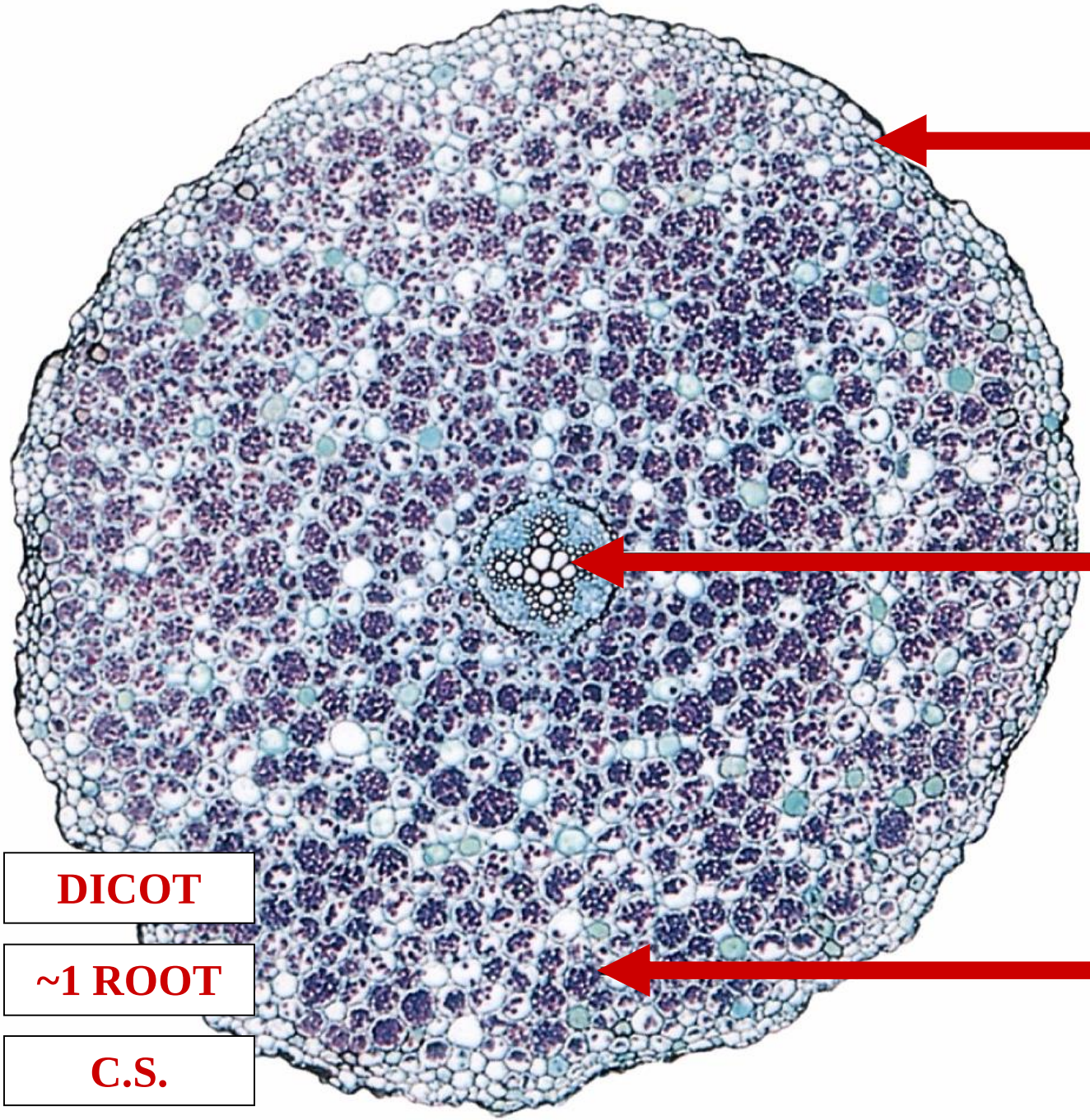
DICOT ROOT PRIMARY GROWTH SUMMARY

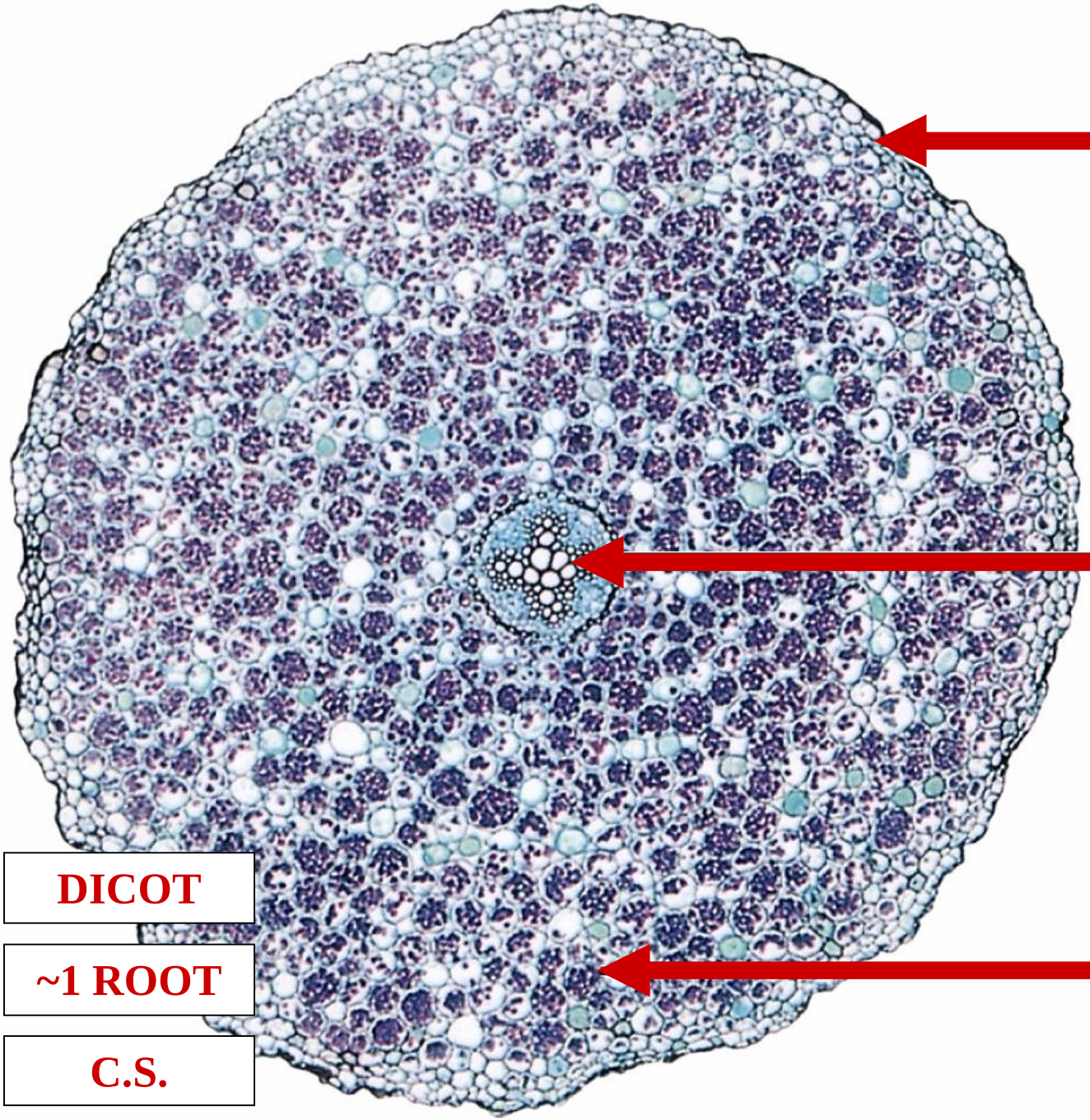


1

DICOT

~1 ROOT

C.S.

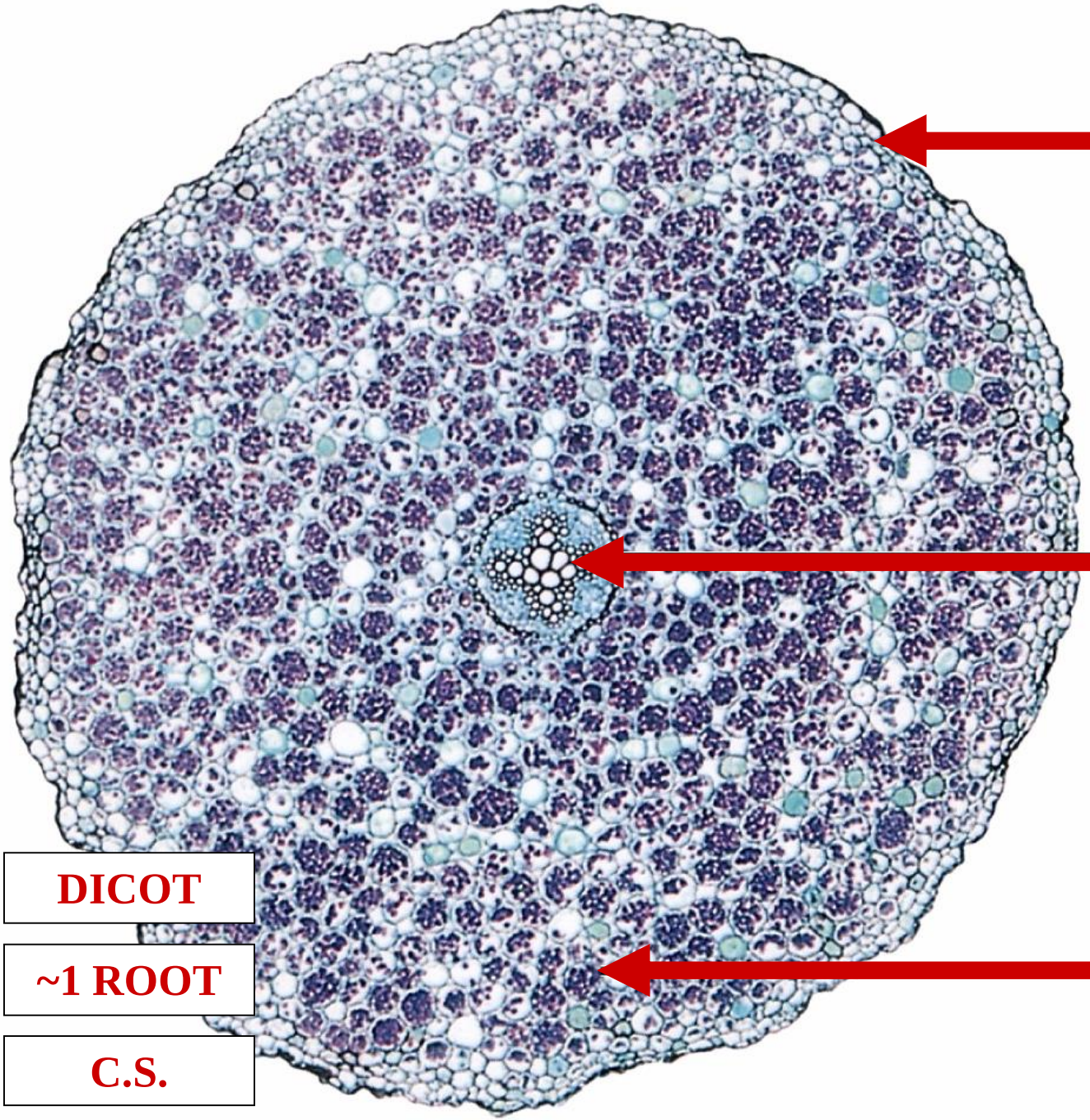


EPIDERMIS

DICOT

~1 ROOT

C.S.



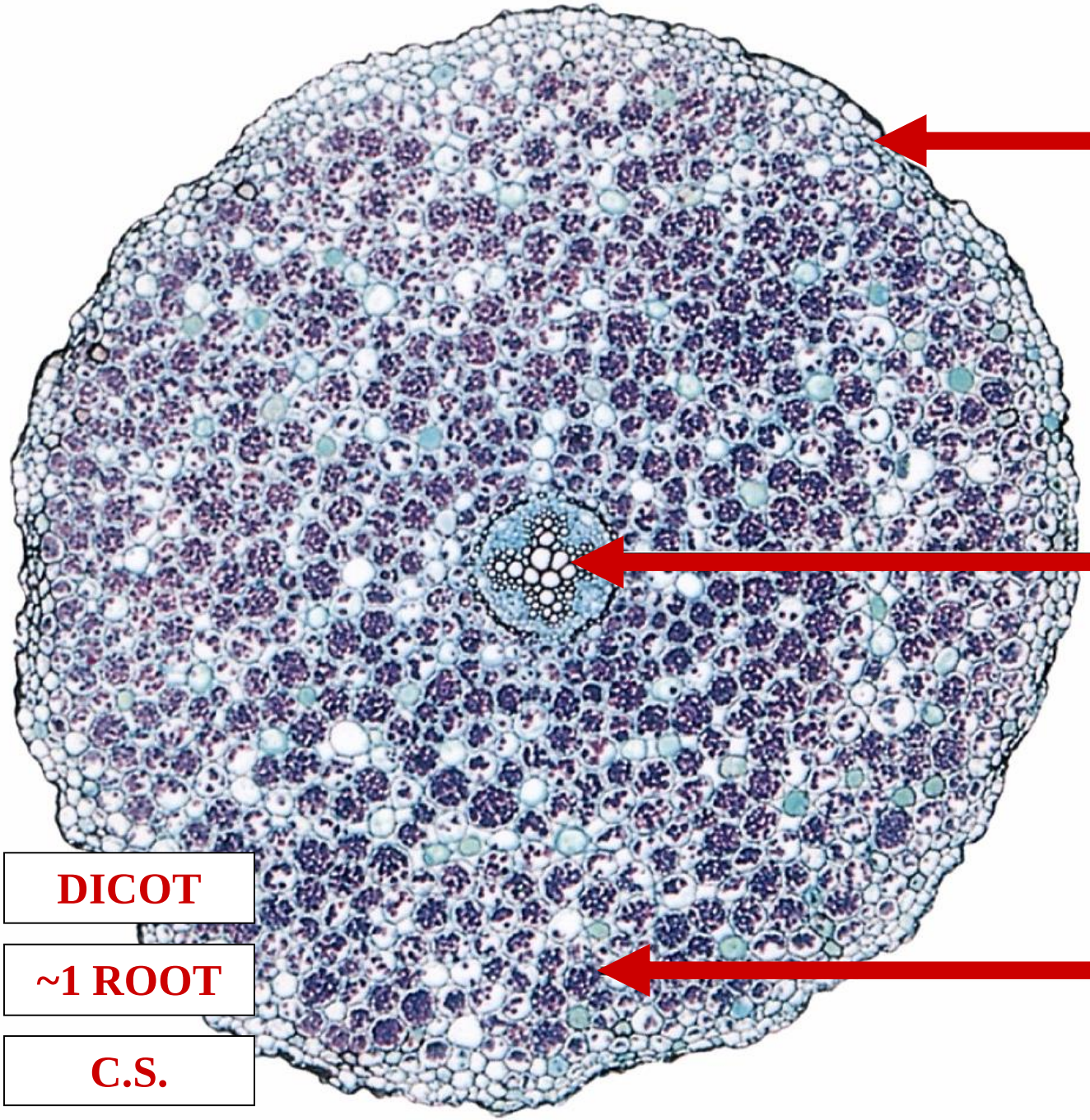
EPIDERMIS

DICOT

~1 ROOT

C.S.

2



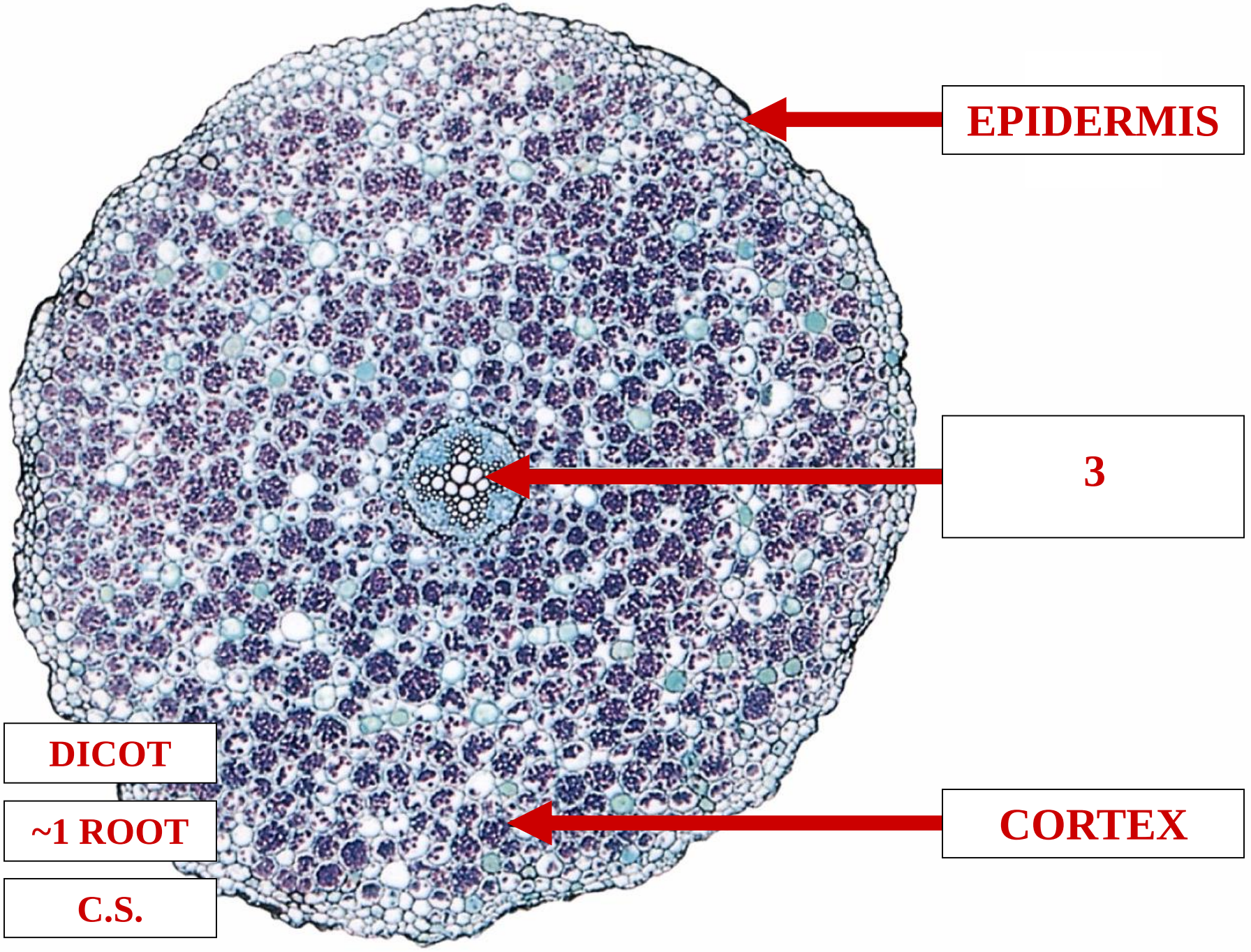
EPIDERMIS

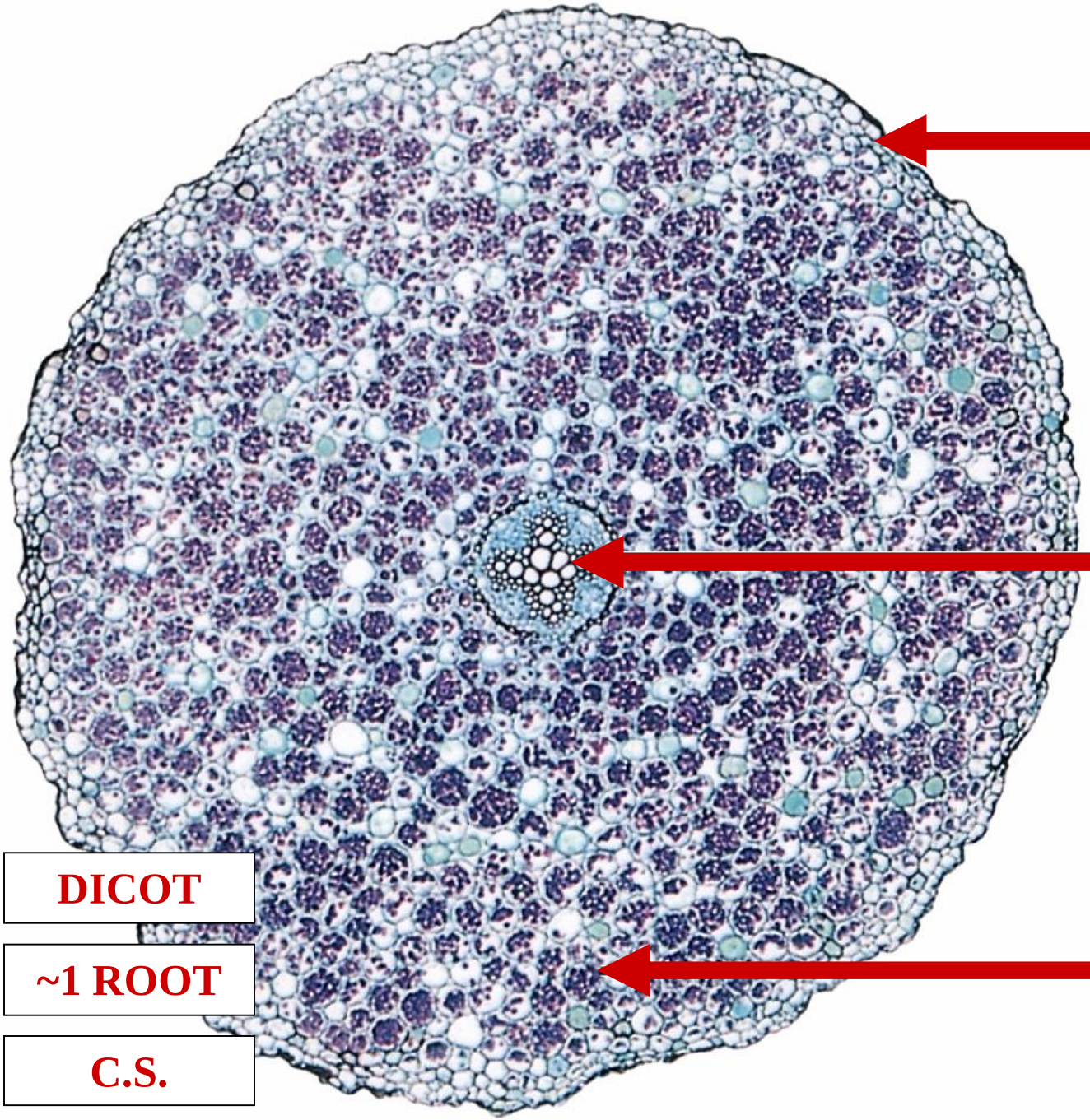
CORTEX

DICOT

~1 ROOT

C.S.


EPIDERMIS
3
CORTEX
DICOT
~1 ROOT
C.S.



EPIDERMIS

VASCULAR STELE

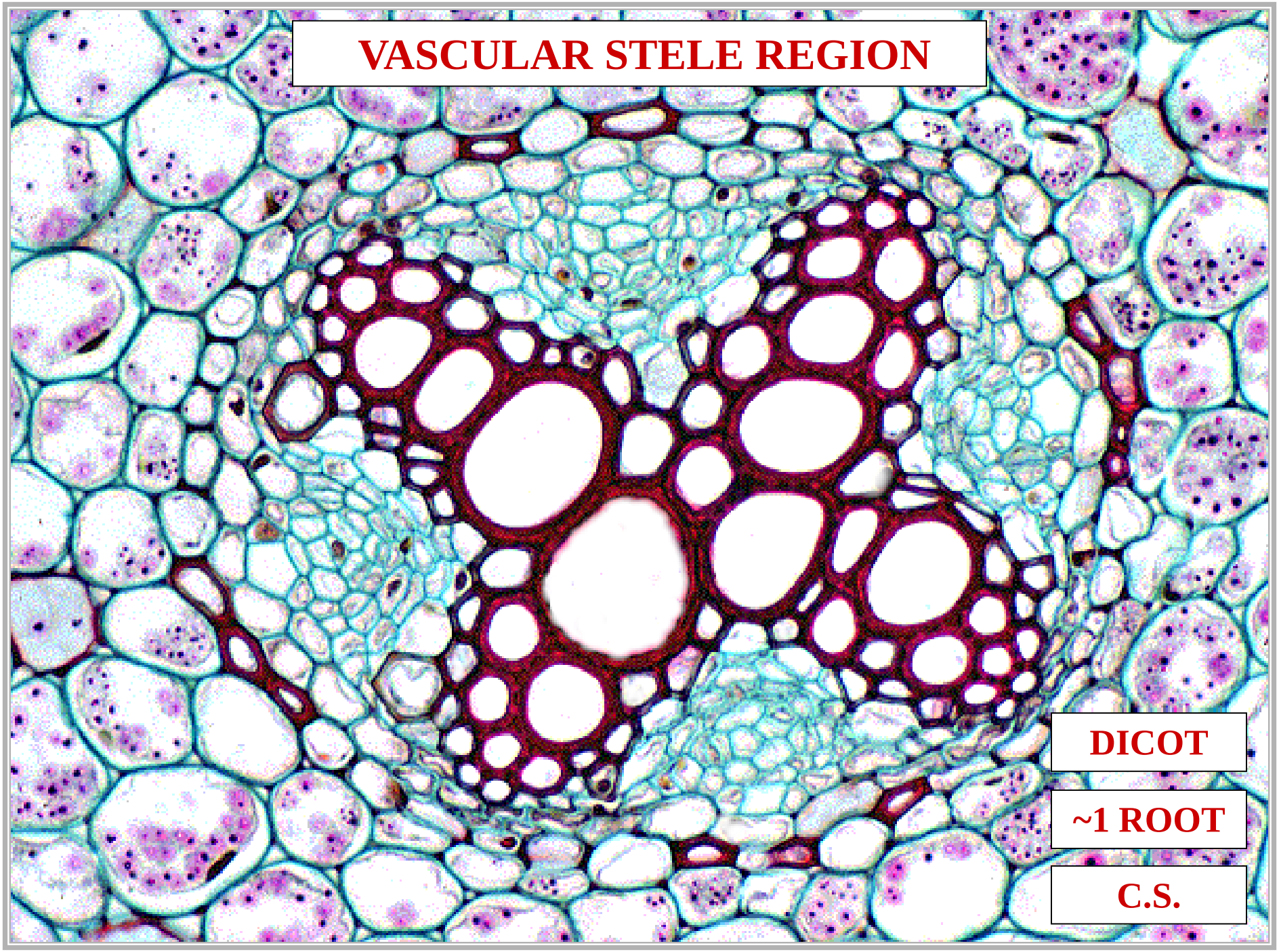
CORTEX

DICOT

~1 ROOT

C.S.

