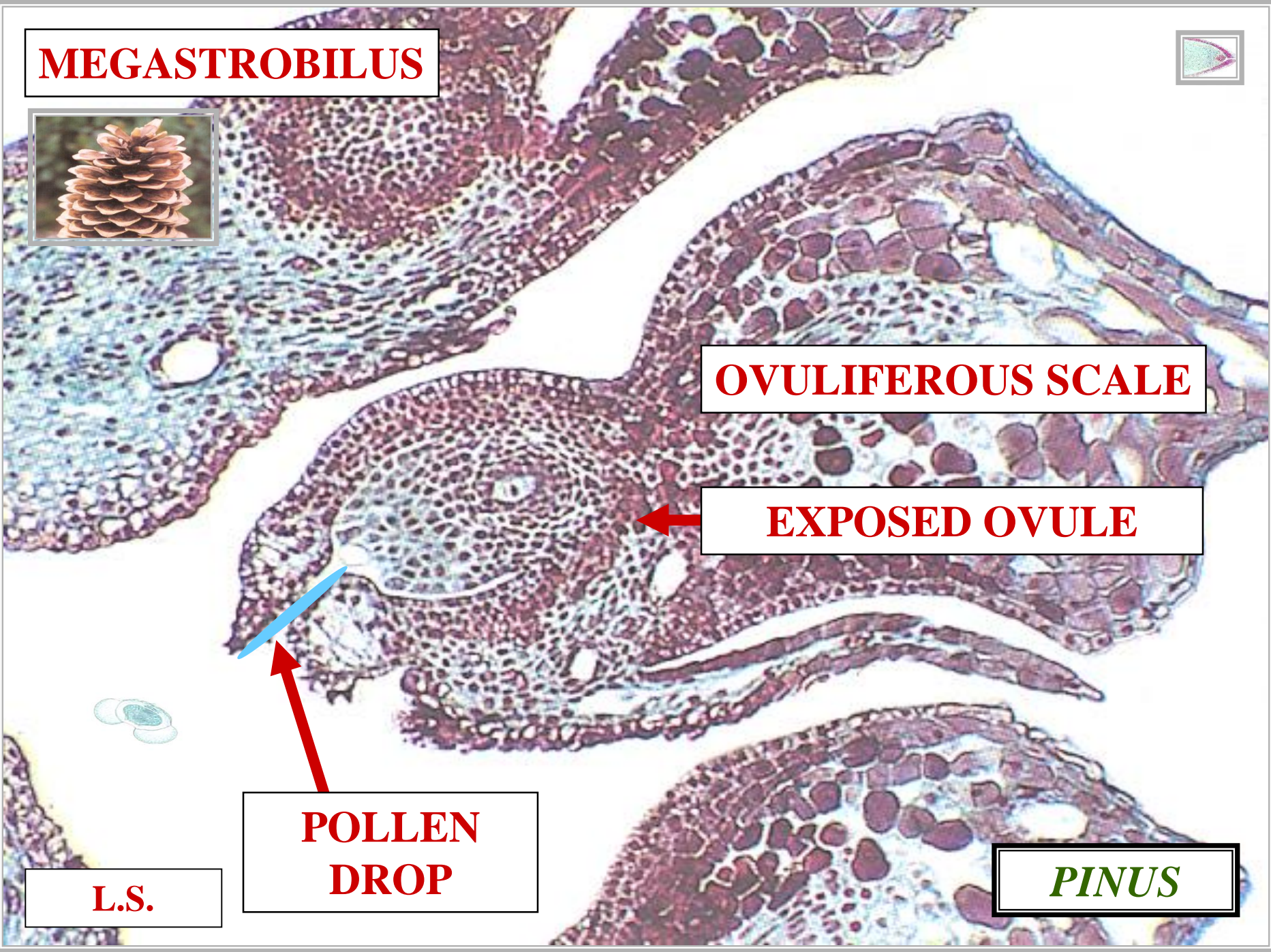
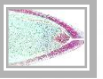


# MEGASTROBILUS



**OVULIFEROUS SCALE**

**EXPOSED OVULE**

**POLLEN DROP**

**L.S.**

***PINUS***



**OVULE**

**INTEGUMENT**

?

