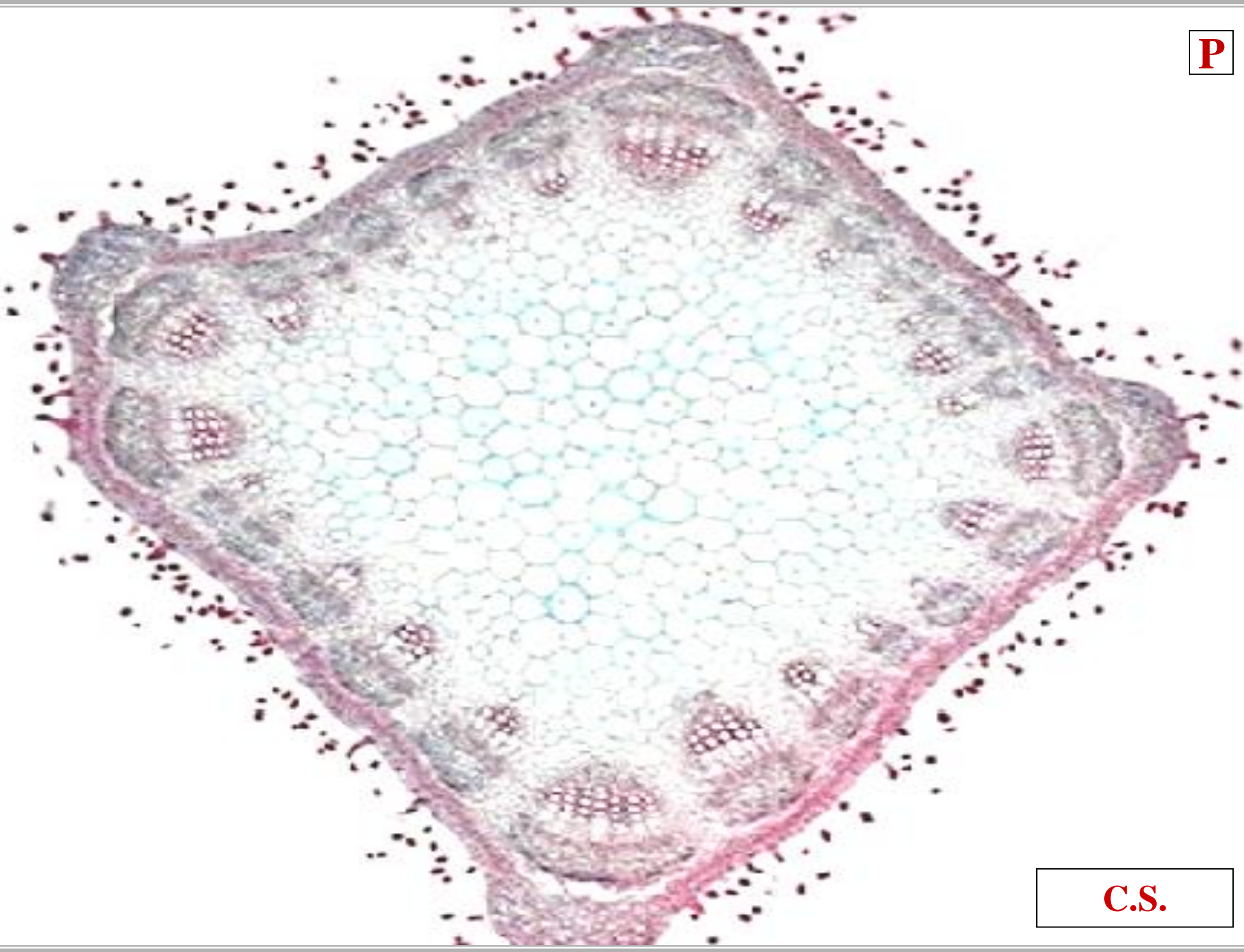
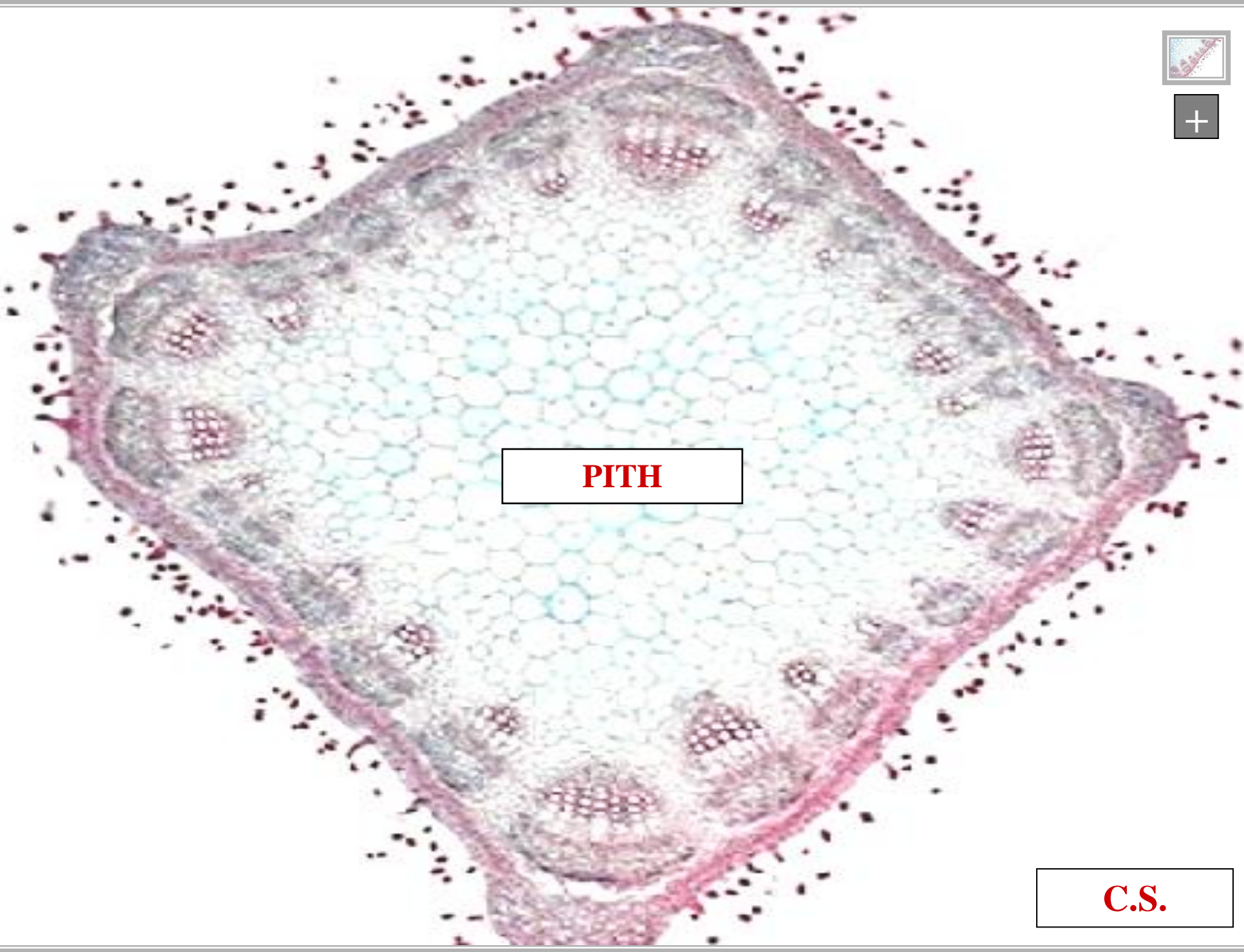


P



C.S.