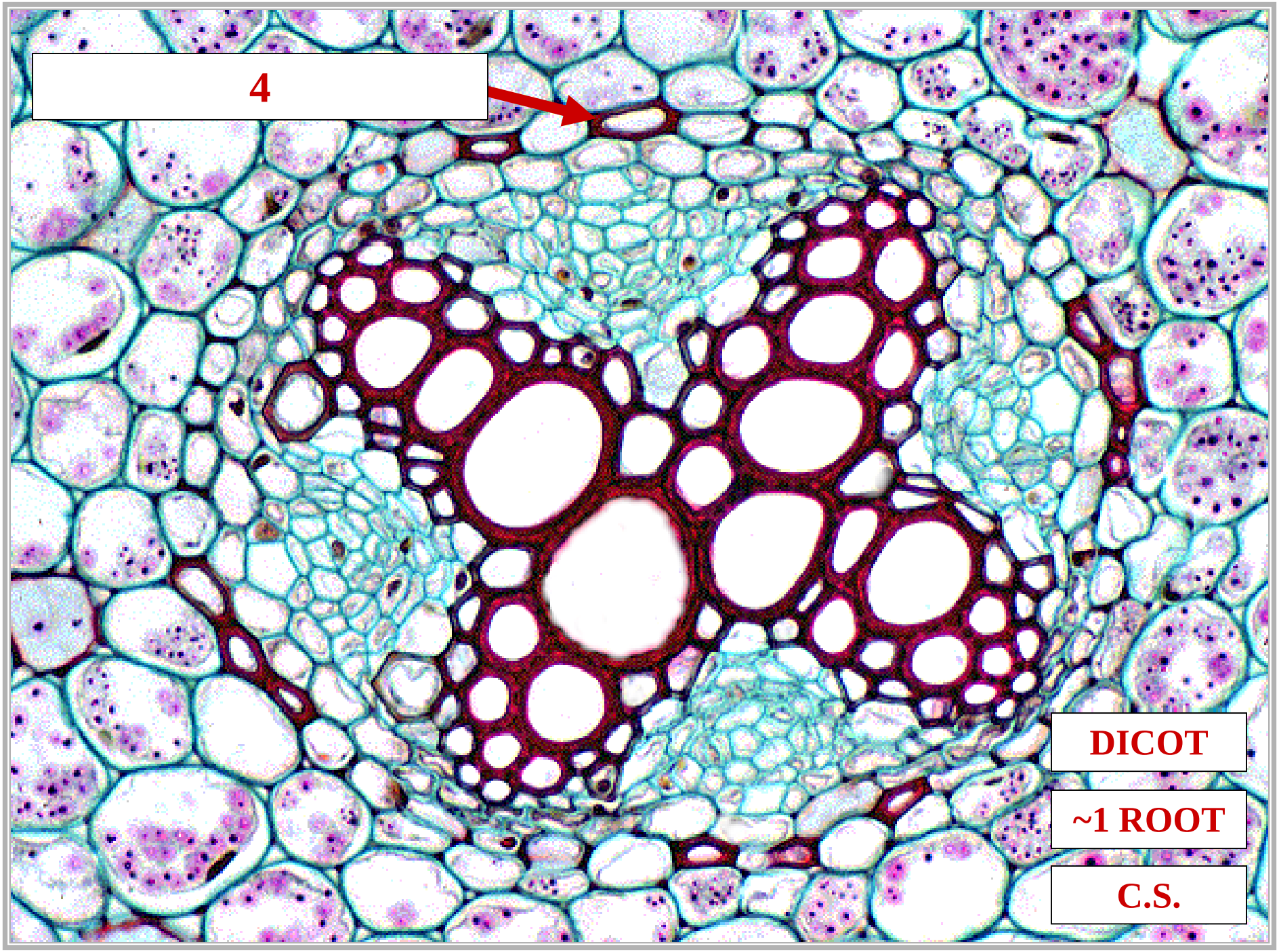
VASCULAR STELE REGION

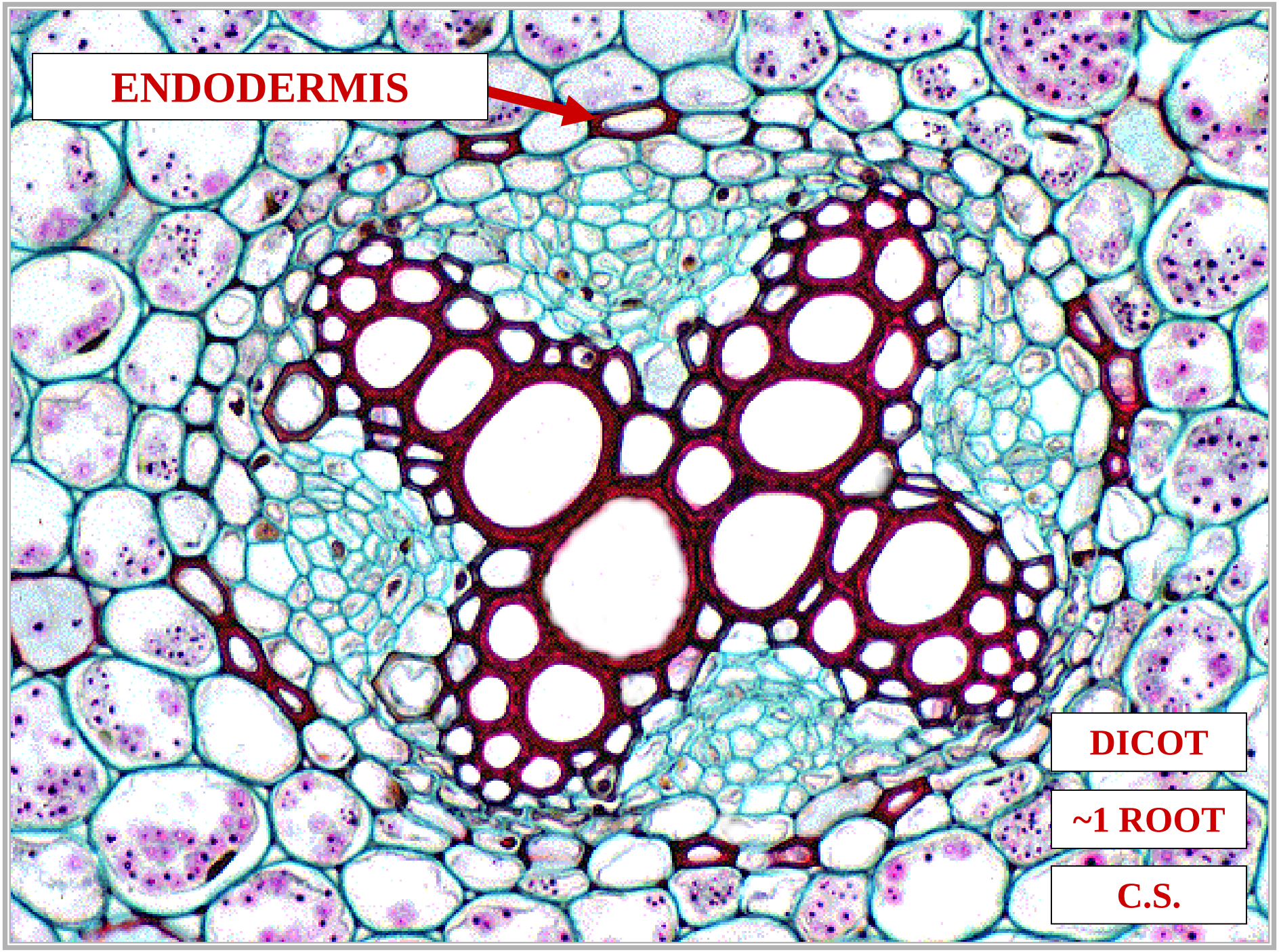


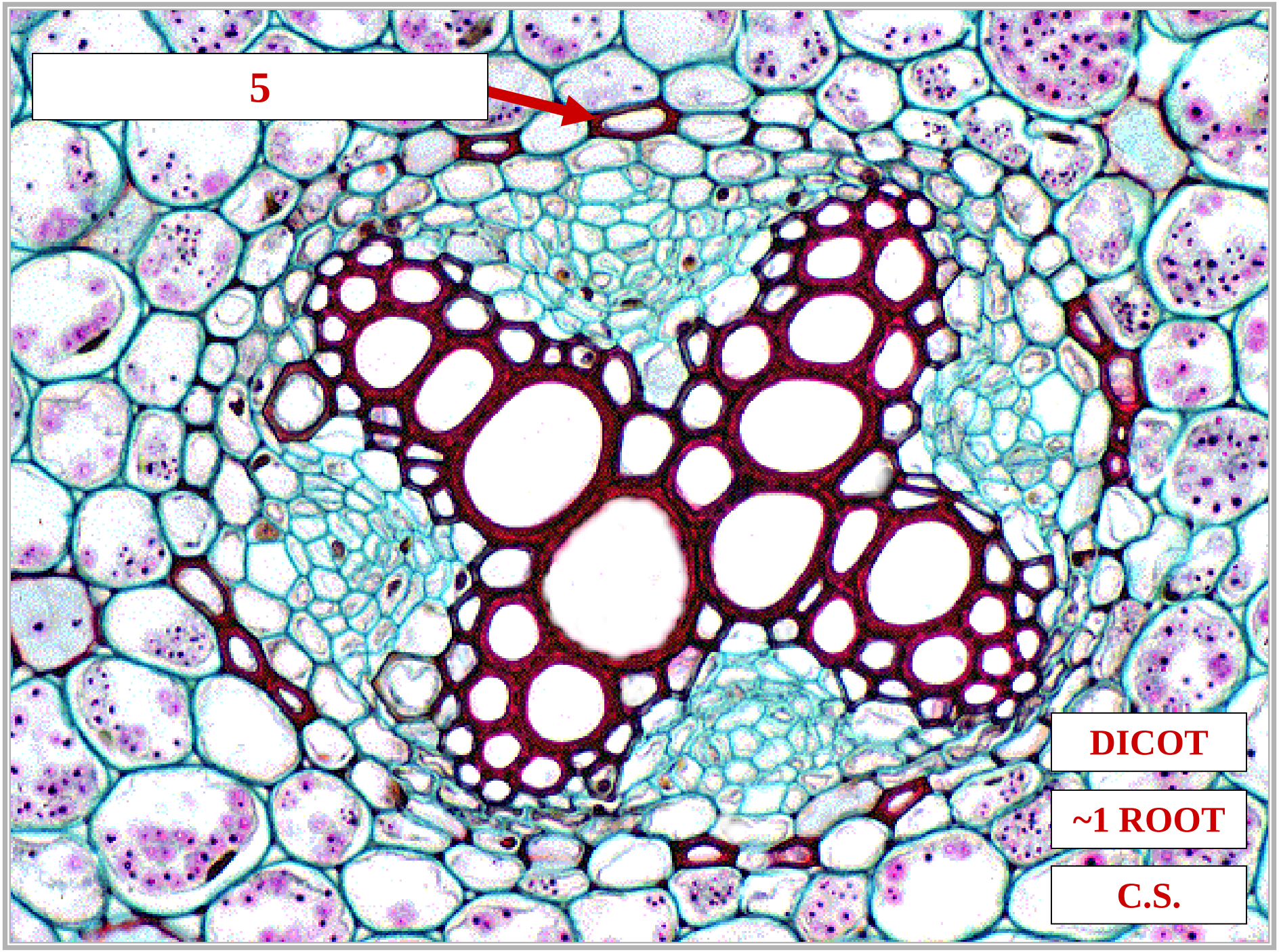
DICOT

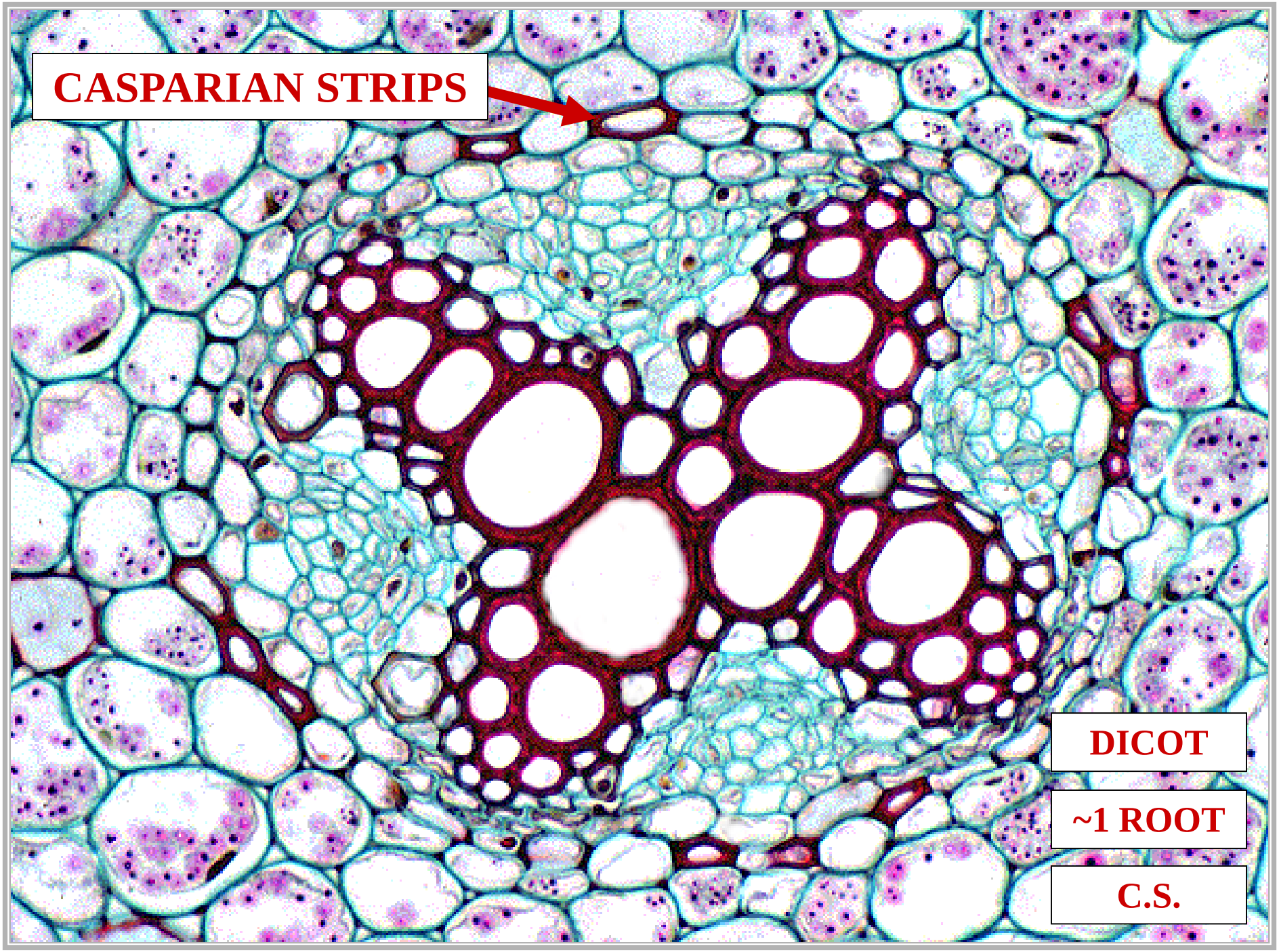
~1 ROOT

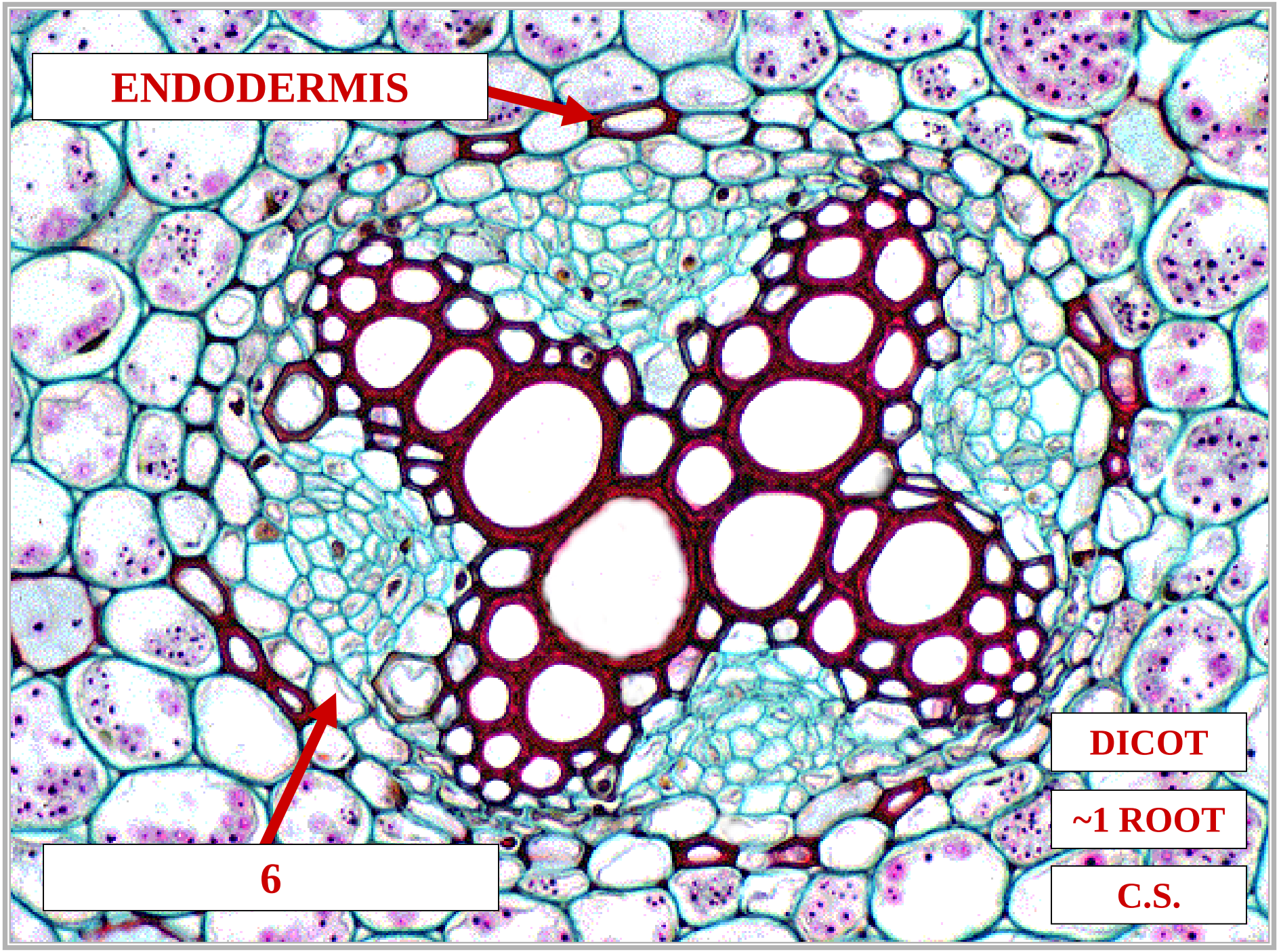
C.S.

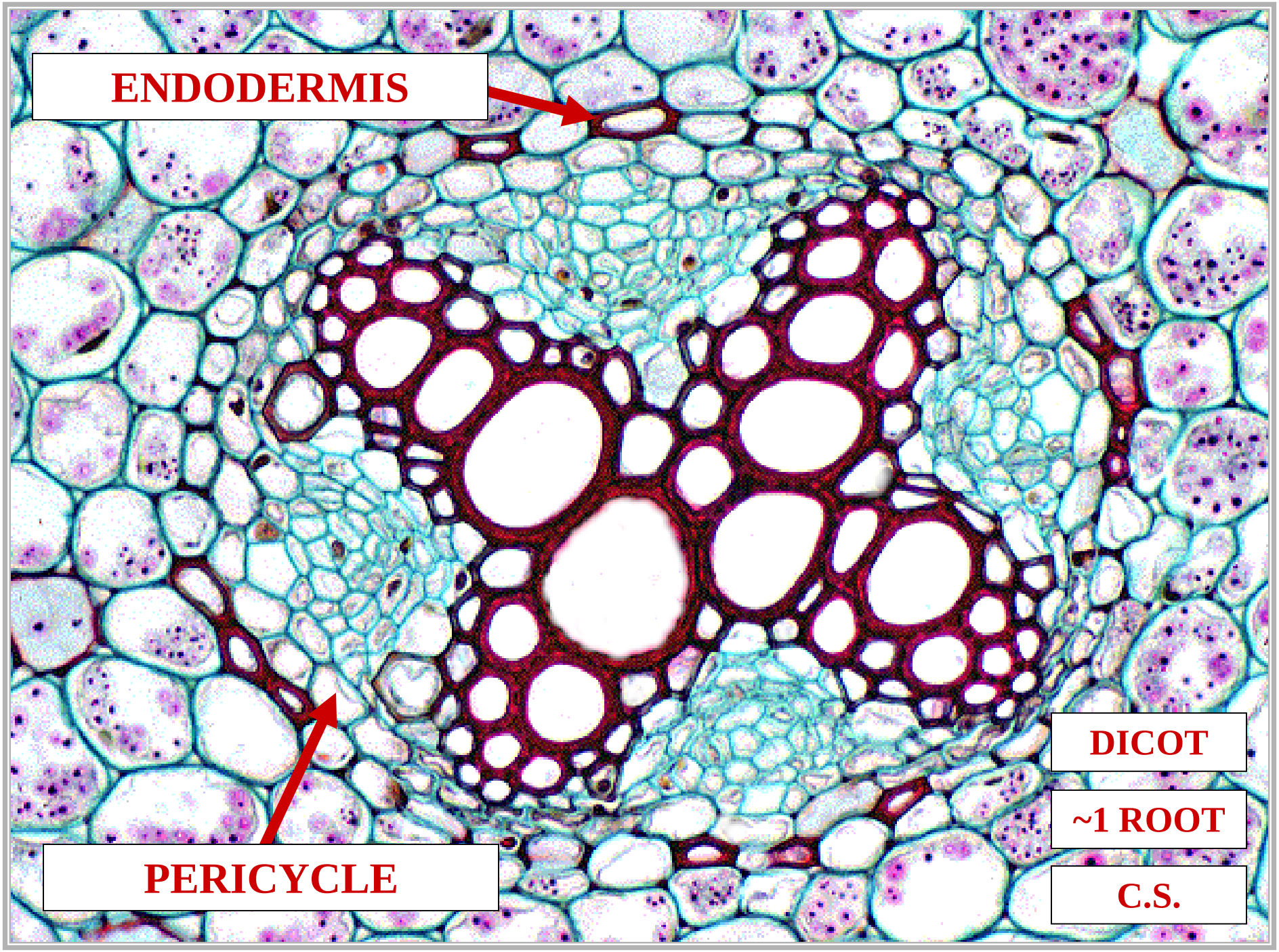

4
DICOT
~1 ROOT
C.S.

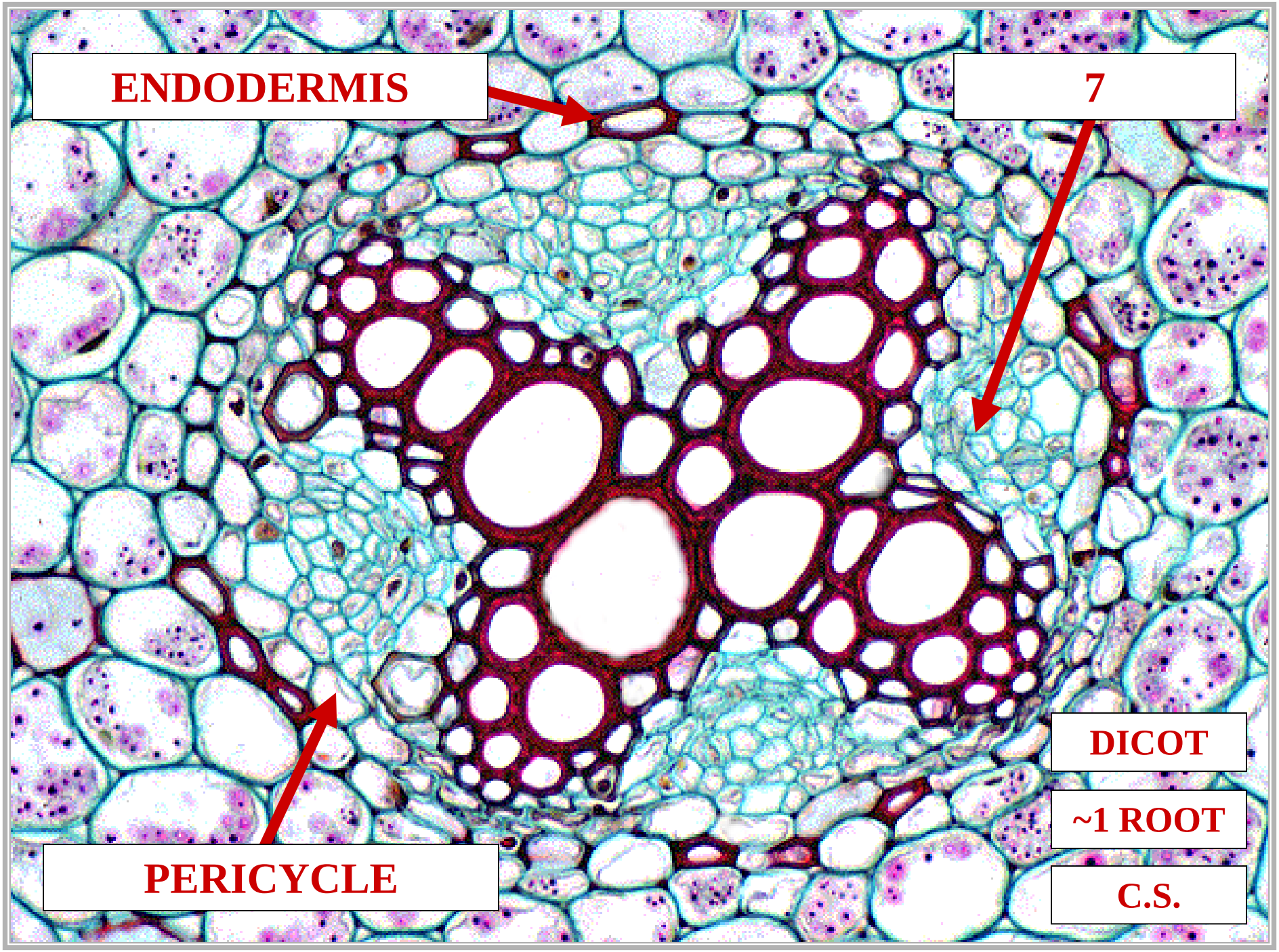

ENDODERMIS
DICOT
~1 ROOT
C.S.

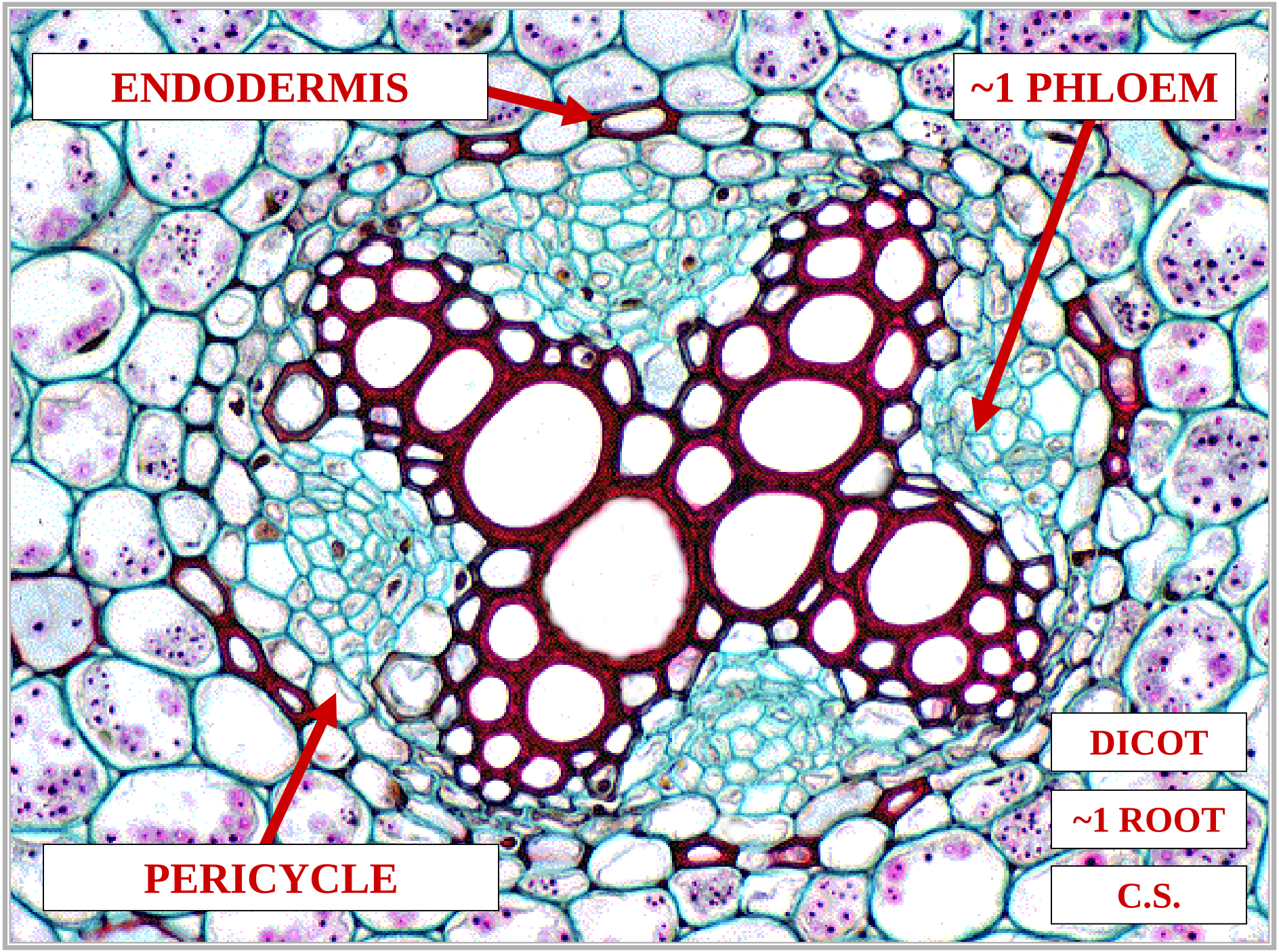

5
DICOT
~1 ROOT
C.S.

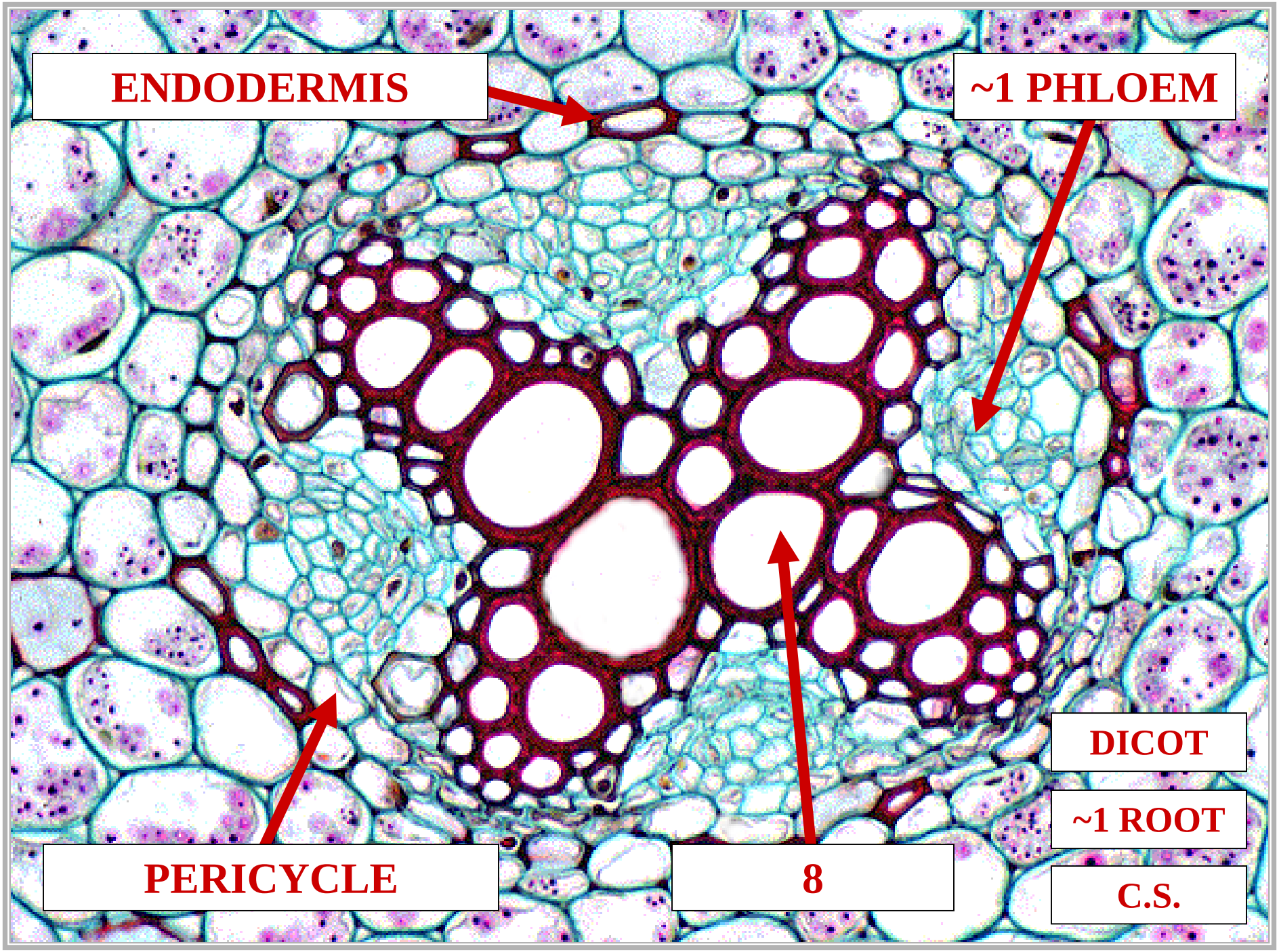

CASPARIAN STRIPS
DICOT
~1 ROOT
C.S.