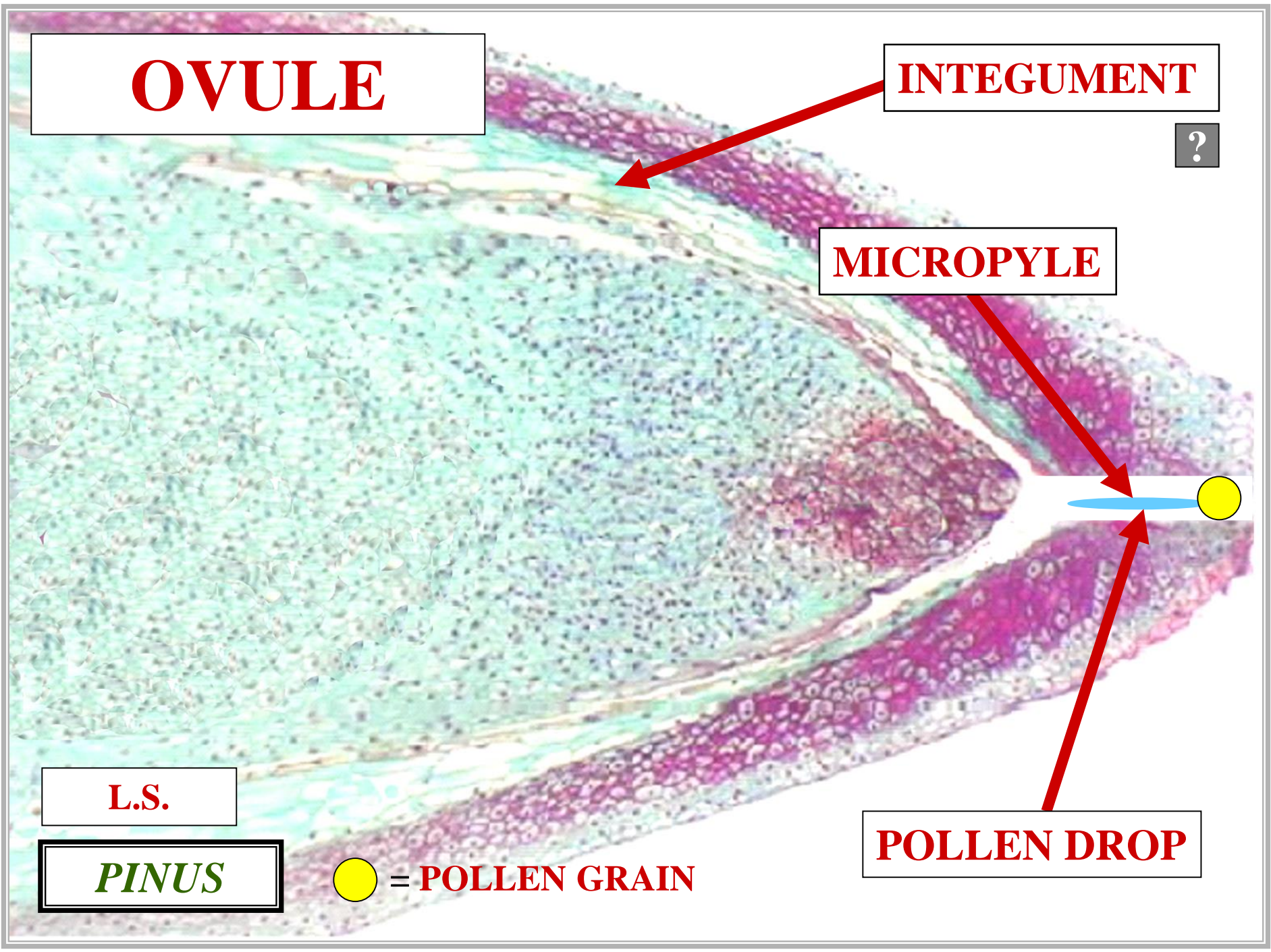
**MICROPYLE**

**L.S.**

***PINUS***

● = **POLLEN GRAIN**

**POLLEN DROP**





**OVULE**

**INTEGUMENT**

**M**

**MICROPYLE**

**POLLEN GRAIN**

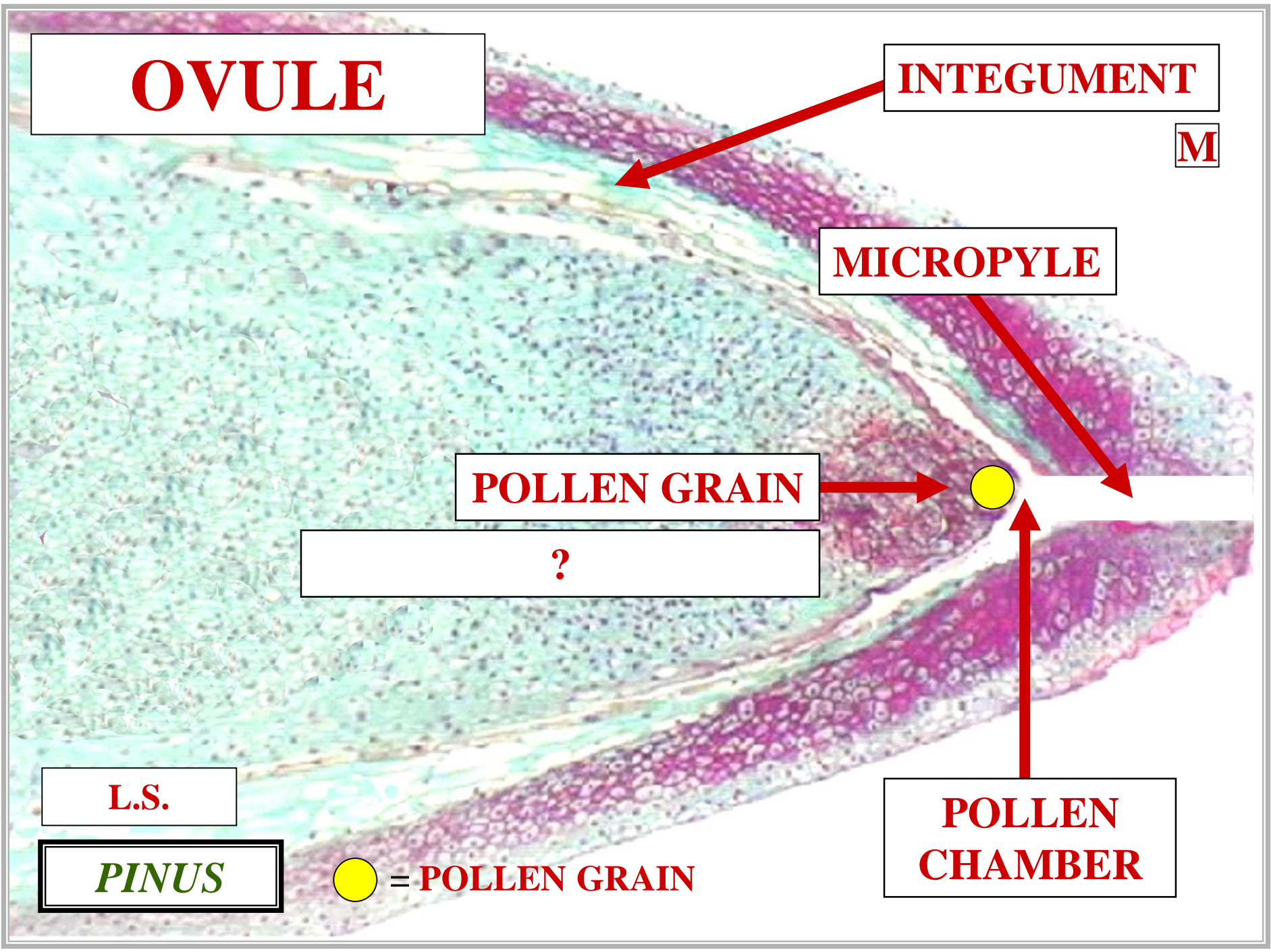
**?**

**L.S.**

***PINUS***

**● = POLLEN GRAIN**

**POLLEN CHAMBER**



**OVULE**

**INTEGUMENT**

**P**

**MICROPYLE**

**POLLEN GRAIN**

**MEGASPORANGIUM**

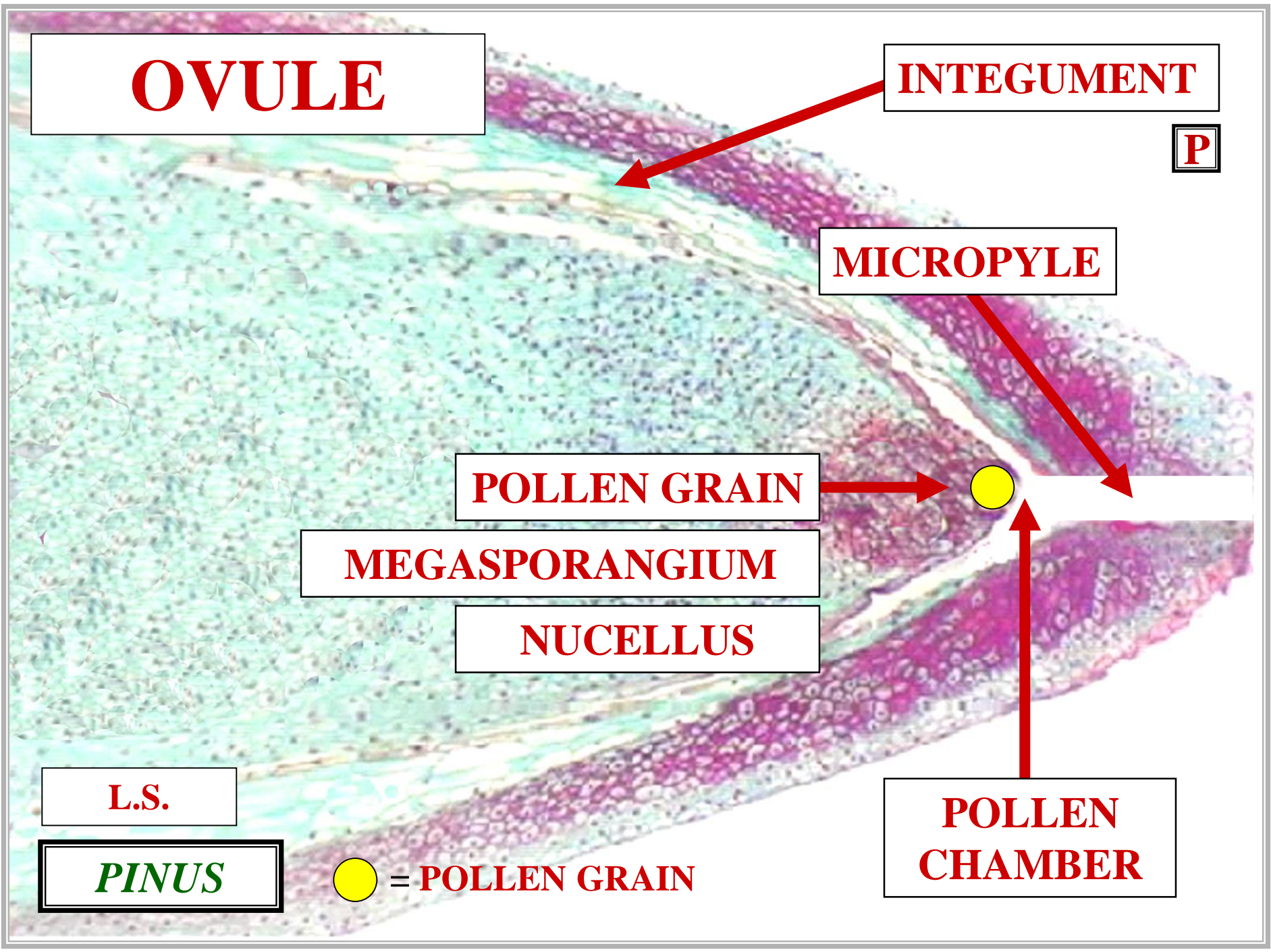
**NUCELLUS**

**L.S.**

***PINUS***

**● = POLLEN GRAIN**

**POLLEN CHAMBER**





**OVULE**

**INTEGUMENT**

^

**MICROPYLE**

**POLLINATION**

**POLLEN GRAIN**

**MEGASPORANGIUM**

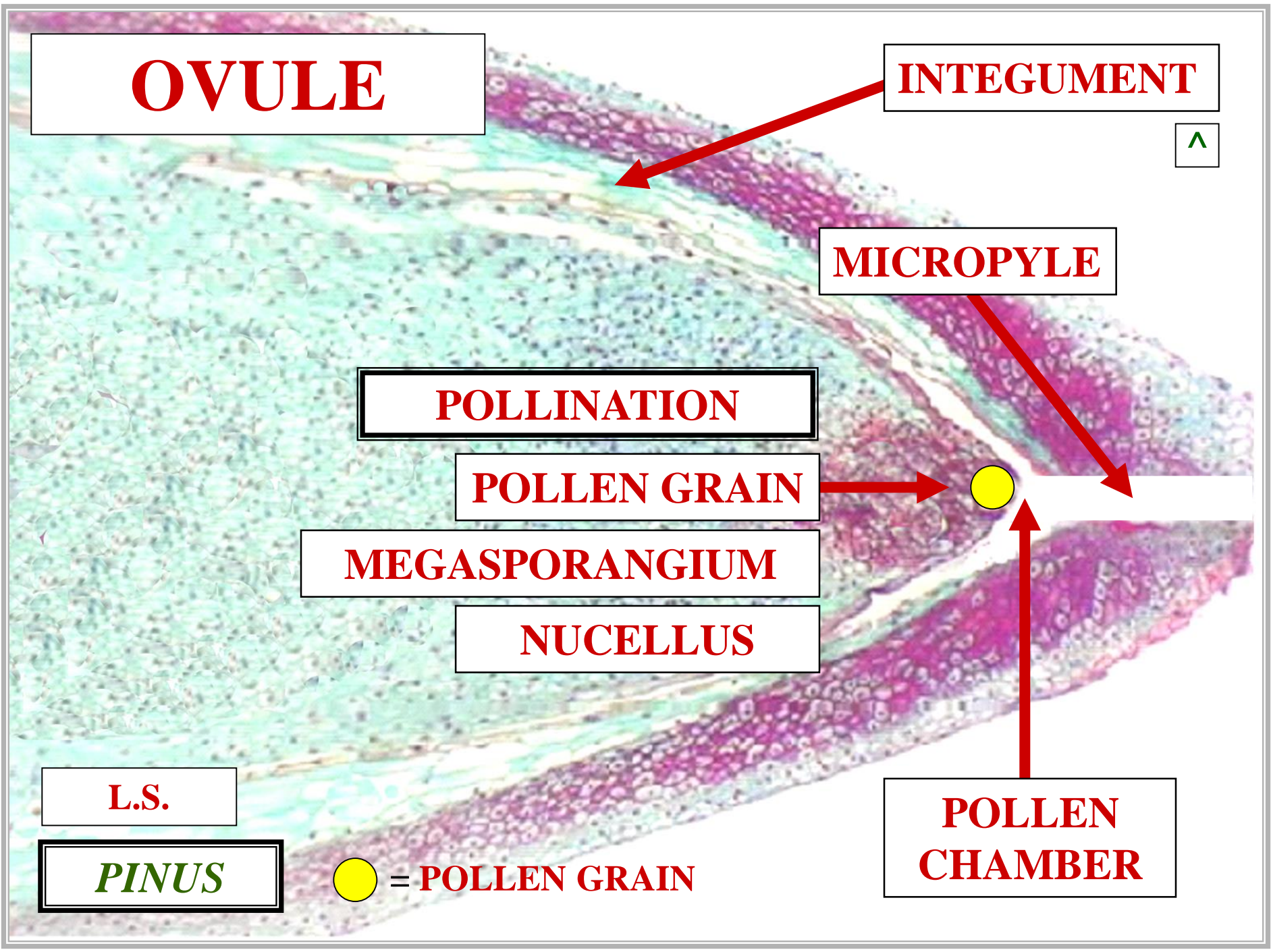
**NUCELLUS**

**L.S.**

***PINUS***

● = **POLLEN GRAIN**

**POLLEN CHAMBER**







**EXTANT  
PHYLUM**

**PHYLUM**

**MAGNOLIOPHYTA**

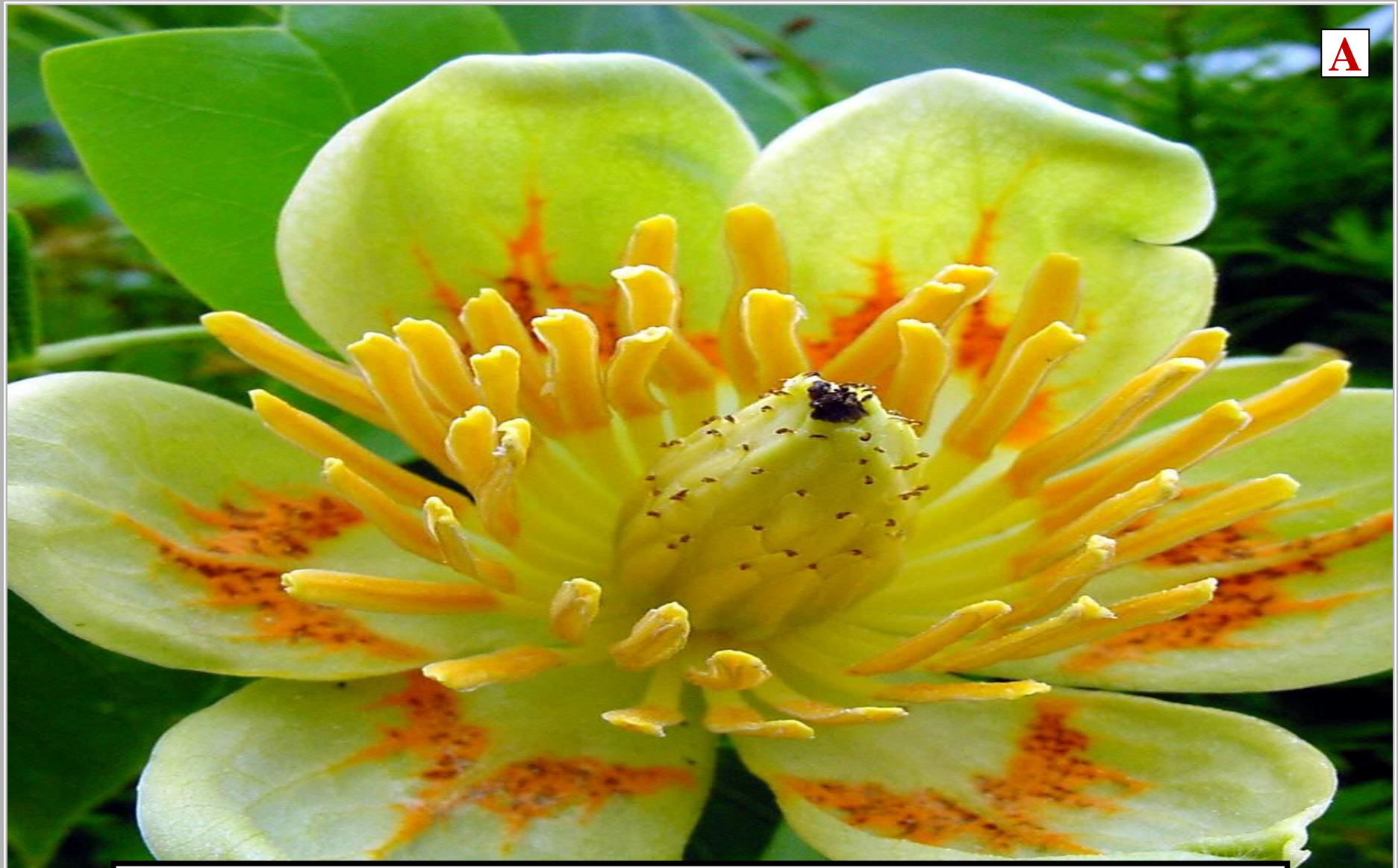
**EXTANT  
PHYLUM**





**SYNONYM**





# ANTHOPHYTA



**ANTHER**



**ANTHOPHYTA**





# COMMON NAMES



# ANGIOSPERMS





# **FLOWERING PLANTS**



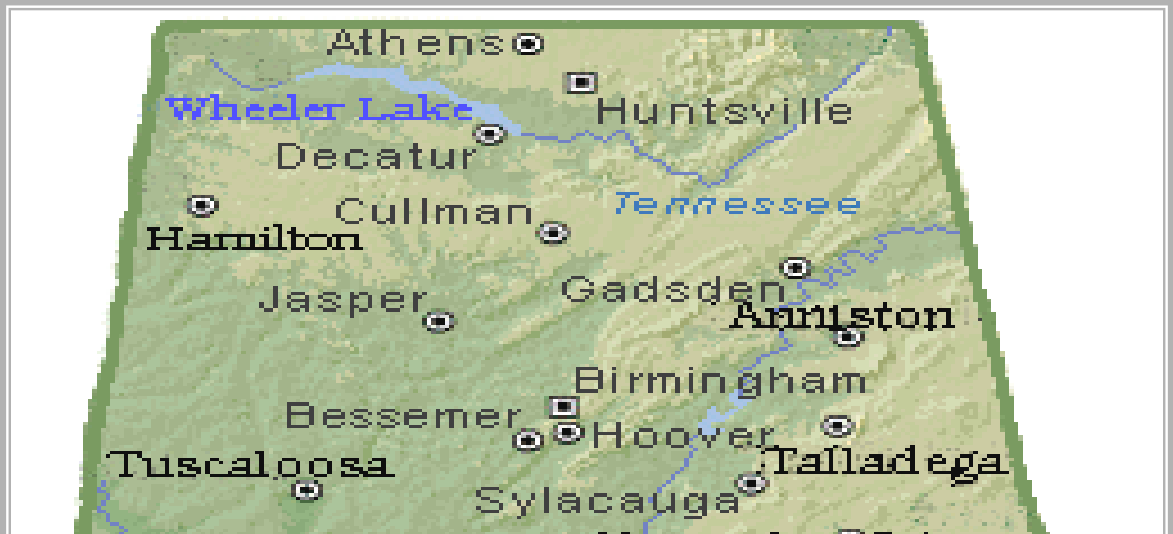
# DIVERSITY





**~235,000 SPECIES**

**EARTH**



**~3,500 SPECIES**







**MAGNOLIOPHYTA  
MOST DIVERSE  
TRACHEOPHYTE  
PHYLUM**

**EARTH**



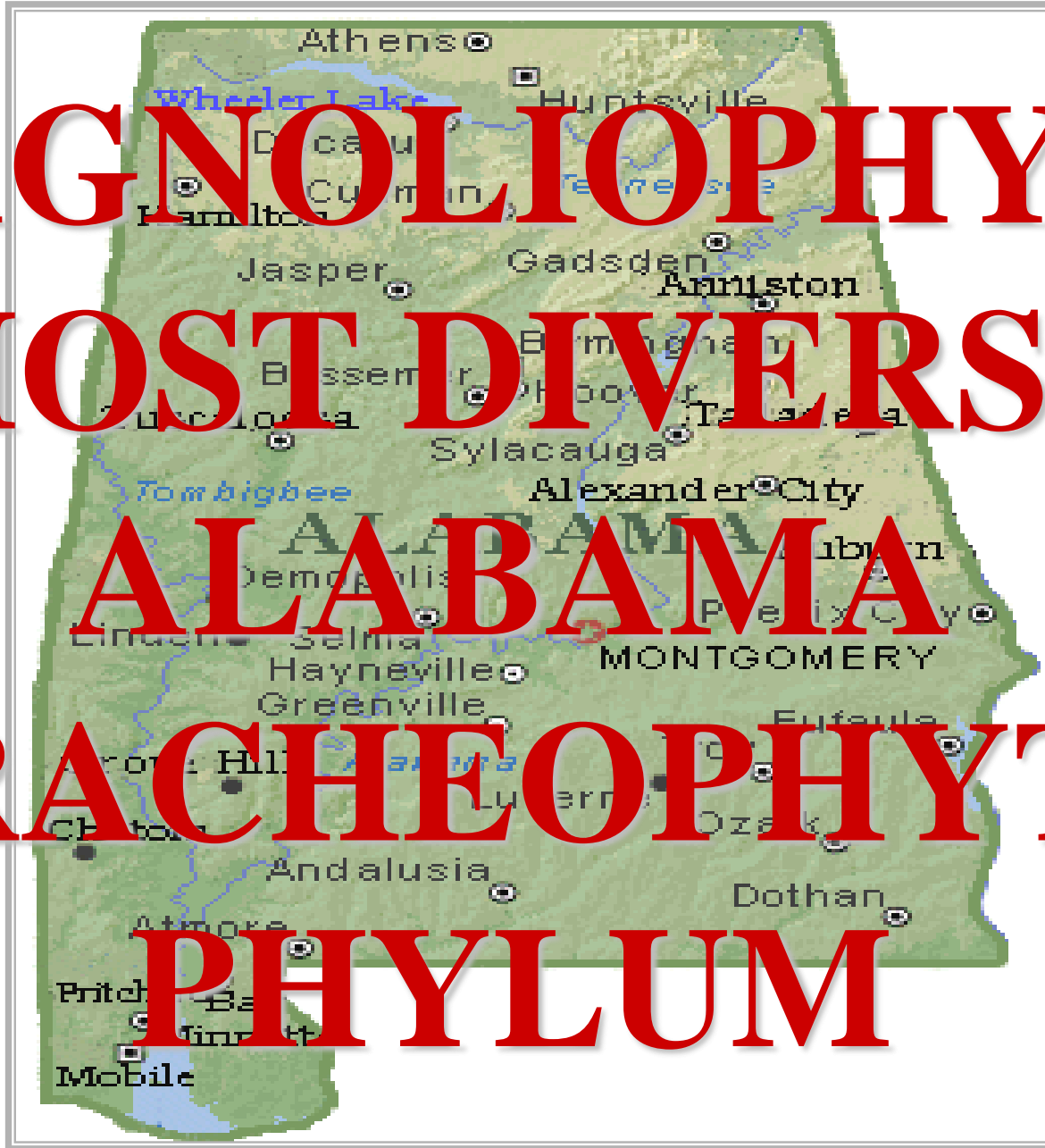
**MAGNOLIOPHYTA**

**MOST DIVERSE**

**ALABAMA**

**TRACHEOPHYTE**

**PHYLUM**





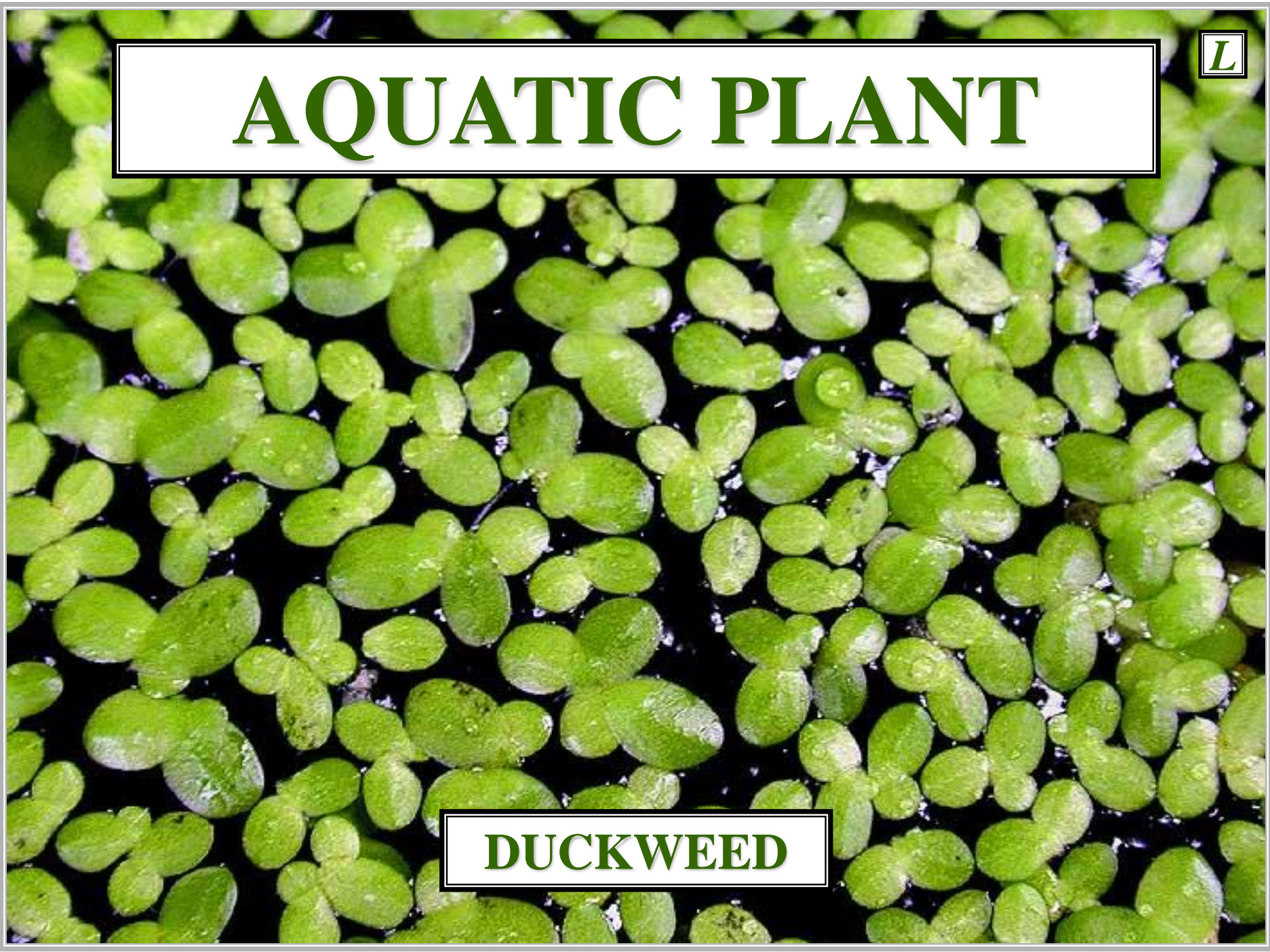
# AQUATIC PLANT

?



# AQUATIC PLANT

**DUCKWEED**







# AQUATIC PLANT



*LEMNA*



# AQUATIC PLANT



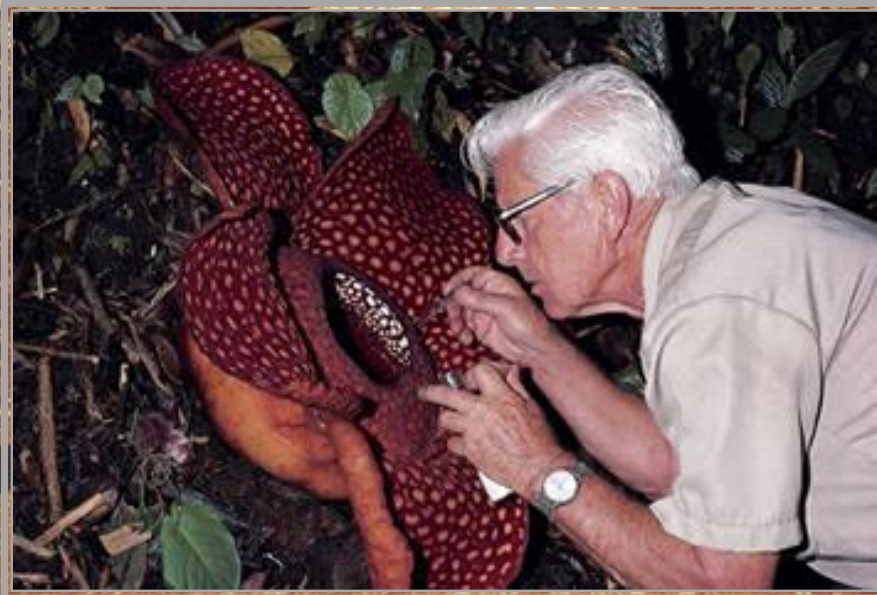
*LEMNA*





***RAFFLESIA***





***RAFFLESIA***

# MAGNOLIOPHYTA

## CLASSES



**MAGNOLIOPHYTA  
CLASSES**

**MAGNOLIOPSIDA**

**MAGNOLIOPHYTA  
CLASSES**

# MAGNOLIOPHYTA

## CLASSES



MAGNOLIOPSIDA  
LILIOPSIDA

MAGNOLIOPHYTA  
CLASSES



# MAGNOLIOPSIDA

# COMMON NAME



# DICOTS







# EUDICOTS





# **SPECIES DIVERSITY**





**~170,000 SPECIES**

**EARTH**



# LILIOPSIDA

# COMMON NAME





# MONOCOTS





# **SPECIES DIVERSITY**





**~65,000 SPECIES**

**EARTH**



**MAGNOLIOPHYTA**  
**CLASS**  
**CHARACTERS**



# MAGNOLIOPSIDA CHARACTERS



# COTYLEDONS

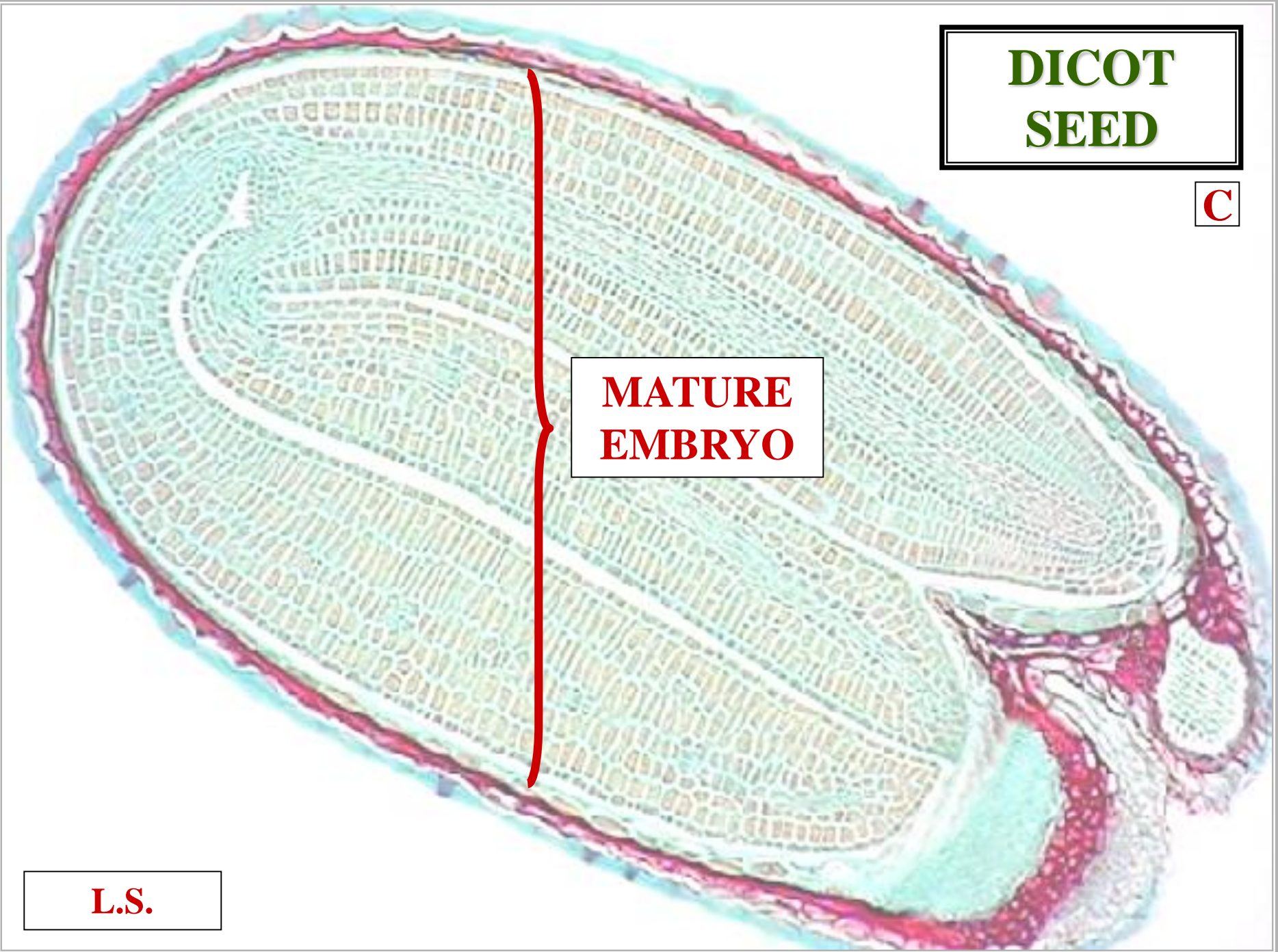


# DICOT SEED

C

MATURE  
EMBRYO

L.S.