PITH

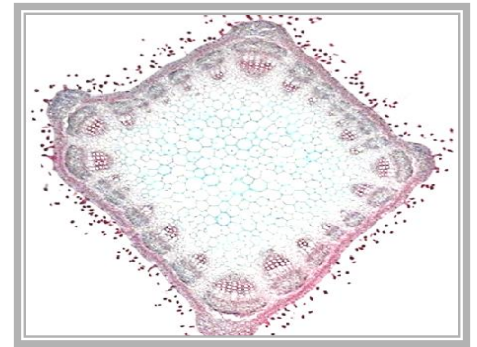
C.S.



PITH

This micrograph shows a cross-section of a plant stem. The pith is the central region, composed of large, thin-walled parenchyma cells. Surrounding the pith are vascular bundles, each containing primary xylem, a vascular cambium, and primary phloem. The outermost layer is the cortex, which consists of several layers of cells, including a prominent epidermis and a thick cuticle. The vascular bundles are arranged in a ring, and the stem exhibits a distinct secondary growth pattern.

VB



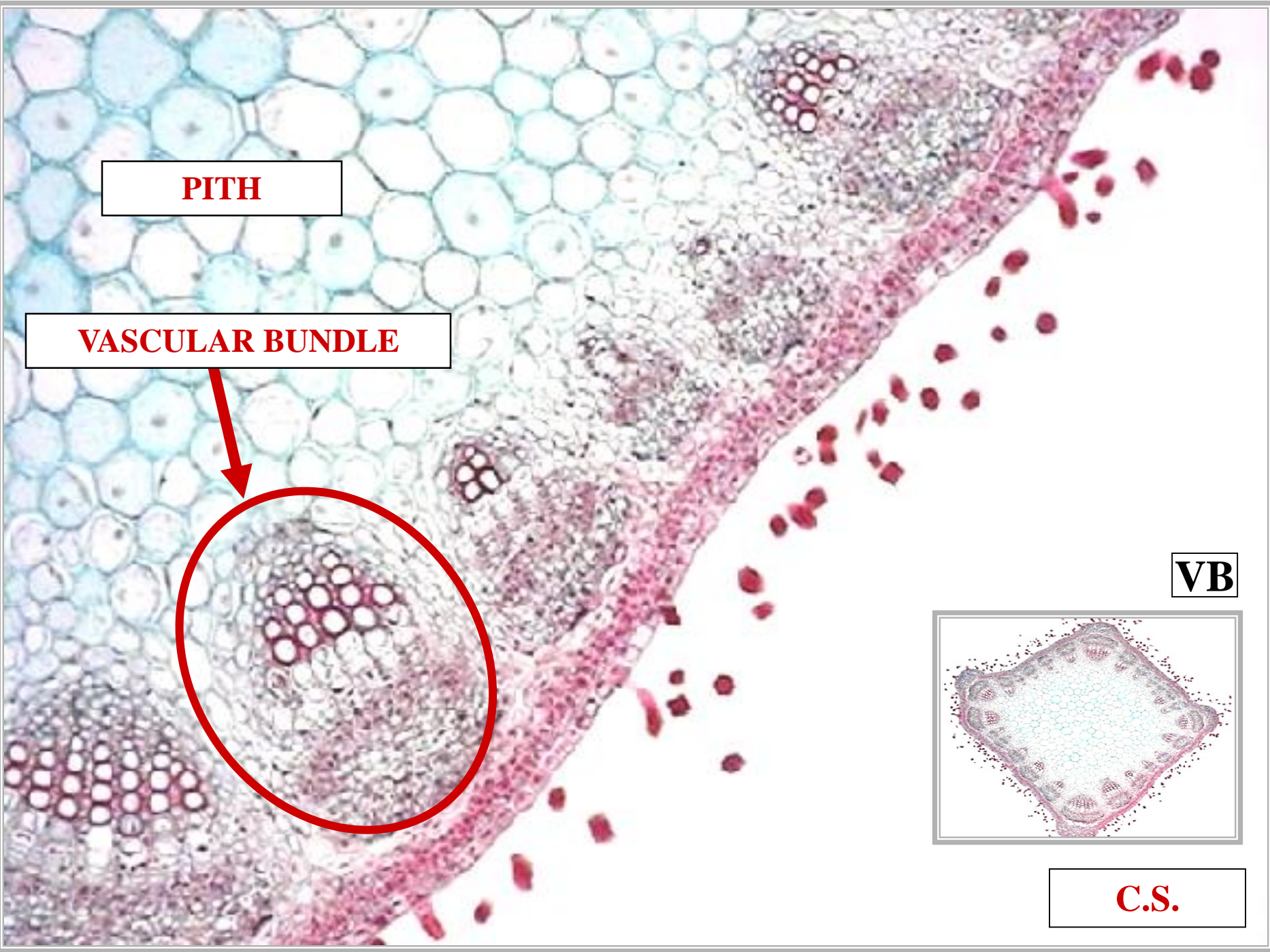
C.S.

PITH

VASCULAR BUNDLE

VB

C.S.



VASCULAR BUNDLE

**SIPHONOSTELE
EUSTELE
VASCULAR BUNDLES**

**XYLEM & PHLOEM
STRAND**

**SIPHONOSTELE
EUSTELE
VASCULAR BUNDLES**



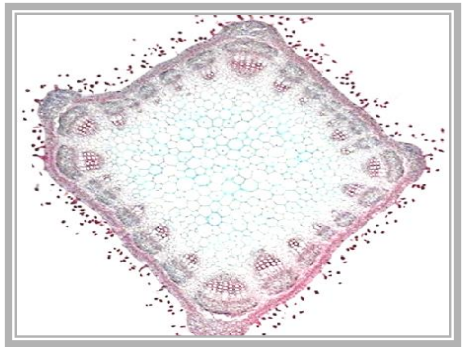
VB



PITH

VASCULAR BUNDLE

X



C.S.