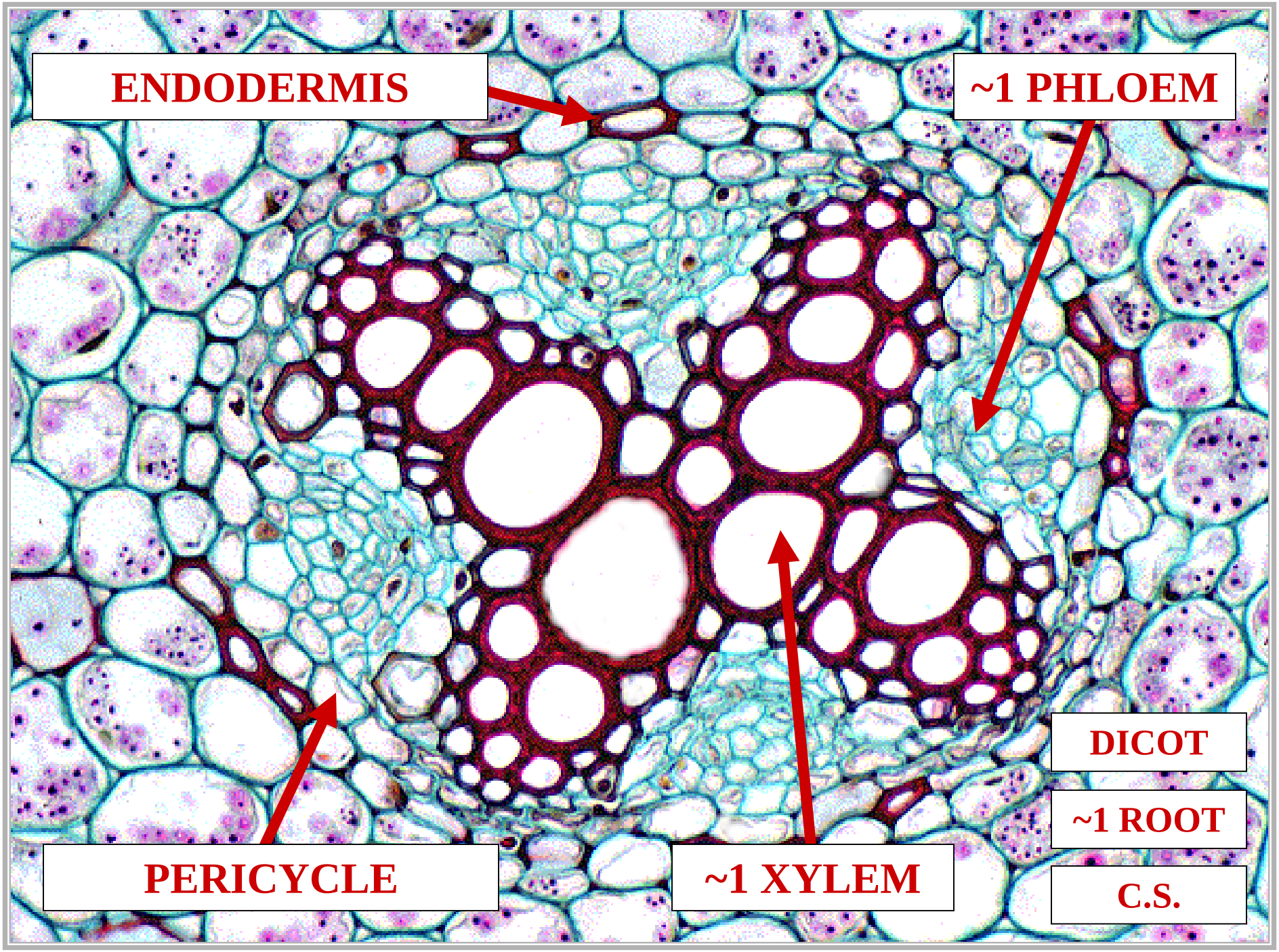

ENDODERMIS
6
DICOT
~1 ROOT
C.S.

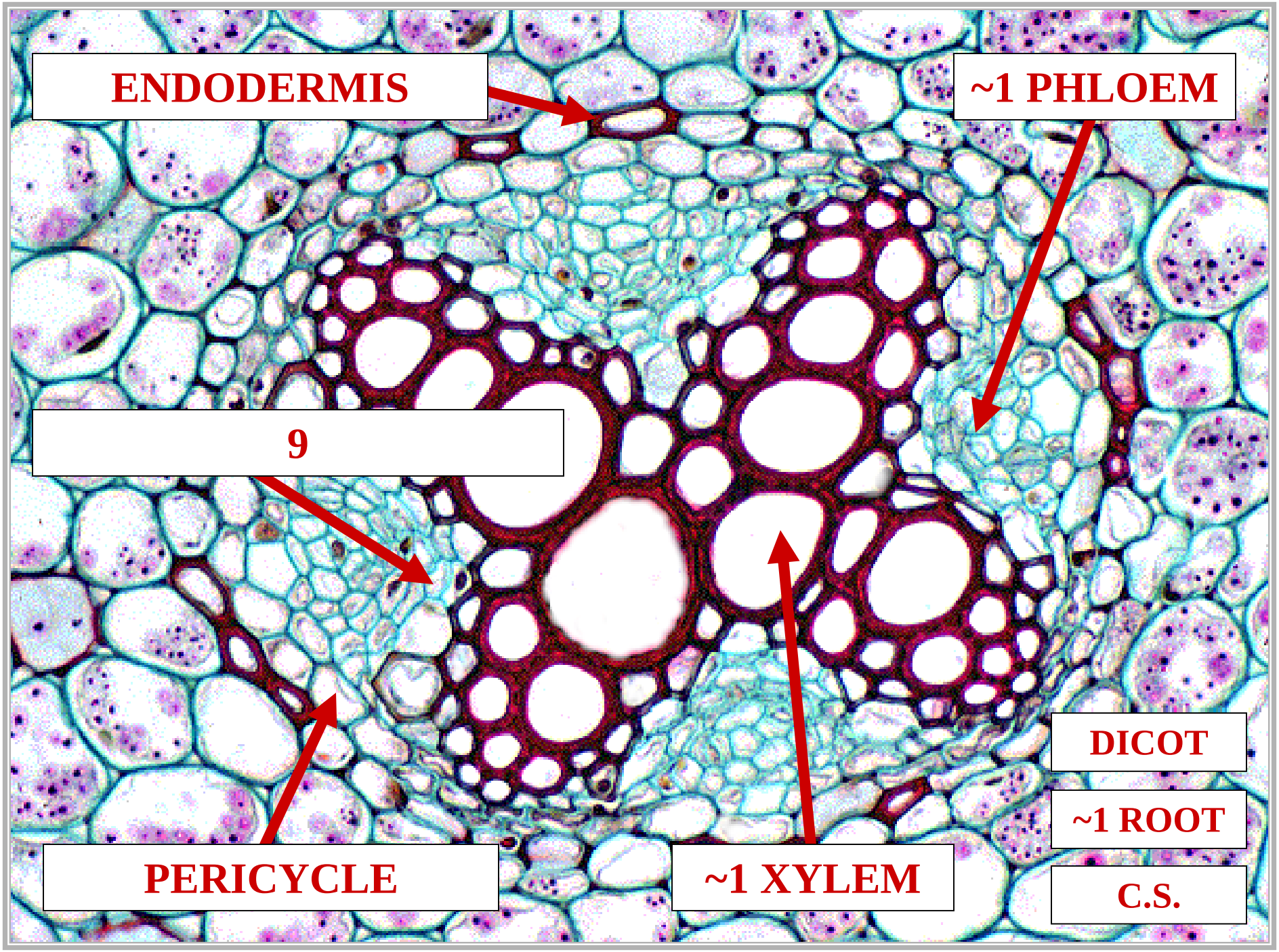

ENDODERMIS
PERICYCLE
DICOT
~1 ROOT
C.S.

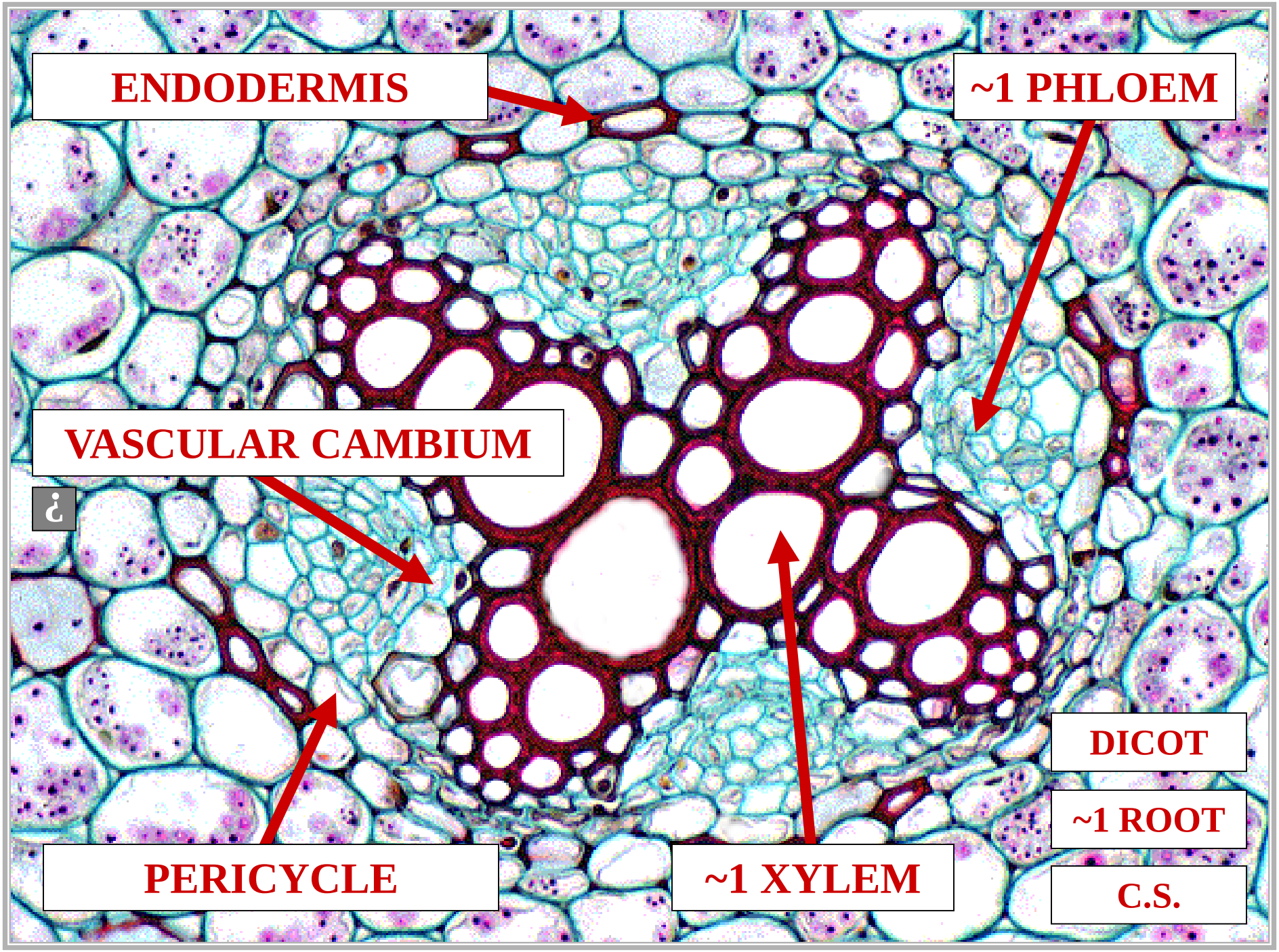

ENDODERMIS
7
PERICYCLE
DICOT
~1 ROOT
C.S.

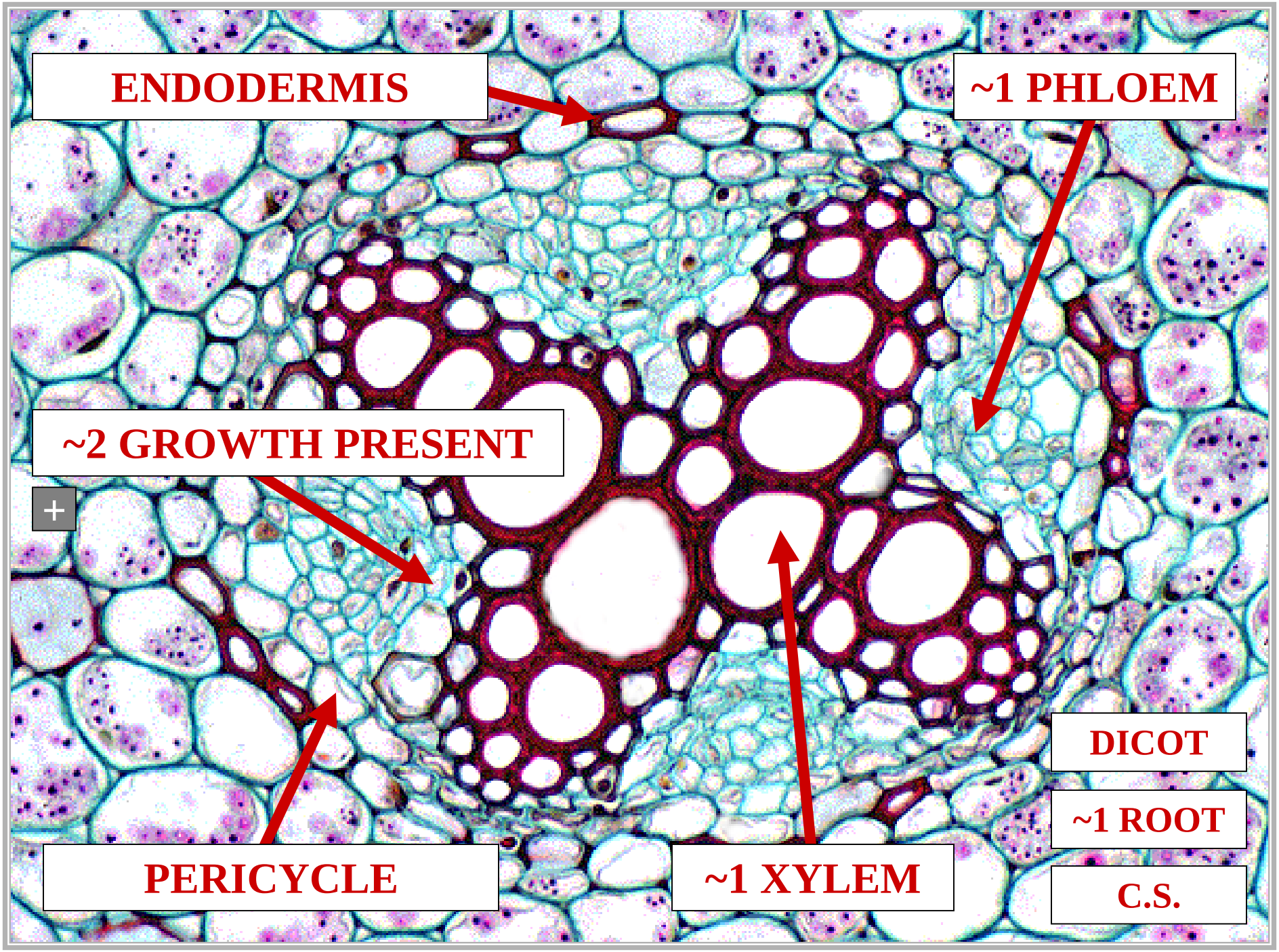

ENDODERMIS
~1 PHLOEM
PERICYCLE
DICOT
~1 ROOT
C.S.

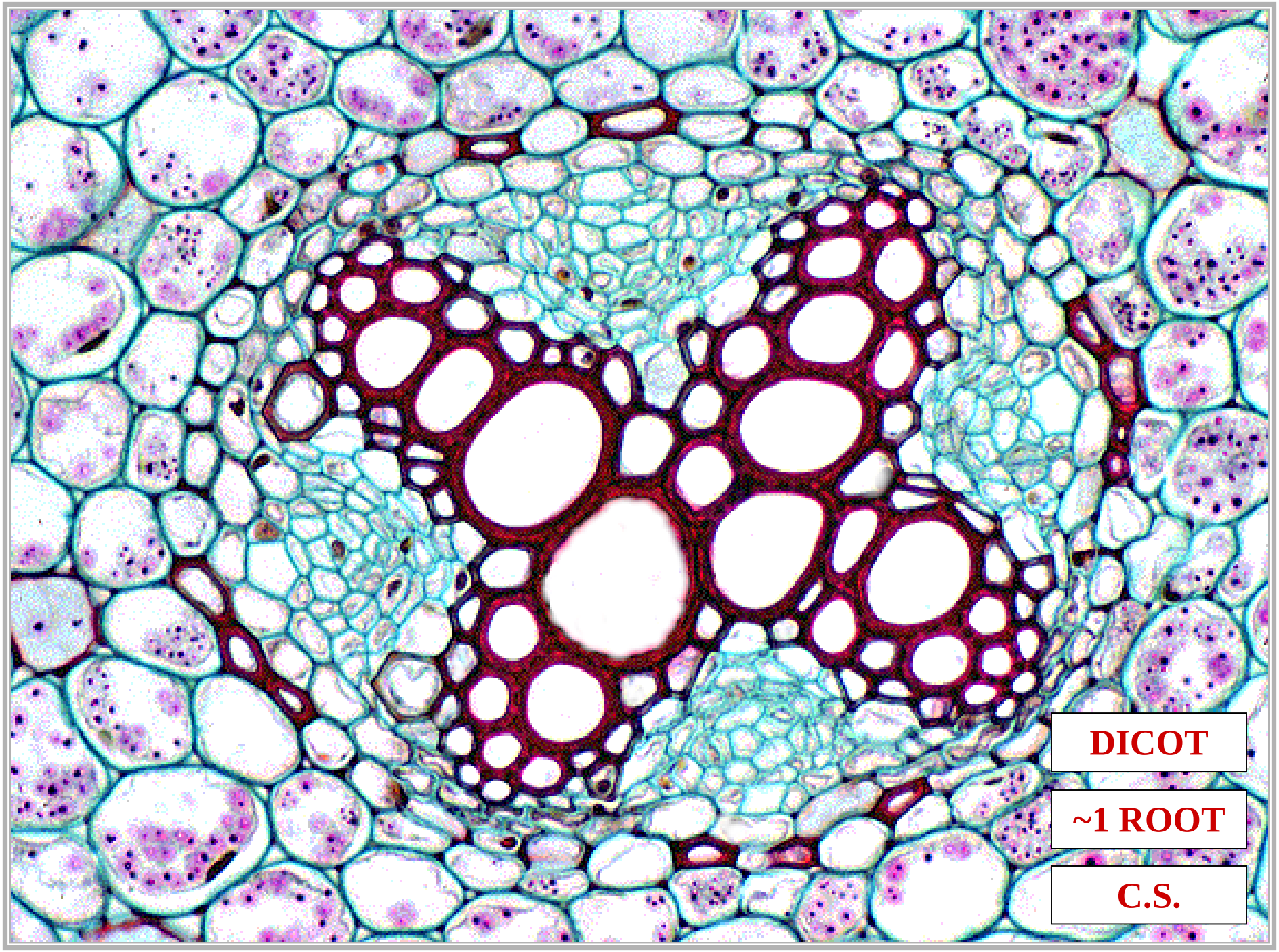

ENDODERMIS
~1 PHLOEM
DICOT
~1 ROOT
C.S.
PERICYCLE
8

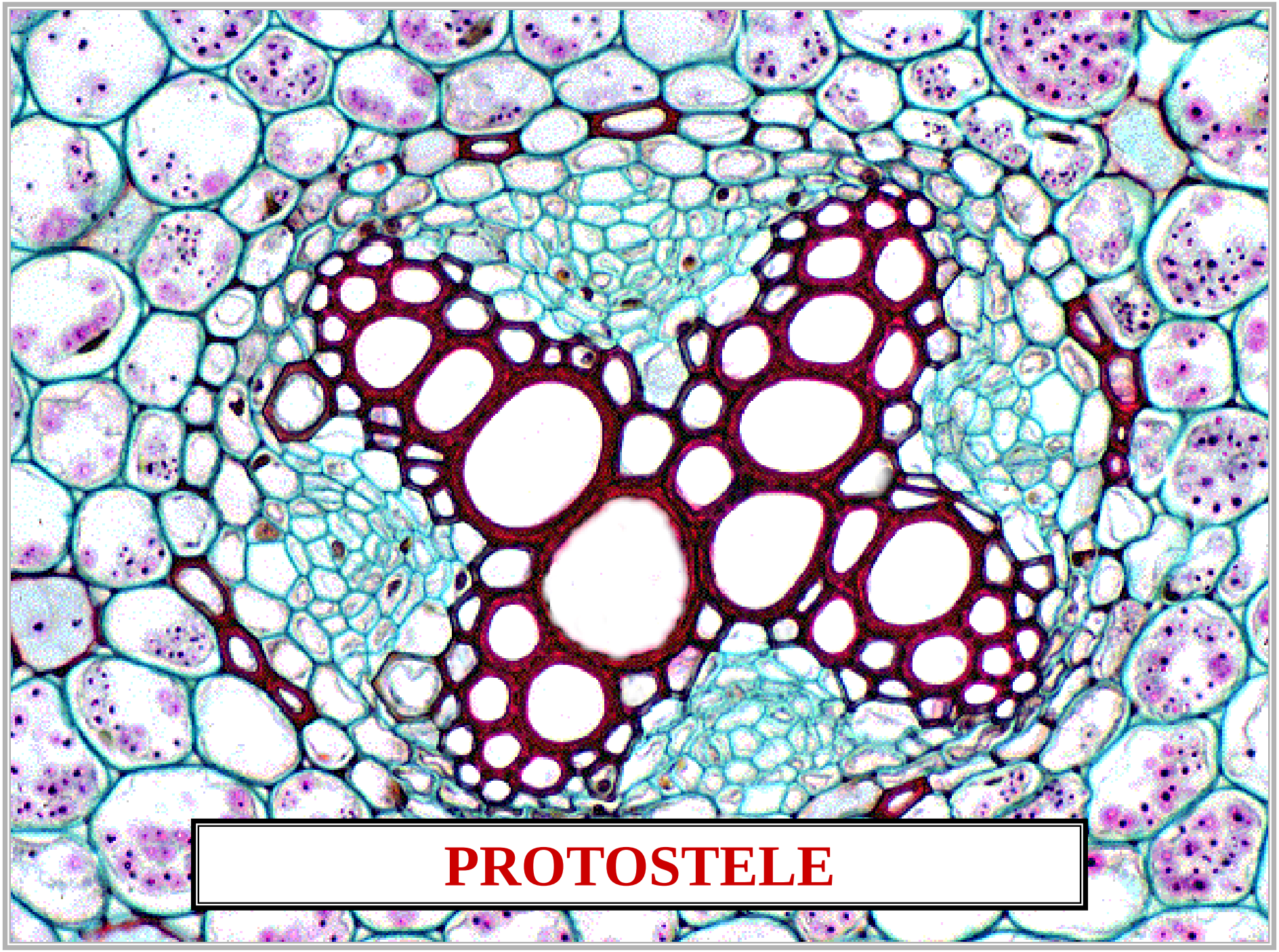

ENDODERMIS
~1 PHLOEM
PERICYCLE
~1 XYLEM
DICOT
~1 ROOT
C.S.


ENDODERMIS
~1 PHLOEM
9
PERICYCLE
~1 XYLEM
DICOT
~1 ROOT
C.S.

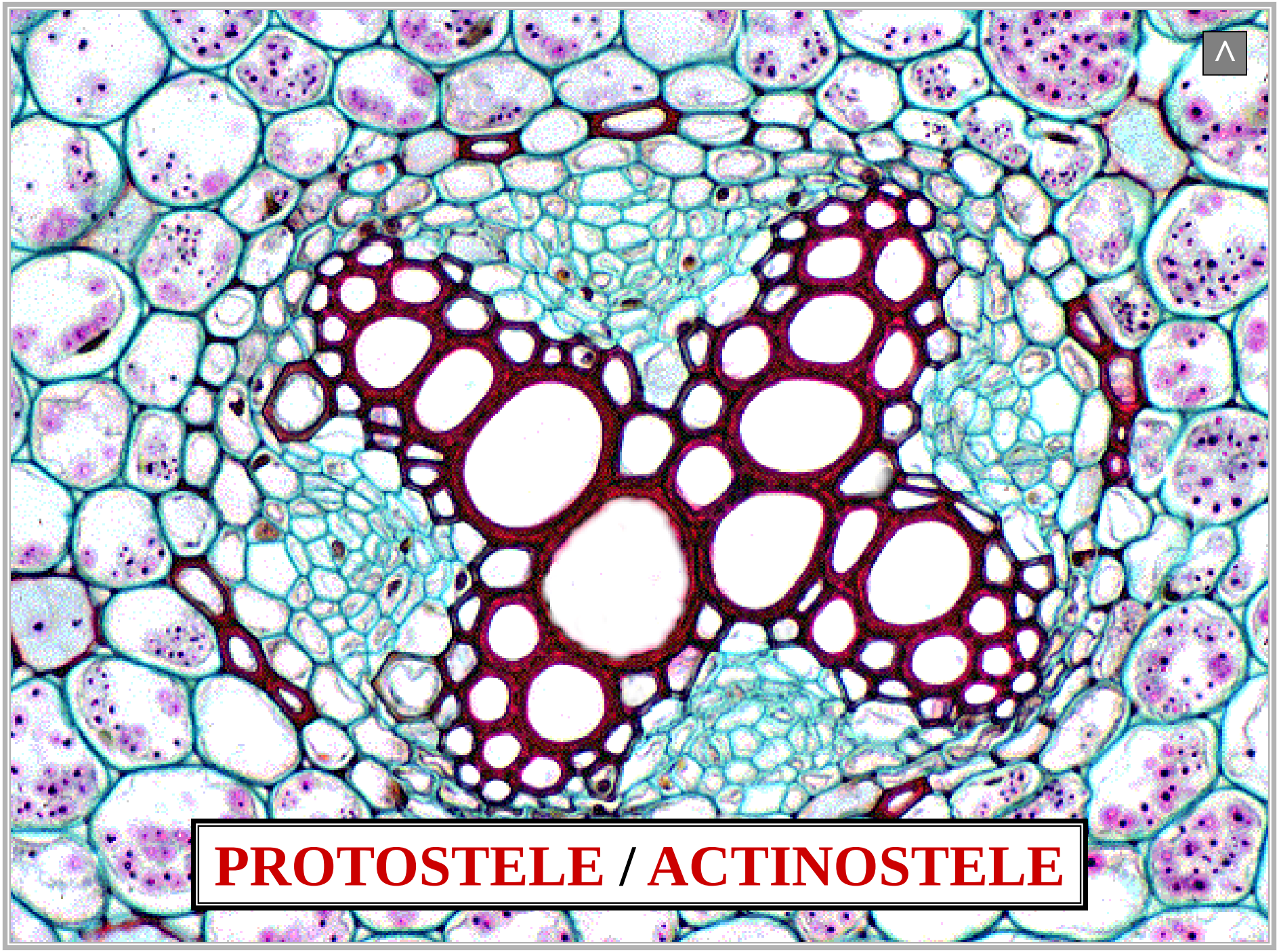

ENDODERMIS
~1 PHLOEM
VASCULAR CAMBIUM
¿
PERICYCLE
~1 XYLEM
DICOT
~1 ROOT
C.S.


ENDODERMIS
~1 PHLOEM
~2 GROWTH PRESENT
PERICYCLE
~1 XYLEM
DICOT
~1 ROOT
C.S.

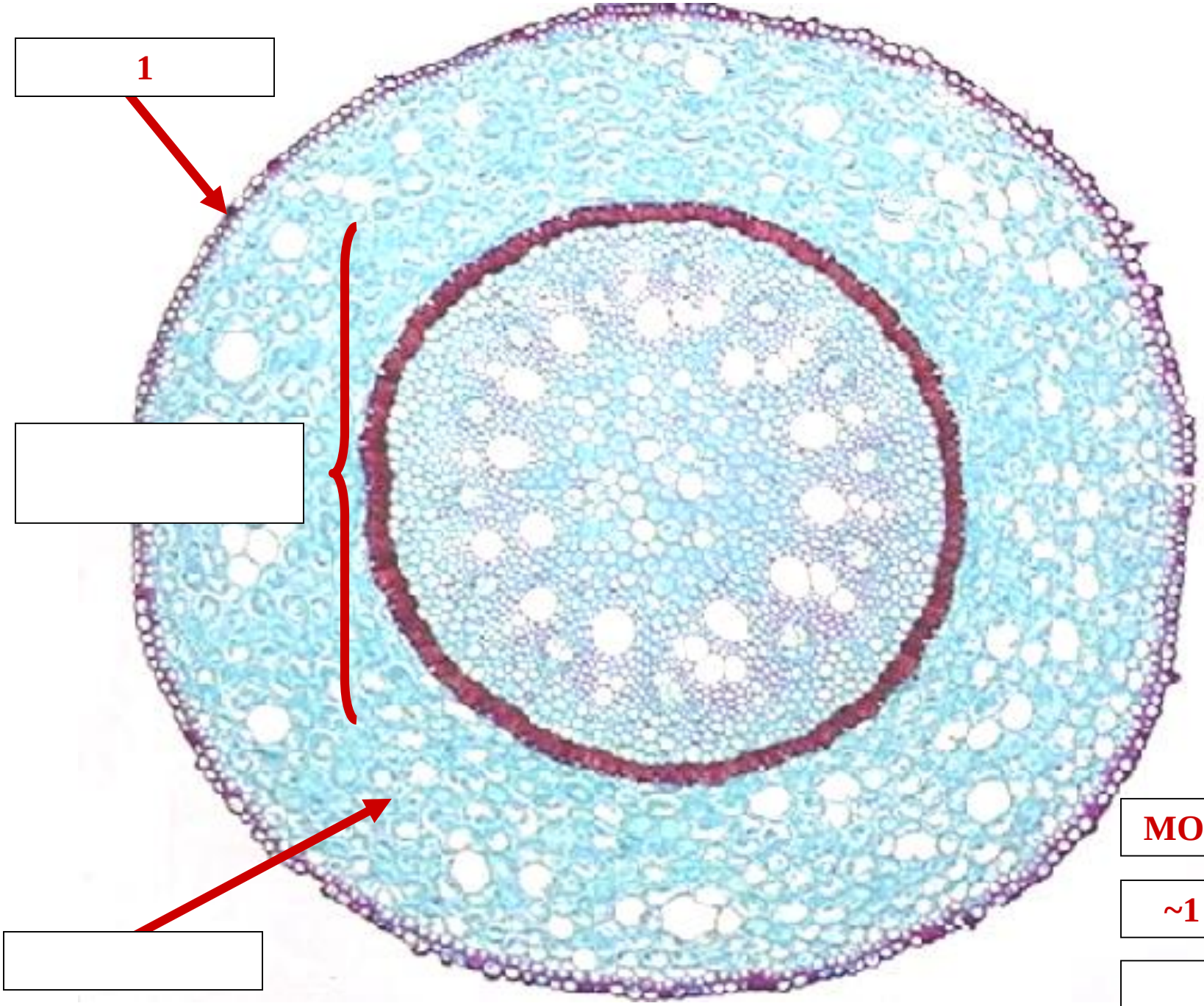

DICOT
~1 ROOT
C.S.