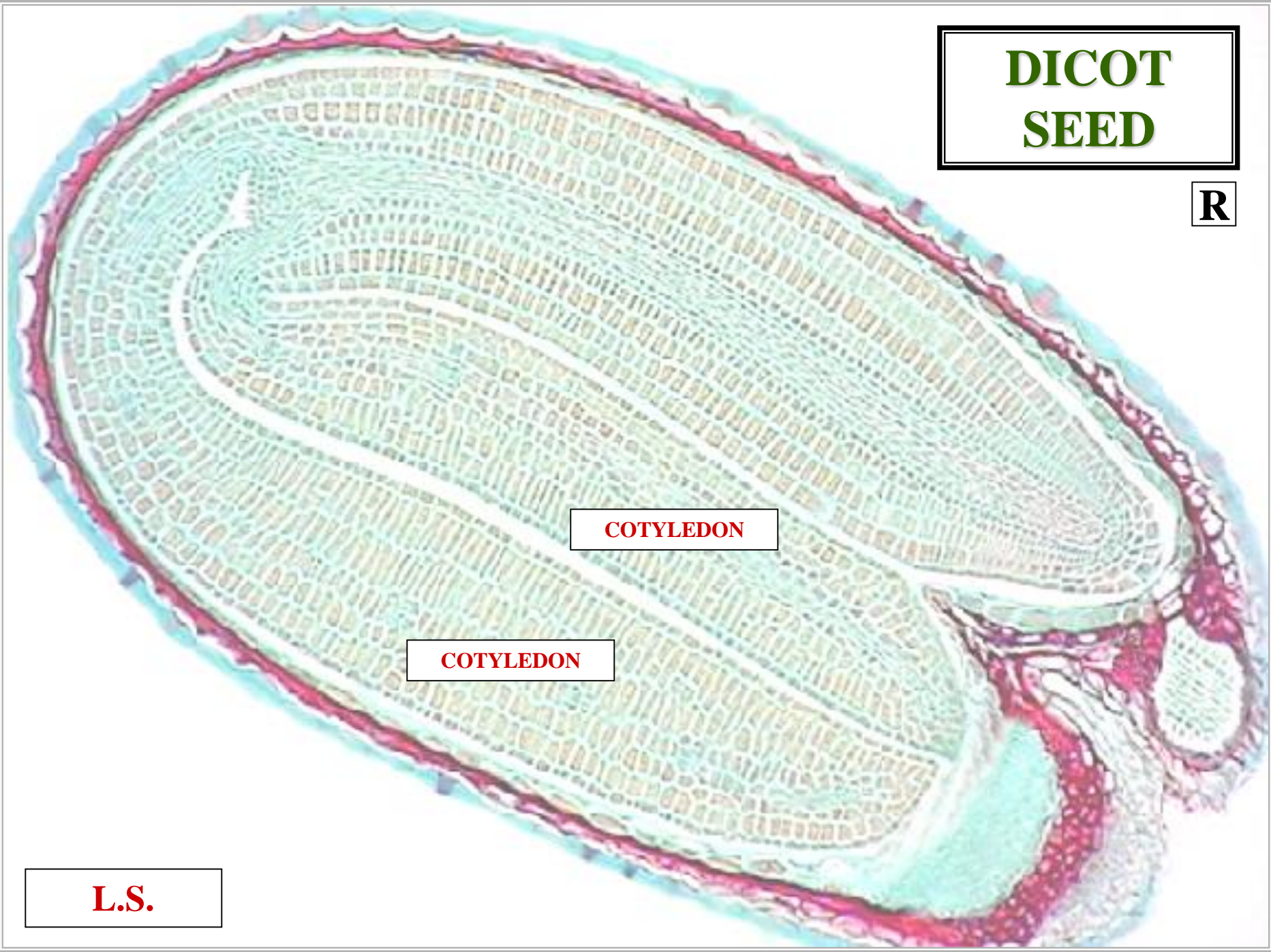
# DICOT SEED

R

COTYLEDON

COTYLEDON

L.S.