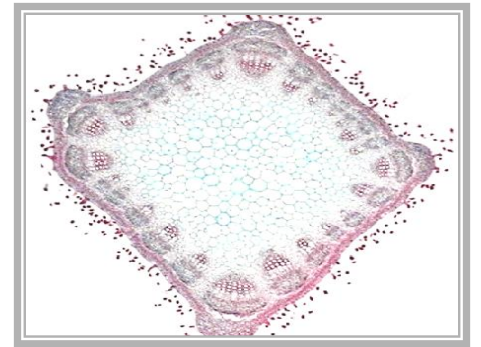


PITH

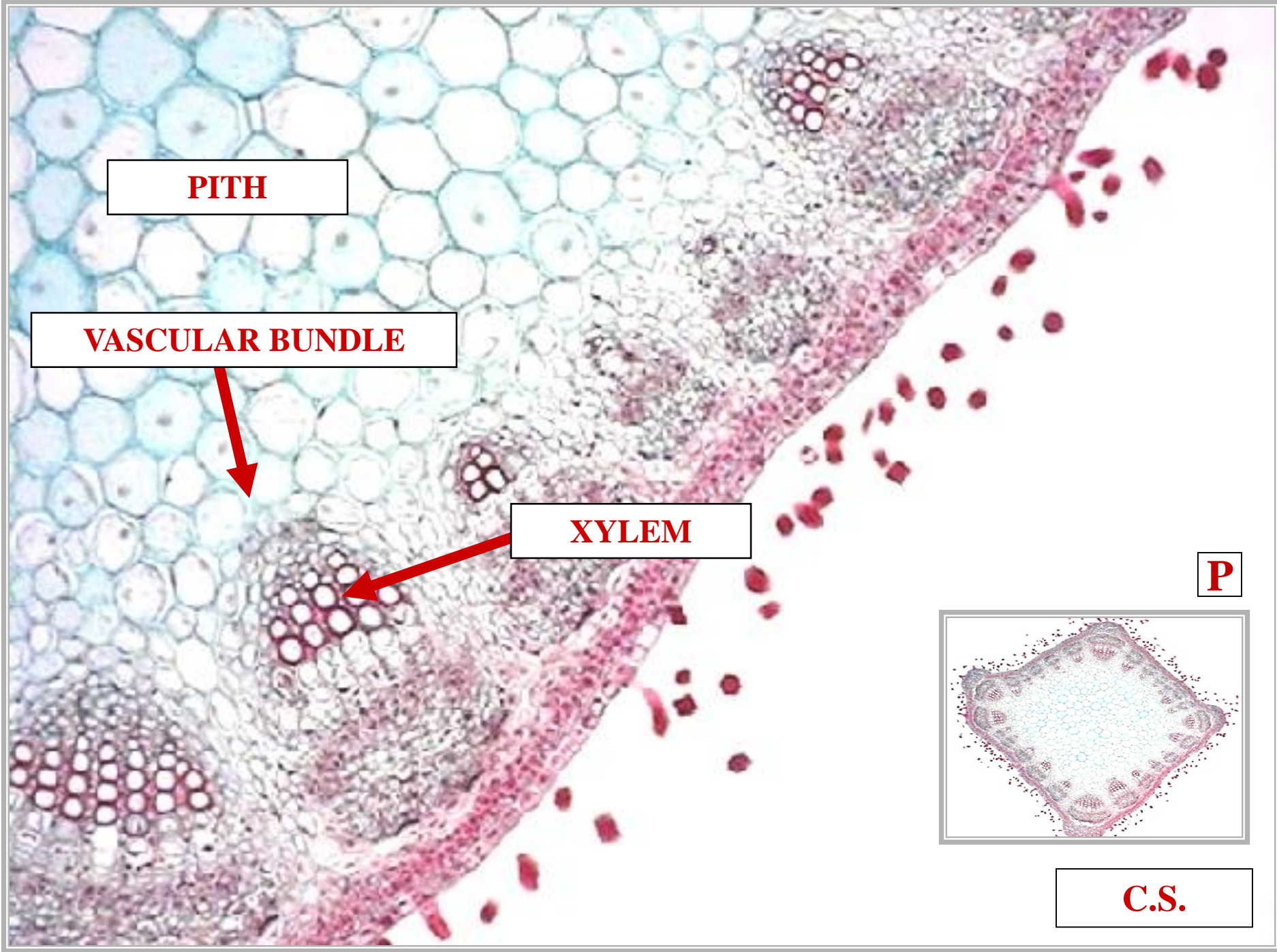
VASCULAR BUNDLE

XYLEM

P



C.S.