PROTOSTELE


PROTOSTELE / ACTINOSTELE

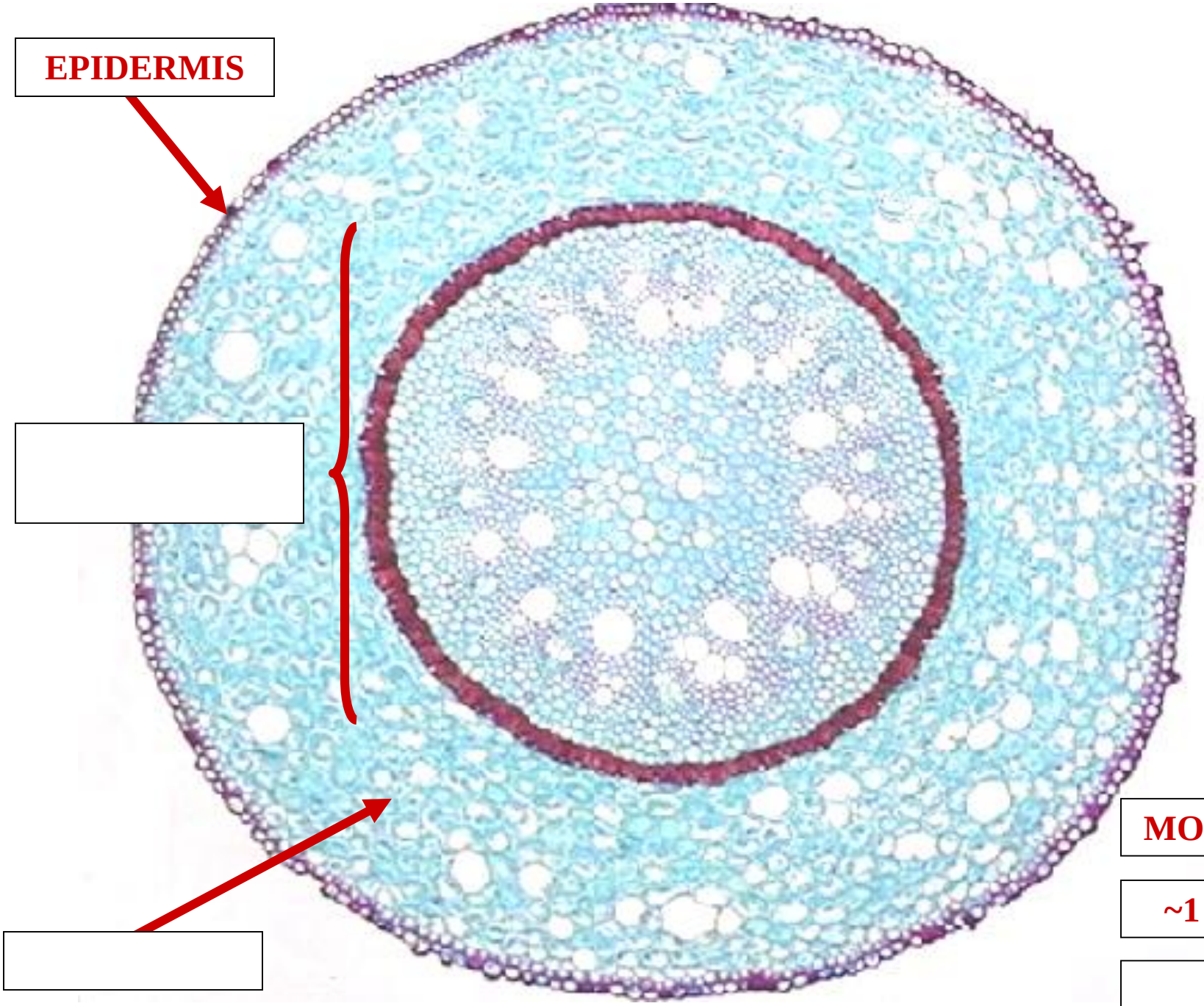
MONOCOT ROOT PRIMARY GROWTH SUMMARY

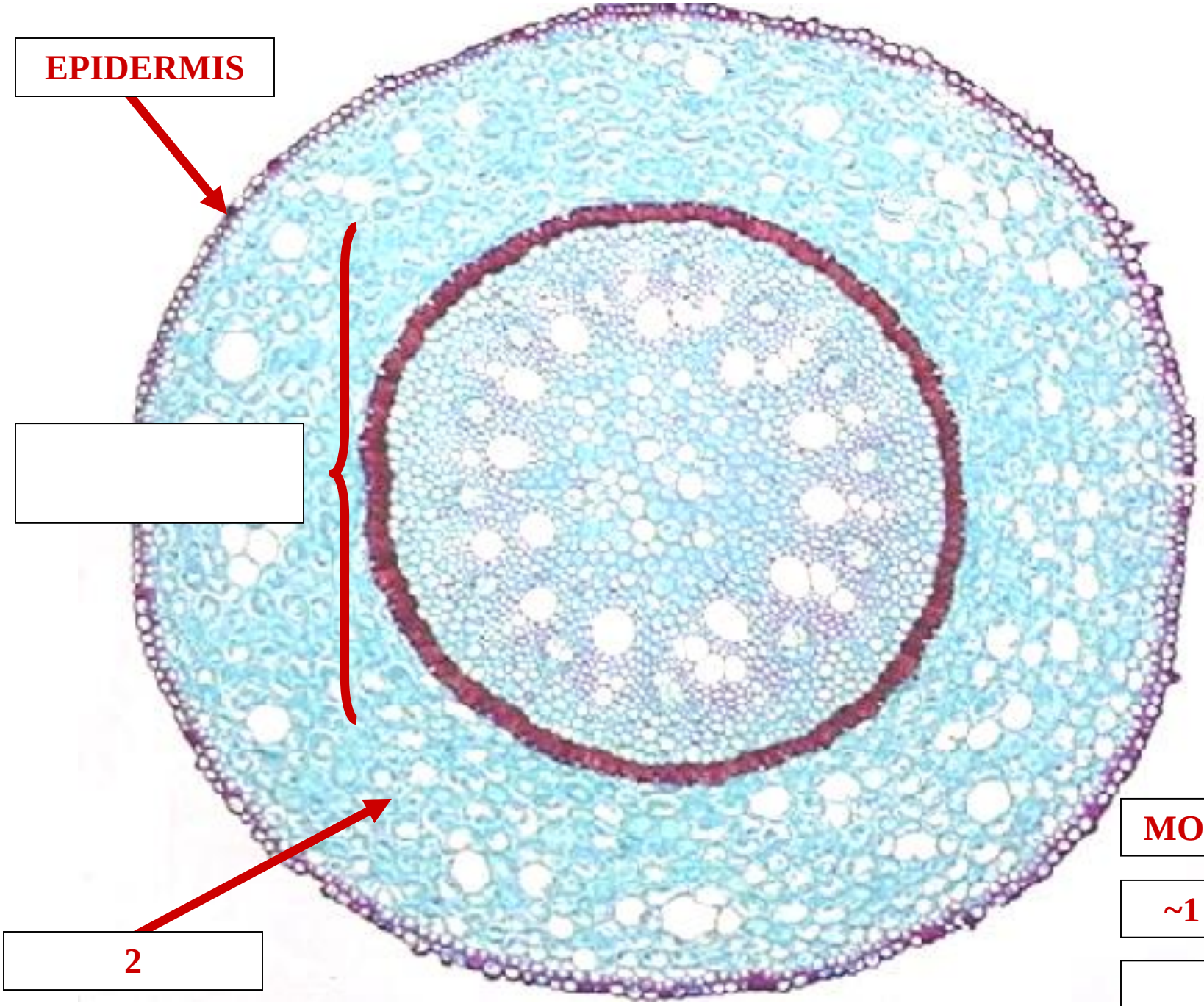


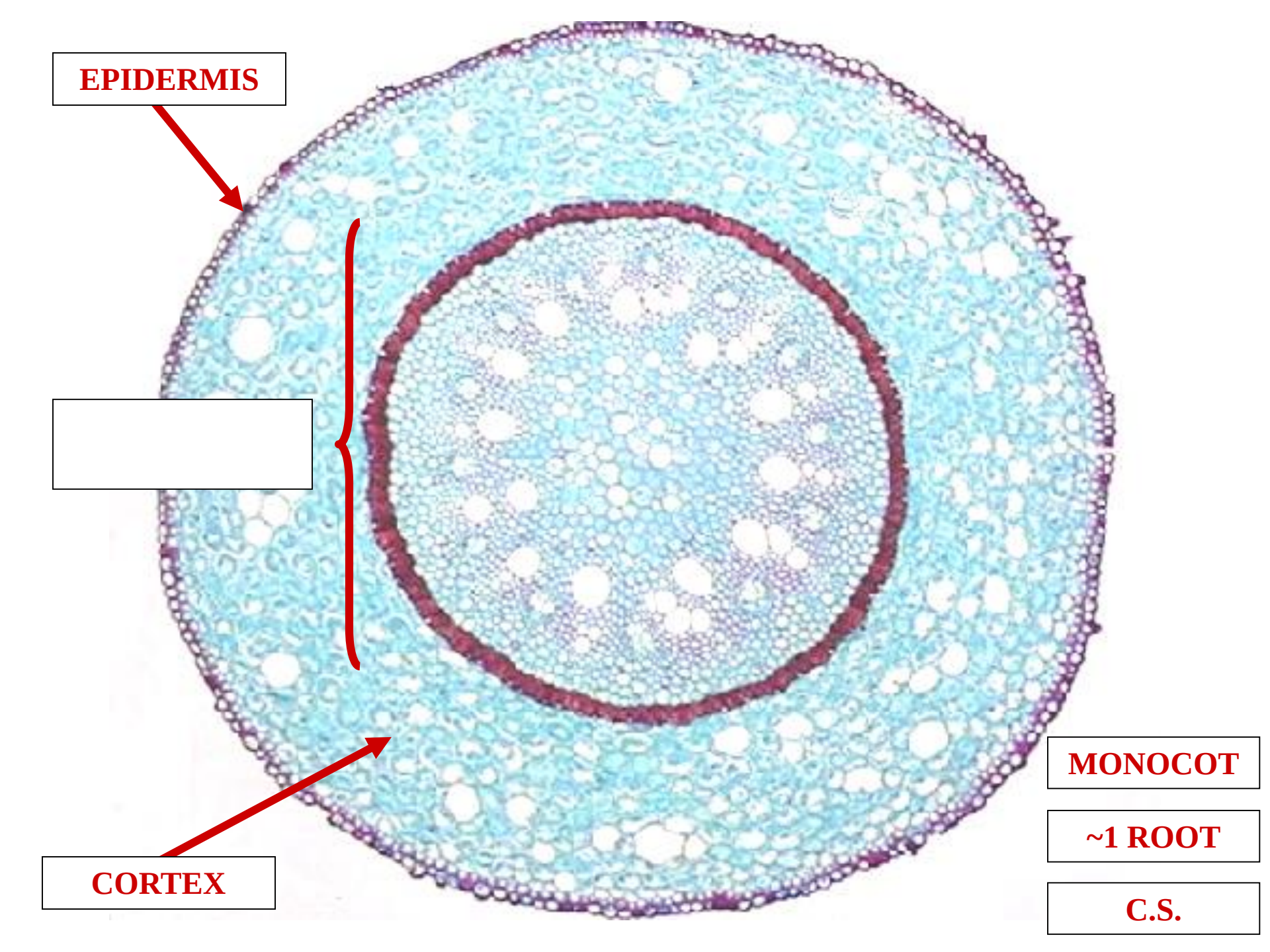
MONOCOT

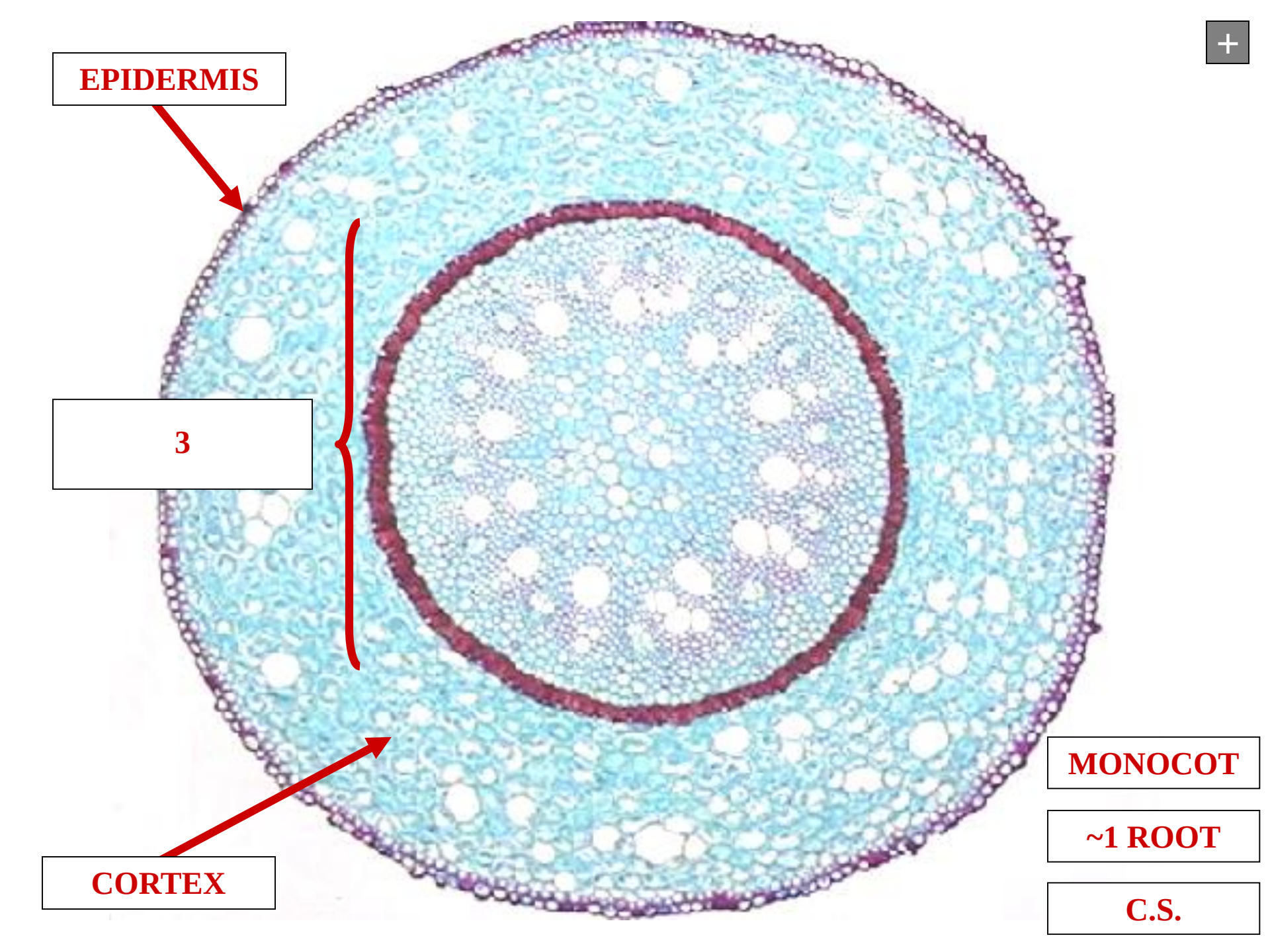
~1 ROOT

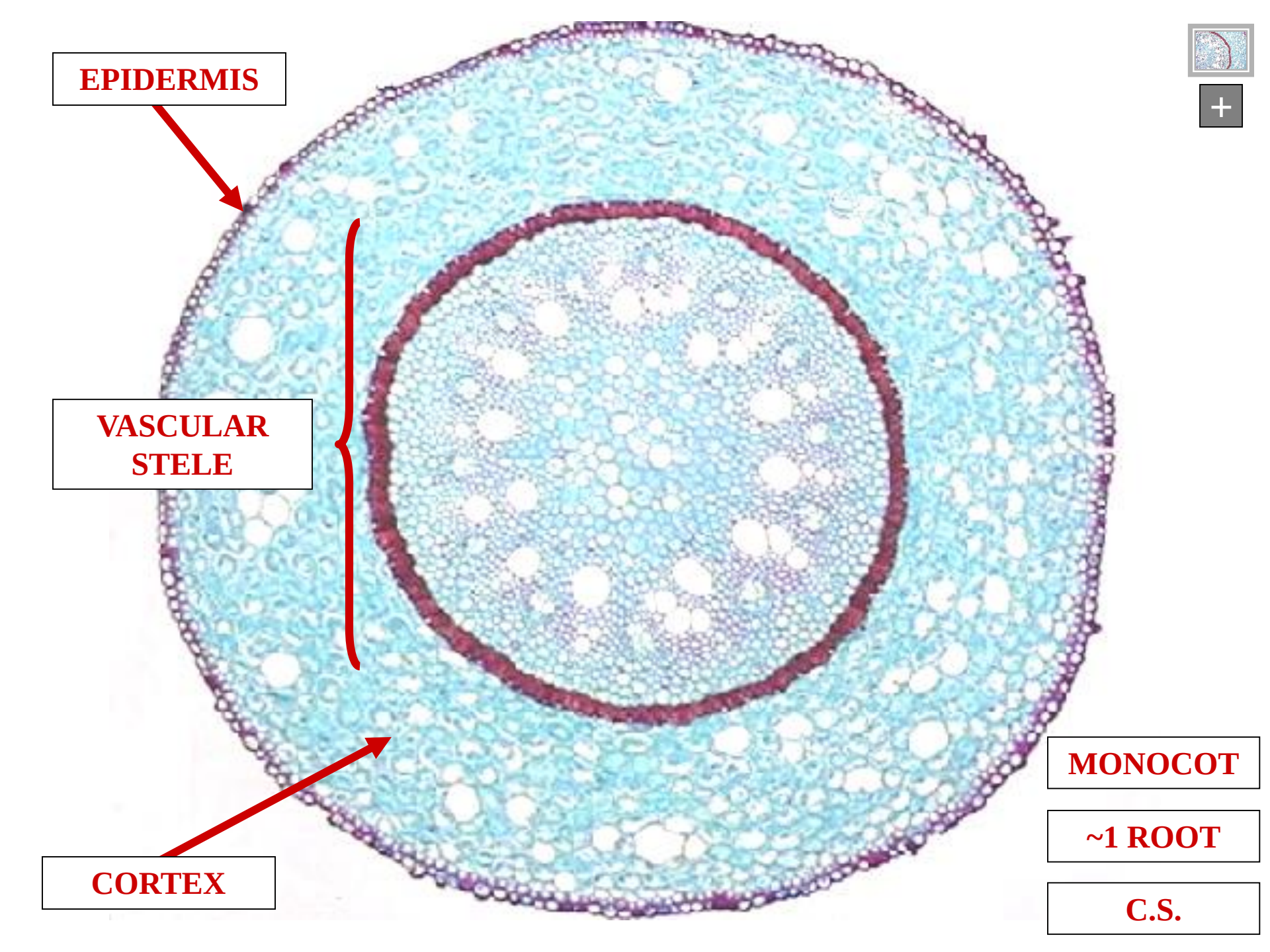
C.S.


EPIDERMIS
MONOCOT
~1 ROOT
C.S.

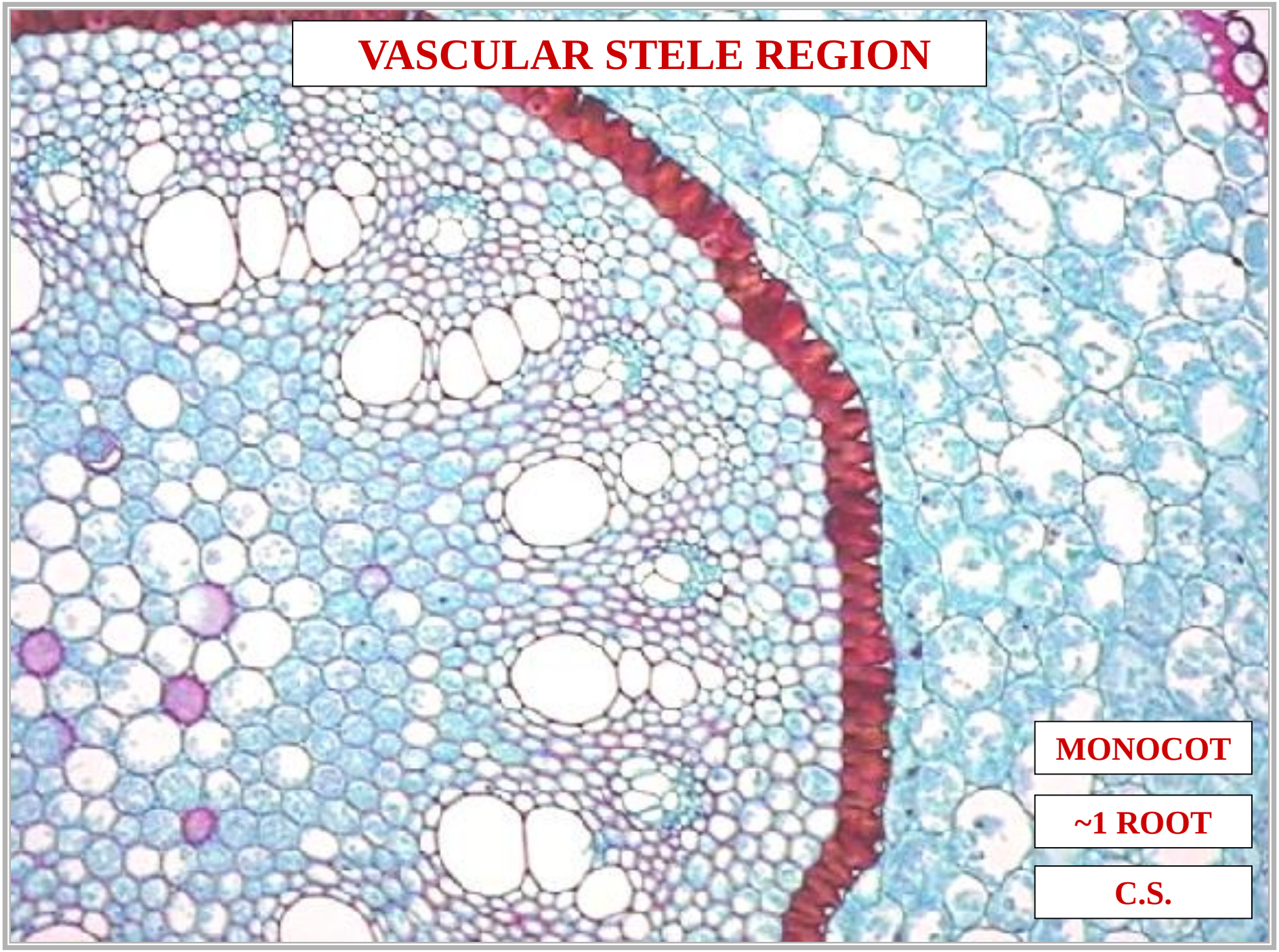

EPIDERMIS
2
MONOCOT
~1 ROOT
C.S.


EPIDERMIS
CORTEX
MONOCOT
~1 ROOT
C.S.


EPIDERMIS
3
CORTEX
MONOCOT
~1 ROOT
C.S.


EPIDERMIS
VASCULAR STELE
CORTEX
MONOCOT
~1 ROOT
C.S.