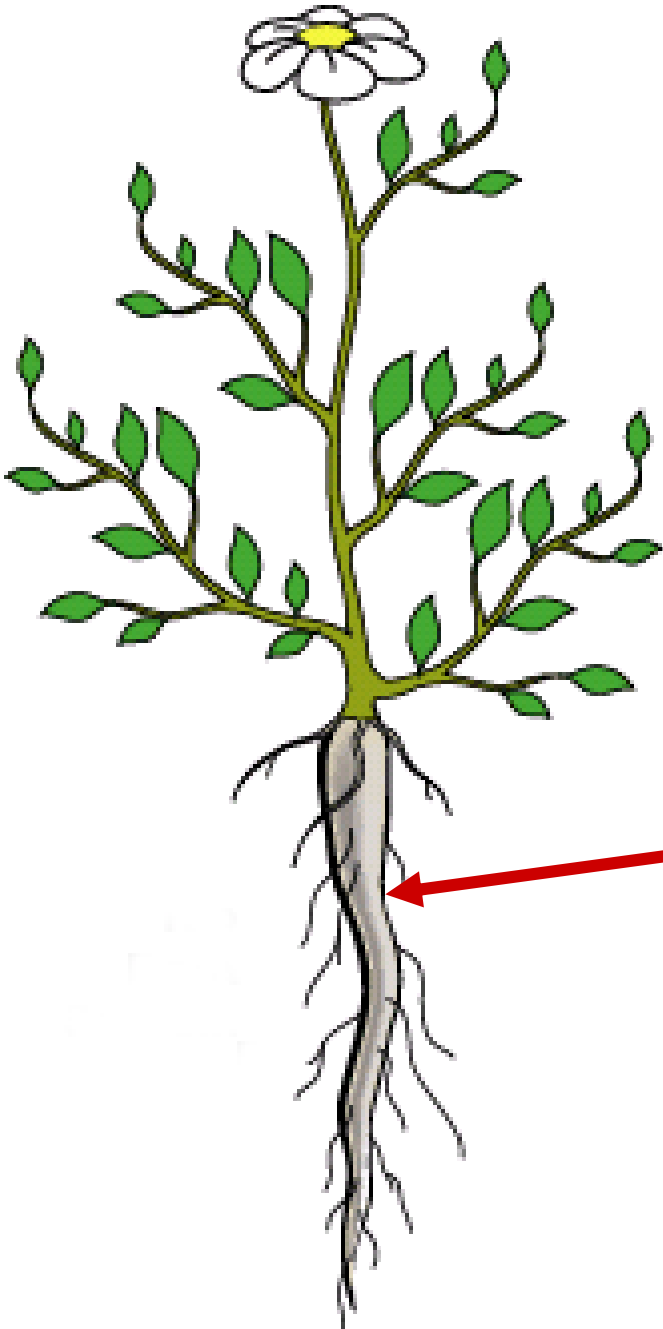






# ROOT HABIT

# DICOT ROOT

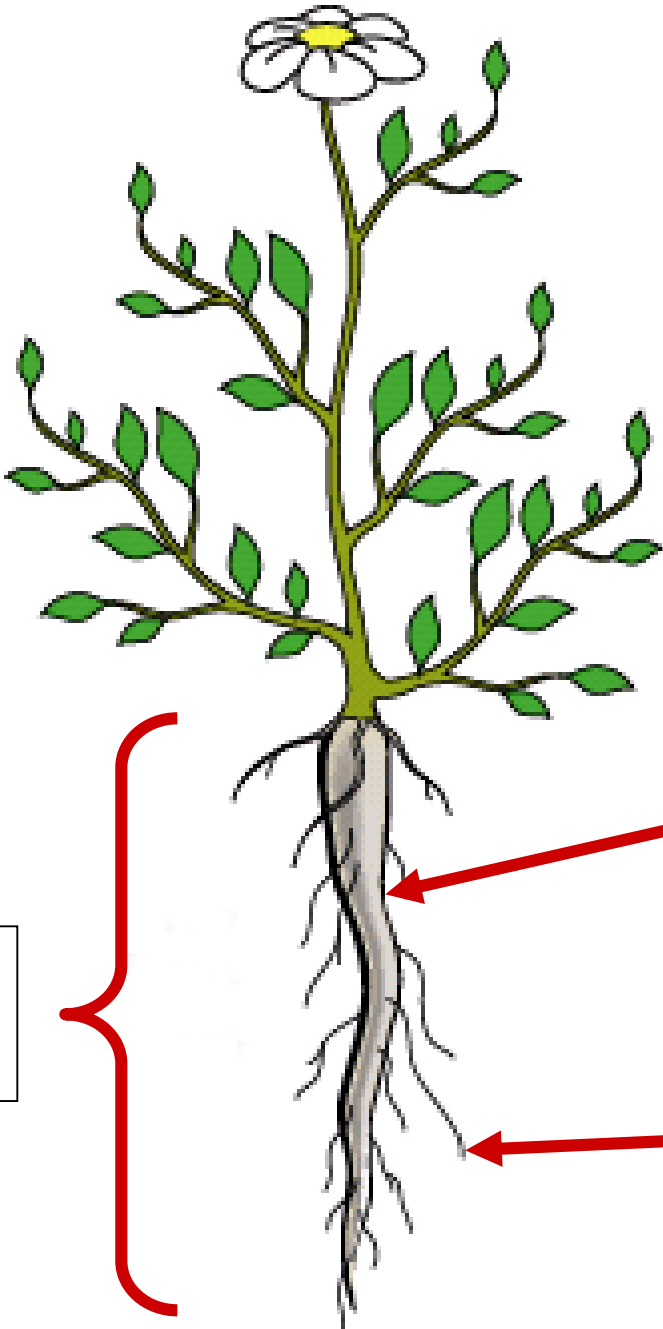


**TAP ROOT  
SYSTEM**



# DICOT ROOT

**TAP ROOT  
SYSTEM**



**PRIMARY  
ROOT**

**STOUT  
LATERAL  
ROOT**

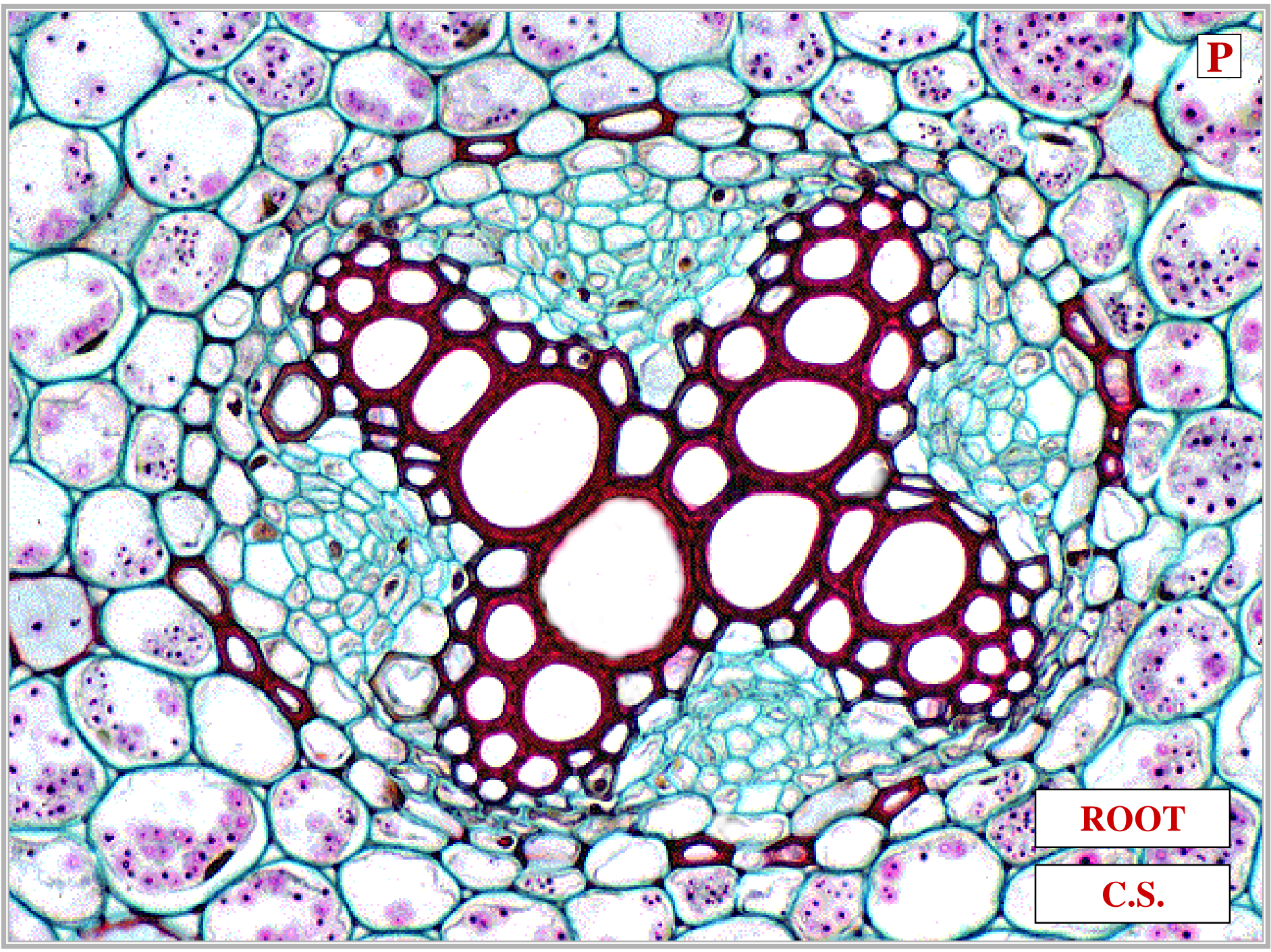
**DEEP SOIL  
PENETRATION**



# ROOT STELE



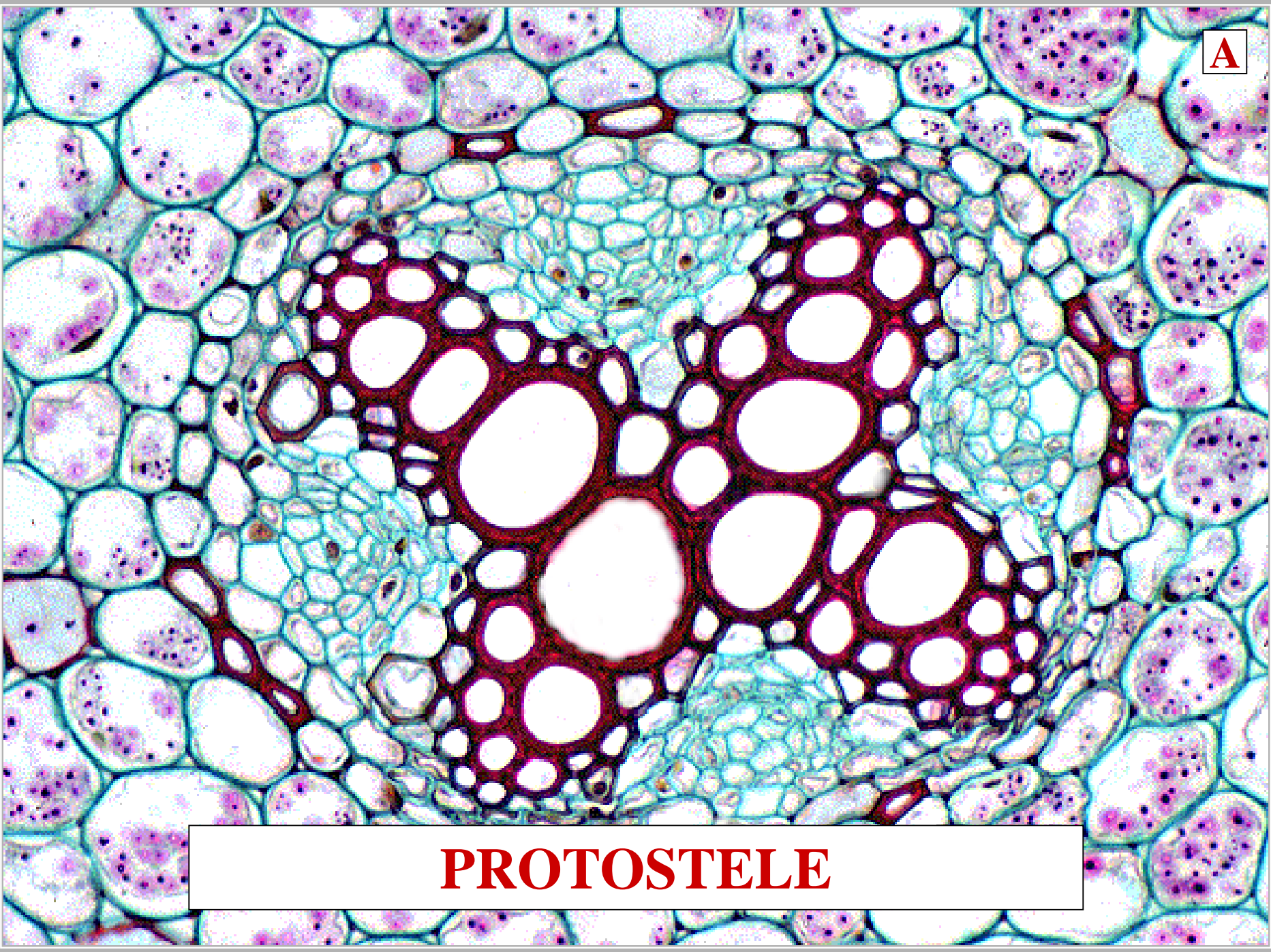
**P**



**ROOT**

**C.S.**

A



**PROTOSTELE**

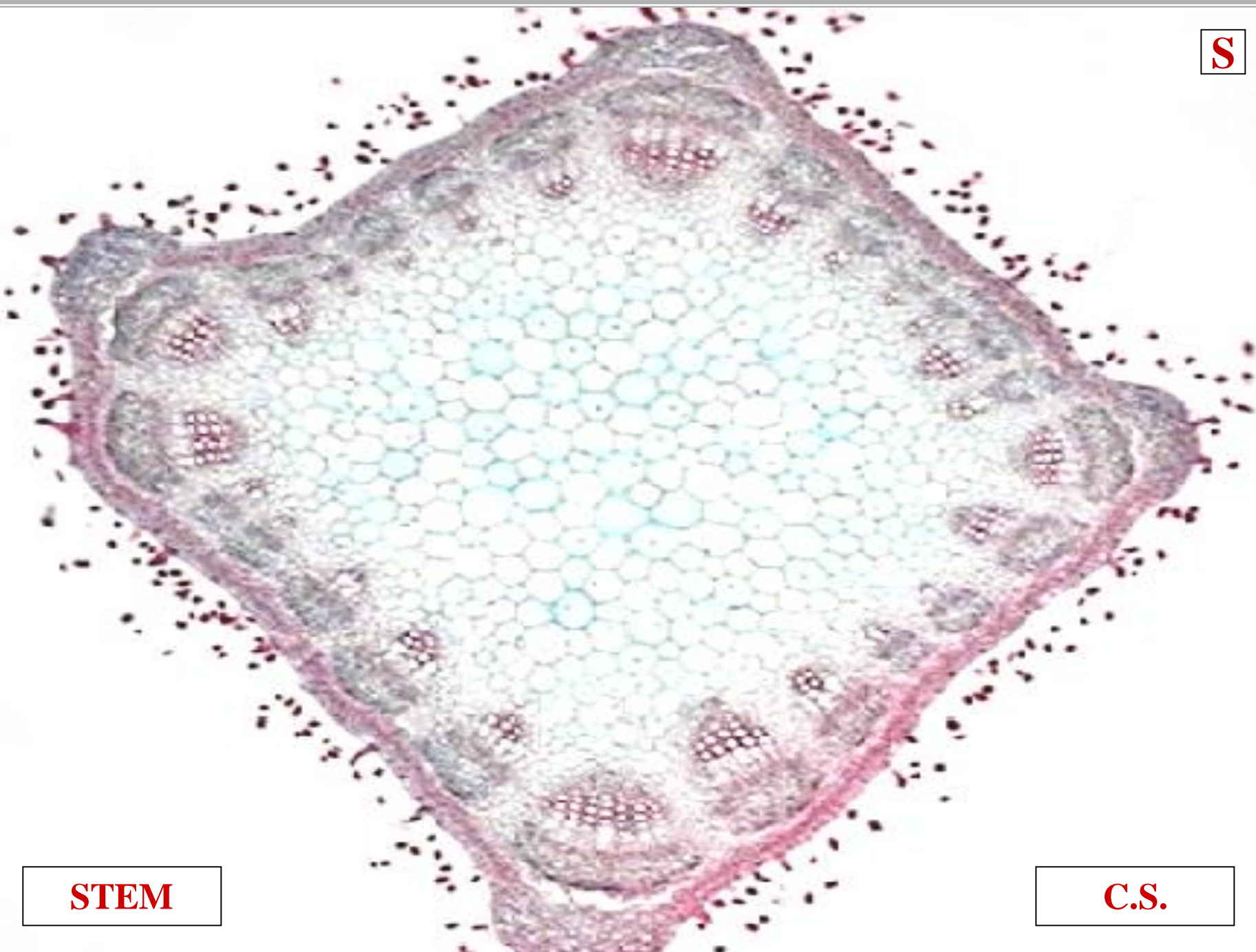






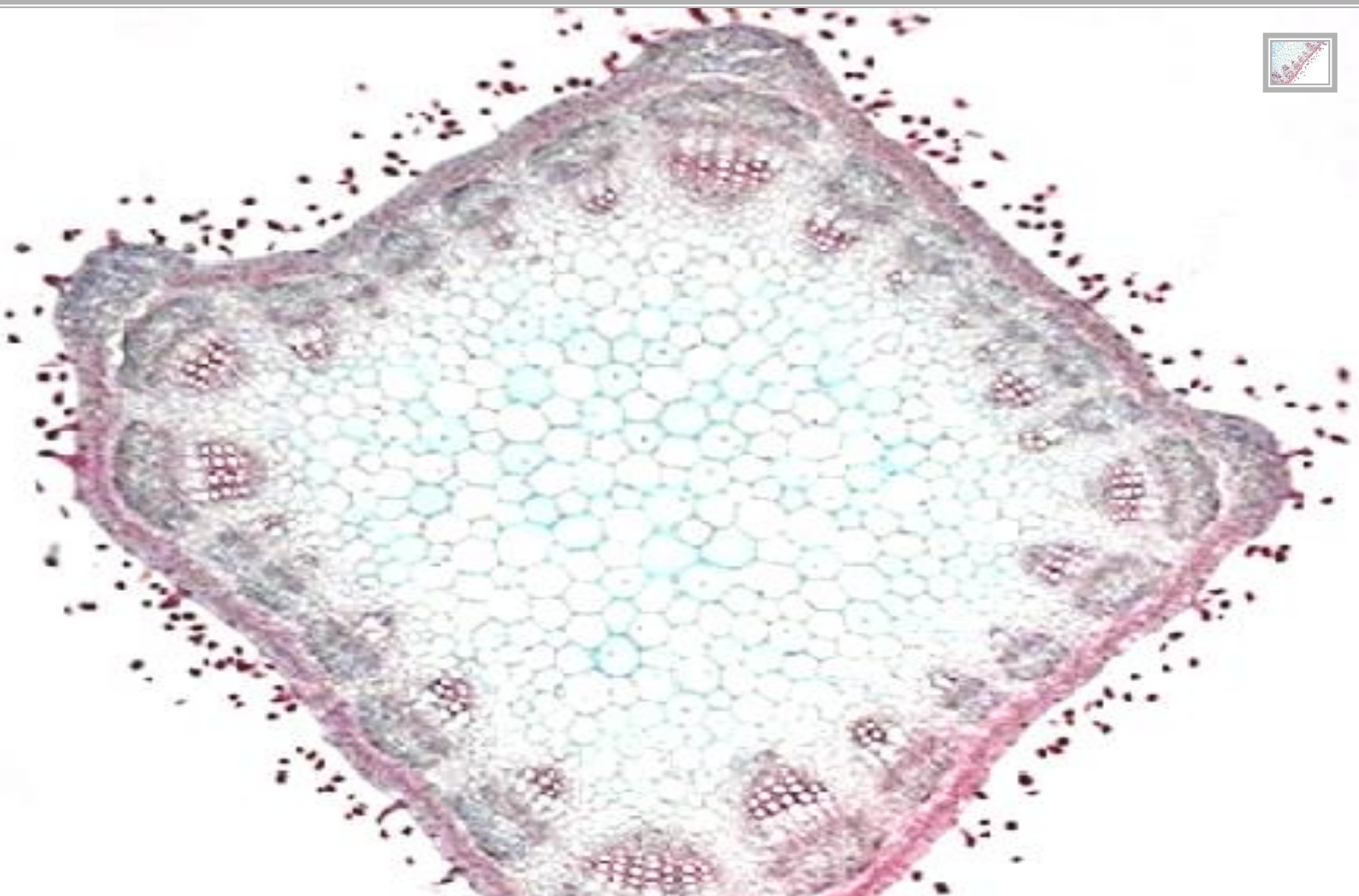
# STEM STELE

**S**



**STEM**

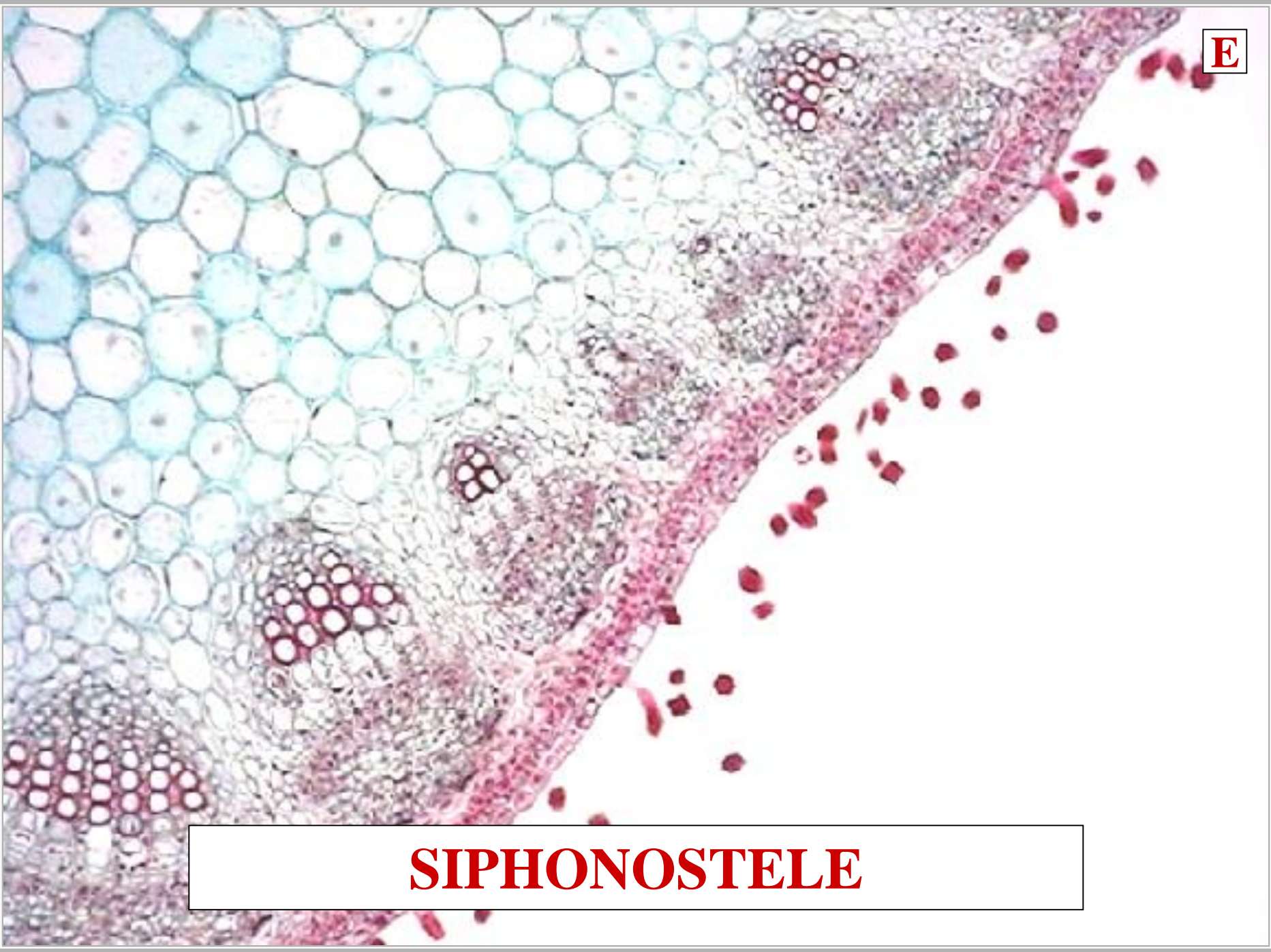
**C.S.**



**SIPHONOSTELE**



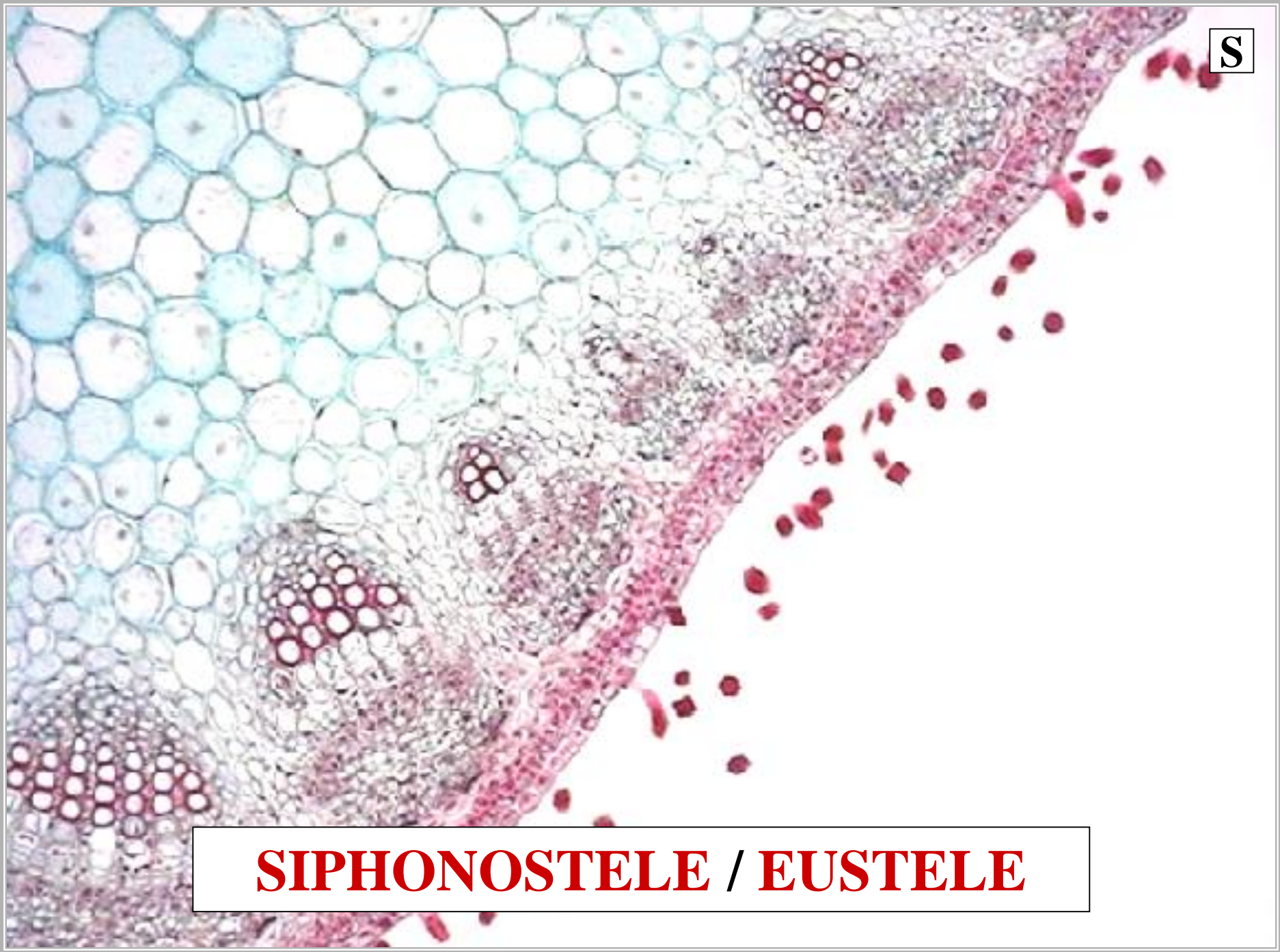
**E**



**SIPHONOSTELE**

S

**SIPHONOSTELE / EUSTELE**

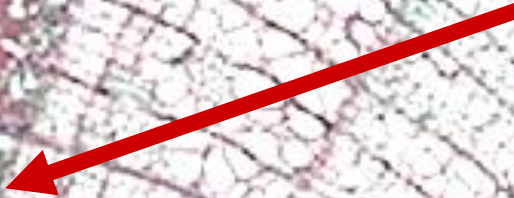




# SECONDARY GROWTH



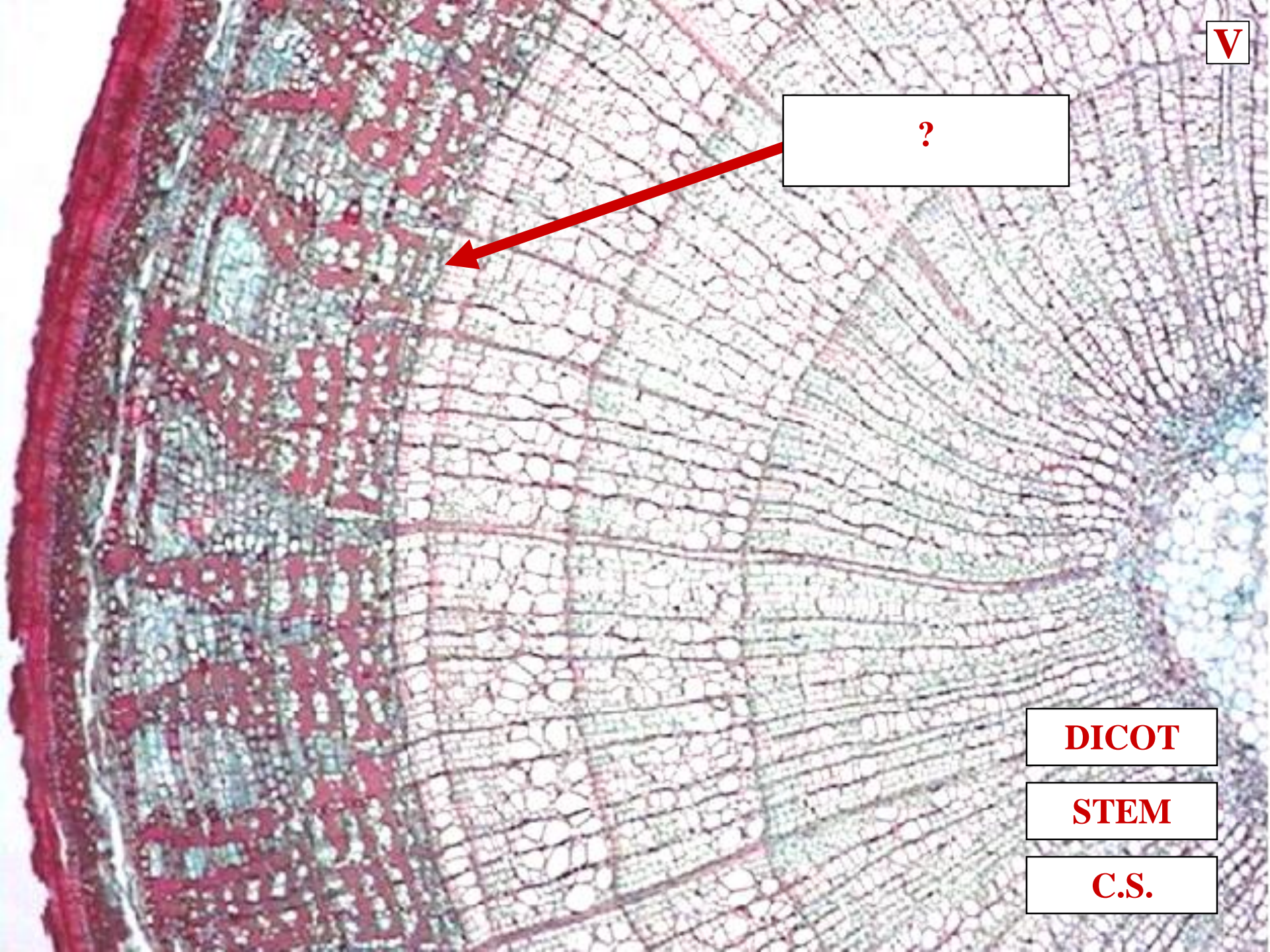
?



**DICOT**

**STEM**

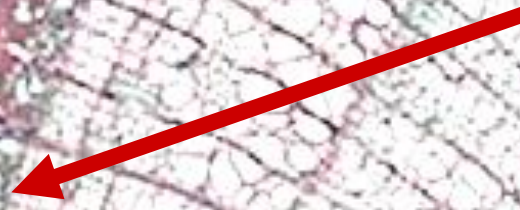
**C.S.**





?