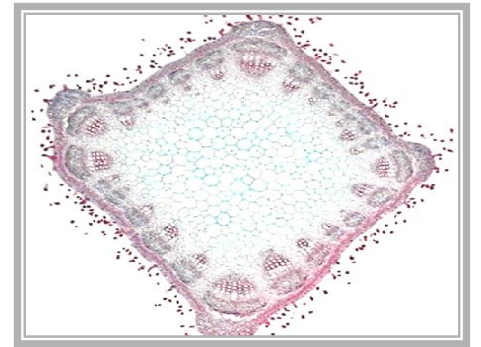
PITH

VASCULAR BUNDLE

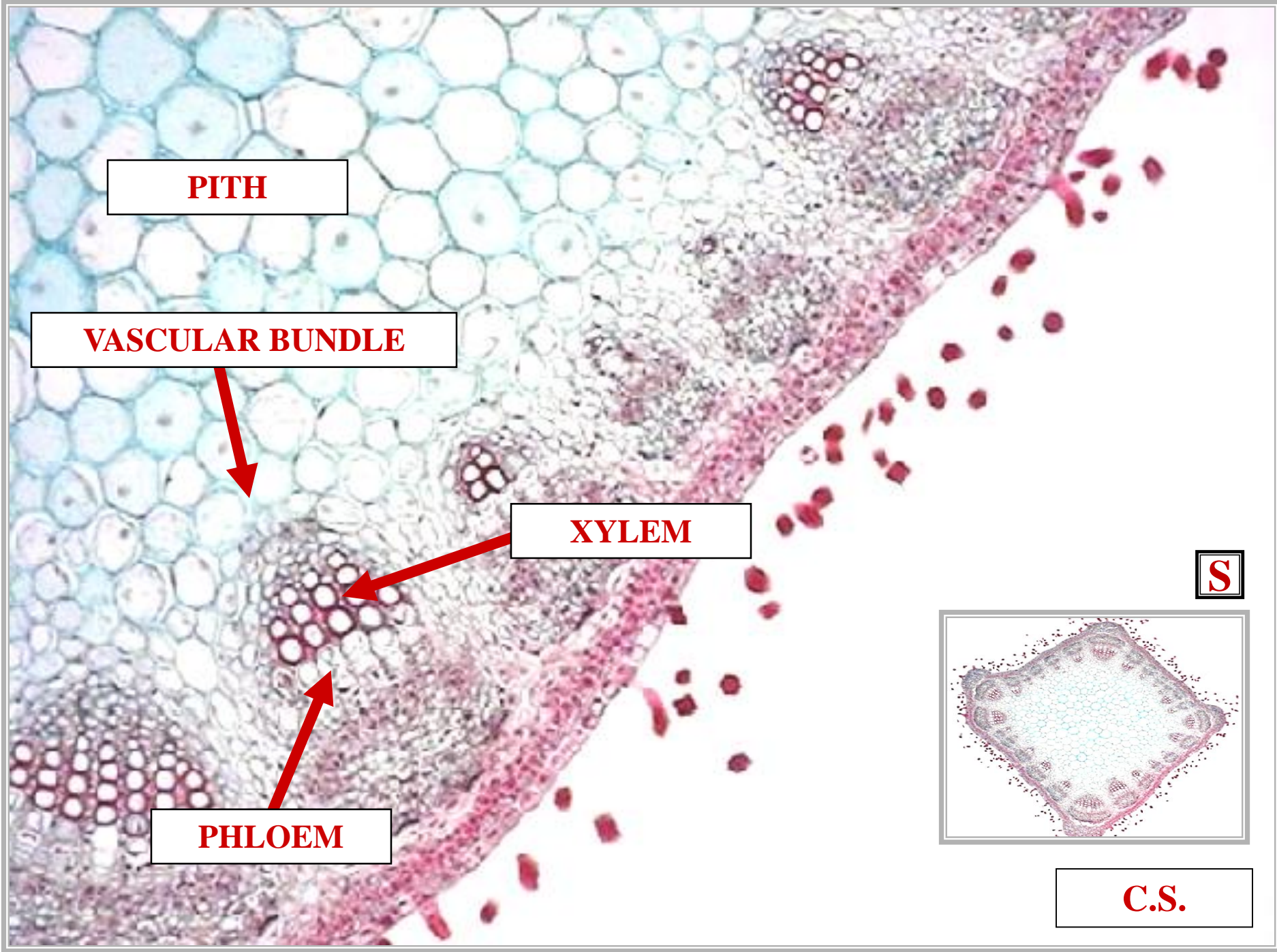
XYLEM

PHLOEM

S



C.S.



SIPHONOSTELE

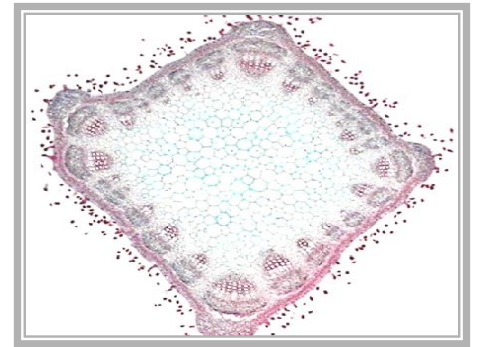
PITH

VASCULAR BUNDLE

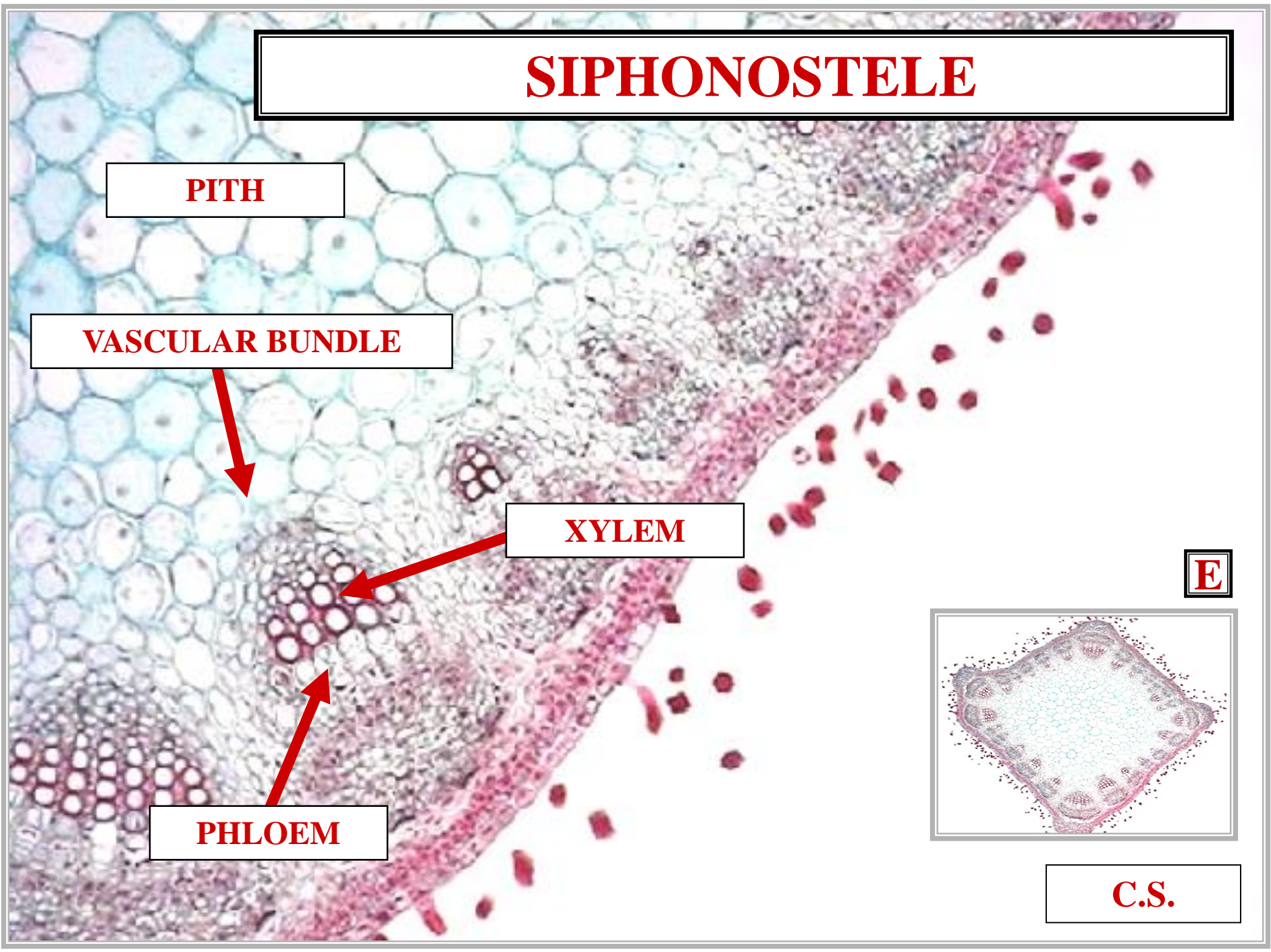
XYLEM

PHLOEM

E



C.S.



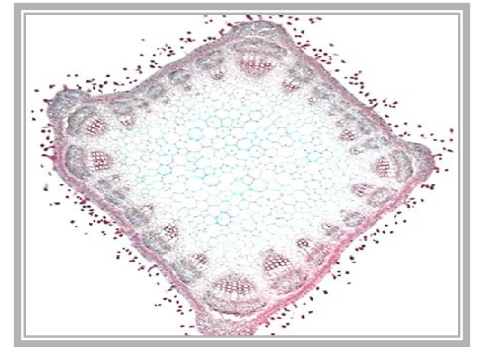
SIPHONOSTELE / EUSTELE

PITH

VASCULAR BUNDLE

XYLEM

PHLOEM



C.S.