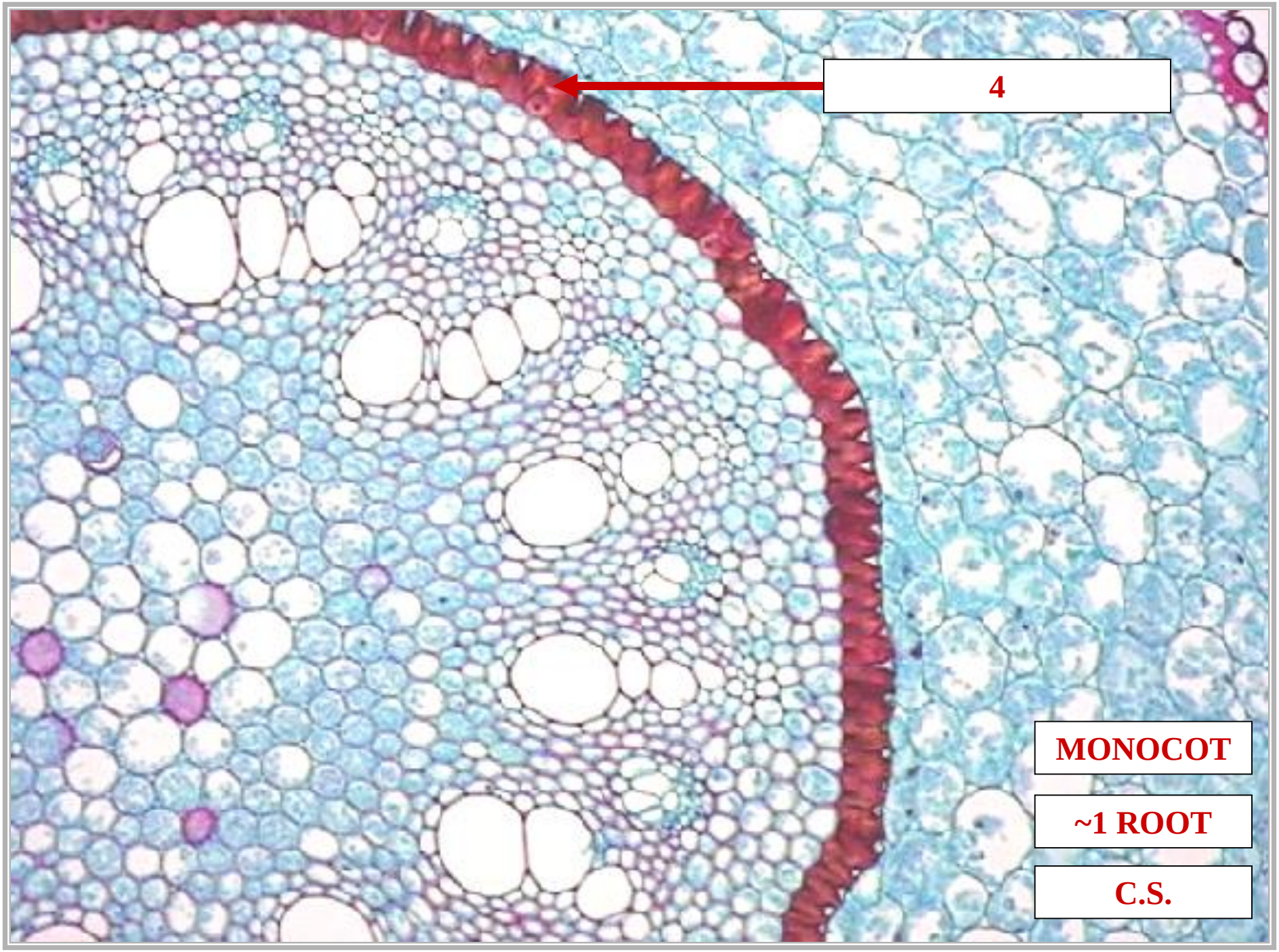
VASCULAR STELE REGION

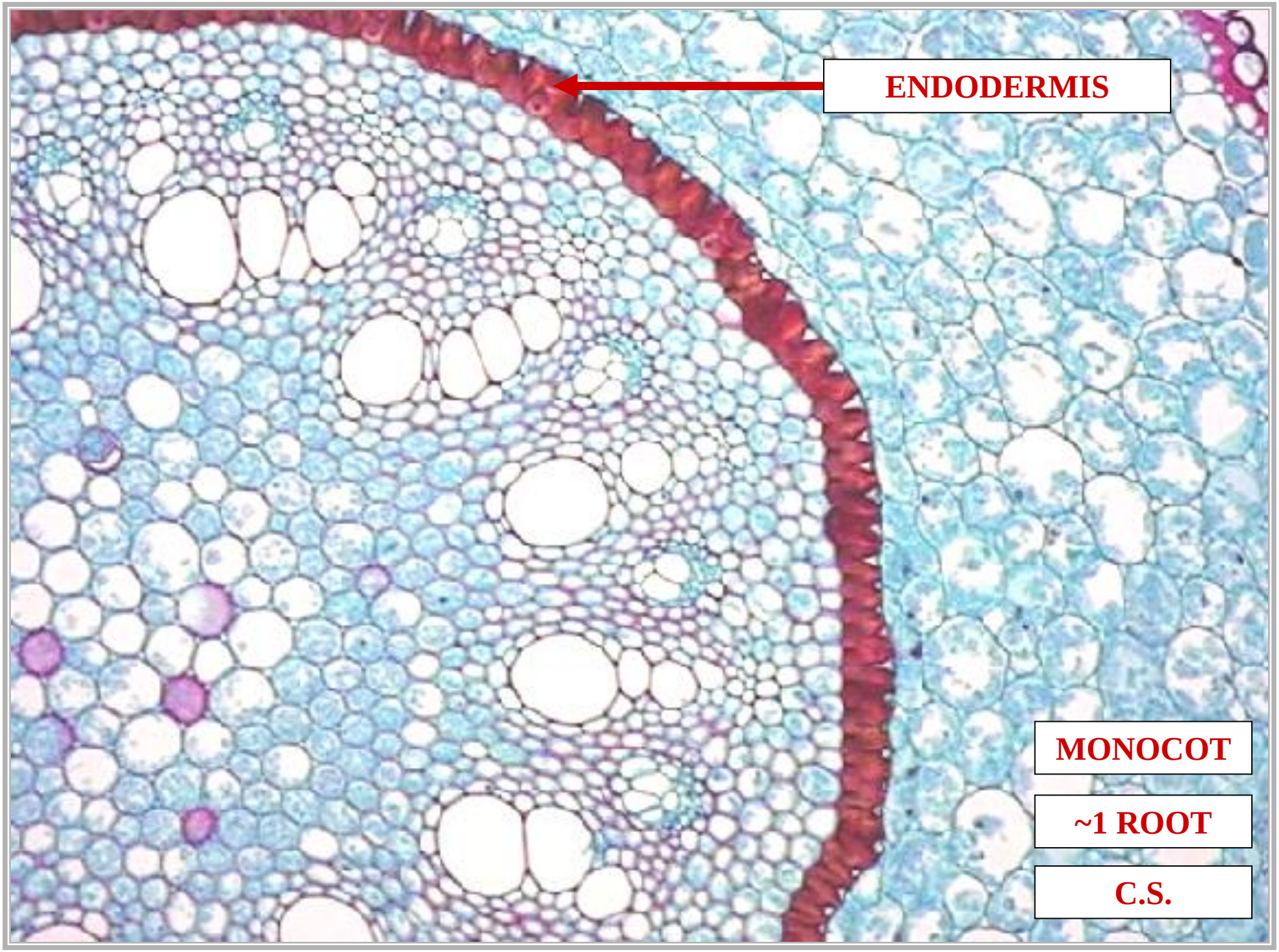


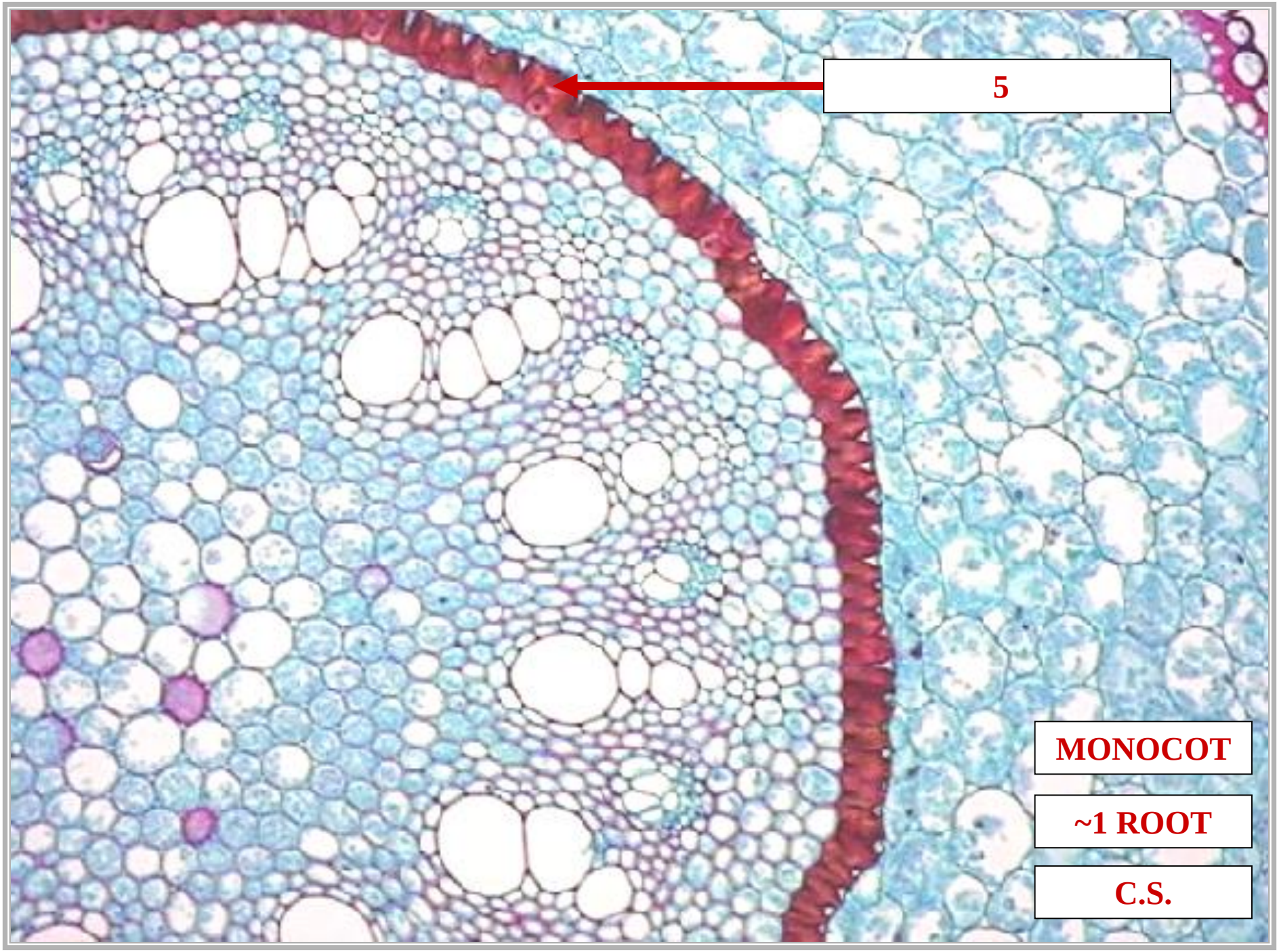
MONOCOT

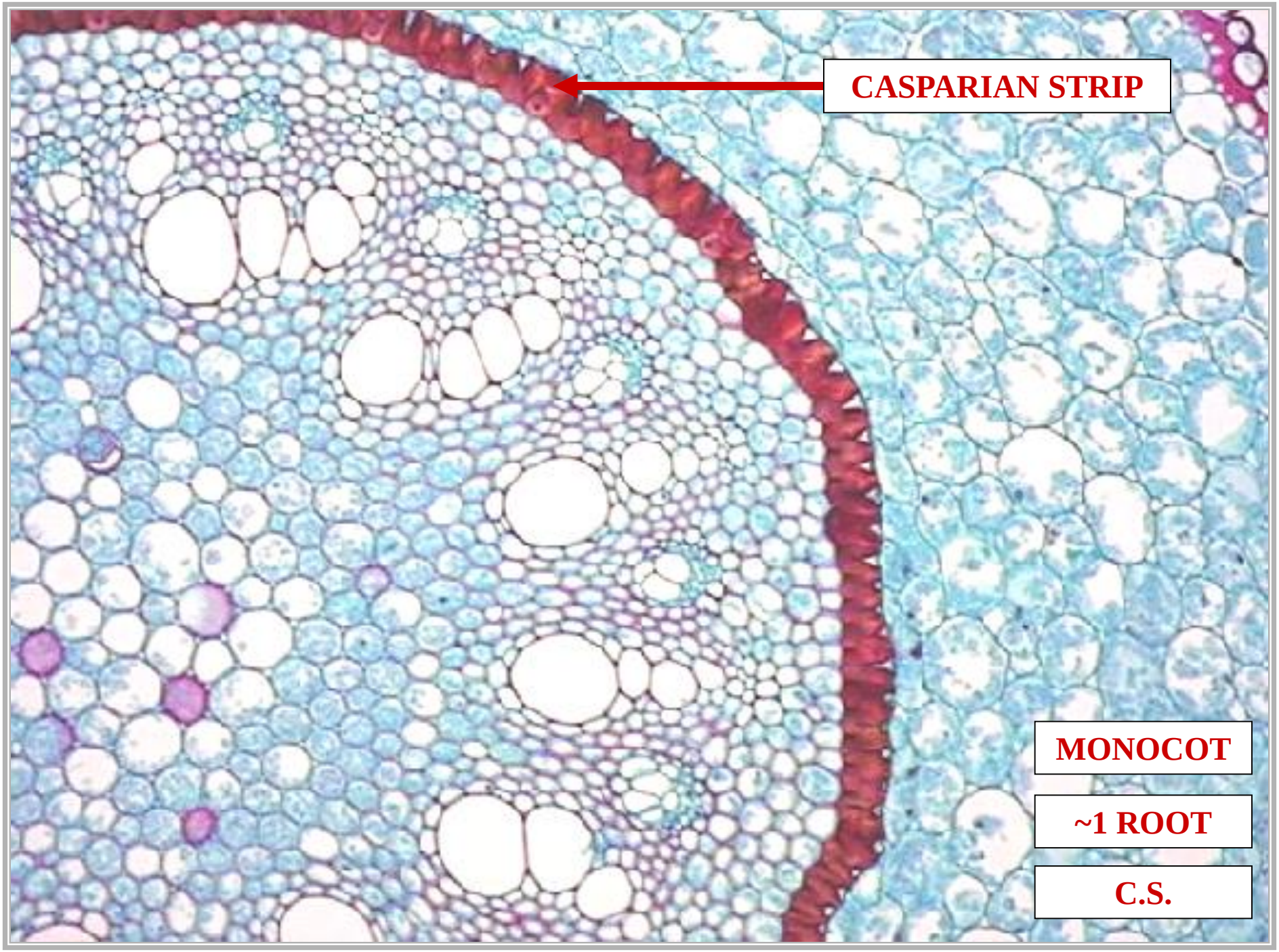
~1 ROOT

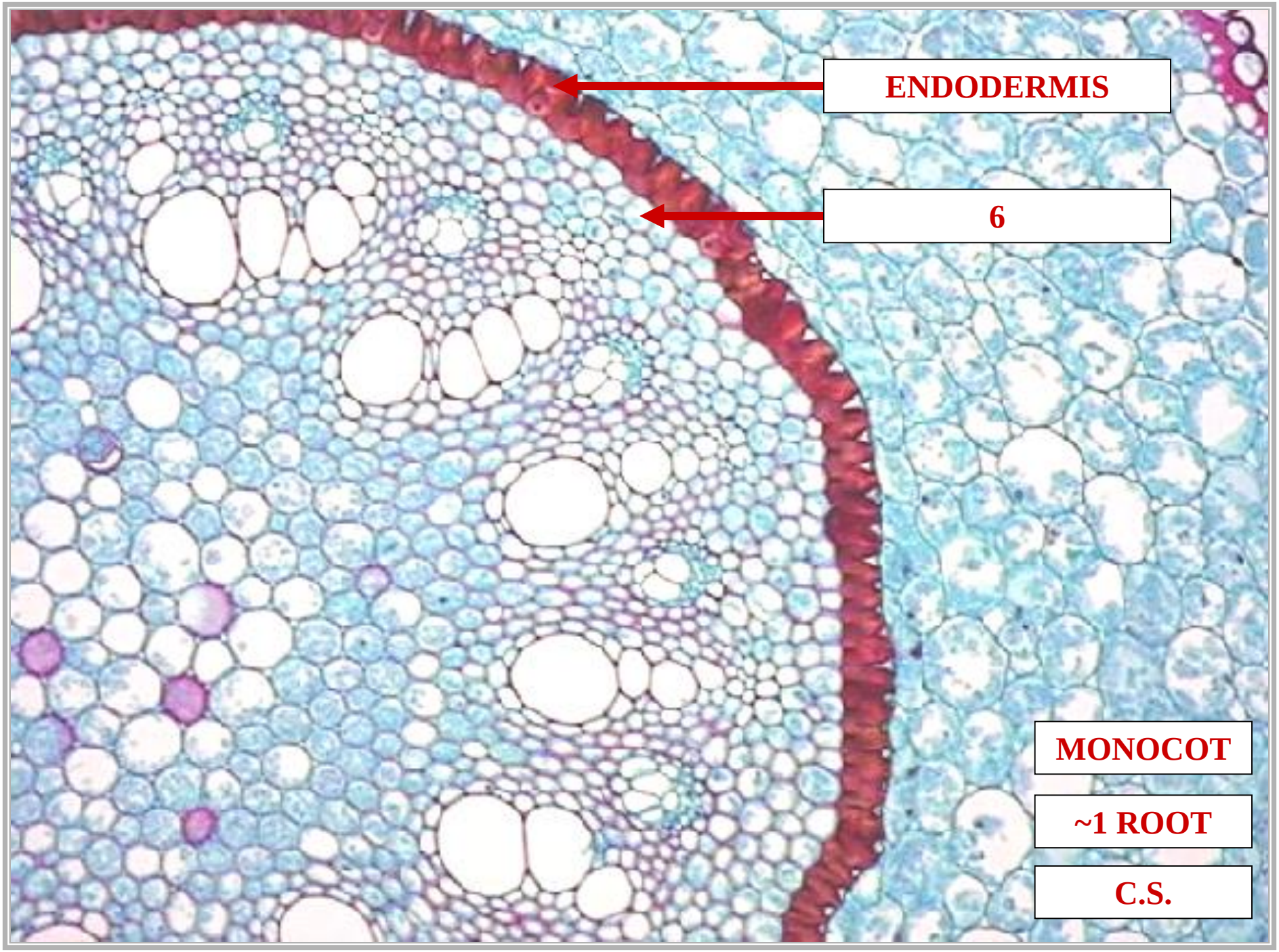
C.S.

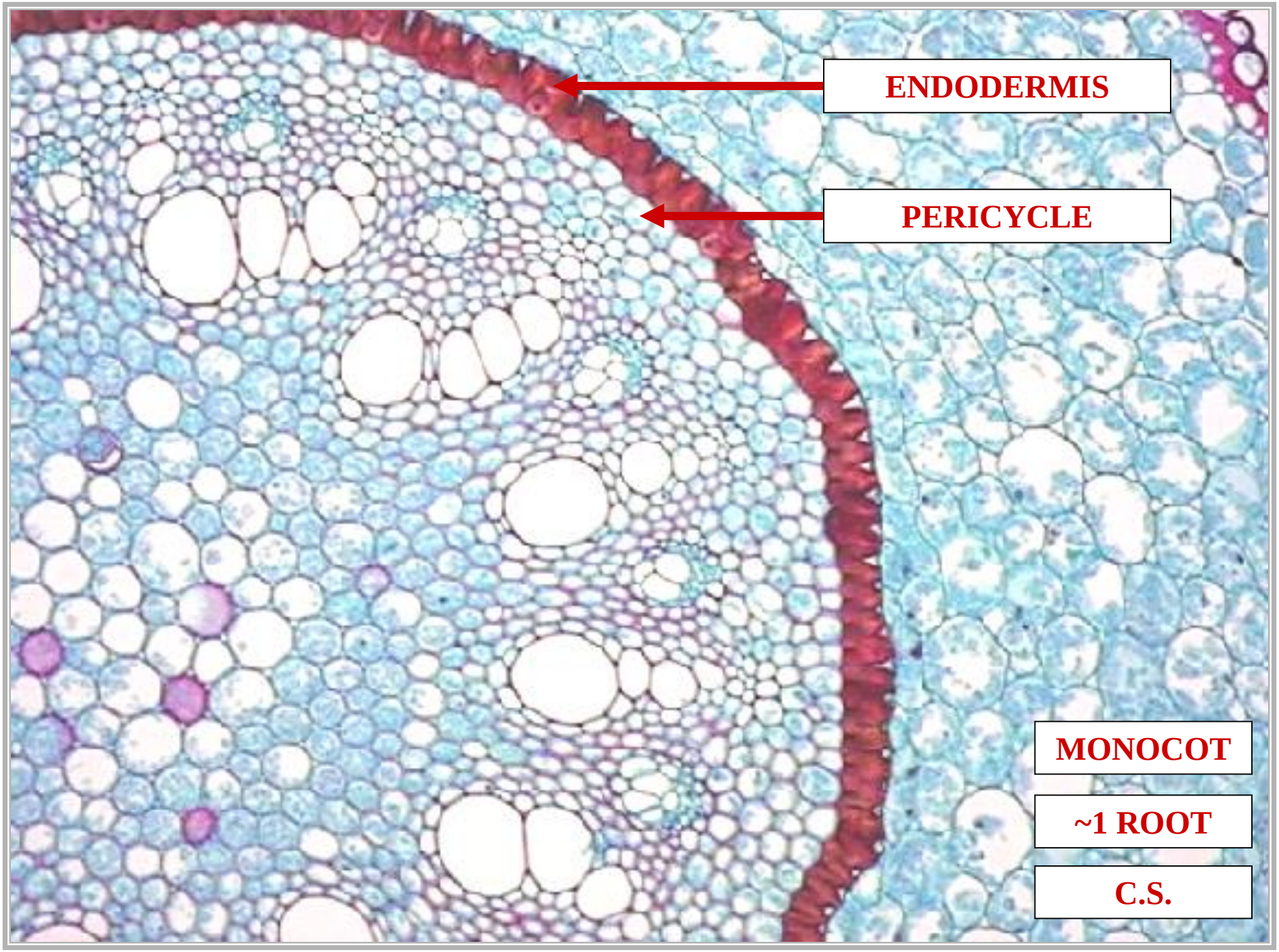

4
MONOCOT
~1 ROOT
C.S.

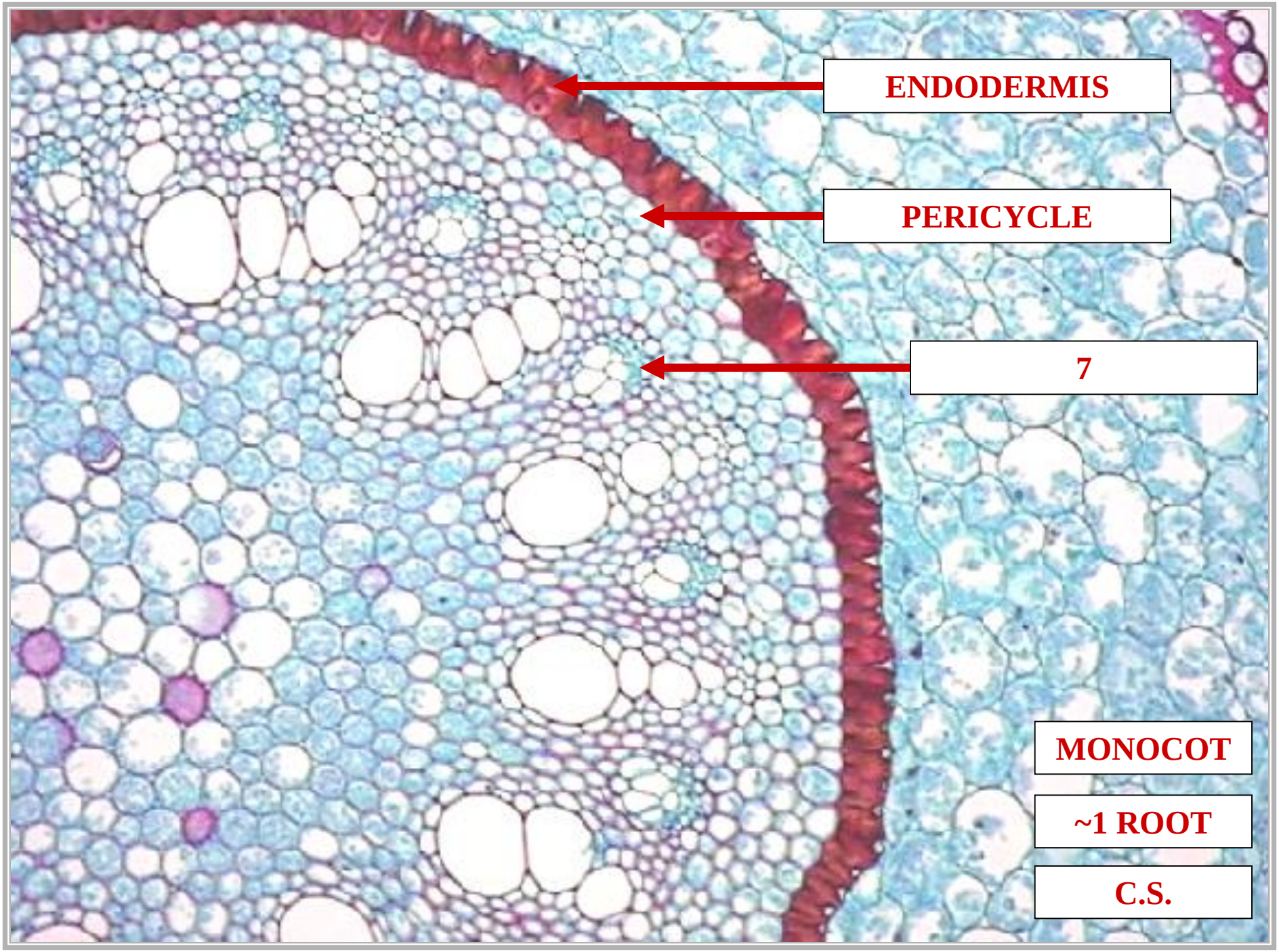

ENDODERMIS
MONOCOT
~1 ROOT
C.S.

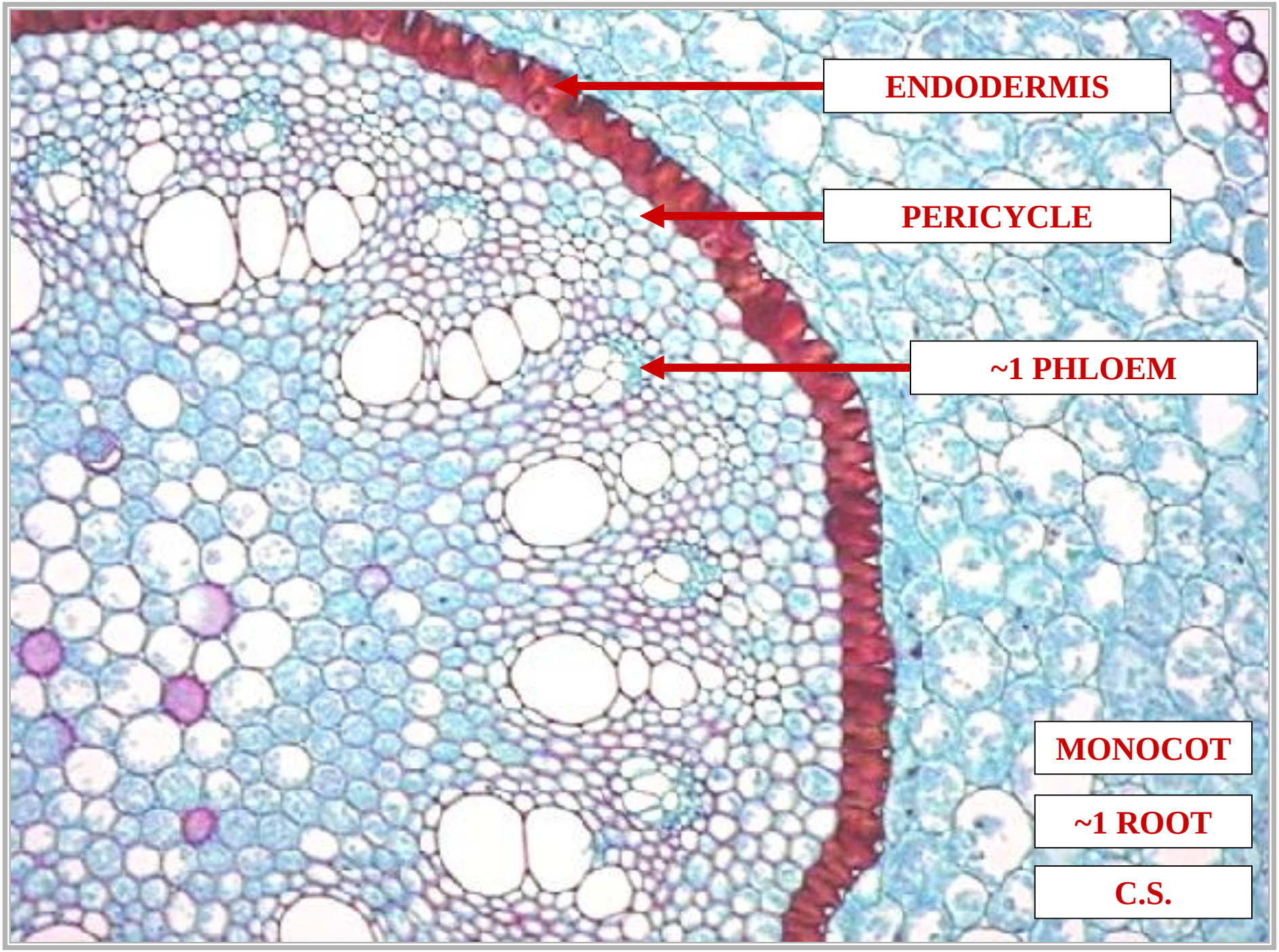

5
MONOCOT
~1 ROOT
C.S.

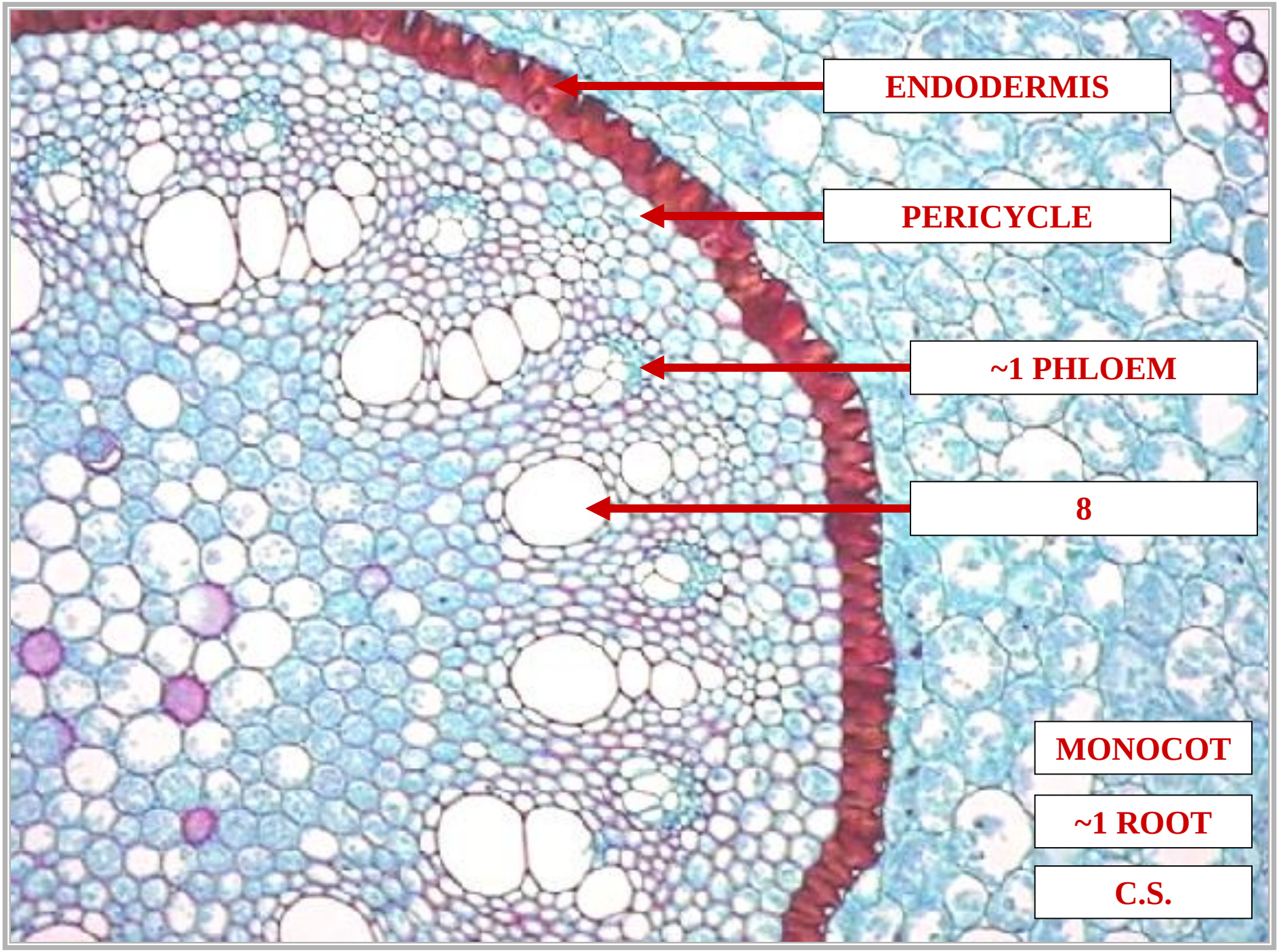

CASPARIAN STRIP
MONOCOT
~1 ROOT
C.S.

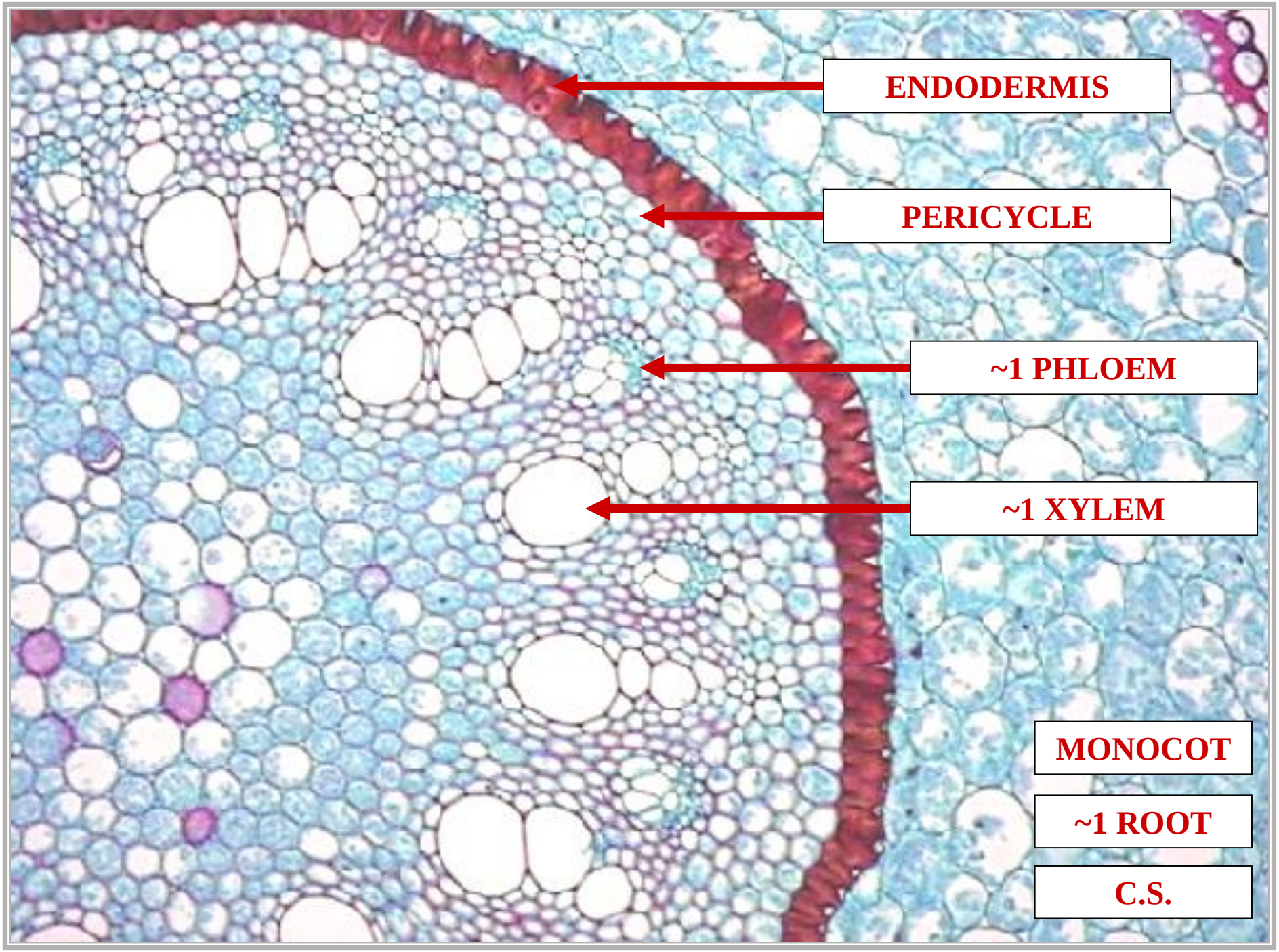

ENDODERMIS
6
MONOCOT
~1 ROOT
C.S.