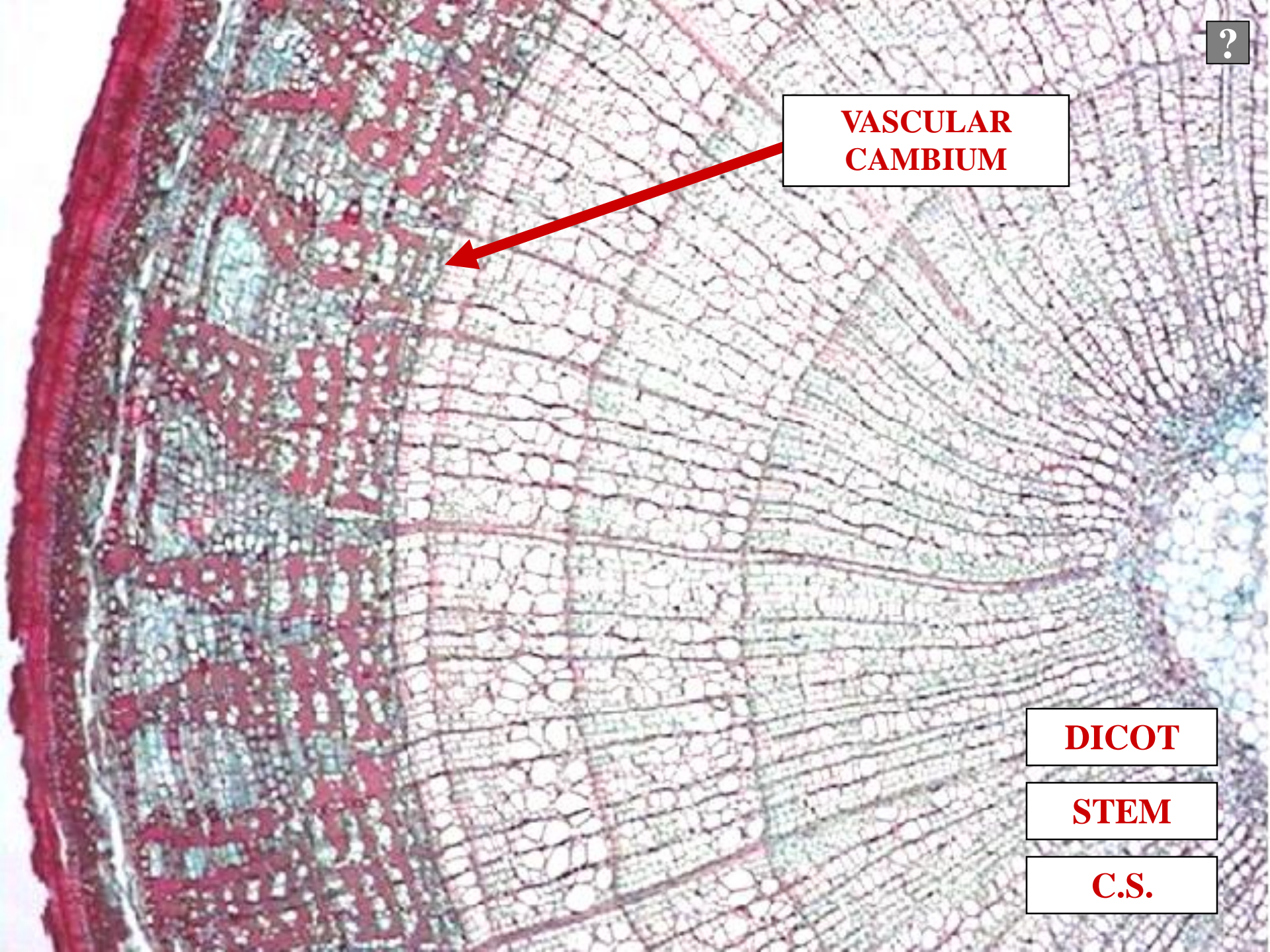
**VASCULAR  
CAMBIUM**



**DICOT**

**STEM**

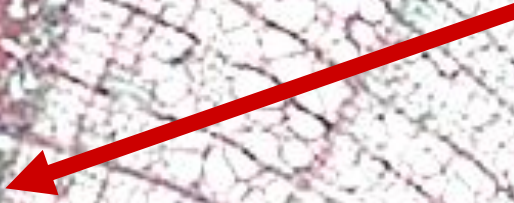
**C.S.**





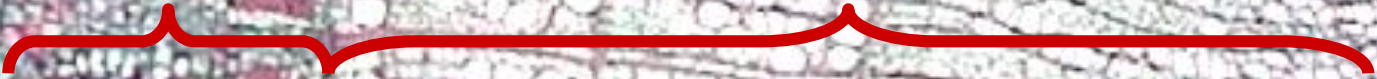
**P**

**VASCULAR  
CAMBIUM**



**?**

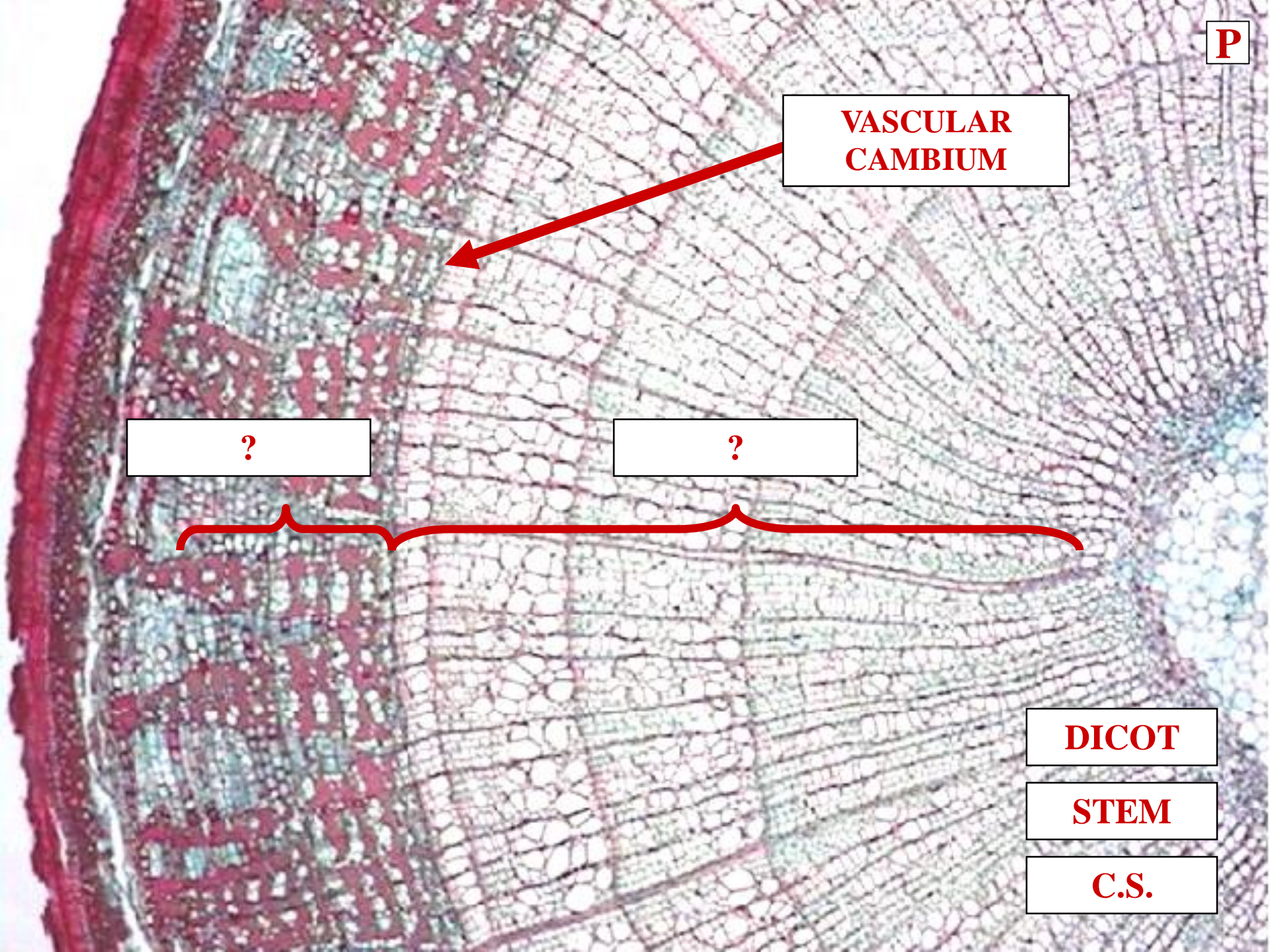
**?**



**DICOT**

**STEM**

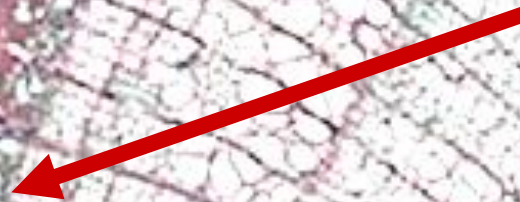
**C.S.**





X

VASCULAR  
CAMBIUM



~2 PHLOEM

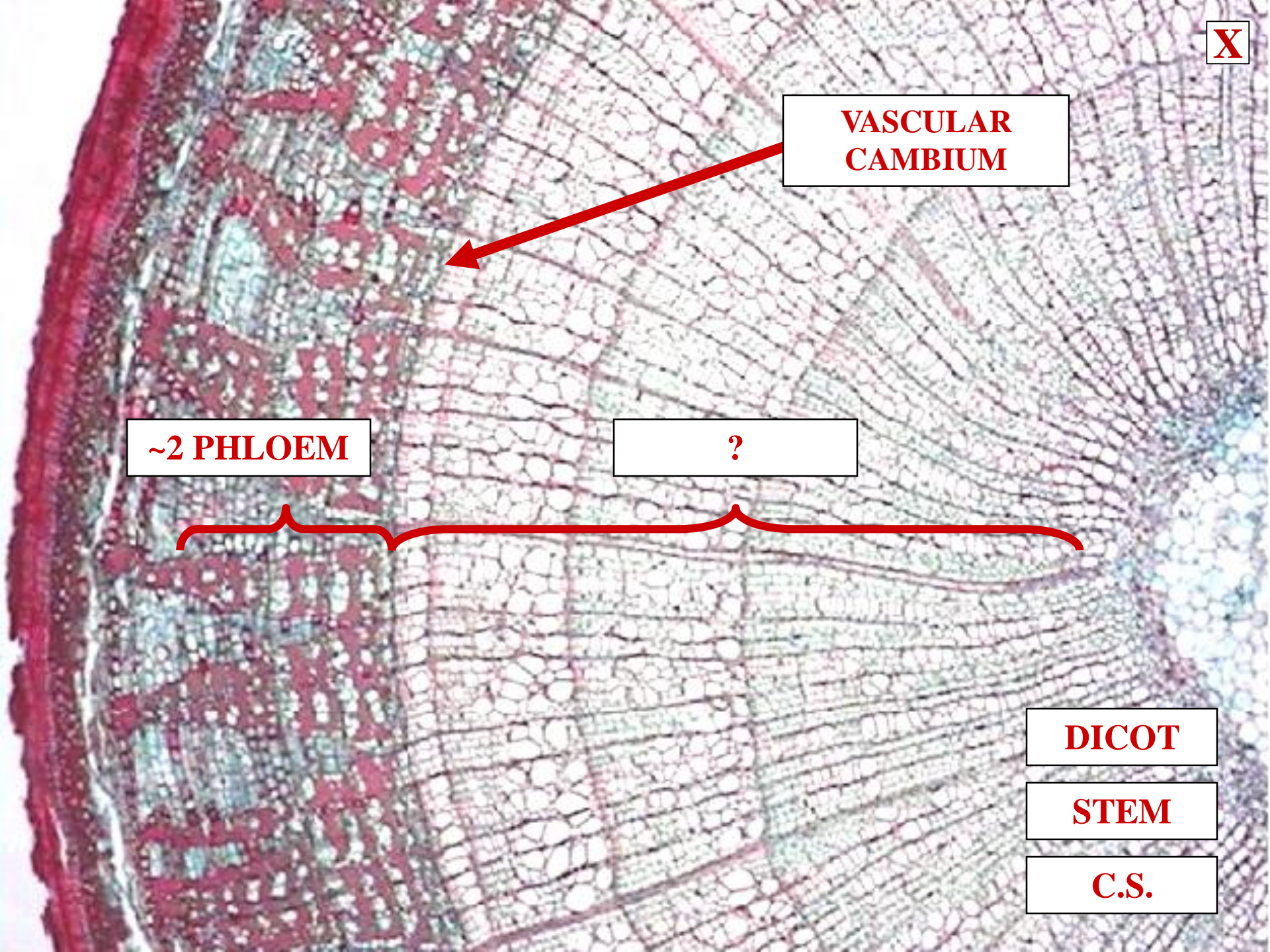
?



DICOT

STEM

C.S.