ATACTOSTELE

ATACTOSTELE

VASCULAR STELE
ATACTOSTELE

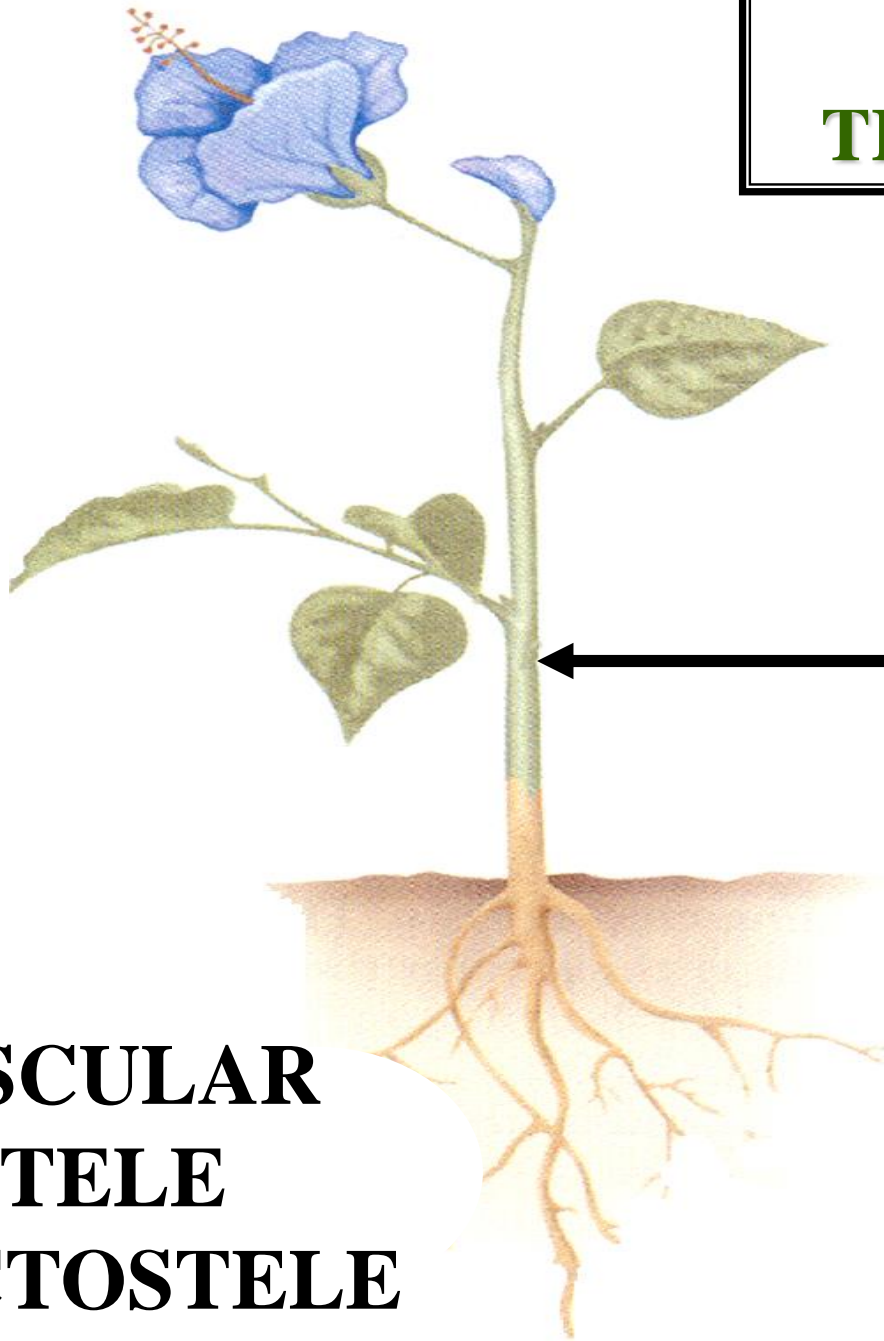


ST

SCATTERED
VASCULAR BUNDLES