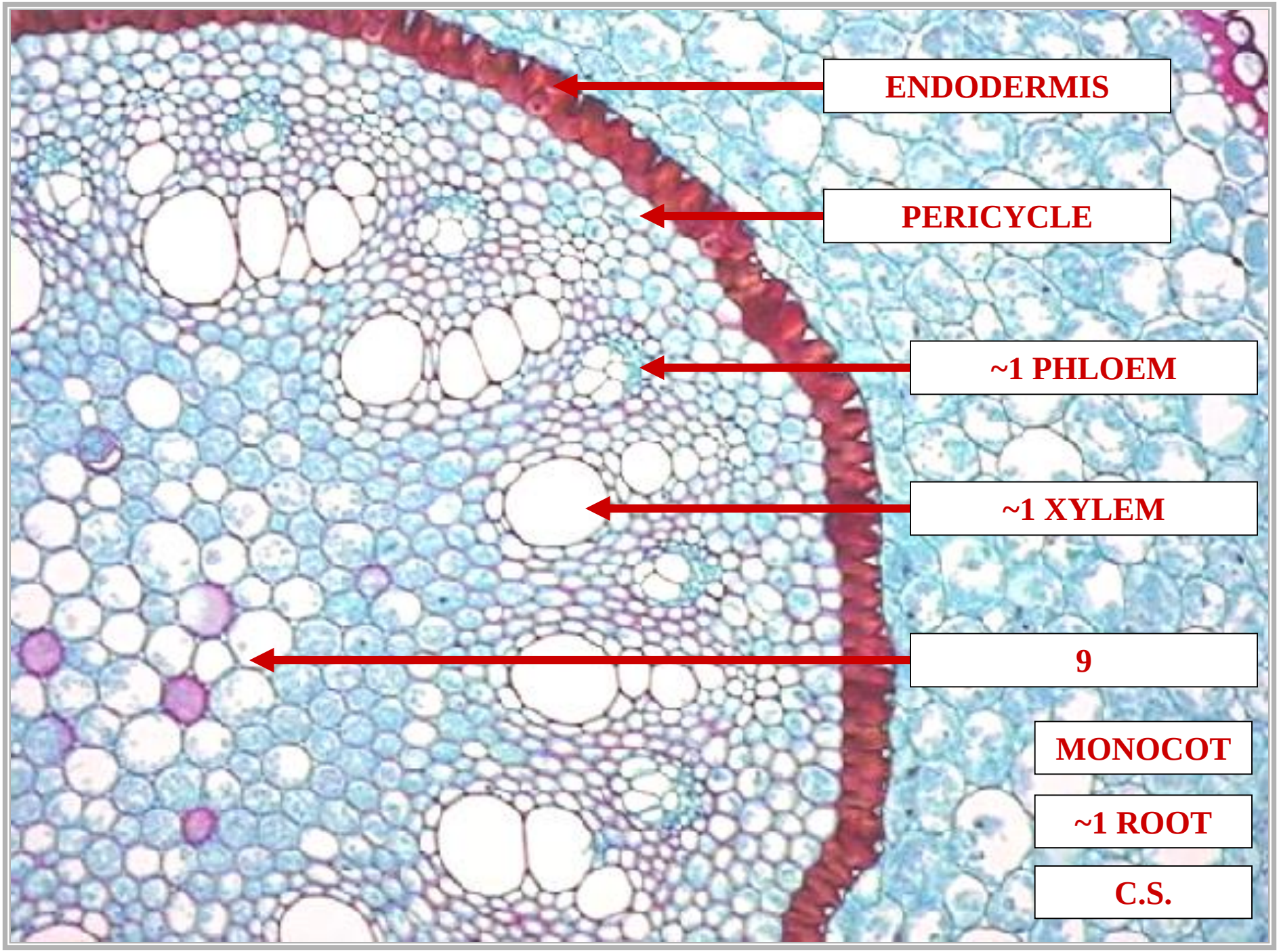

ENDODERMIS
PERICYCLE
MONOCOT
~1 ROOT
C.S.

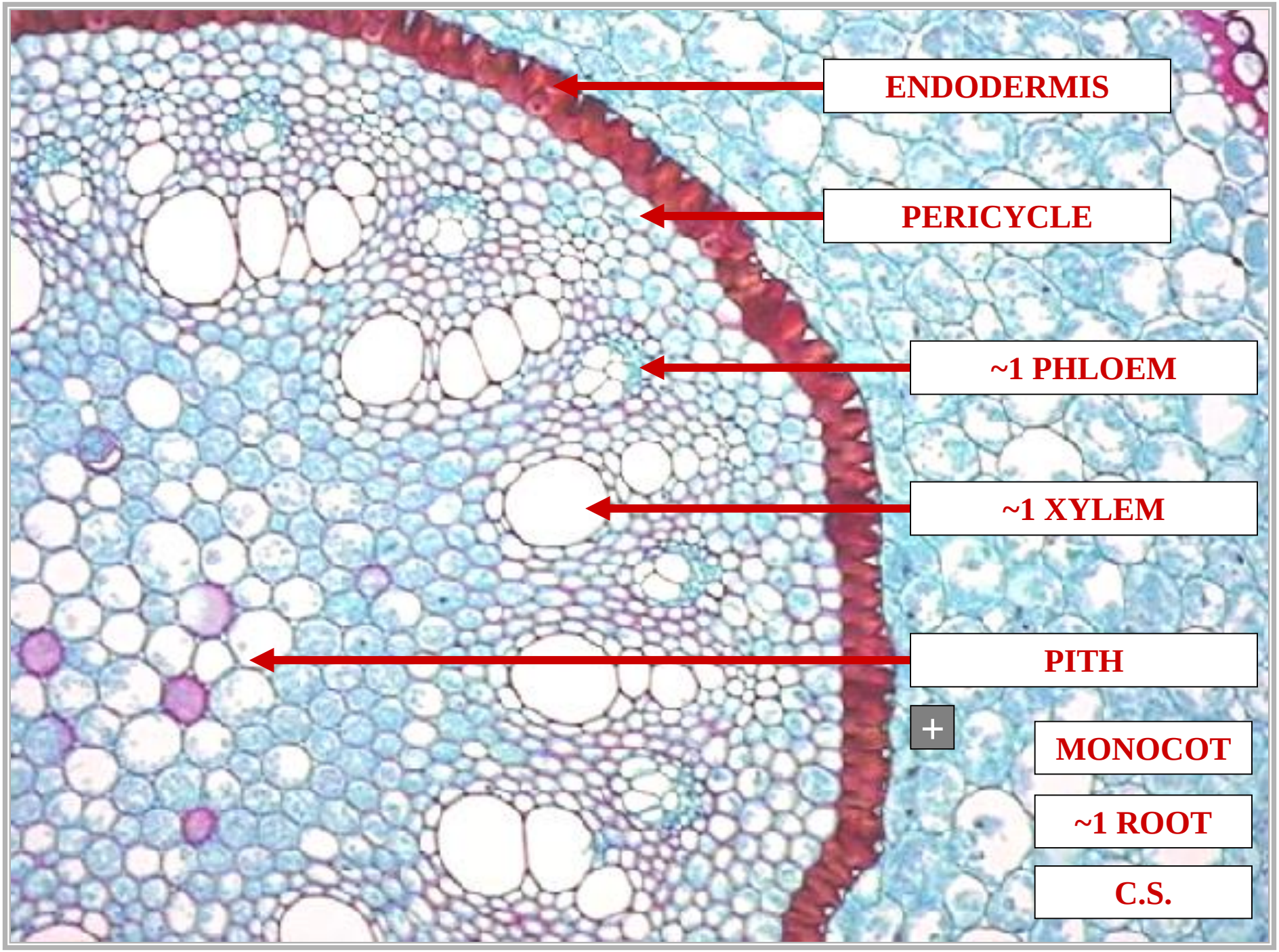

ENDODERMIS
PERICYCLE
7
MONOCOT
~1 ROOT
C.S.

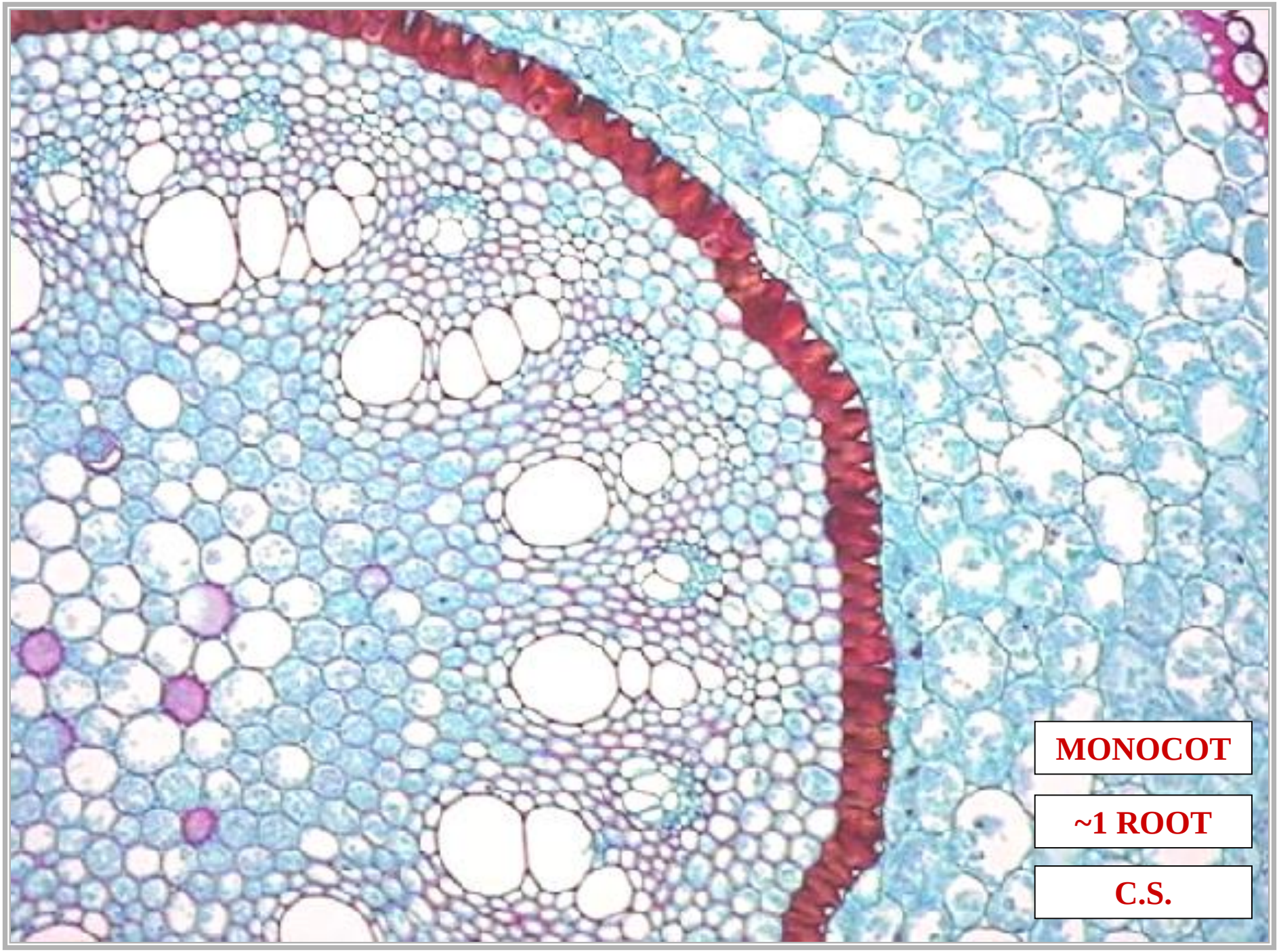

ENDODERMIS
PERICYCLE
~1 PHLOEM
MONOCOT
~1 ROOT
C.S.

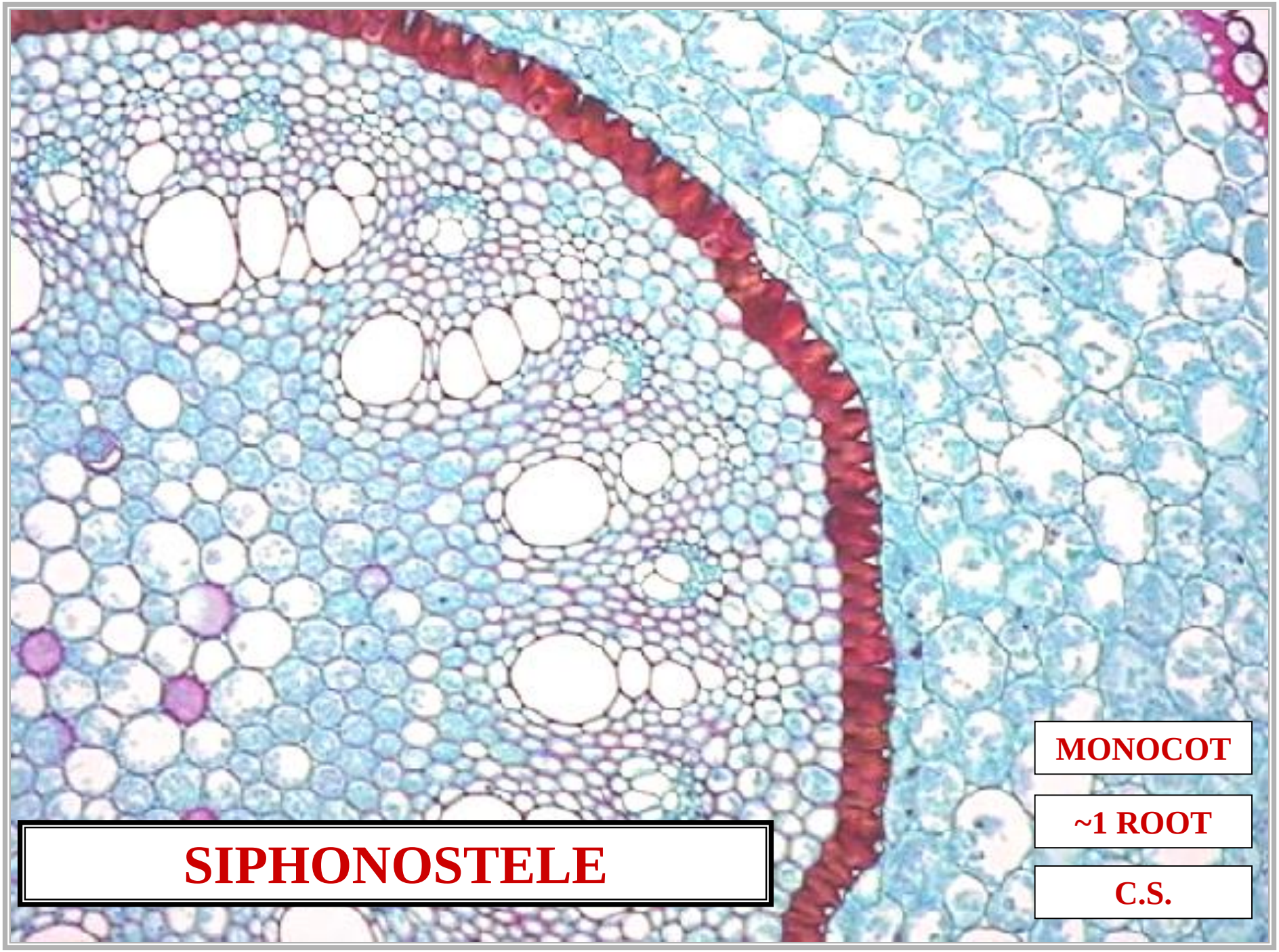

ENDODERMIS
PERICYCLE
~1 PHLOEM
8
MONOCOT
~1 ROOT
C.S.

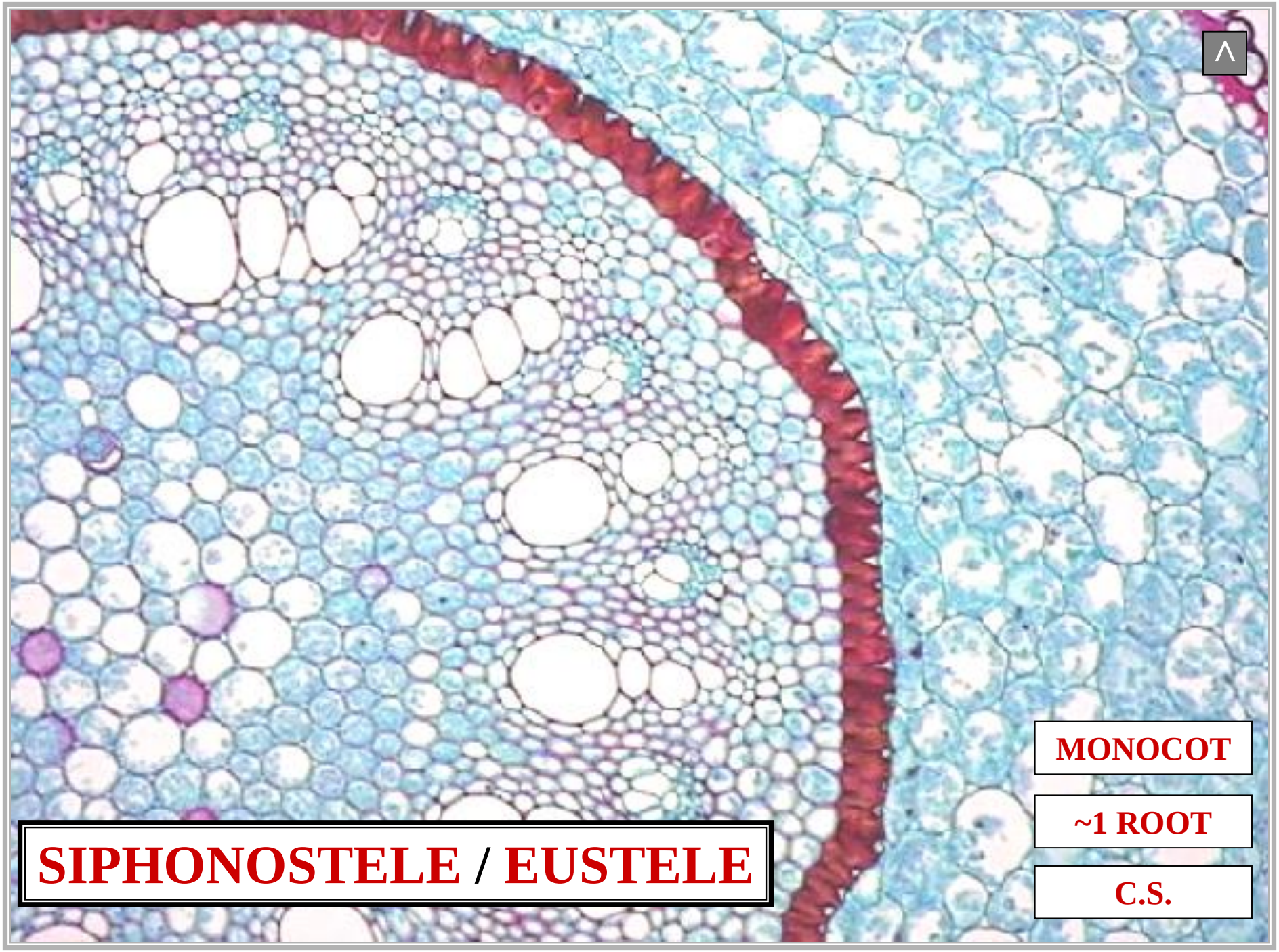

ENDODERMIS
PERICYCLE
~1 PHLOEM
~1 XYLEM
MONOCOT
~1 ROOT
C.S.


ENDODERMIS
PERICYCLE
~1 PHLOEM
~1 XYLEM
9
MONOCOT
~1 ROOT
C.S.


ENDODERMIS
PERICYCLE
~1 PHLOEM
~1 XYLEM
PITH
+
MONOCOT
~1 ROOT
C.S.


MONOCOT
~1 ROOT
C.S.


SIPHONOSTELE
MONOCOT
~1 ROOT
C.S.


SIPHONOSTELE / EUSTELE
MONOCOT
~1 ROOT
C.S.