**VASCULAR  
CAMBIUM**

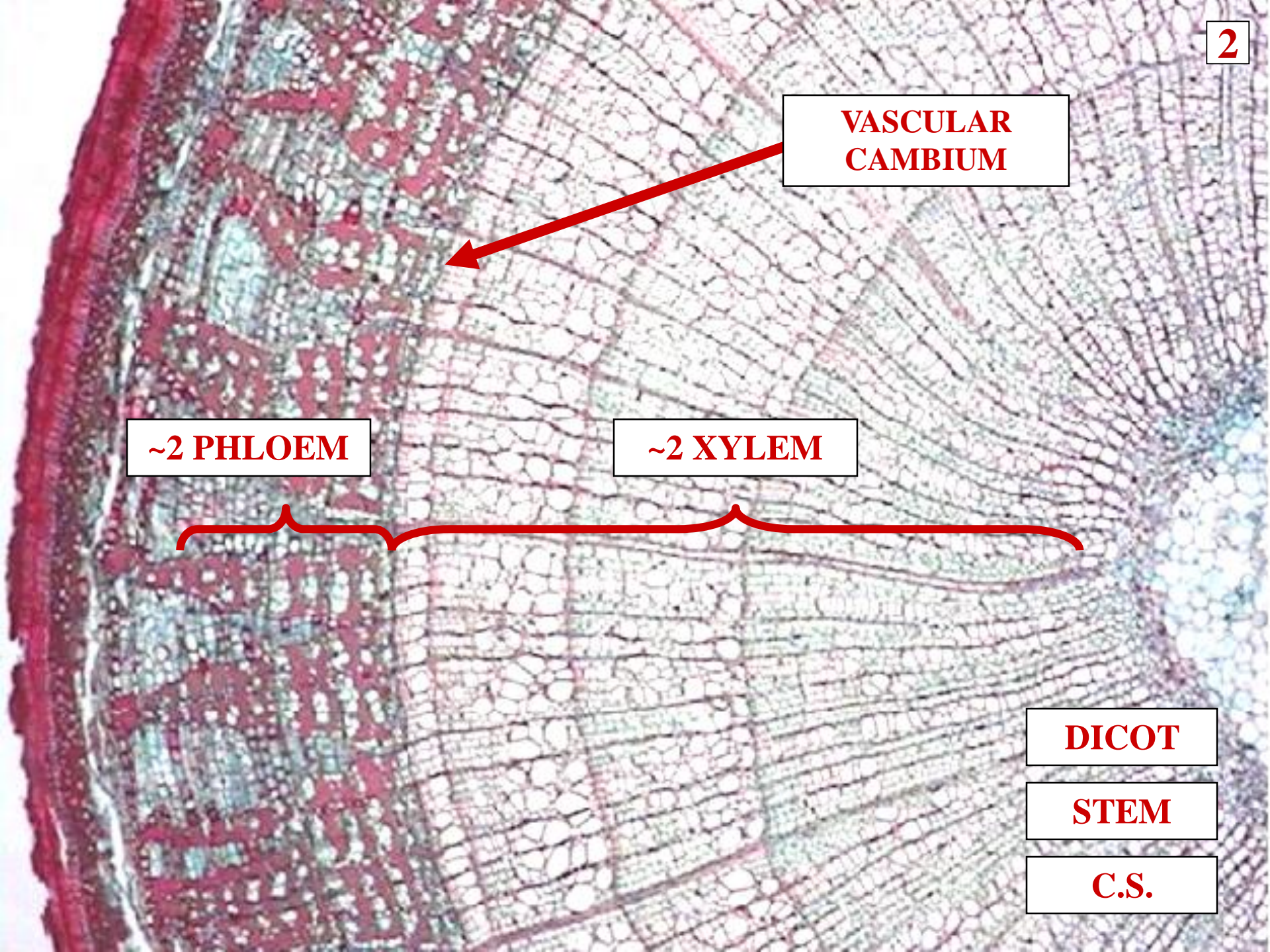
**~2 PHLOEM**

**~2 XYLEM**

**DICOT**

**STEM**

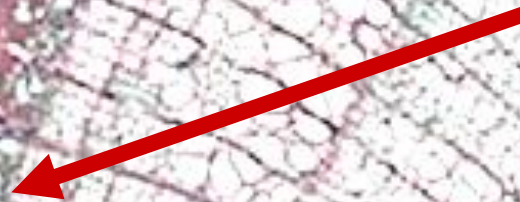
**C.S.**





**L**

**VASCULAR  
CAMBIUM**



**~2 PHLOEM**

**~2 XYLEM**

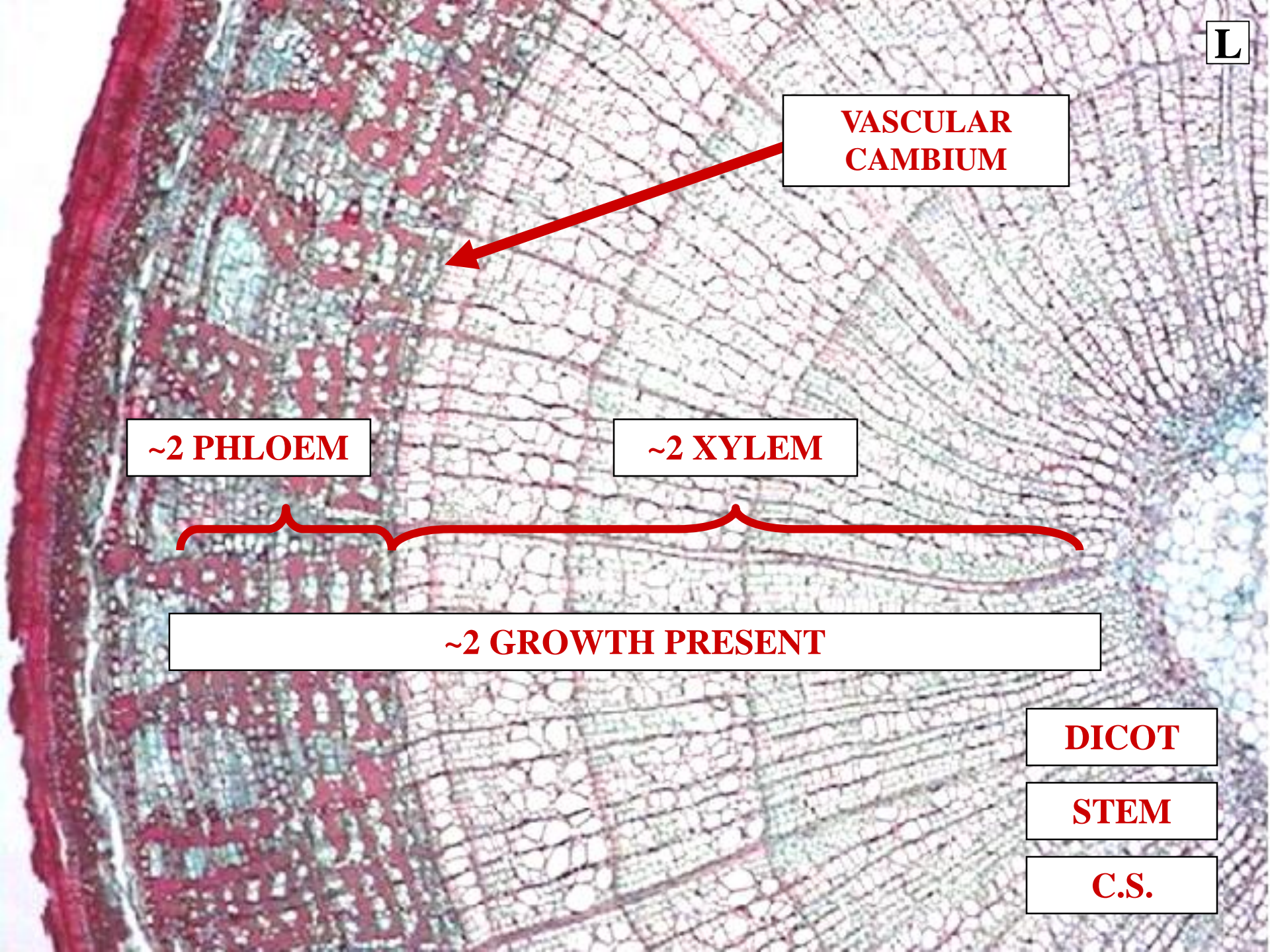


**~2 GROWTH PRESENT**

**DICOT**

**STEM**

**C.S.**

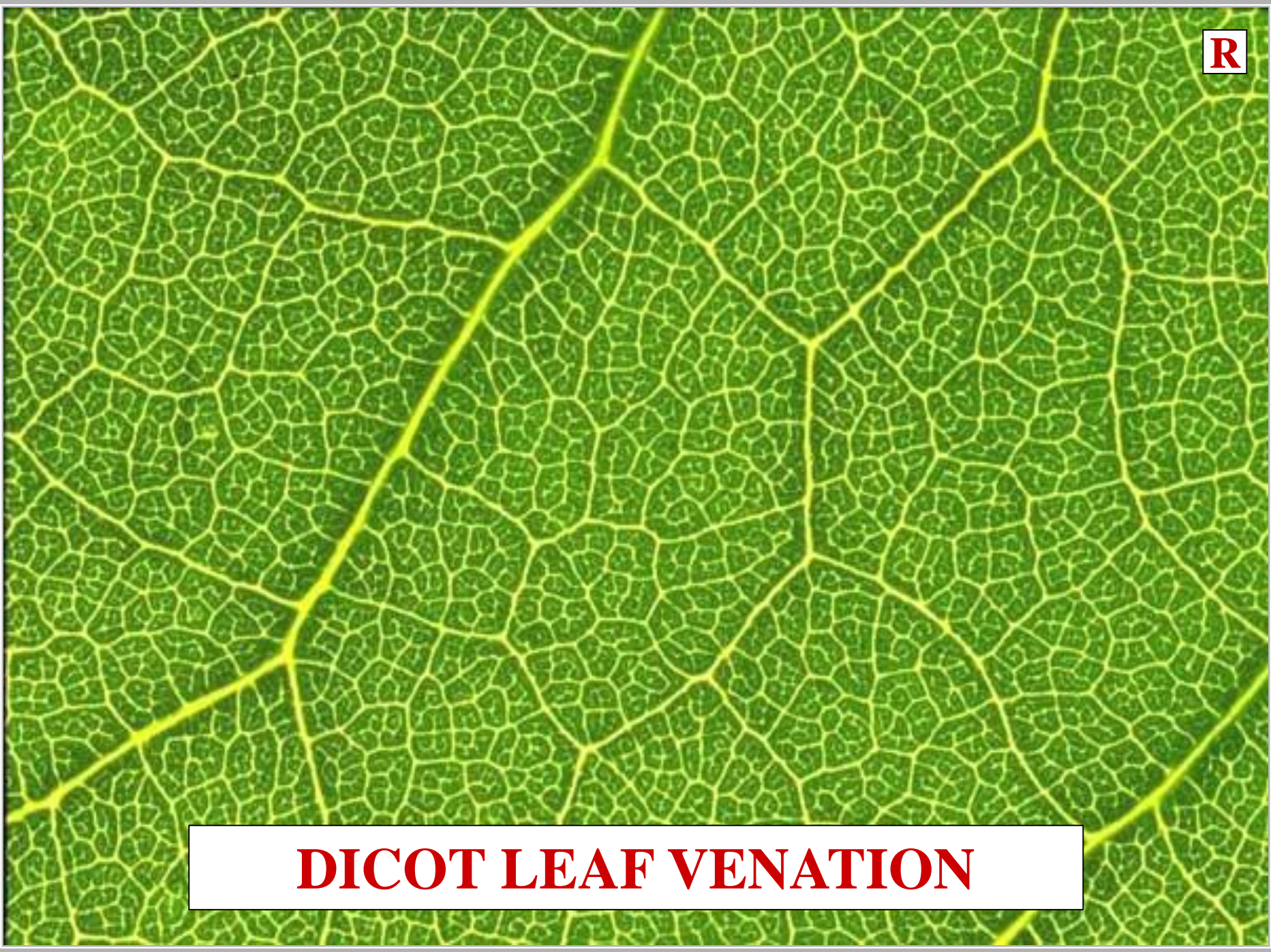




# LEAF VENATION

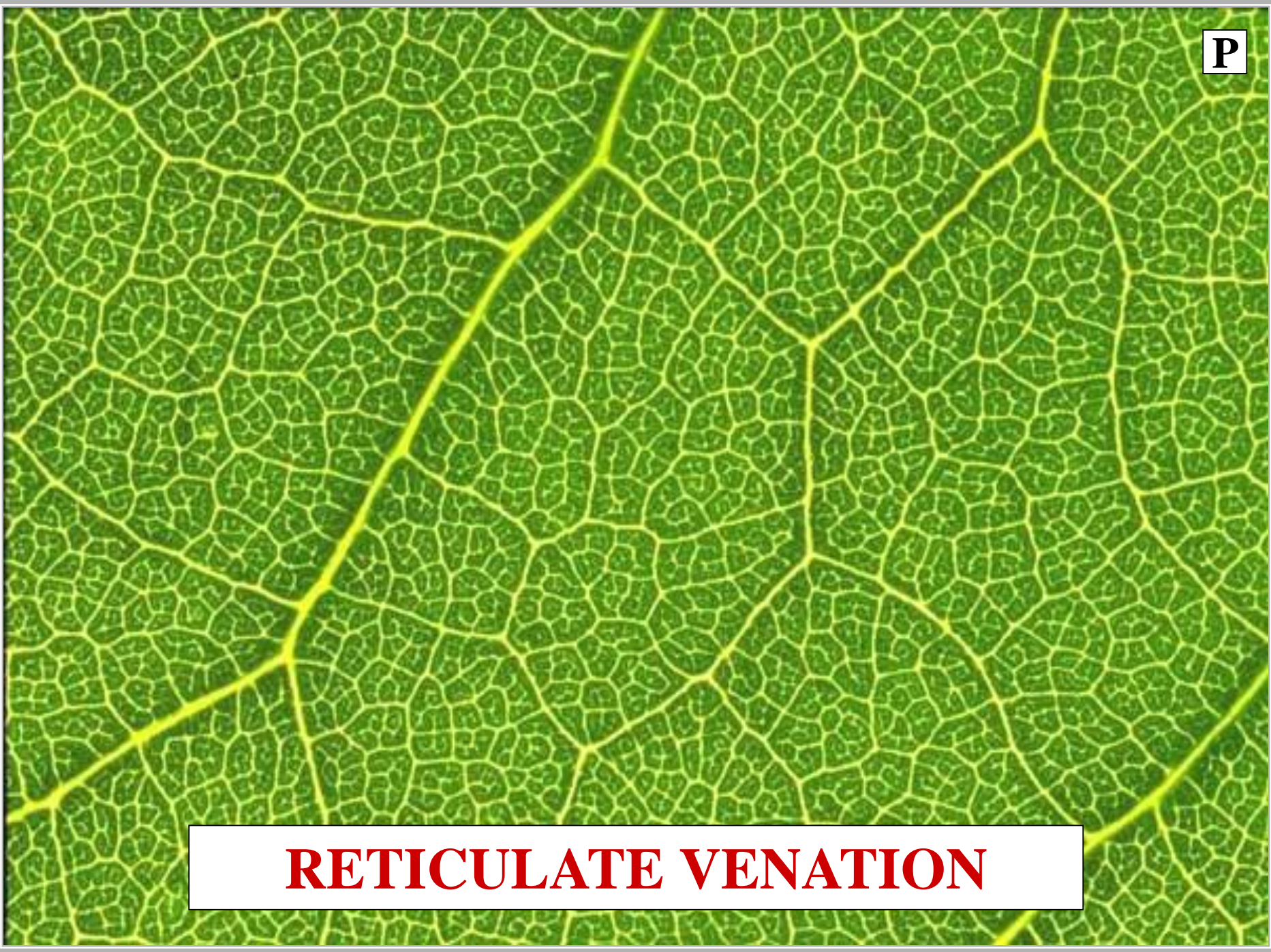


**DICOT LEAF VENATION**





**RETICULATE VENATION**







# PERIANTH



**DICOT FLOWER**



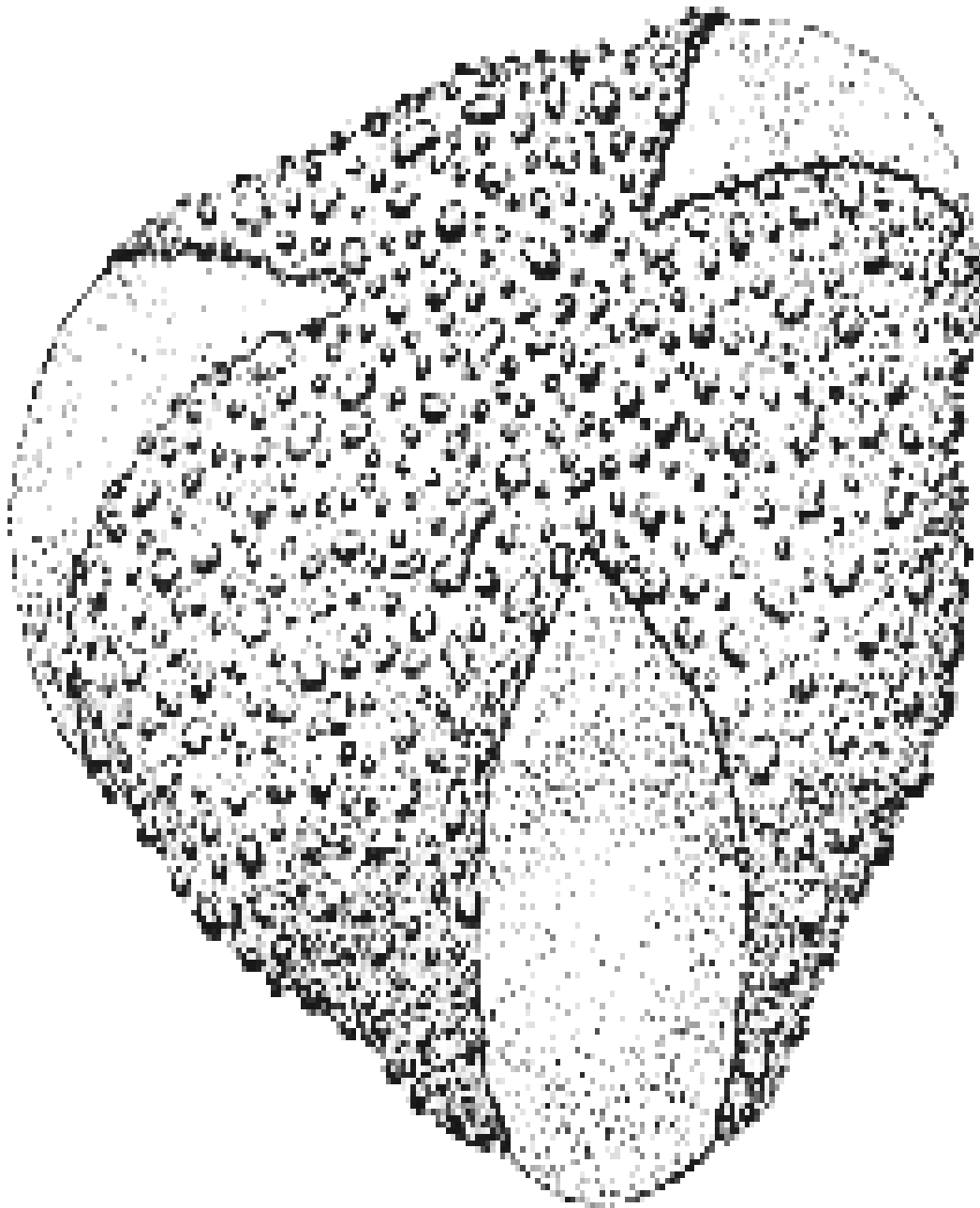


**4-5 PERIANTH SEGMENTS**



# POLLEN





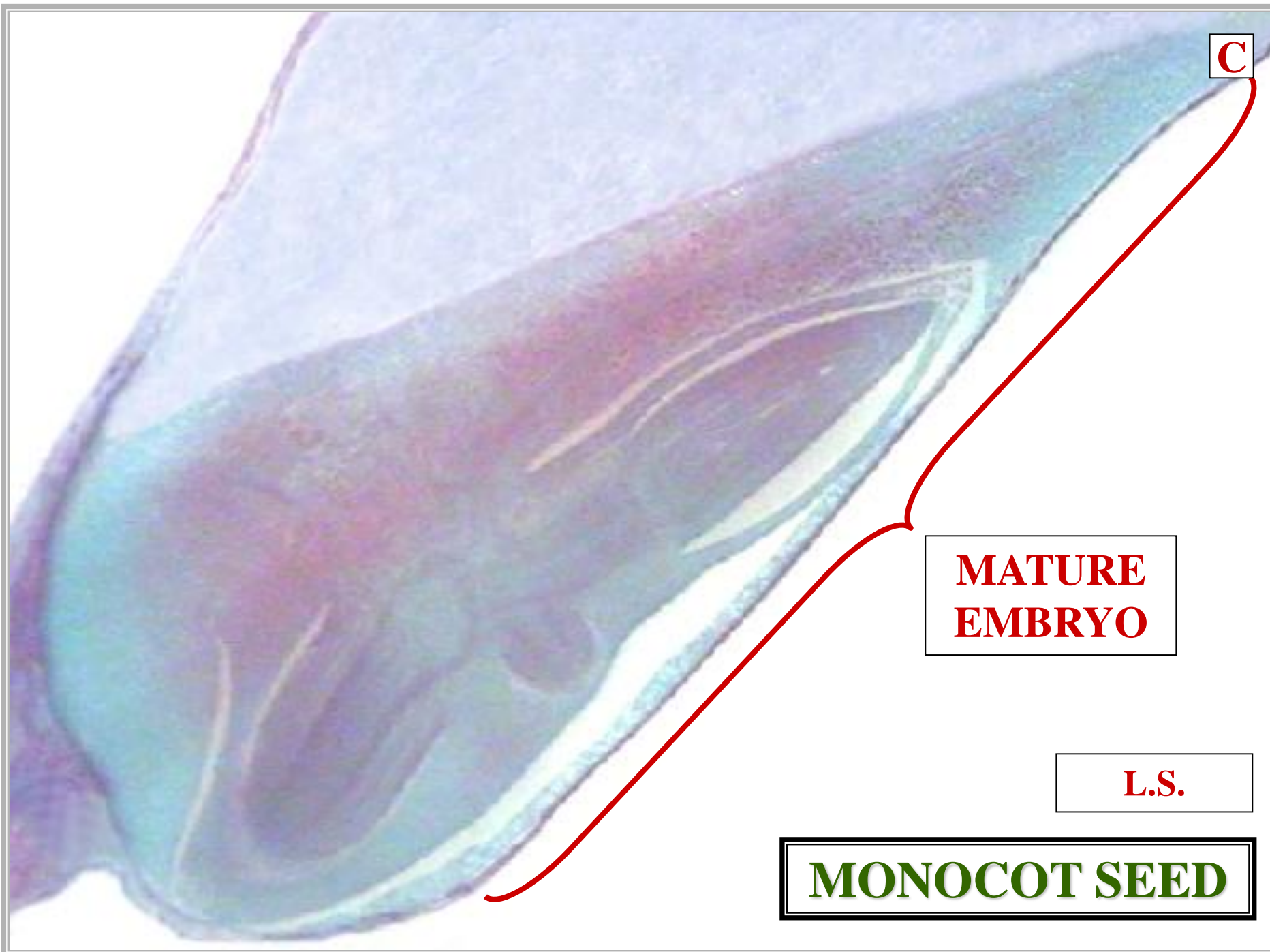