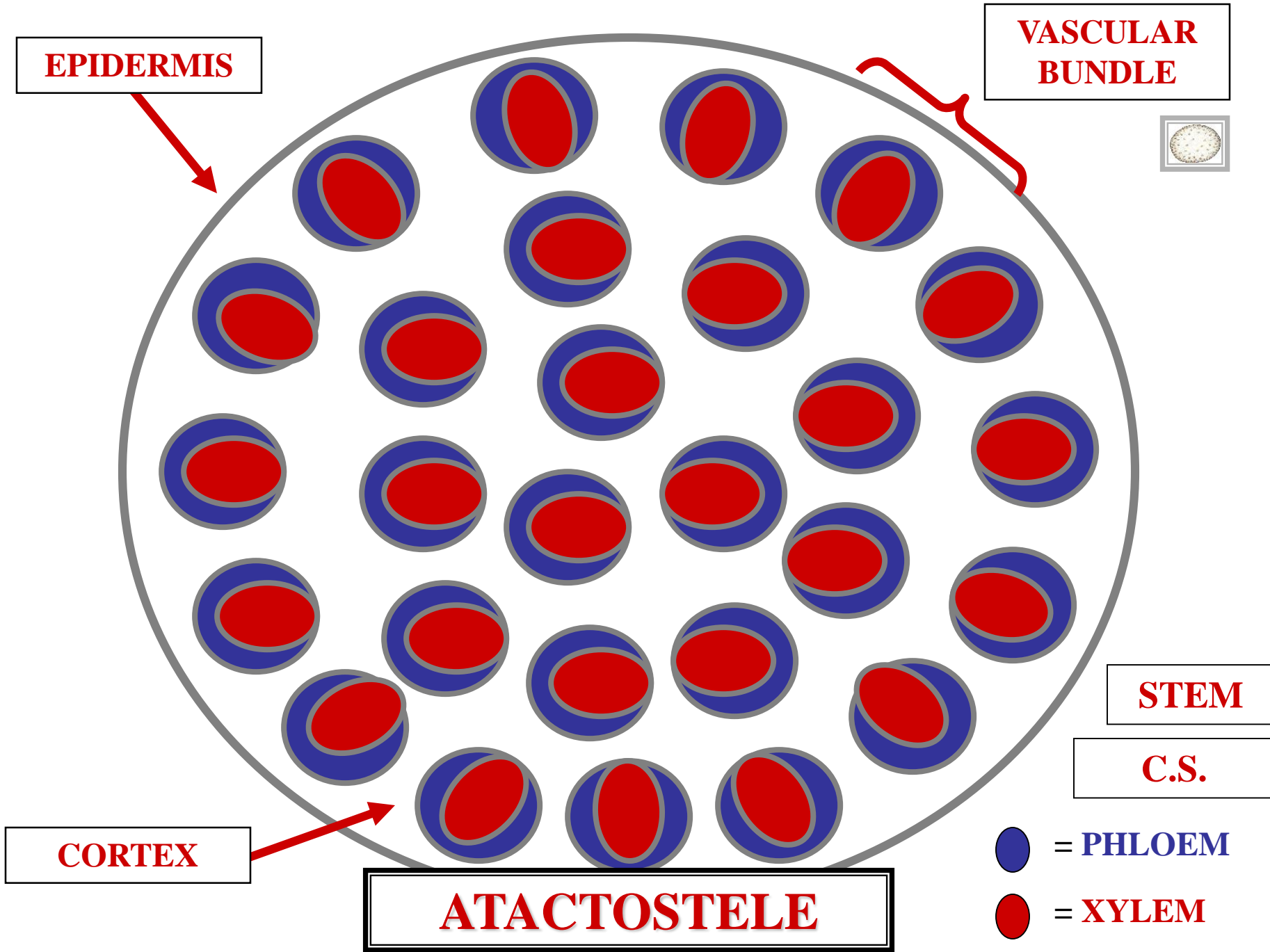
VASCULAR STELE
ATACTOSTELE

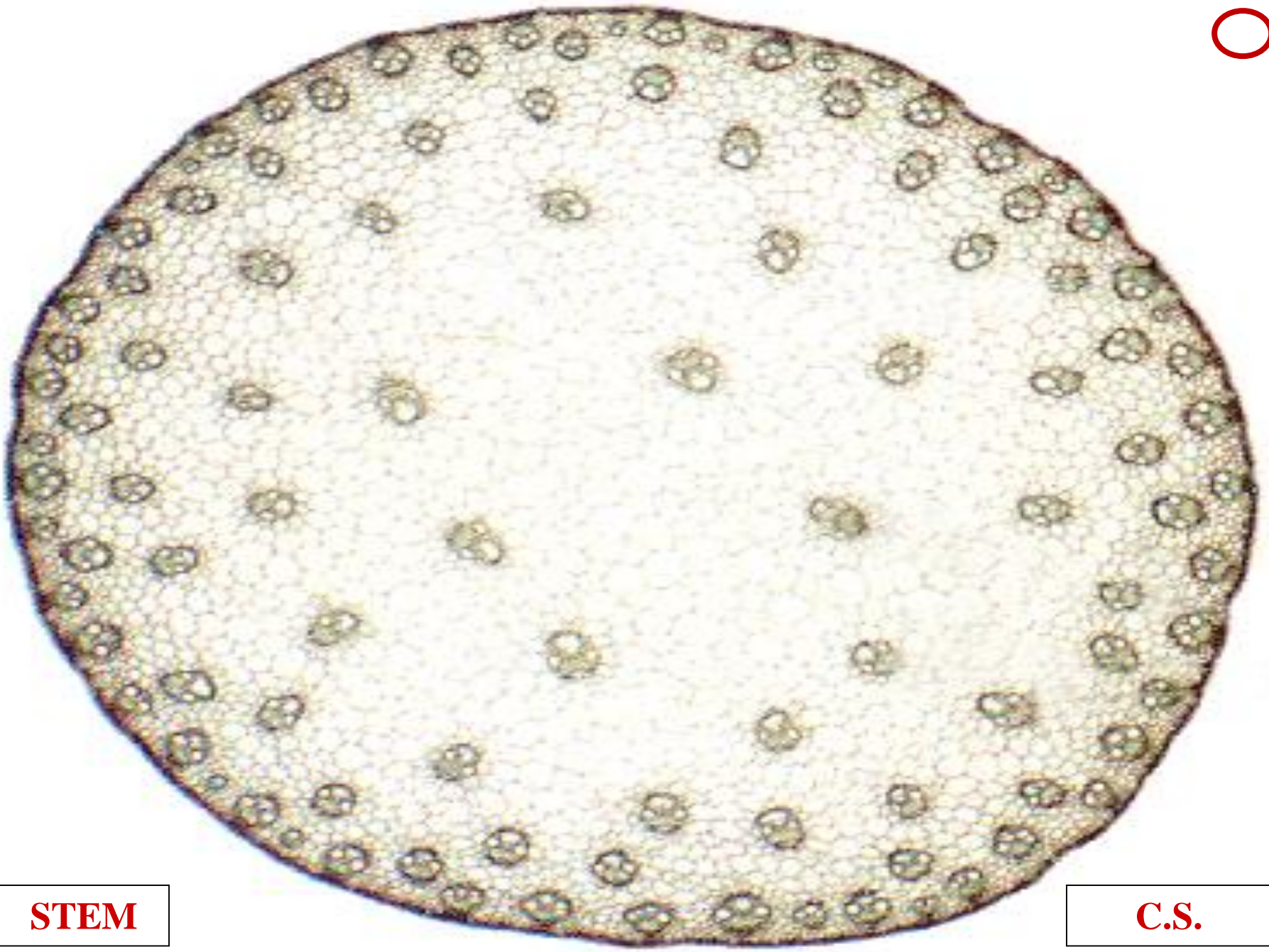
**TYPICAL
TRACHEOPHYTE**



STEM

**VASCULAR
STELE