M

MYCORRHIZAE

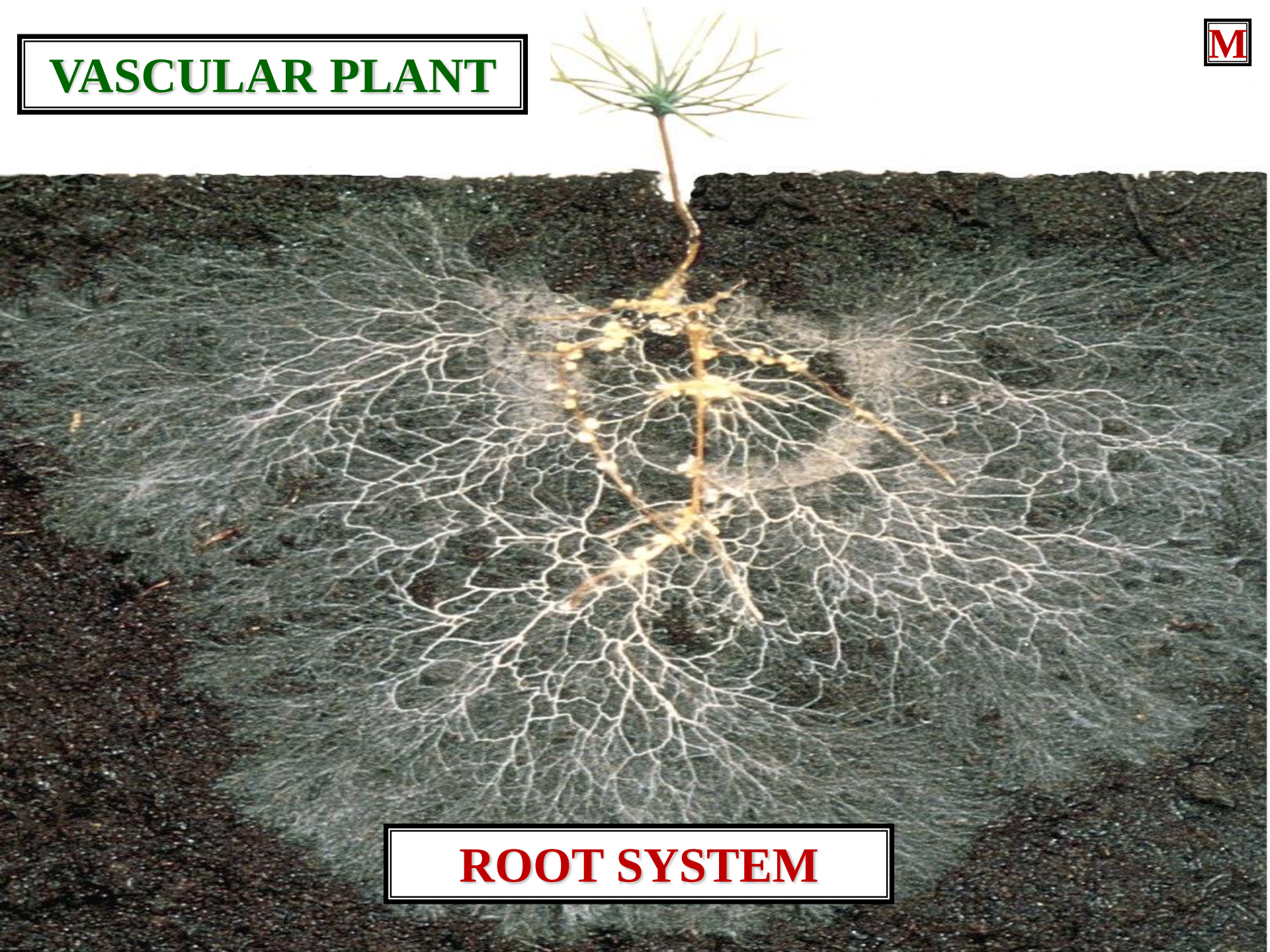
MYCORRHIZAE

MYCORRHIZAE

FUNGUS-VASCULAR PLANT ROOT SYMBIOSIS

MYCORRHIZAE

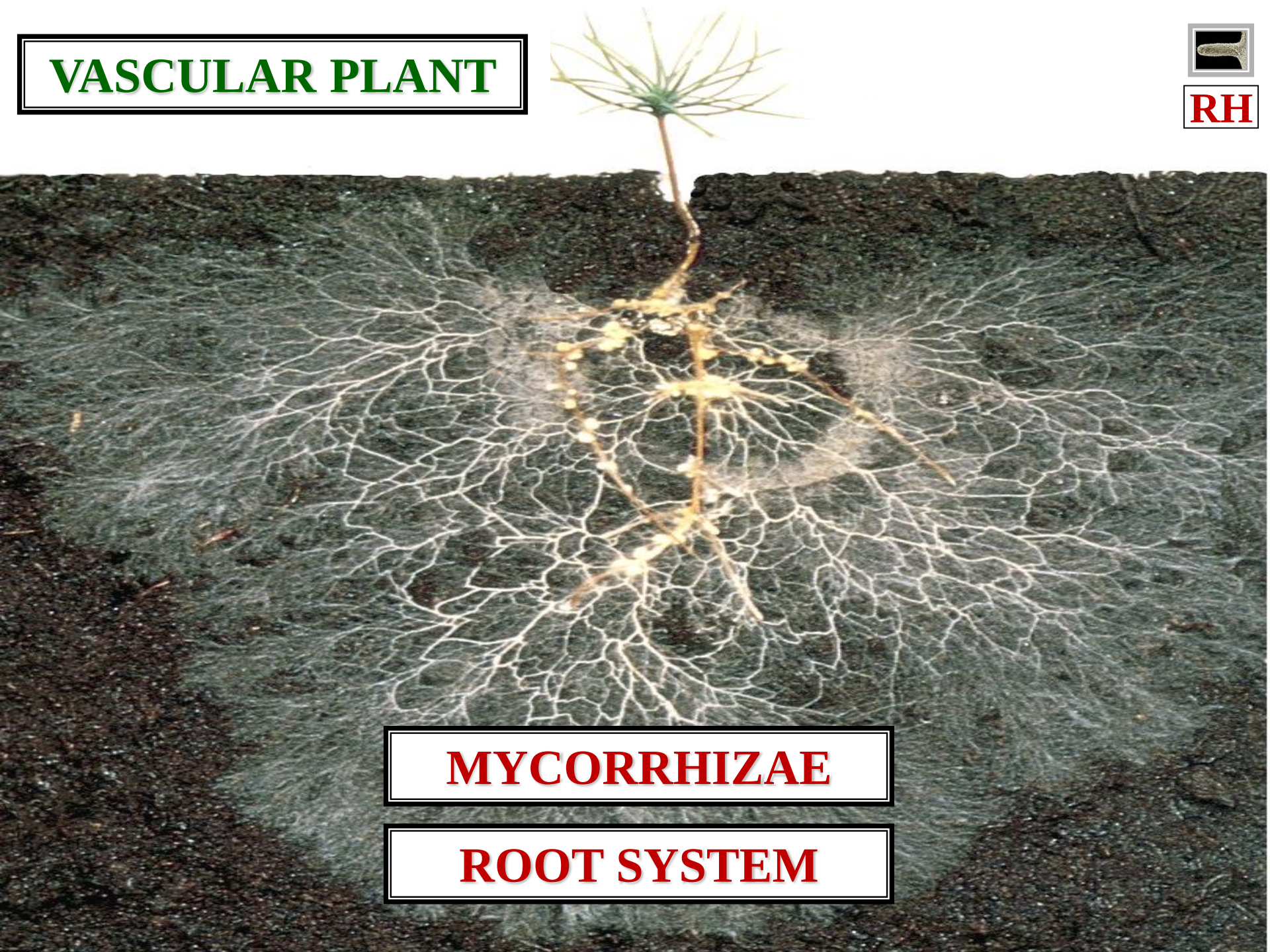
VASCULAR PLANT



ROOT SYSTEM

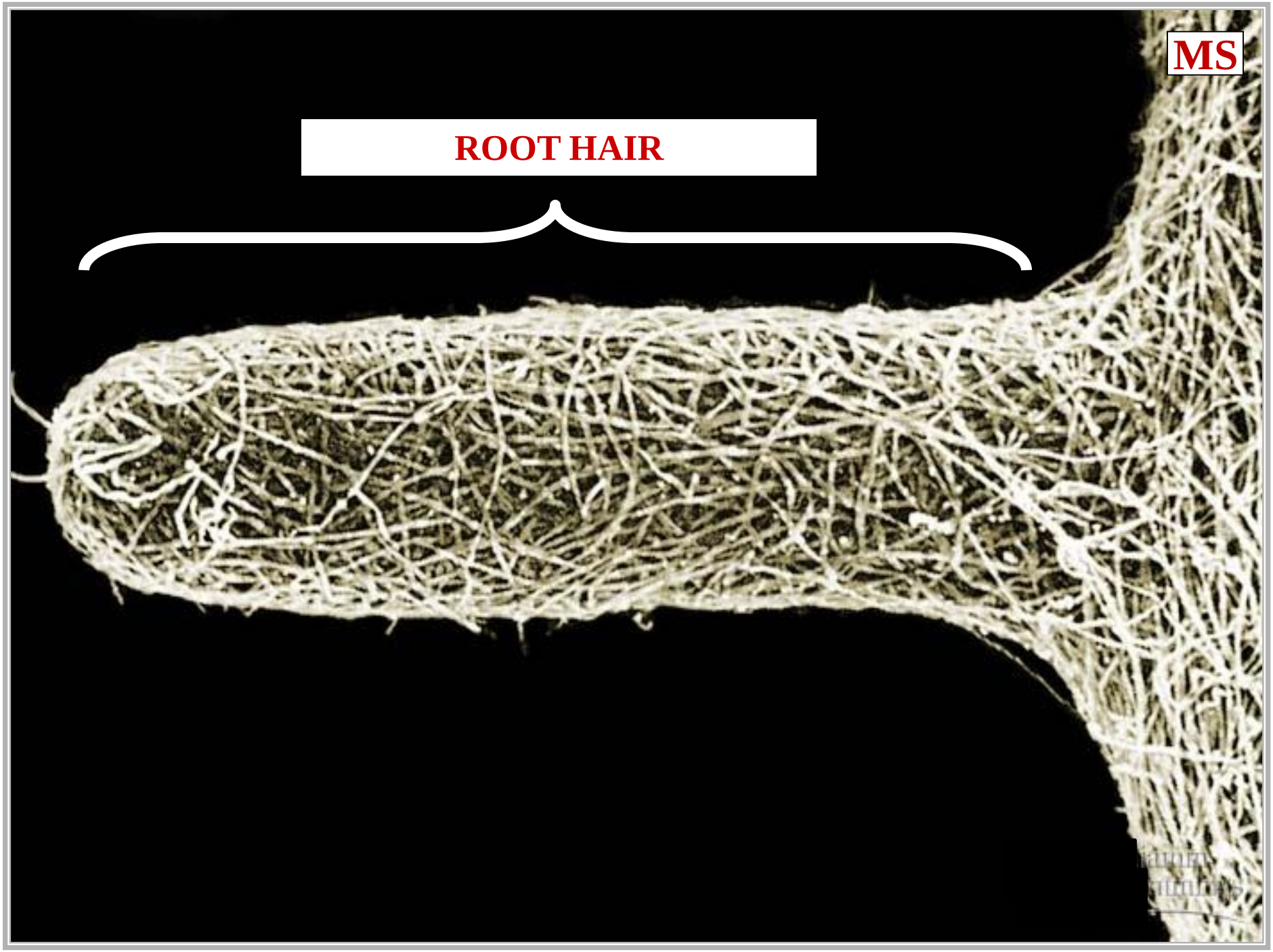
VASCULAR PLANT

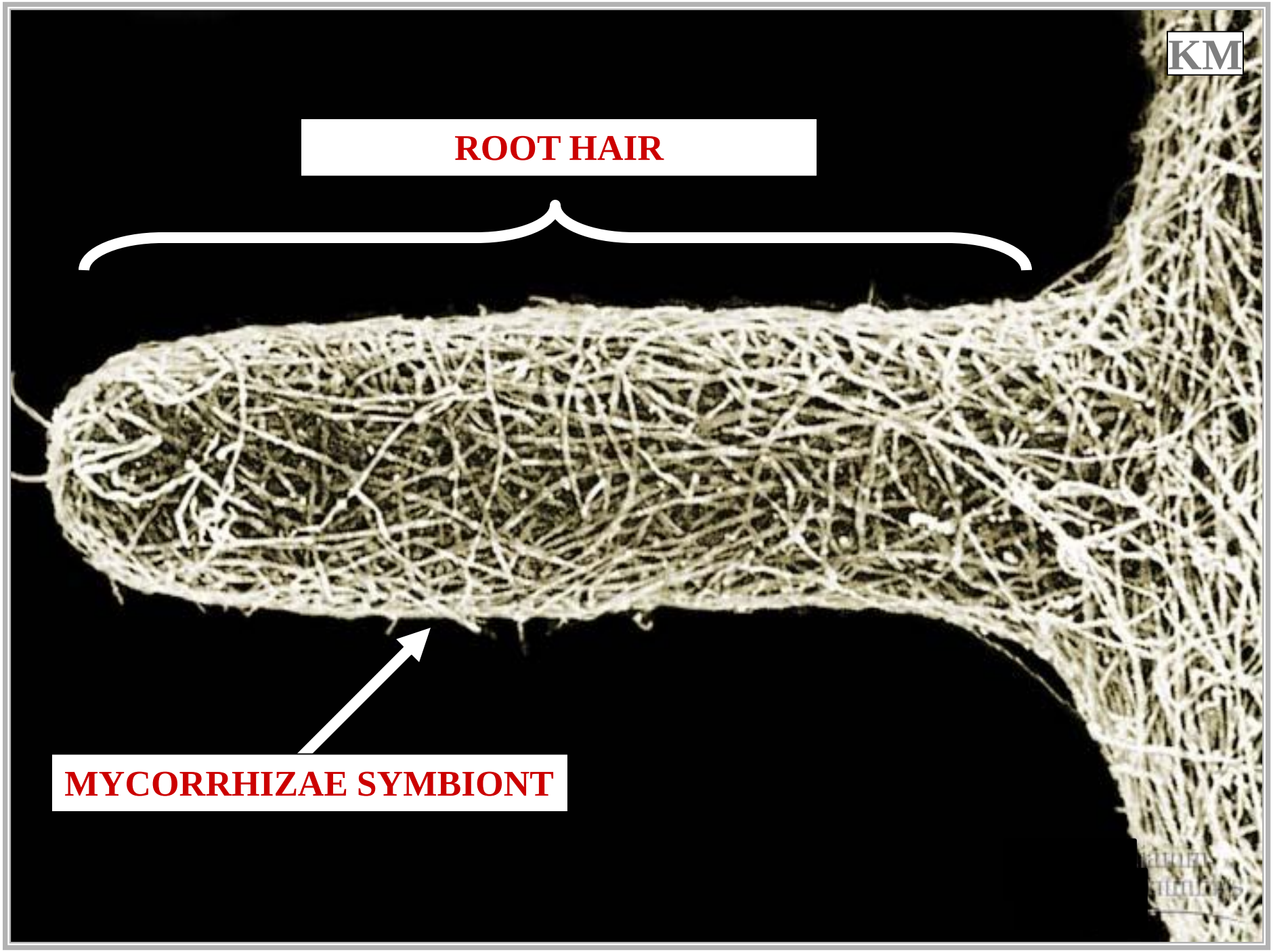
RH

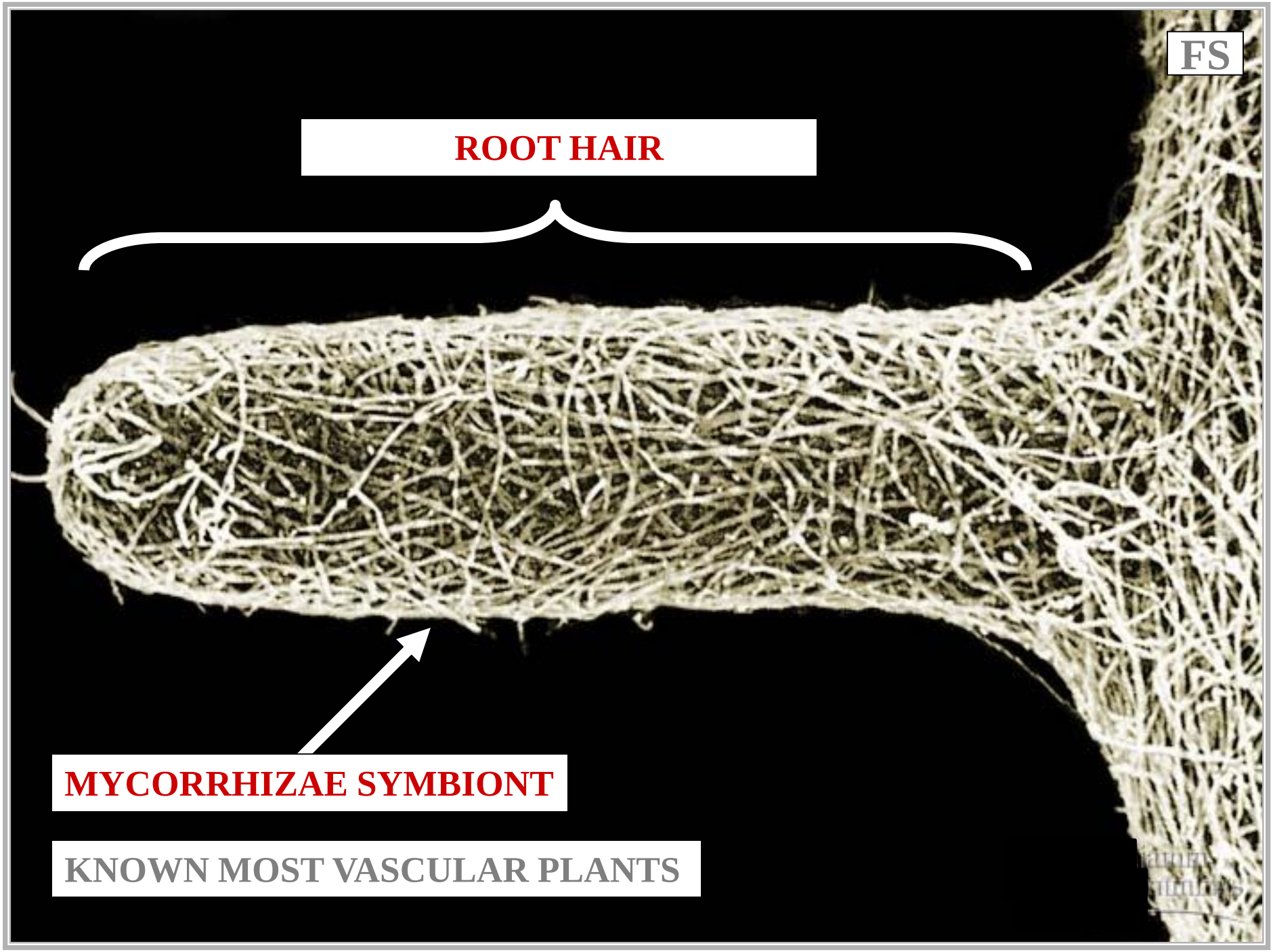


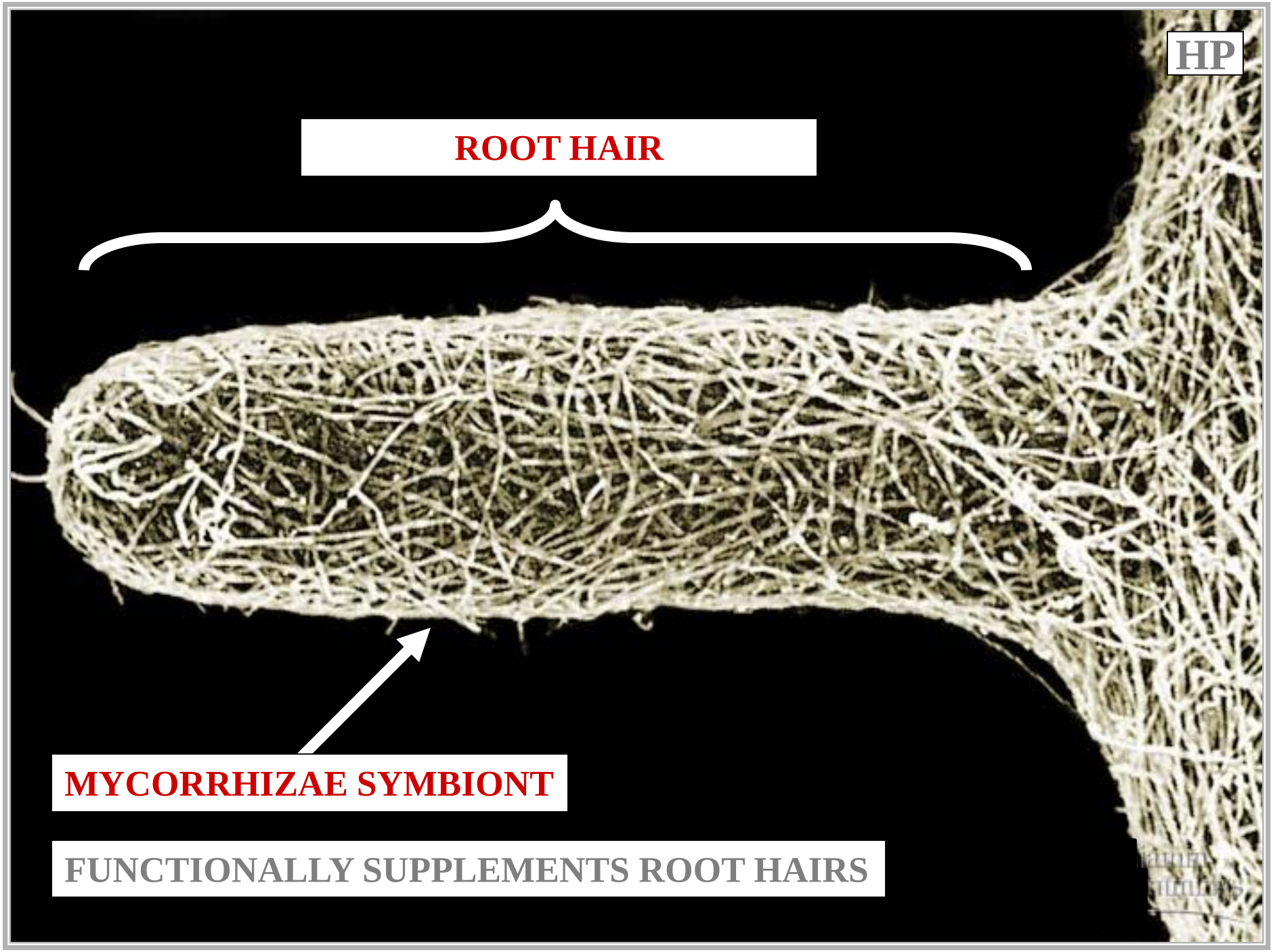
MYCORRHIZAE

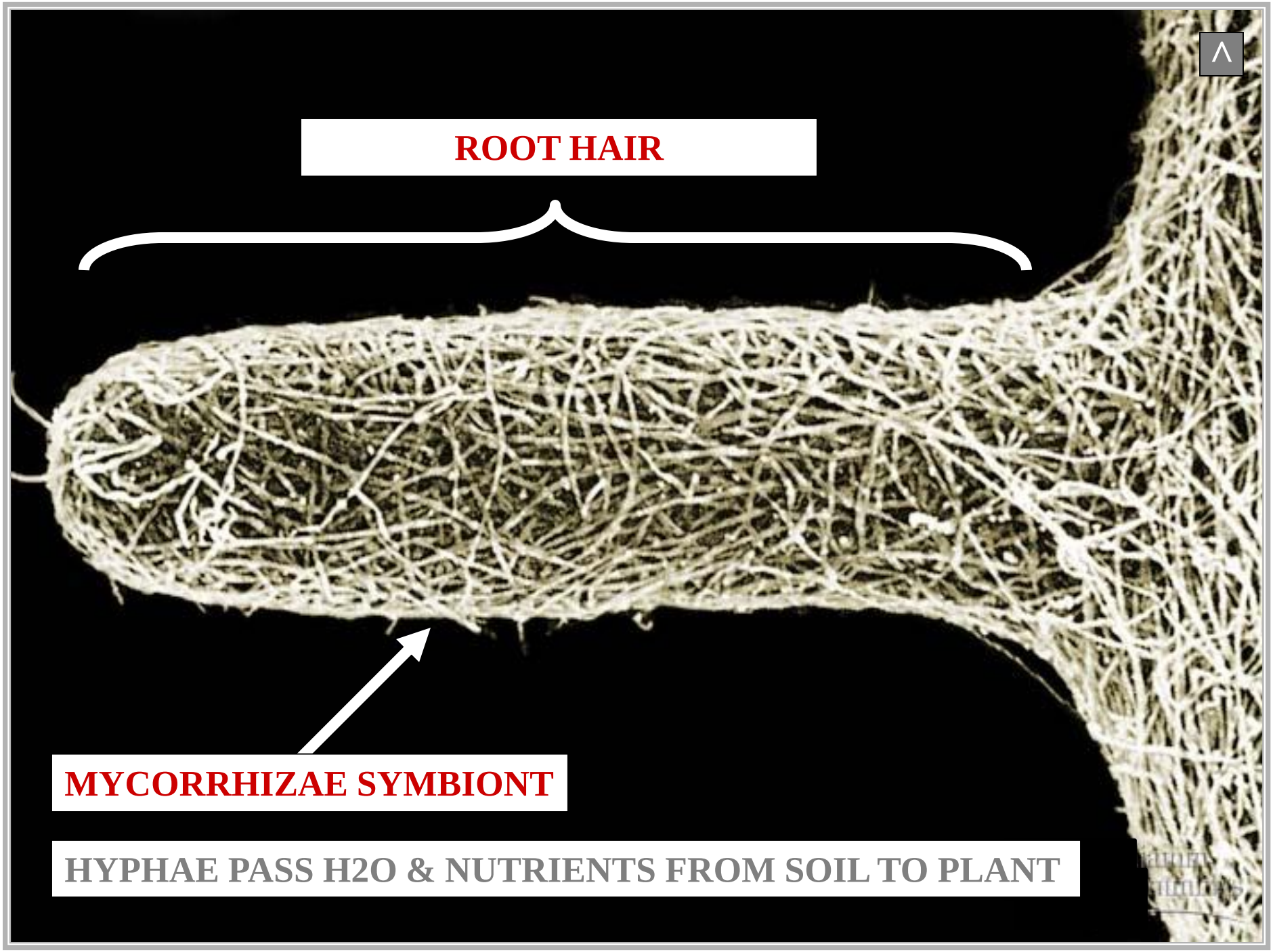
ROOT SYSTEM


MS
ROOT HAIR


KM
ROOT HAIR
MYCORRHIZAE SYMBIONT


FS
ROOT HAIR
MYCORRHIZAE SYMBIONT
KNOWN MOST VASCULAR PLANTS


HP
ROOT HAIR
MYCORRHIZAE SYMBIONT
FUNCTIONALLY SUPPLEMENTS ROOT HAIRS


ROOT HAIR
MYCORRHIZAE SYMBIONT
HYPHAE PASS H2O & NUTRIENTS FROM SOIL TO PLANT

S

SYMBIOSIS

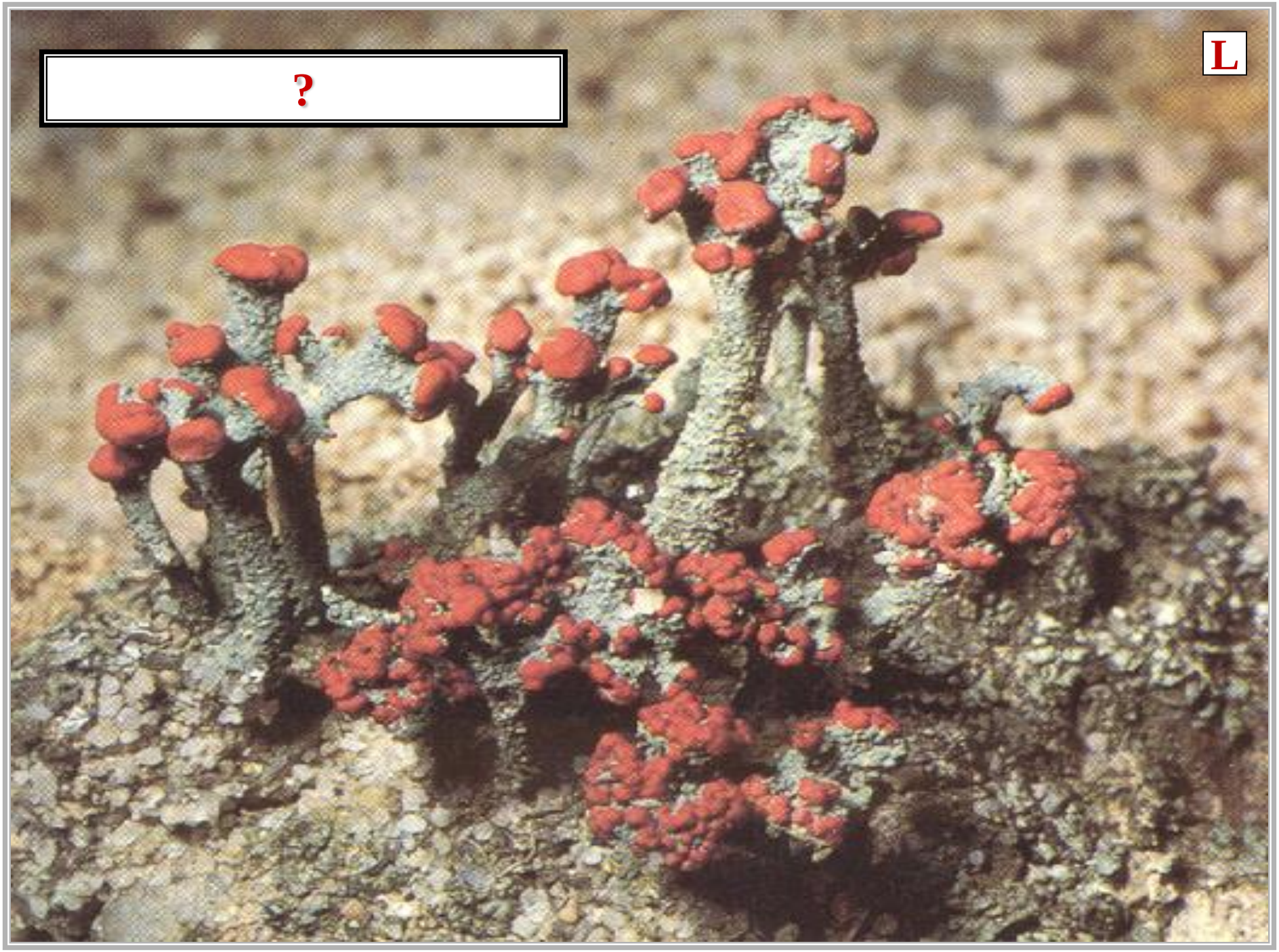
SYMBIOSIS

?

SYMBIOSIS

TWO DIFFERENT SPECIES LIVING IN AN INTRICATE ASSOCIATION

SYMBIOSIS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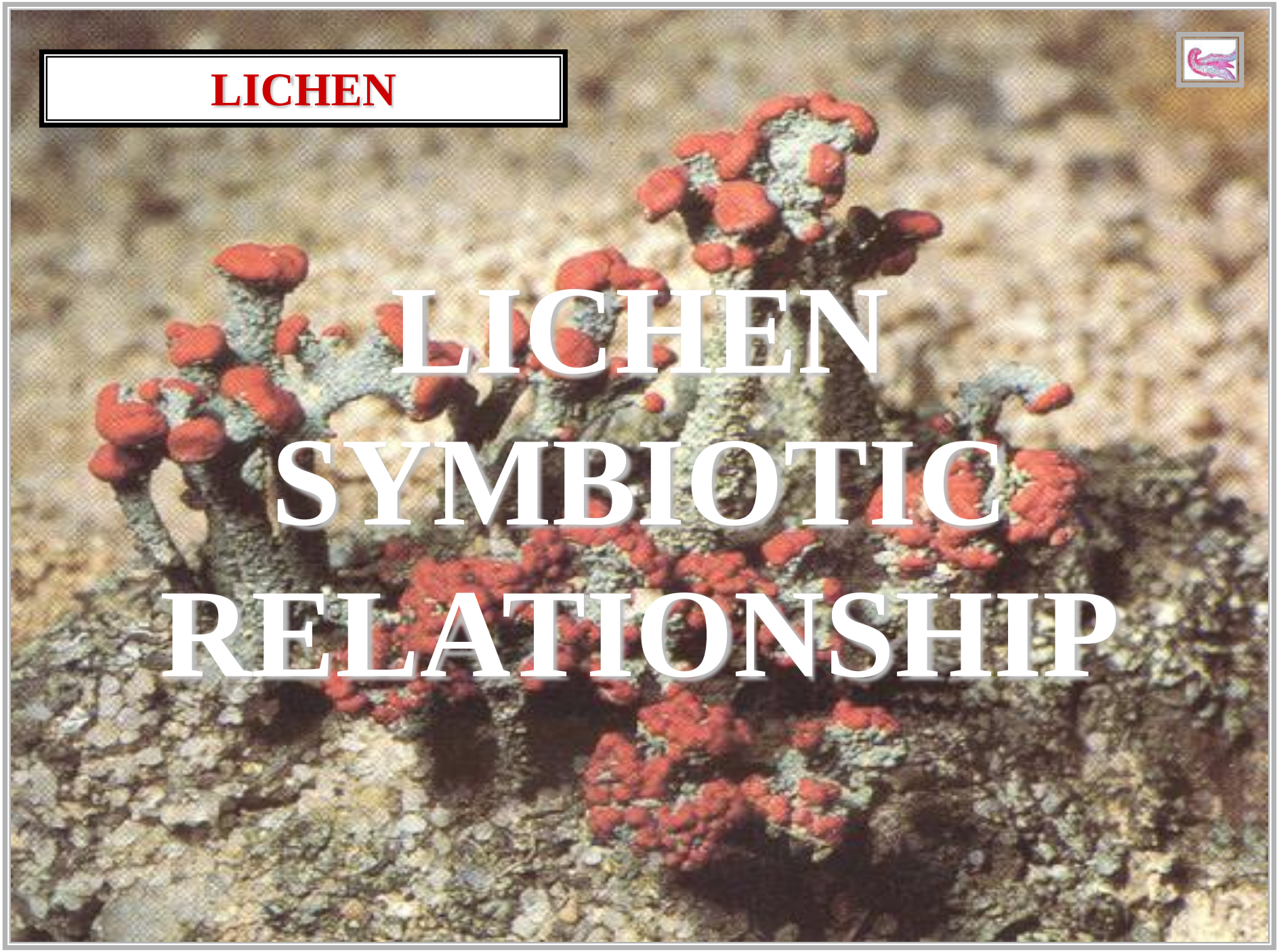


LICHEN SYMBIOTIC RELATIONSHIP

LICHEN THALLUS

SYMBIOSIS

L.S.

LICHEN THALLUS

FS

SYMBIOSIS

L.S.

LICHEN THALLUS

BS

FUNGUS SYMBIONT

L.S.

SYMBIOSIS

LICHEN THALLUS

BACTERIA SYMBIONT

FUNGUS SYMBIONT

L.S.

SYMBIOSIS

D

LICHEN SYMBIOTIC RELATIONSHIP

LICHEN THALLUS

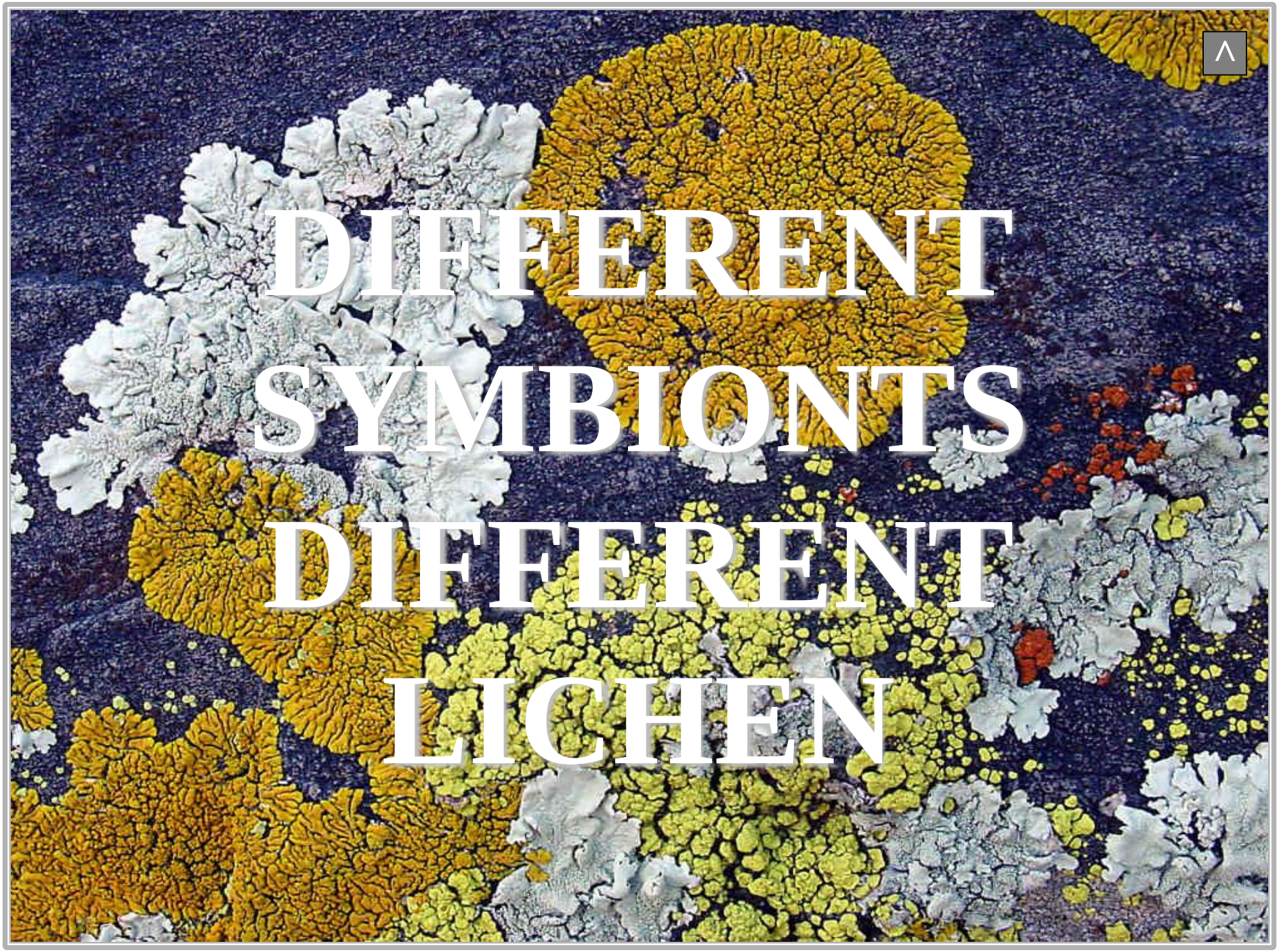
D

DIFFERENT
BACTERIA SYMBIONT

DIFFERENT
FUNGUS SYMBIONT

L.S.