**DICOT  
TRICOLPATE  
POLLEN**

# LILIOPSIDA CHARACTERS





# COTYLEDONS



C

**MATURE  
EMBRYO**

**L.S.**

**MONOCOT SEED**



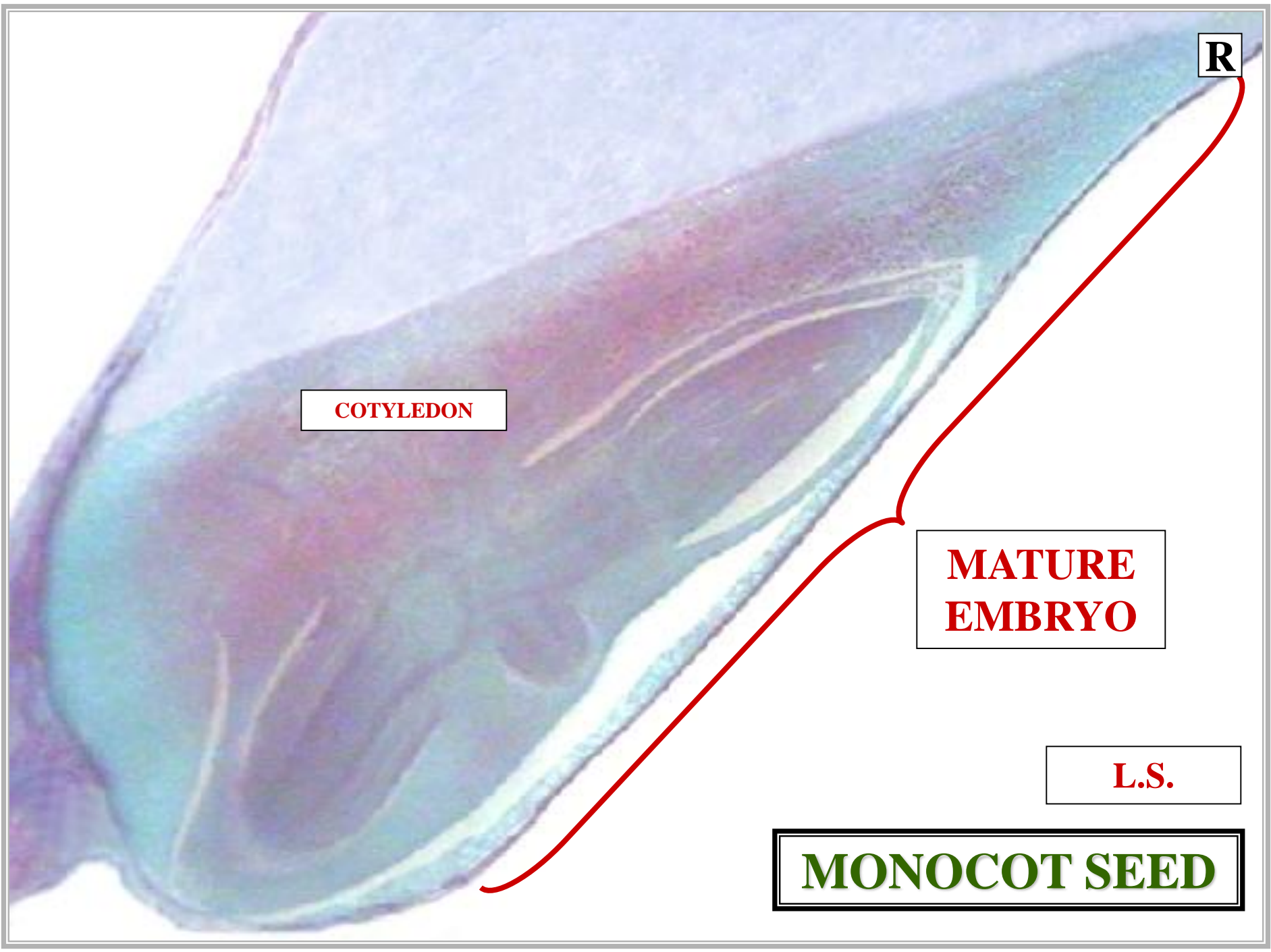
**R**

**COTYLEDON**

**MATURE  
EMBRYO**

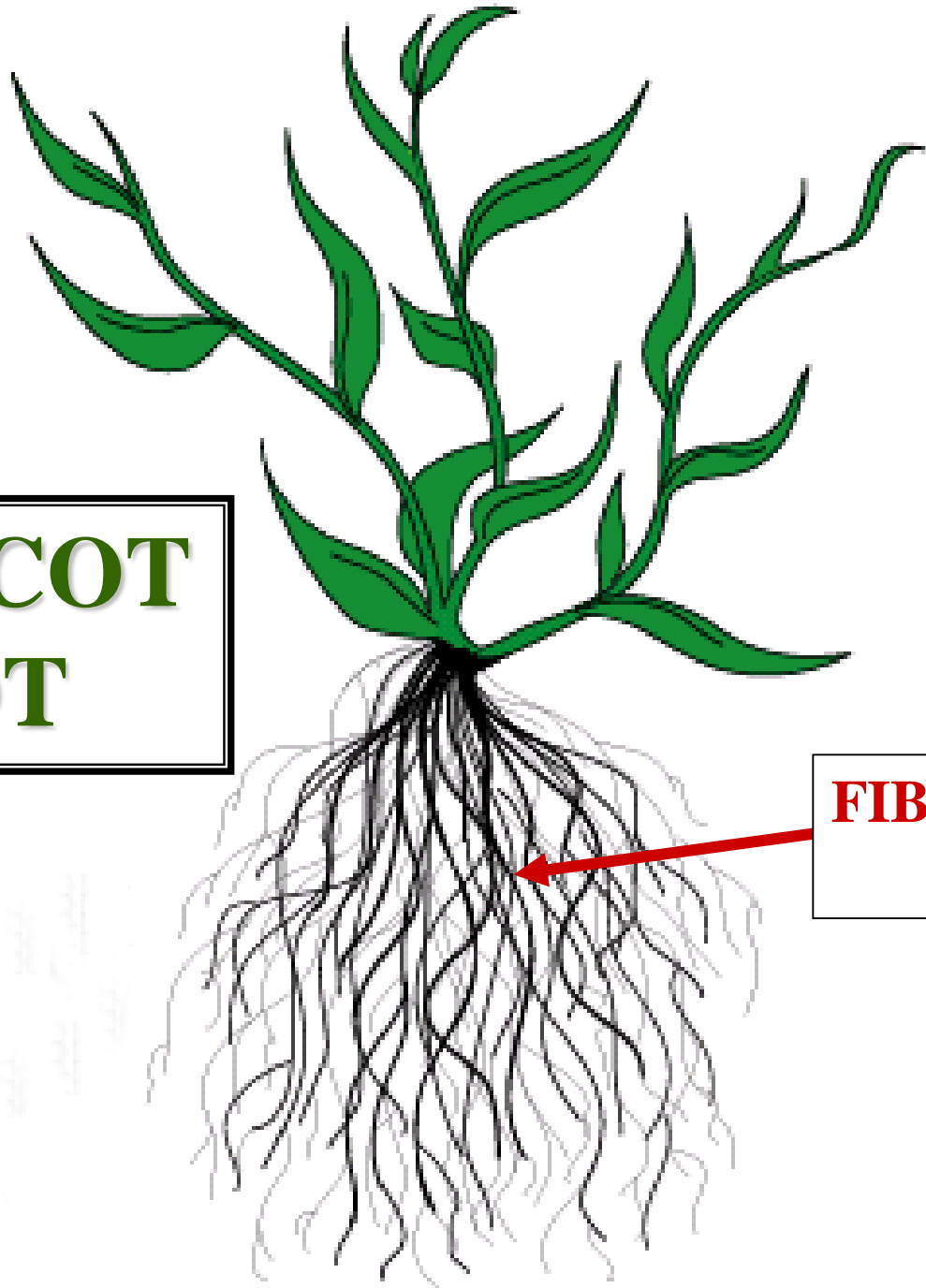
**L.S.**

**MONOCOT SEED**



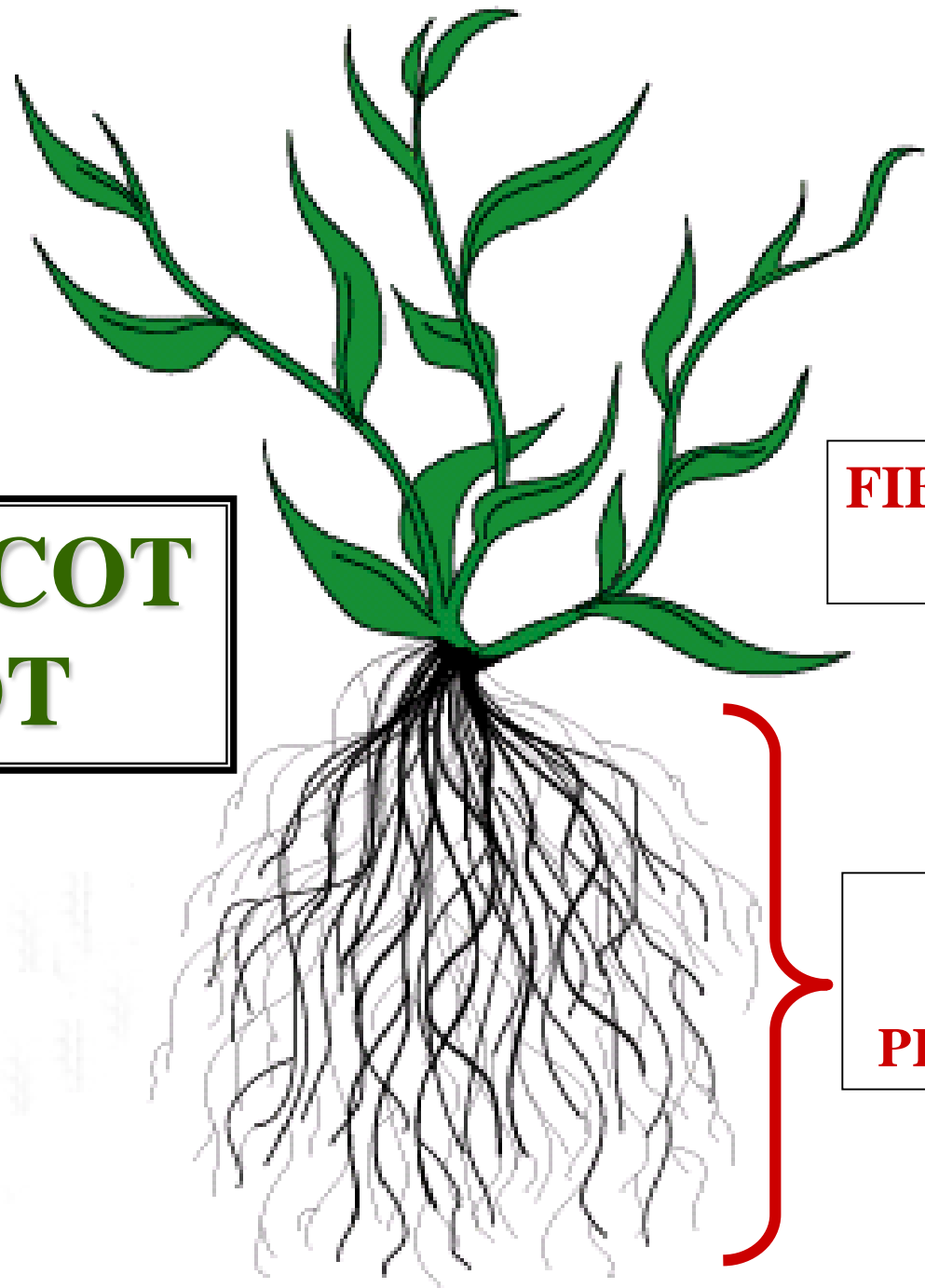
# **ROOT HABIT**





**MONOCOT  
ROOT**

**FIBROUS ROOT  
SYSTEM**



**MONOCOT  
ROOT**

**FIBROUS ROOT  
SYSTEM**

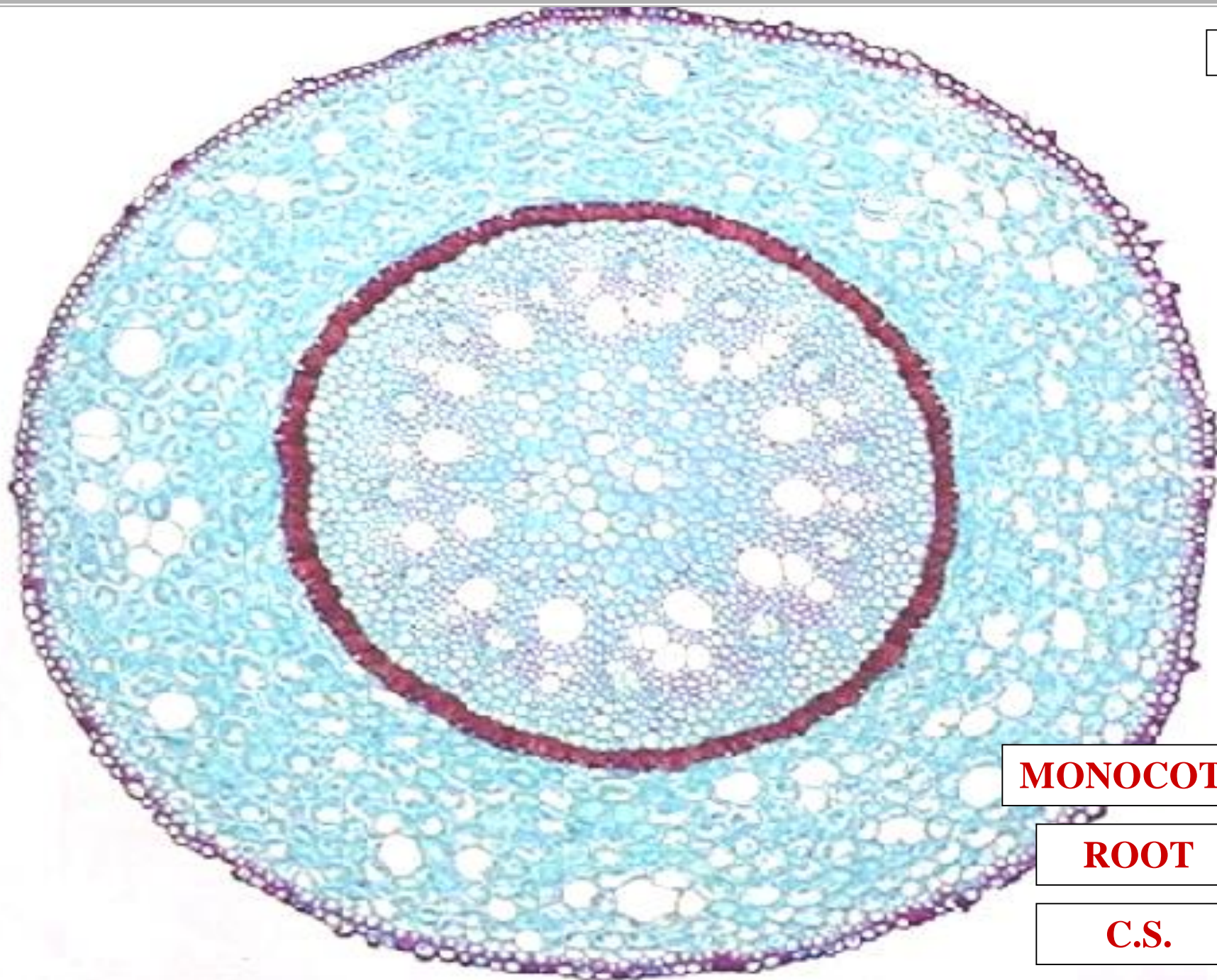
**SHALLOW  
SOIL  
PENETRATION**





# ROOT STELE

**S**

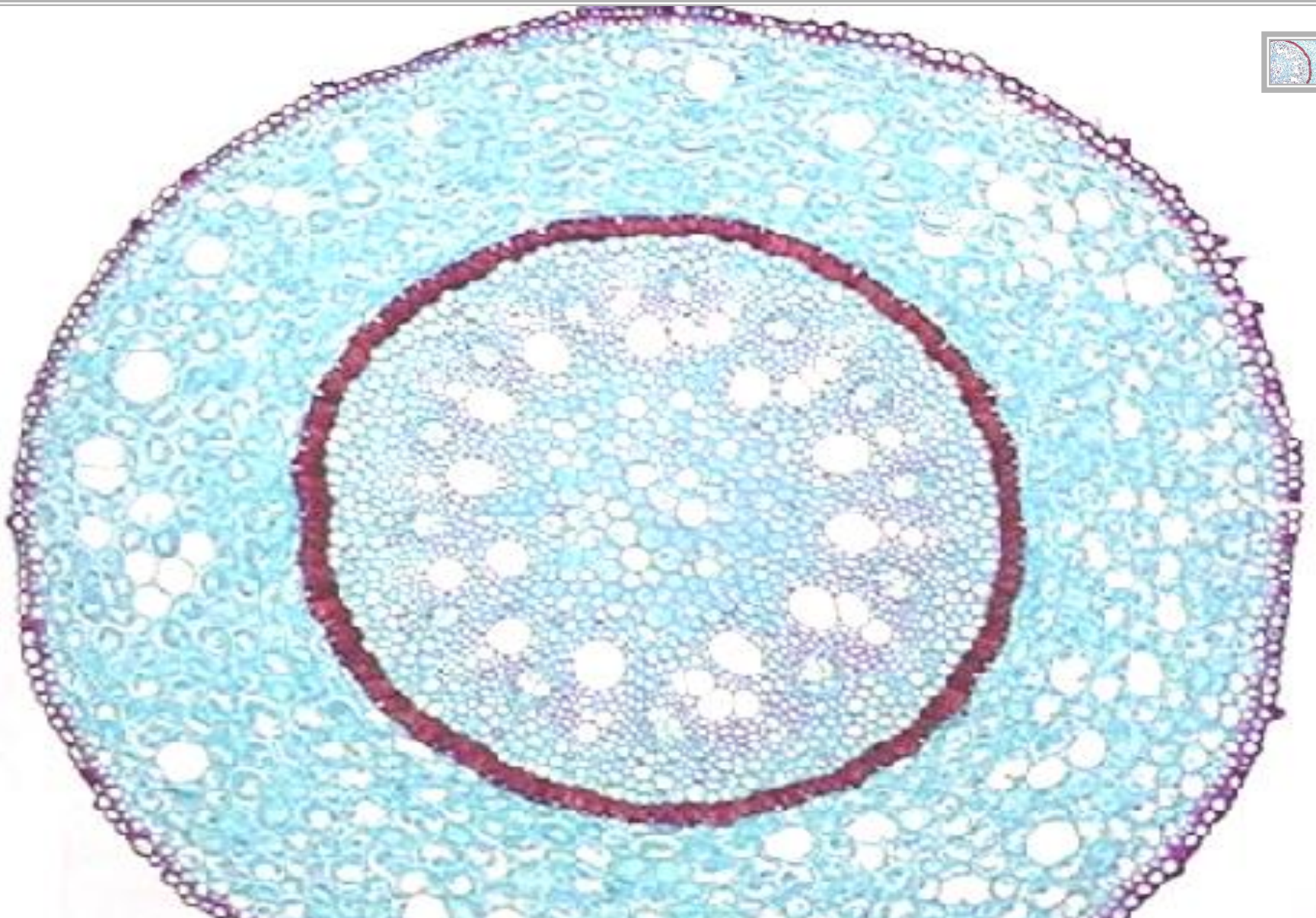
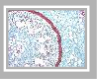