ATACTOSTELE**

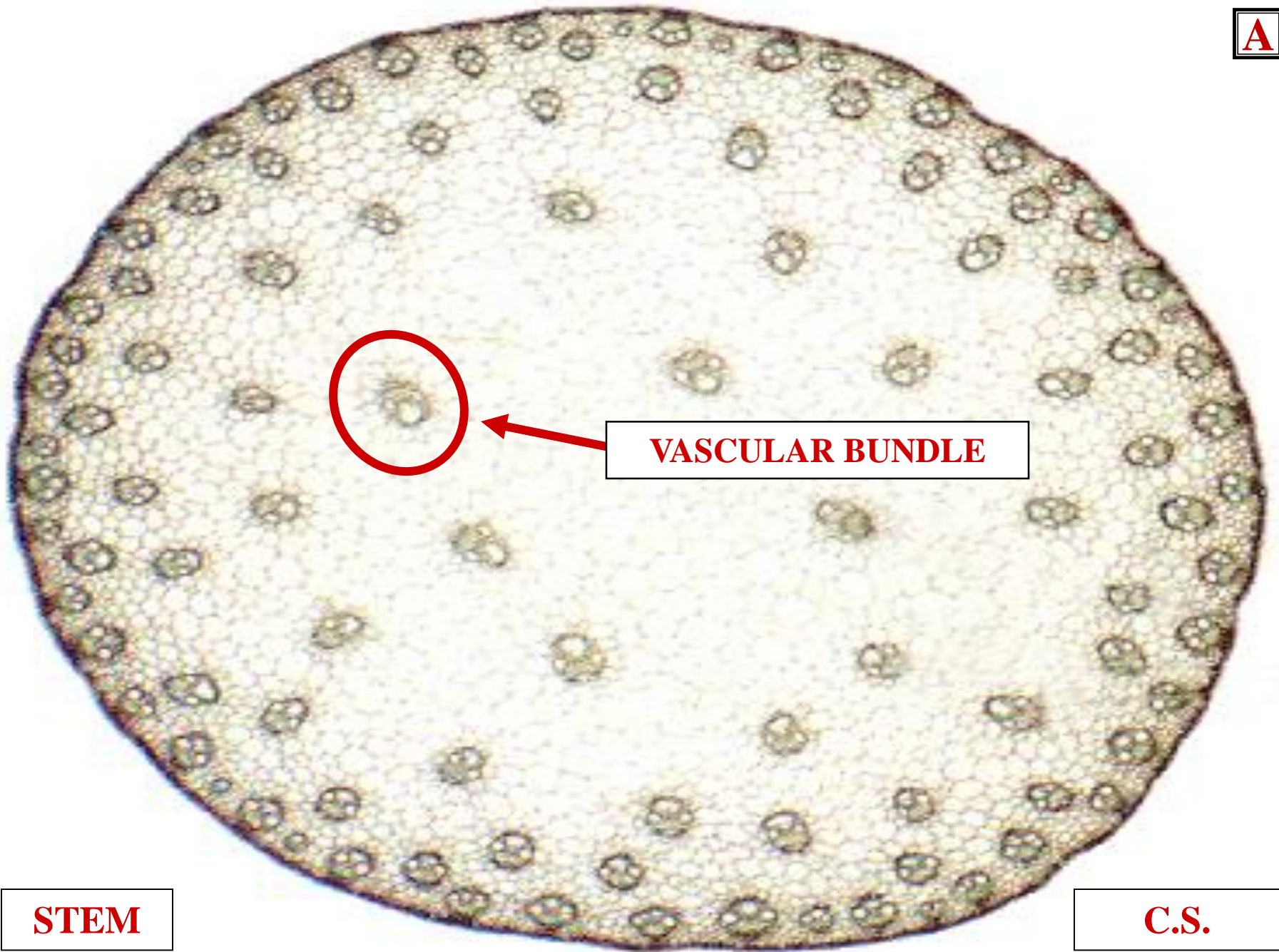




STEM

C.S.

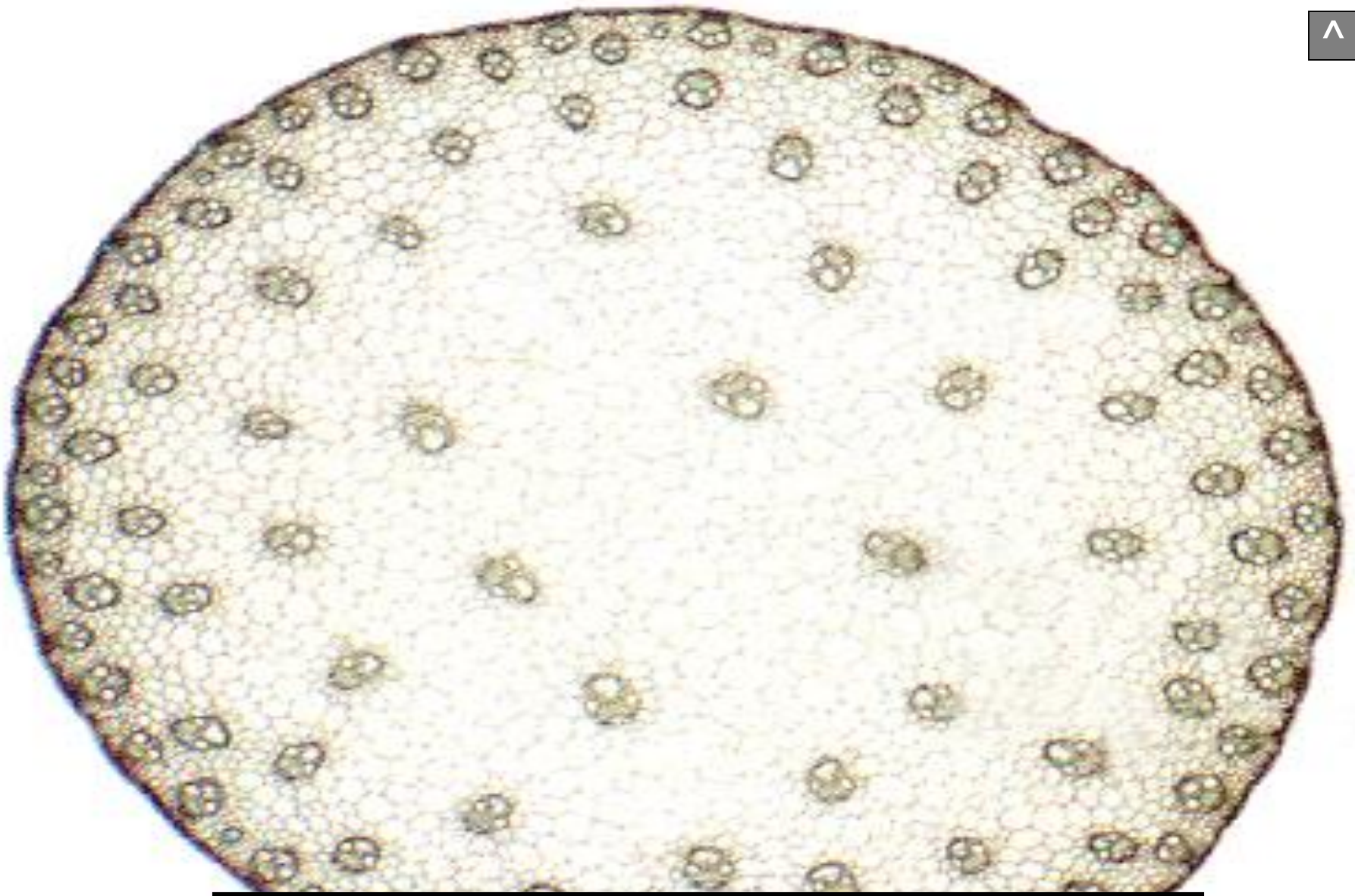
A



STEM

VASCULAR BUNDLE

C.S.