SYMBIOSIS


DIFFERENT
SYMBIONTS
DIFFERENT
LICHEN

SYMBIOSIS TYPES

SYMBIOSIS
TYPES

PARASITISM

SYMBIOSIS
TYPES

SYMBIOSIS
TYPES

PARASITISM
COMMENSALISM

SYMBIOSIS
TYPES

P

SYMBIOSIS TYPES

PARASITISM
COMMENSALISM
MUTUALISM

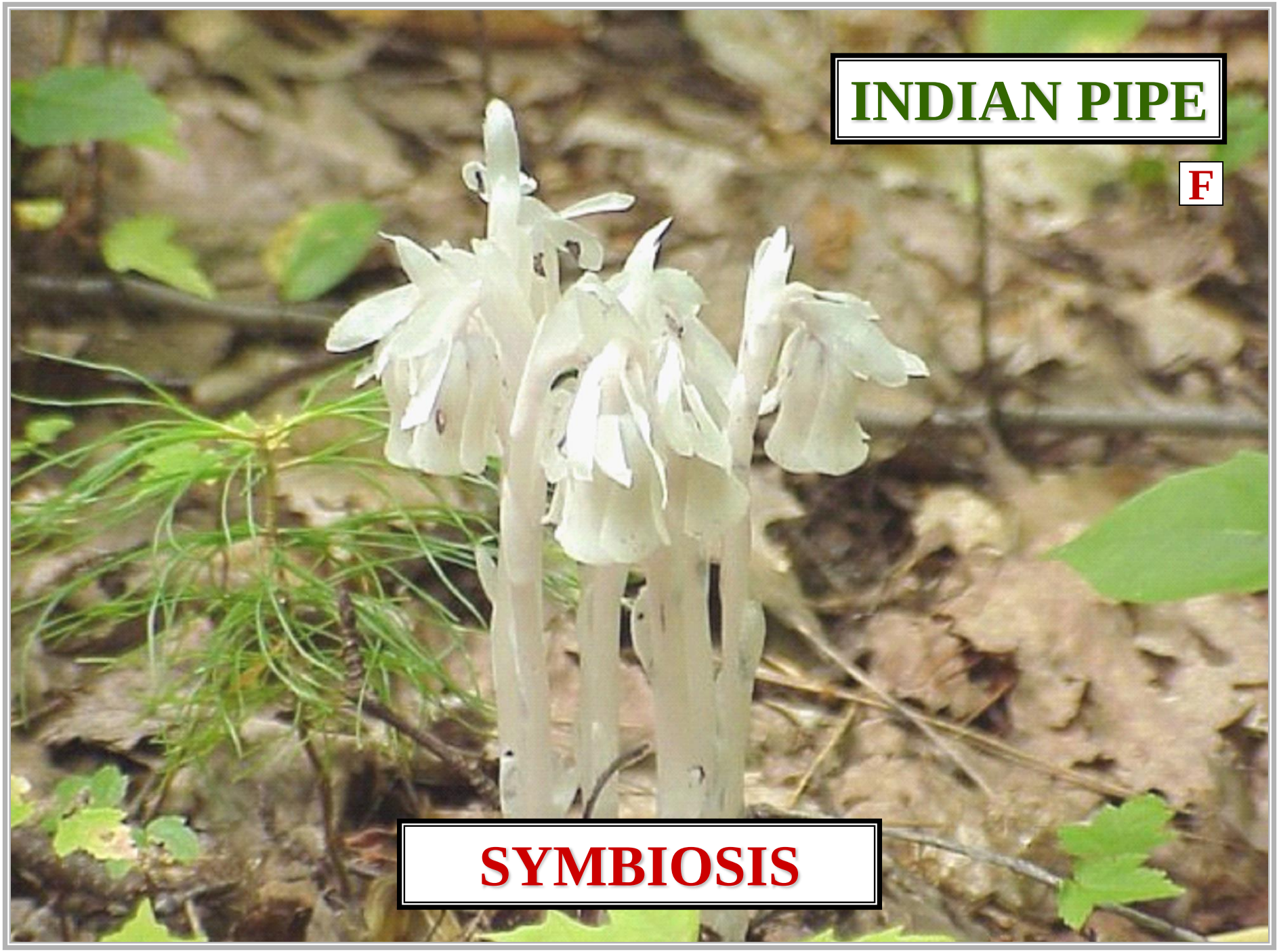
SYMBIOSIS TYPES

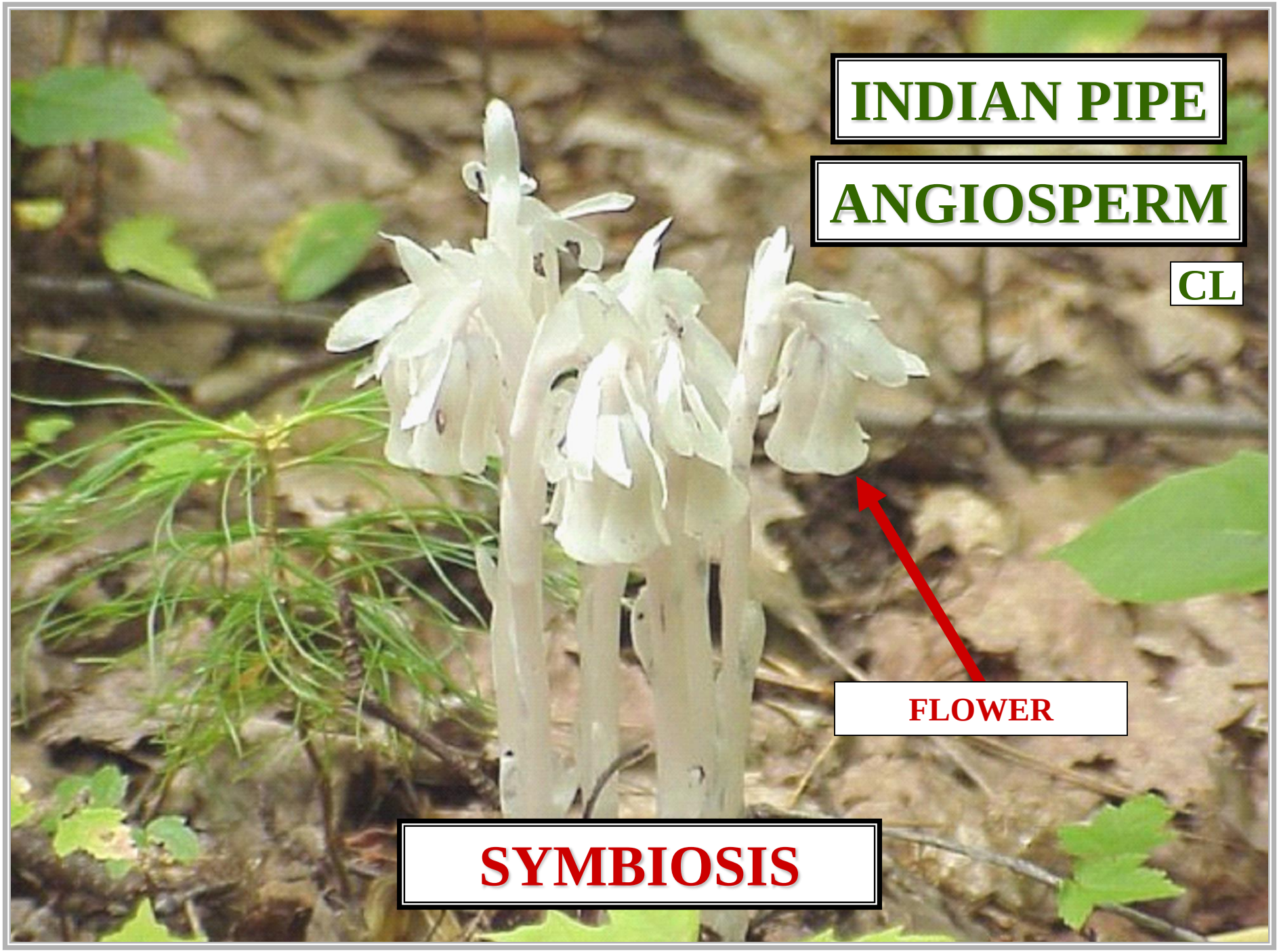
PARASITISM

SYMBIOSIS
PARASITISM

ONE SPECIES BENEFITS
ONE SPECIES ADVERSELY AFFECTED

SYMBIOSIS
PARASITISM


INDIAN PIPE
F
SYMBIOSIS


INDIAN PIPE
ANGIOSPERM
CL
FLOWER
SYMBIOSIS

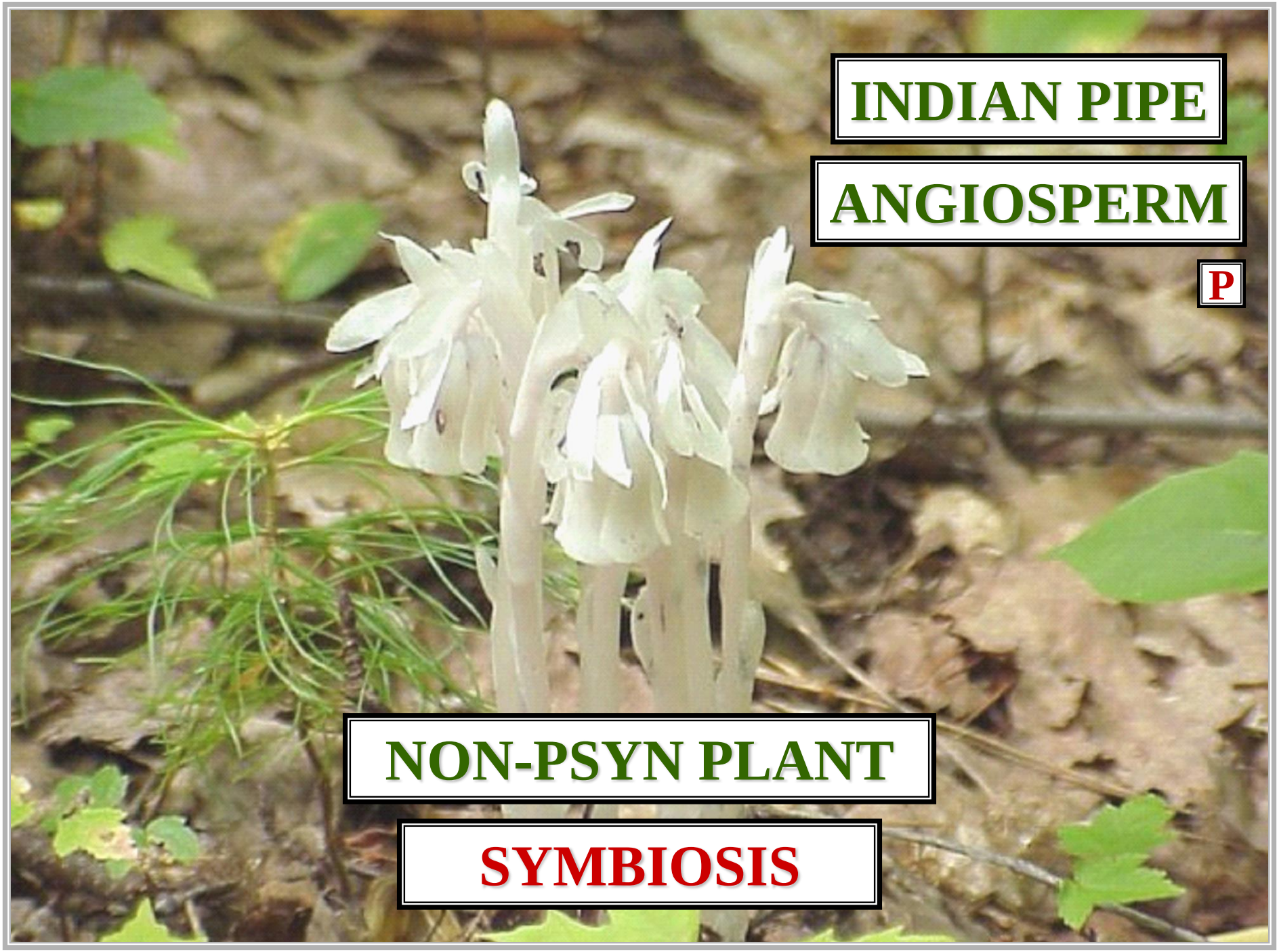
INDIAN PIPE

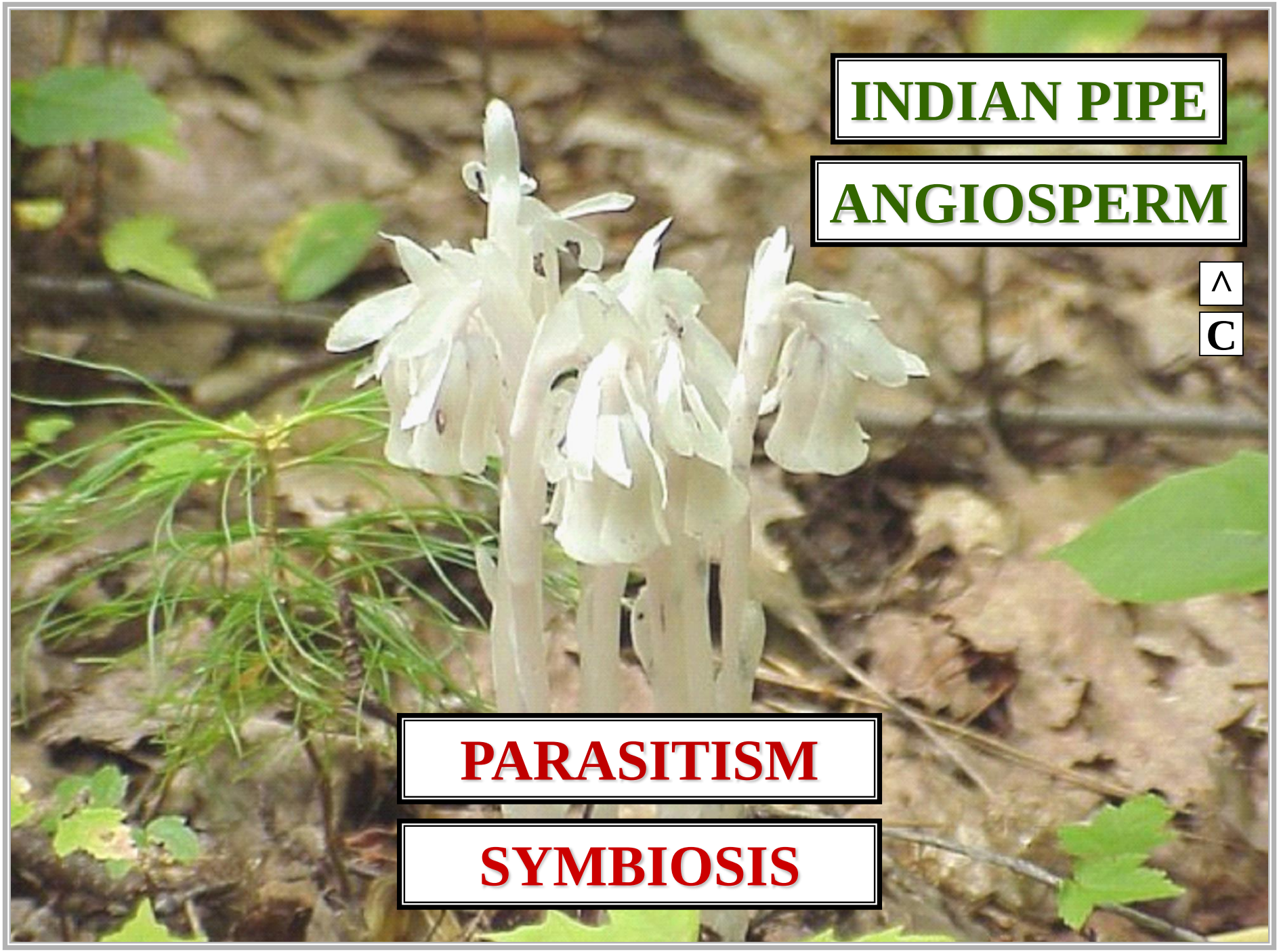
ANGIOSPERM

N

CHLOROPLASTS: ABSENT

SYMBIOSIS


INDIAN PIPE
ANGIOSPERM
P
NON-PSYN PLANT
SYMBIOSIS


INDIAN PIPE
ANGIOSPERM
^
C
PARASITISM
SYMBIOSIS

COMMENSALISM

SYMBIOSIS
COMMENSALISM

ONE SPECIES BENEFITS
ONE SPECIES UNAFFECTED

SYMBIOSIS
COMMENSALISM

AFRICAN SAVANNA

C

SYMBIOSIS


COMMENSALISM
SYMBIOSIS

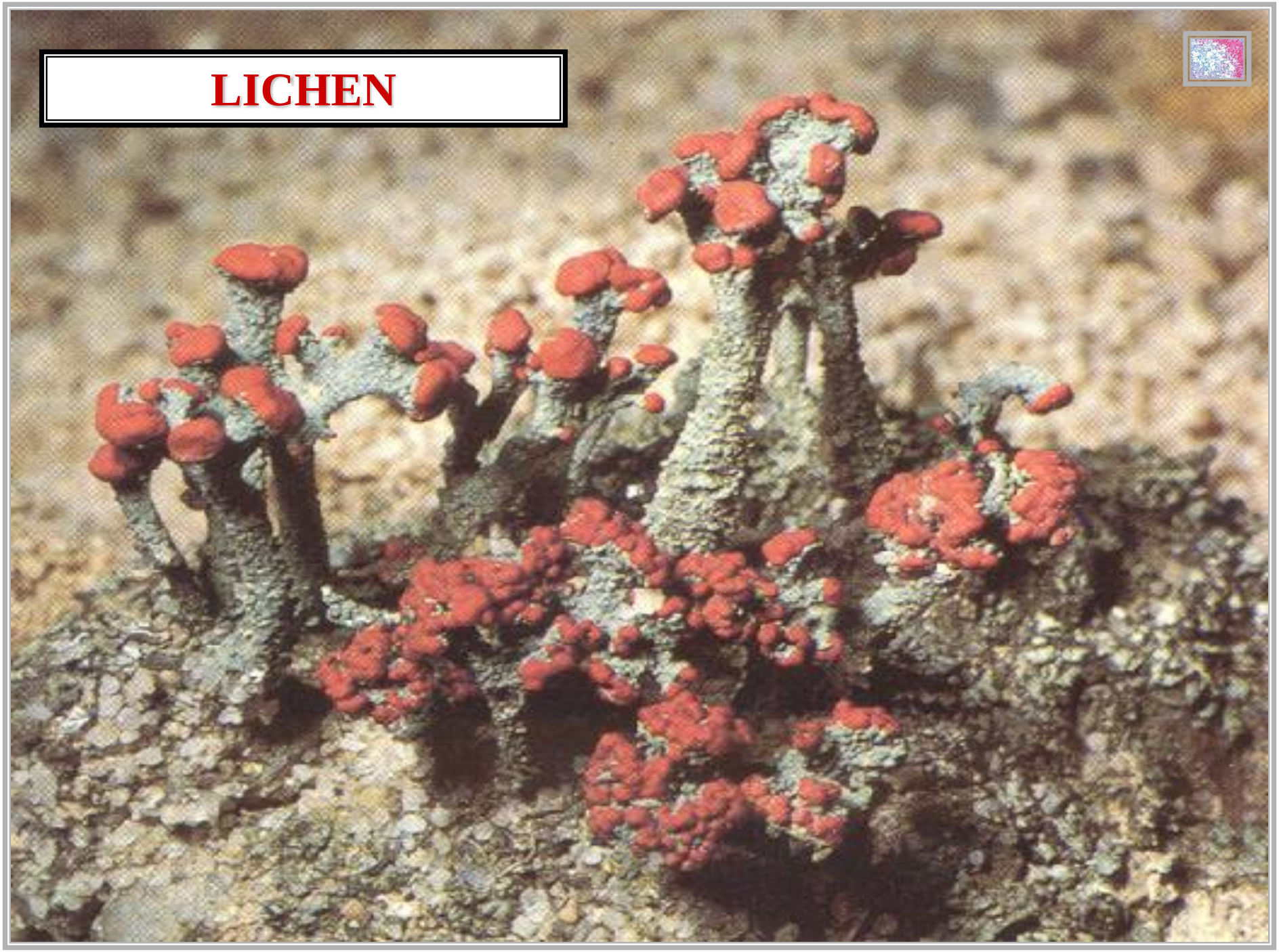
MUTUALISM

SYMBIOSIS
MUTUALISM

BOTH SPECIES BENEFIT

SYMBIOSIS
MUTUALISM

LICHEN



FS

LICHEN THALLUS

SYMBIOSIS

L.S.

LICHEN THALLUS

BS

FUNGUS SYMBIONT

L.S.

SYMBIOSIS

LICHEN THALLUS

BACTERIA SYMBIONT

FUNGUS SYMBIONT

L.S.

SYMBIOSIS

LICHEN THALLUS

BACTERIA SYMBIONT
PHOTOSYNTHESIS

FUNGUS SYMBIONT

SYMBIOSIS

L.S.

LICHEN THALLUS

G

BACTERIA SYMBIONT
PHOTOSYNTHESIS
PROVIDES: GLUCOSE

FUNGUS SYMBIONT

L.S.

SYMBIOSIS

LICHEN THALLUS

BACTERIA SYMBIONT
PHOTOSYNTHESIS
PROVIDES: GLUCOSE

FUNGUS SYMBIONT
PROVIDES: GLUCOSE

L.S.

SYMBIOSIS

LICHEN THALLUS

BACTERIA SYMBIONT
PHOTOSYNTHESIS
PROVIDES: SECURITY

FUNGUS SYMBIONT
PROVIDES: SECURITY

L.S.

SYMBIOSIS

LICHEN THALLUS

BACTERIA SYMBIONT
PHOTOSYNTHESIS
PROVIDES: GLUCOSE

FUNGUS SYMBIONT
PROVIDES: SECURITY

L.S.

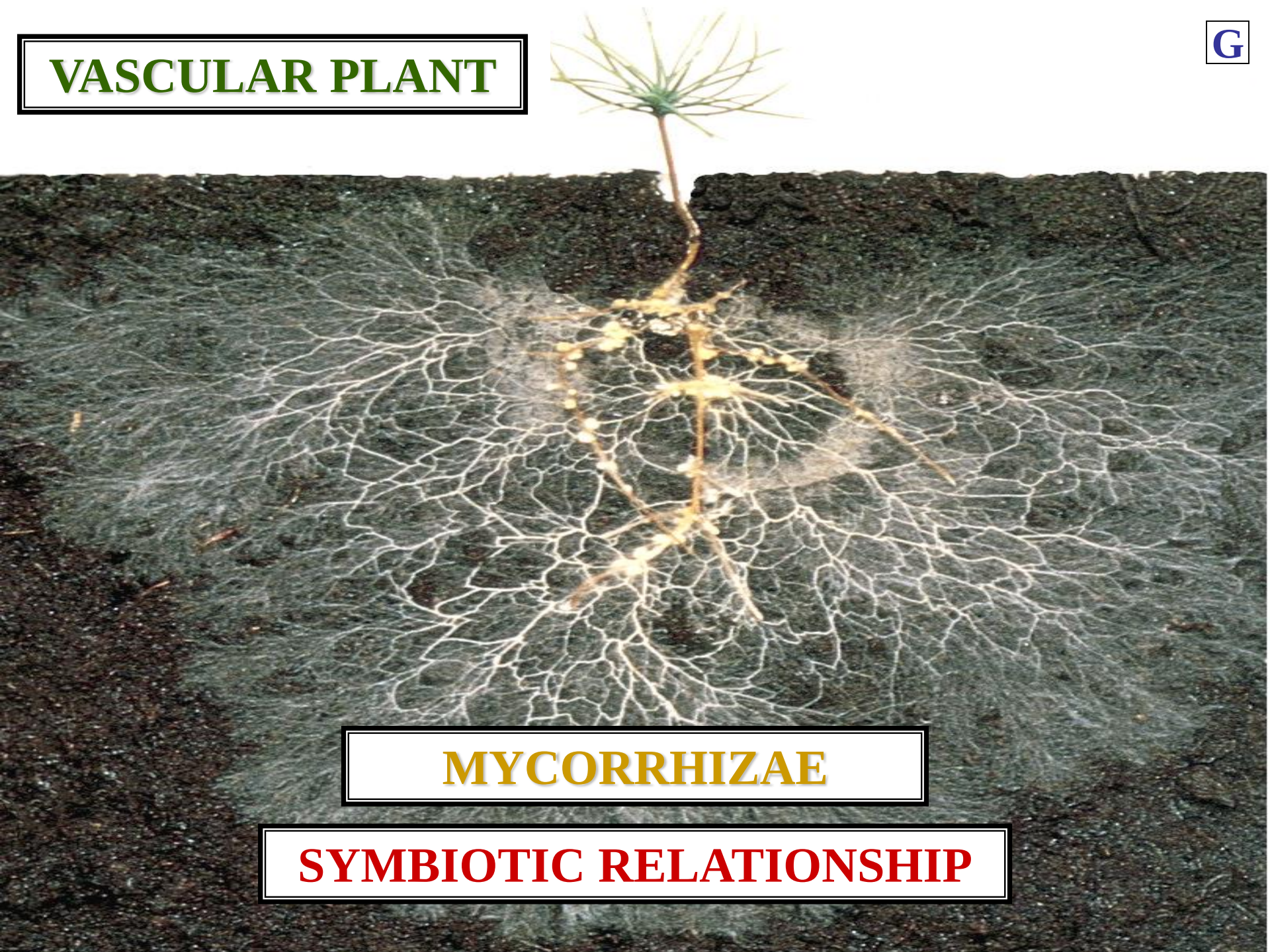
MUTUALISM

SYMBIOSIS

MYCORRHIZAE MUTUALISTIC SYMBIOTIC RELATIONSHIP

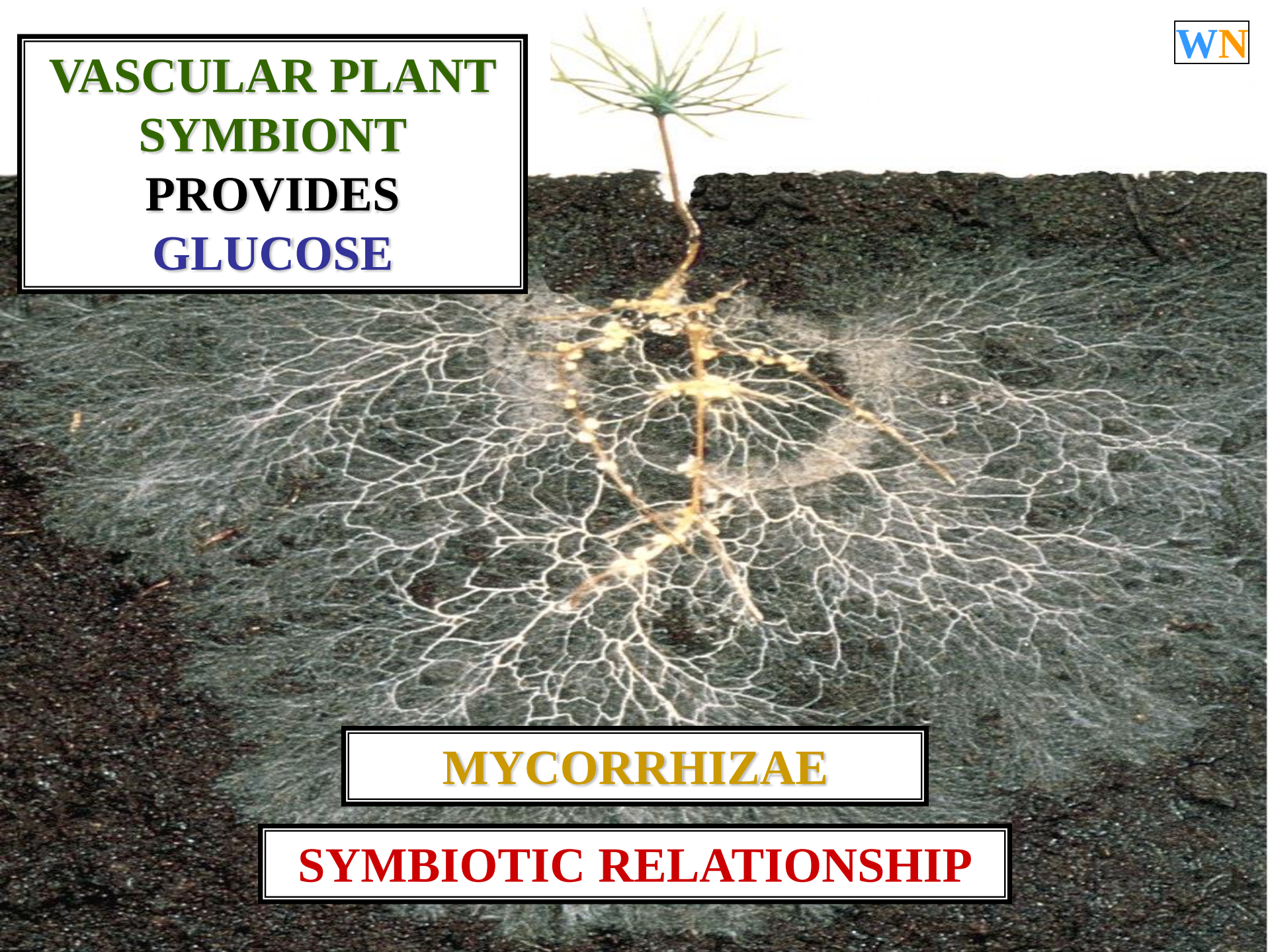
VASCULAR PLANT

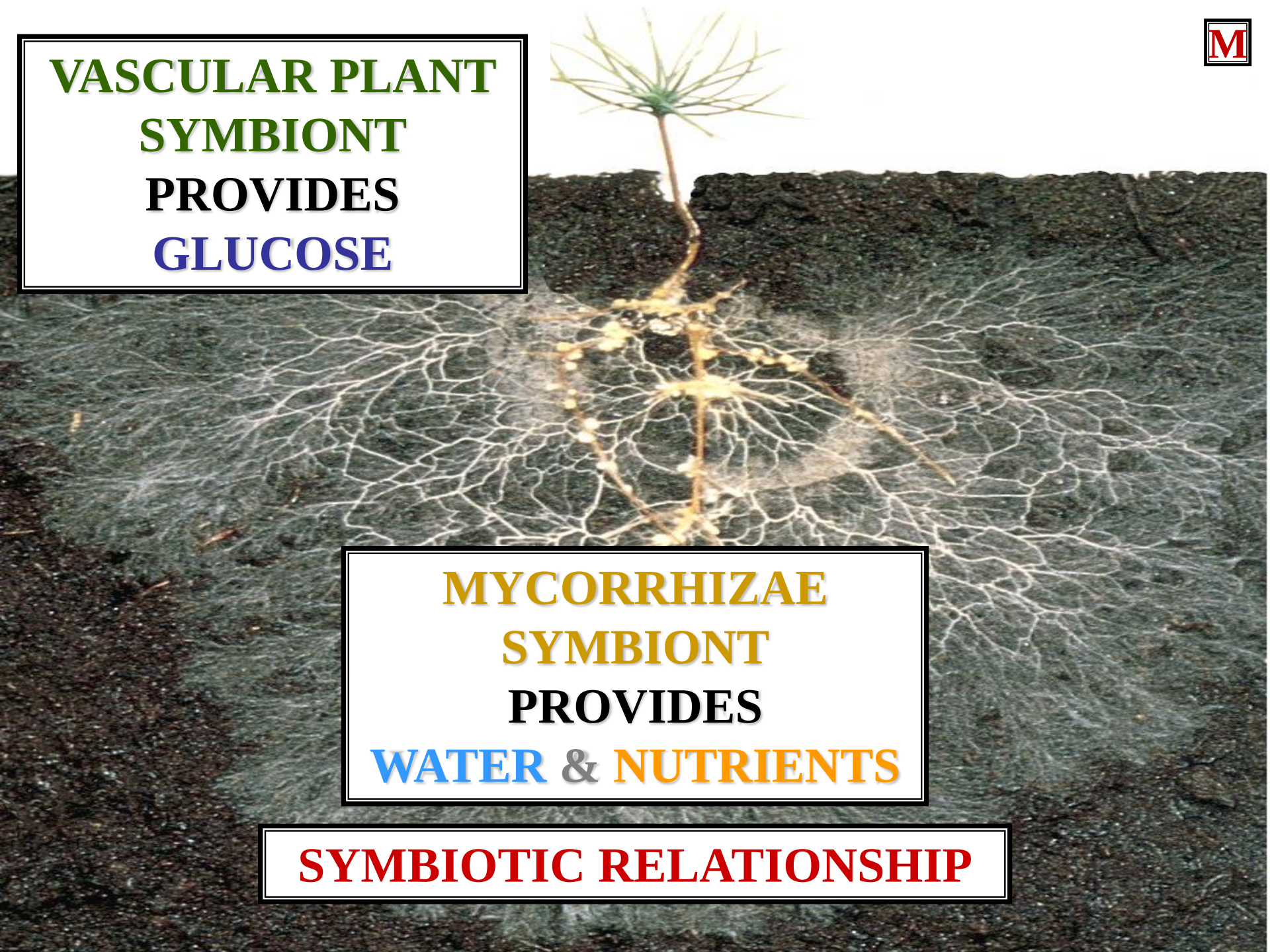
G



MYCORRHIZAE

SYMBIOTIC RELATIONSHIP


VASCULAR PLANT
SYMBIONT
PROVIDES
GLUCOSE
MYCORRHIZAE
SYMBIOTIC RELATIONSHIP


VASCULAR PLANT
SYMBIONT
PROVIDES
GLUCOSE
MYCORRHIZAE
SYMBIONT
PROVIDES
WATER & NUTRIENTS
SYMBIOTIC RELATIONSHIP