**MONOCOT**

**ROOT**

**C.S.**

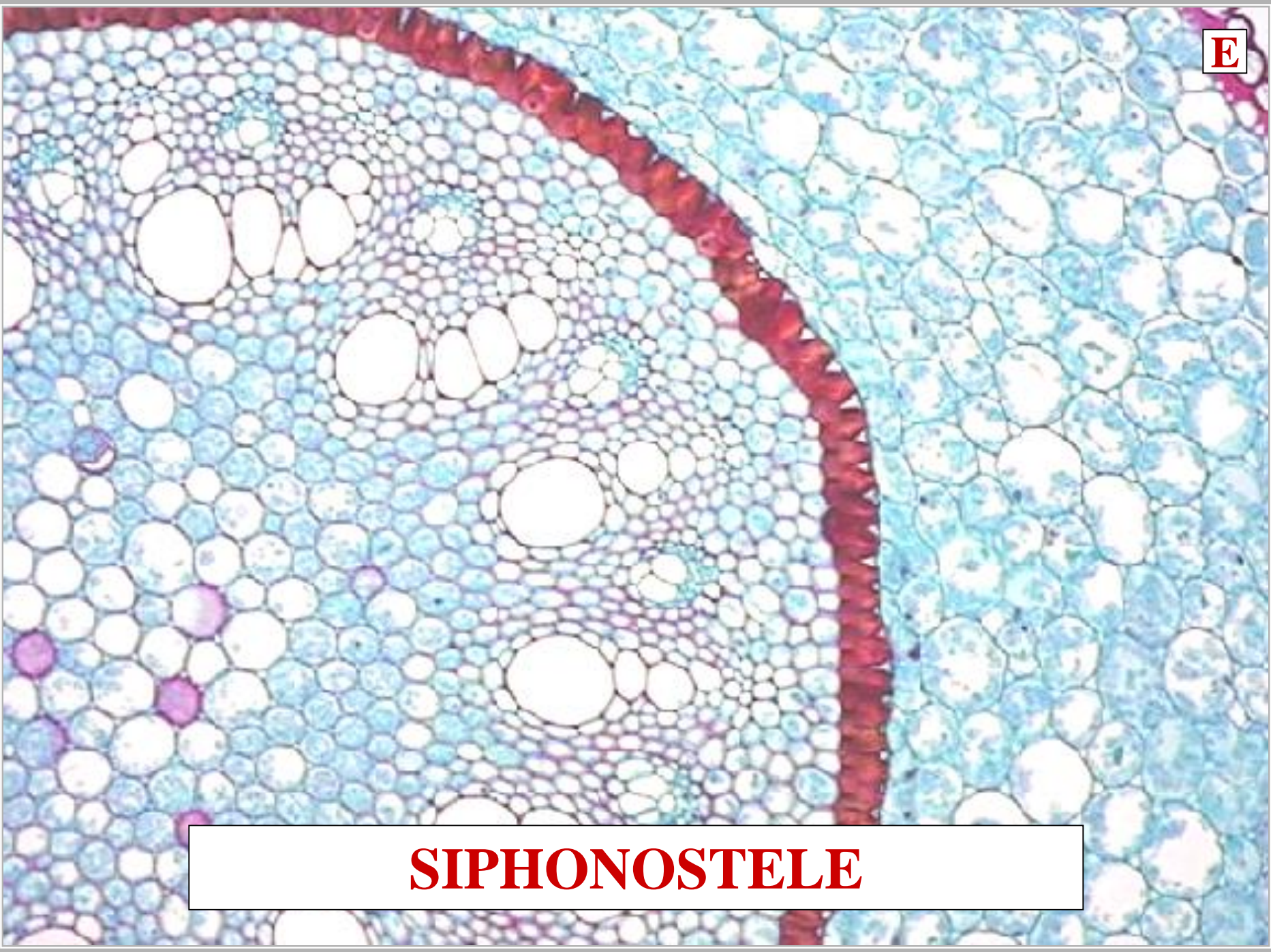




**SIPHONOSTELE**



**E**

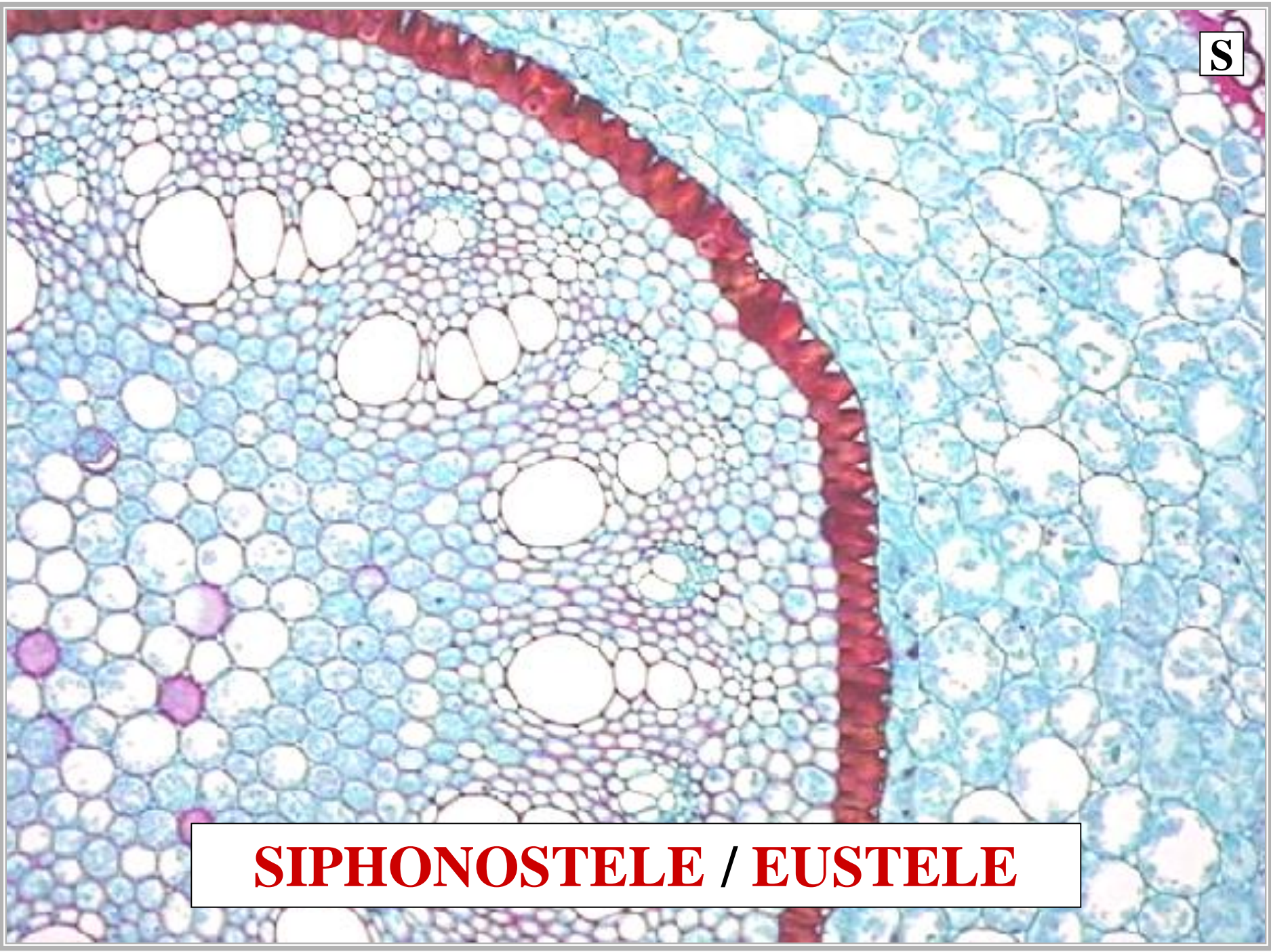


**SIPHONOSTELE**



S

**SIPHONOSTELE / EUSTELE**

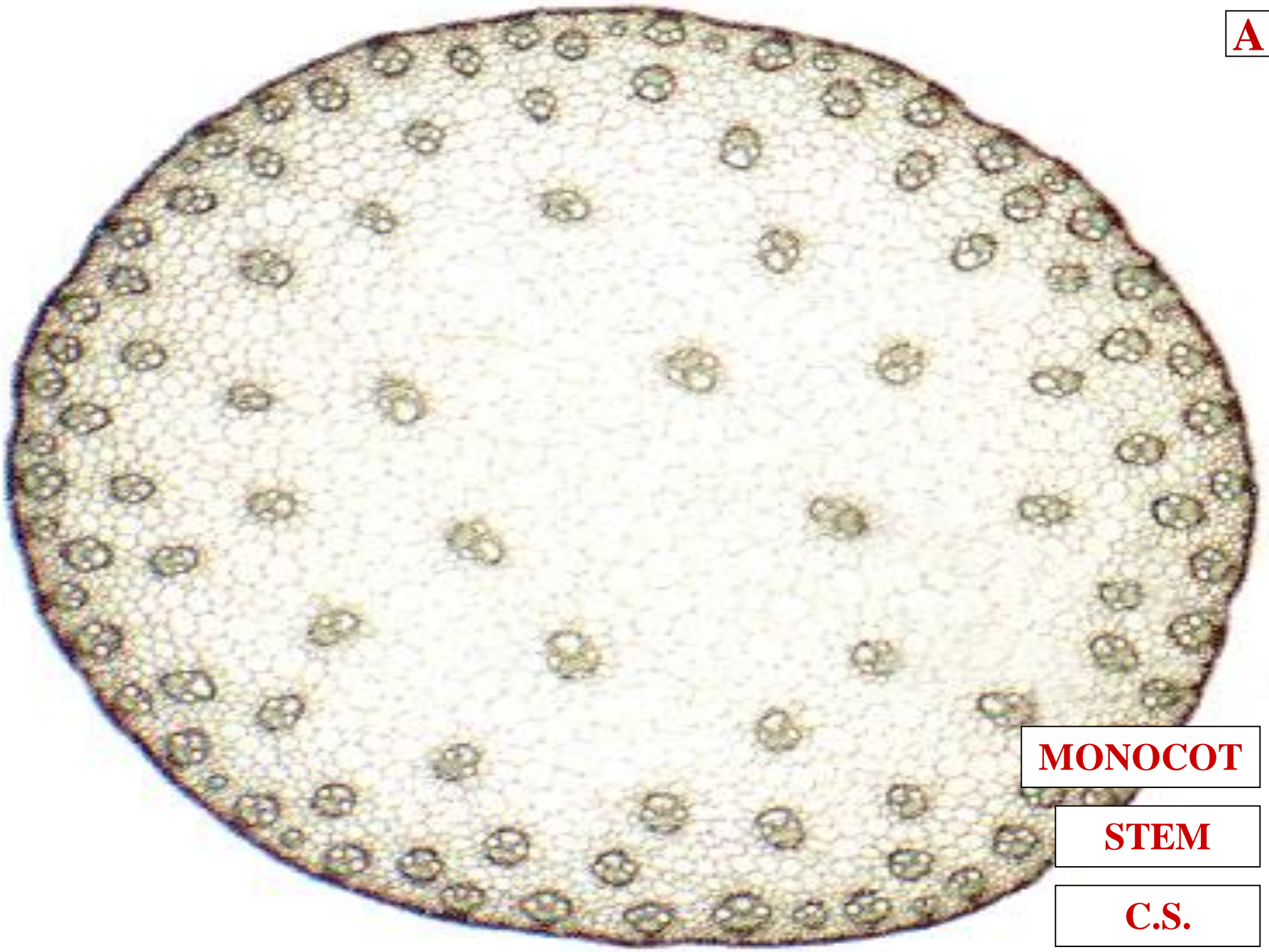




# STEM STELE



**A**

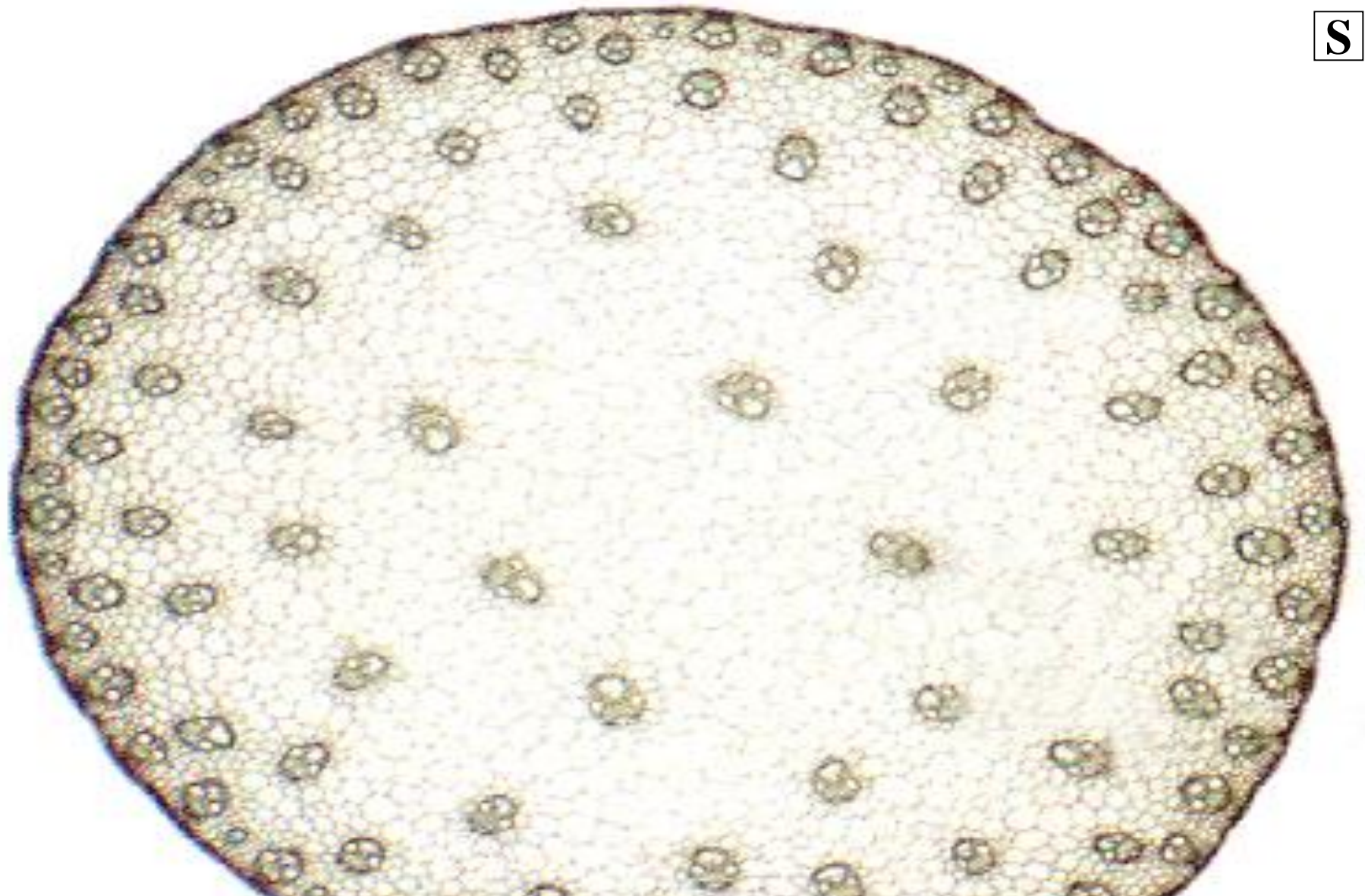


**MONOCOT**

**STEM**

**C.S.**

S

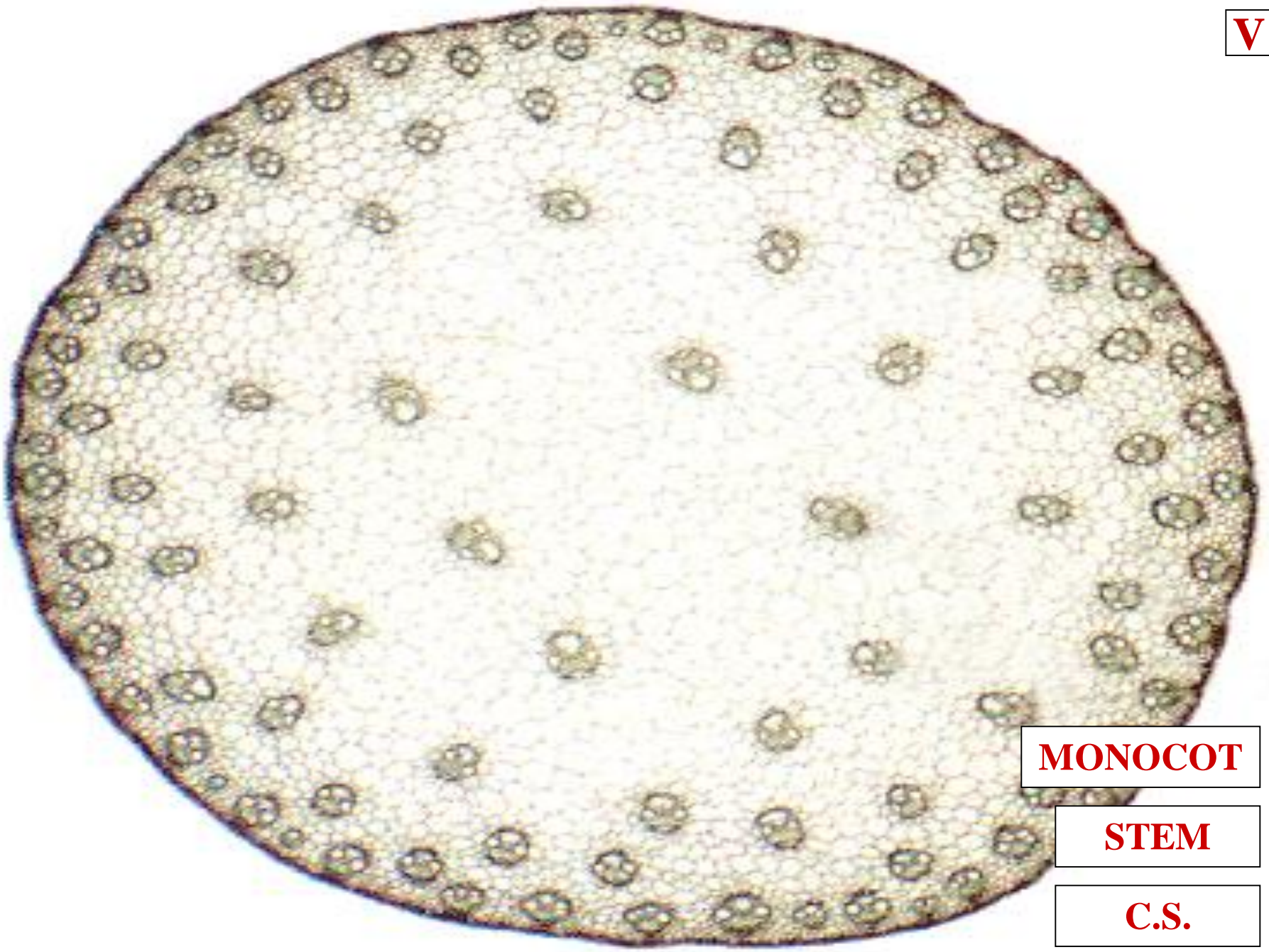


**ATACTOSTELE**





# SECONDARY GROWTH

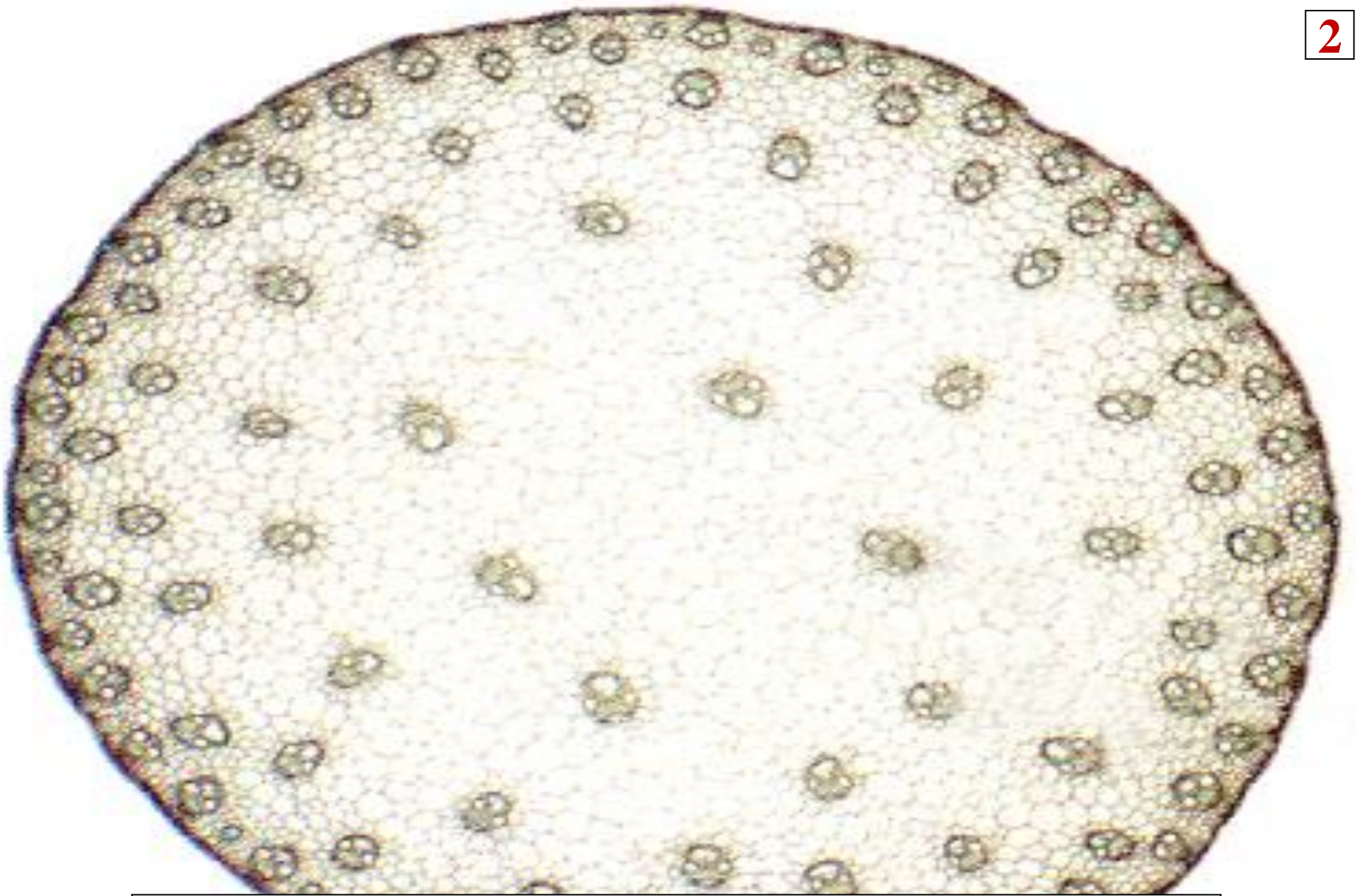


**MONOCOT**

**STEM**

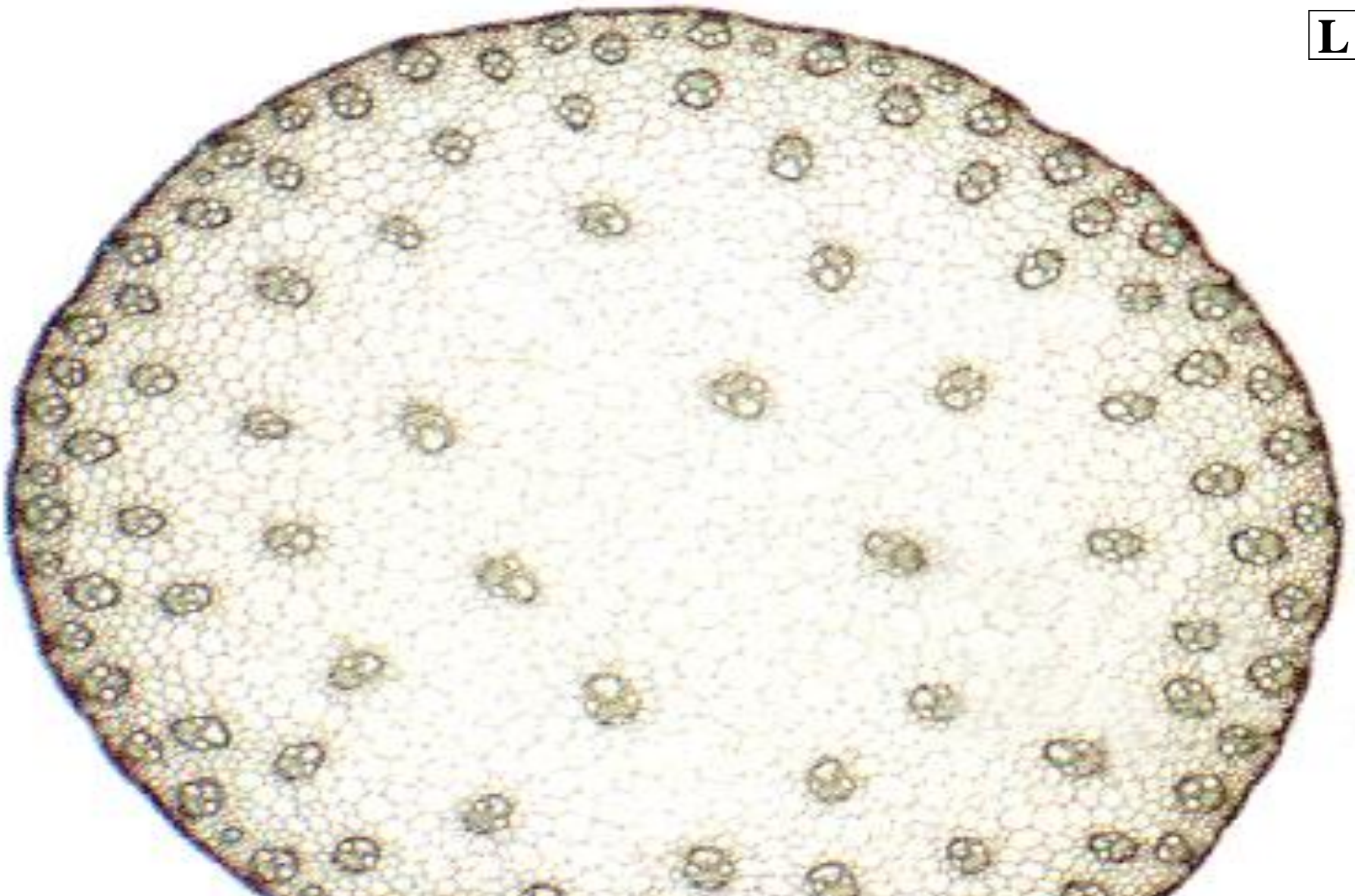
**C.S.**





**VASCULAR CAMBIUM: ABSENT**

L



**~2 GROWTH: ABSENT**



# **LEAF VENATION**

# MONOCOT LEAF VENATION



**PARALLEL VENATION**



# PERIANTH





**MONOCOT FLOWER**



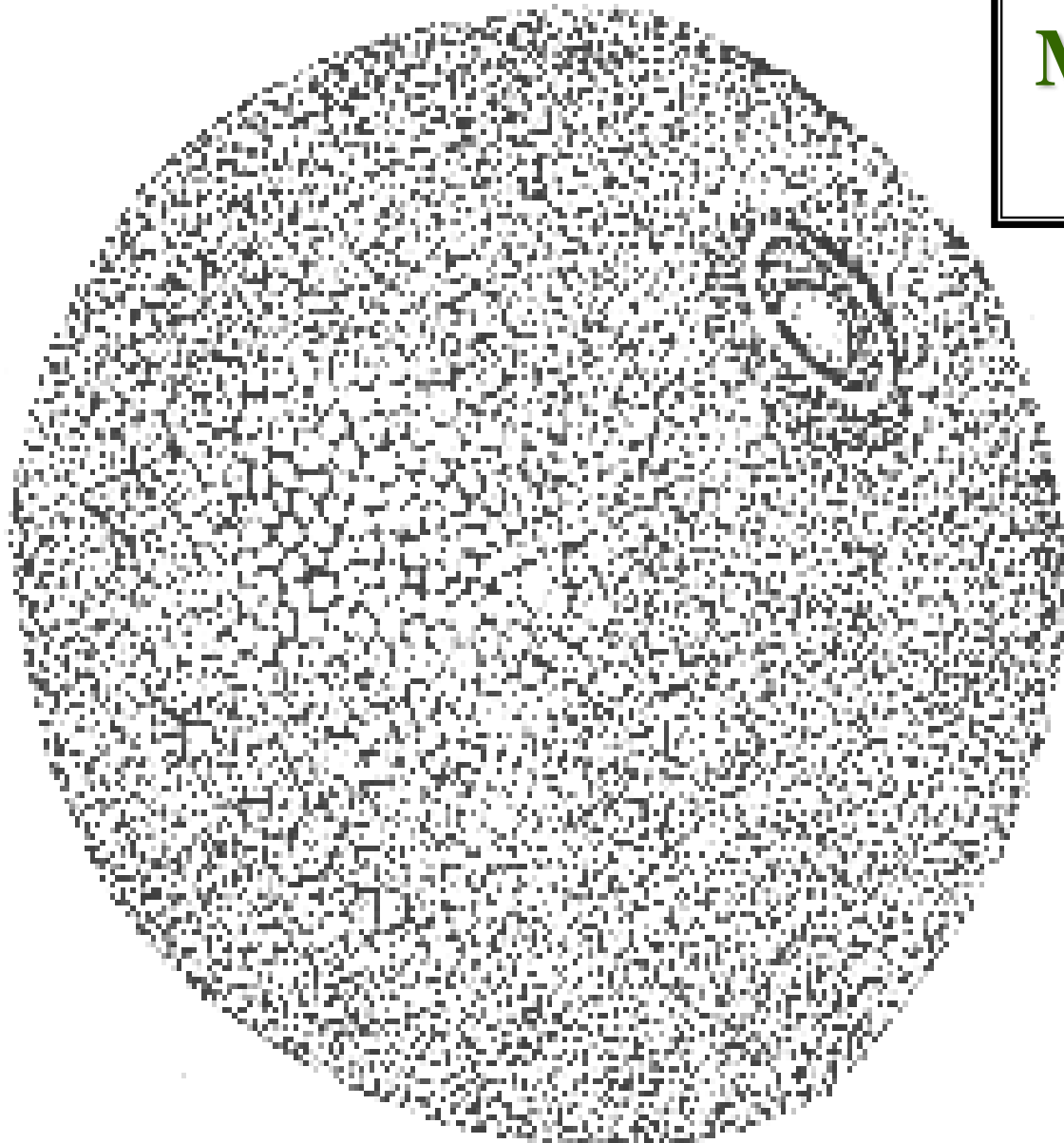
**3 PERIANTH SEGMENTS**





# POLLEN

**MONOCOT  
MONOCOLPATE  
POLLEN**







**CLASS  
CHARACTER  
EXCEPTIONS  
EXIST**





**LEAF: VENATION**





**LEAF: RETICULATE VENATION**