ATACTOSTELE



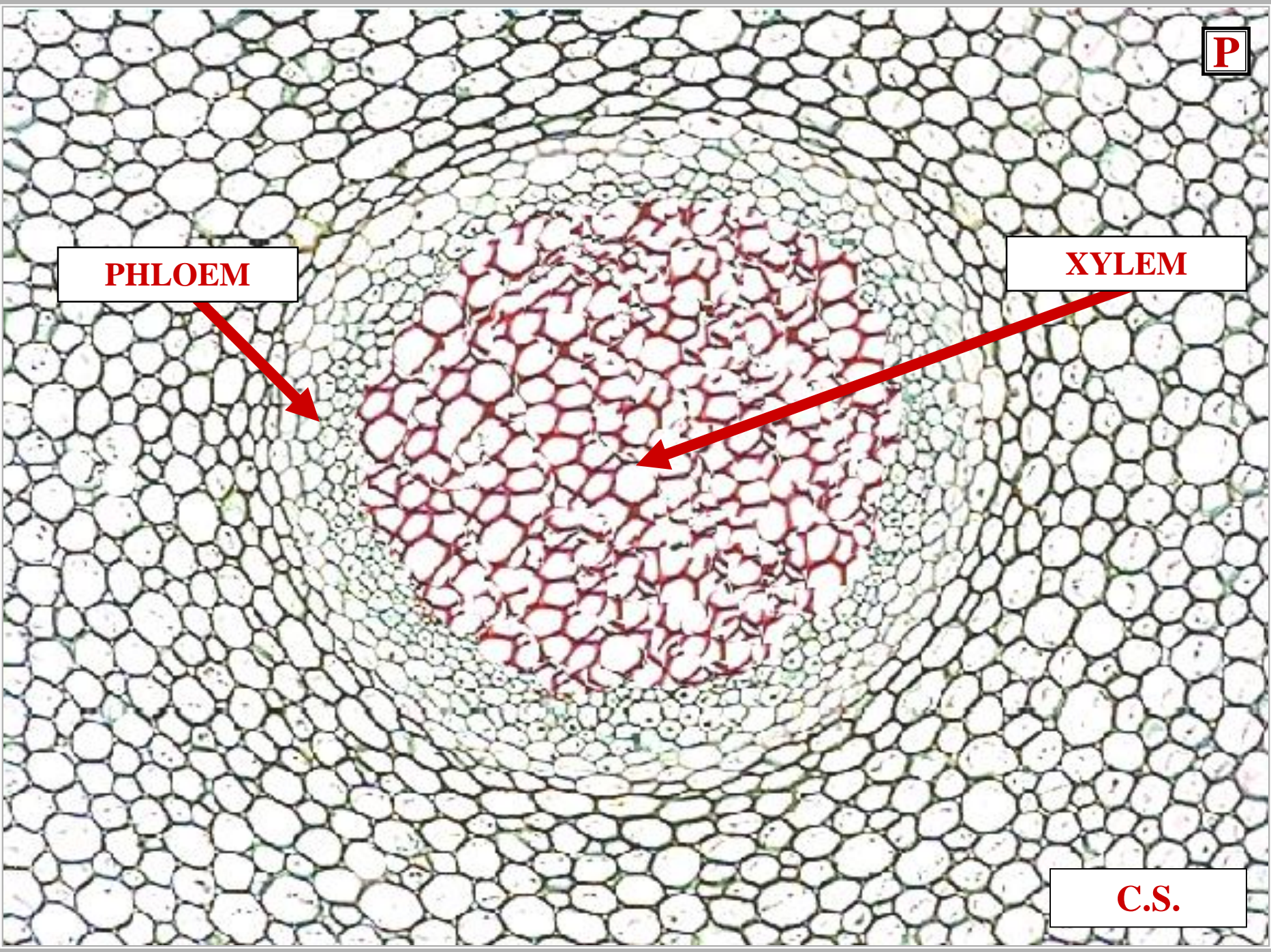
TRACHEOPHYTE STELE TYPES SUMMARY

P

PHLOEM

XYLEM

C.S.

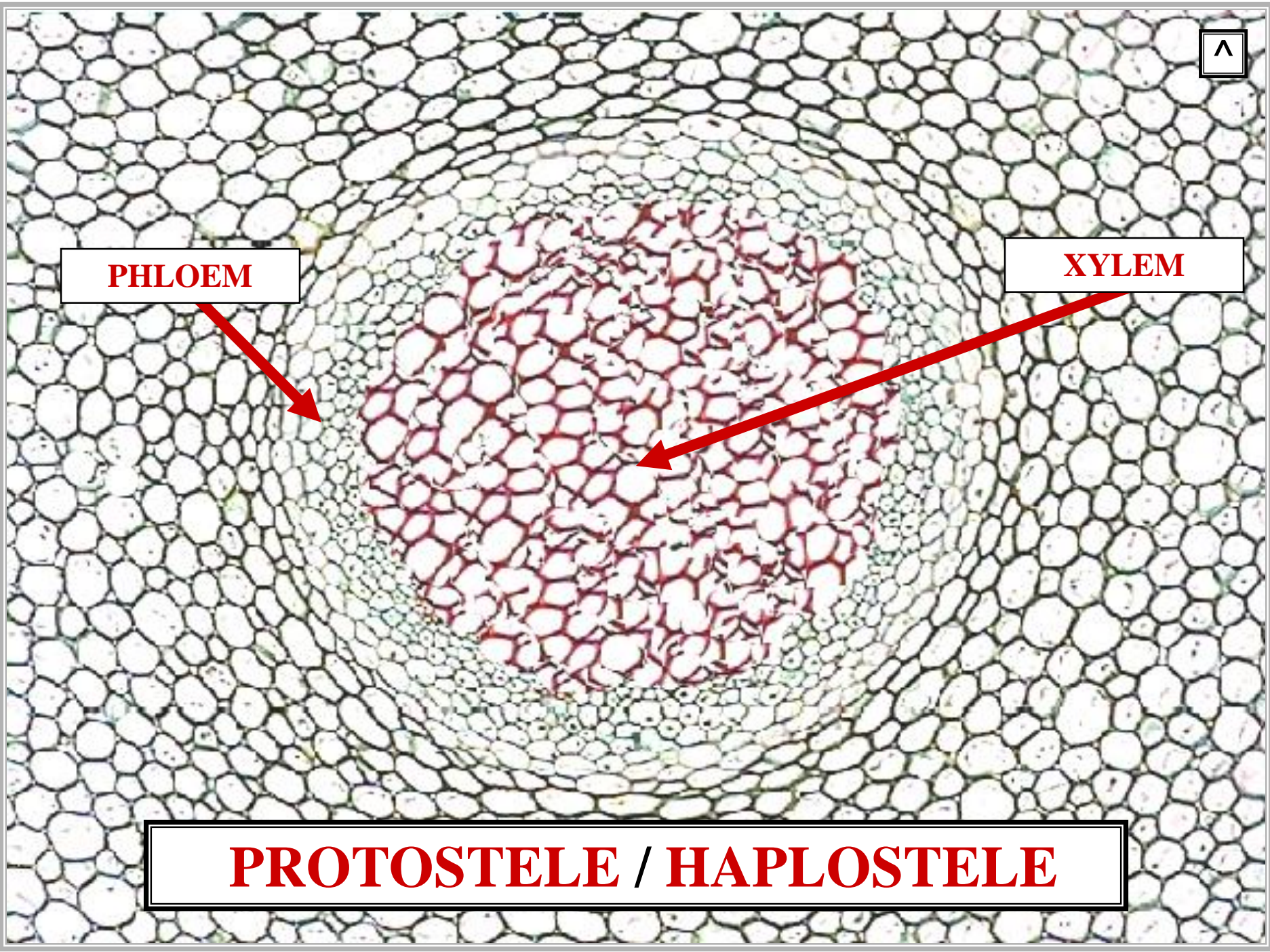




PHLOEM

XYLEM

PROTOSTELE / HAPLOSTELE

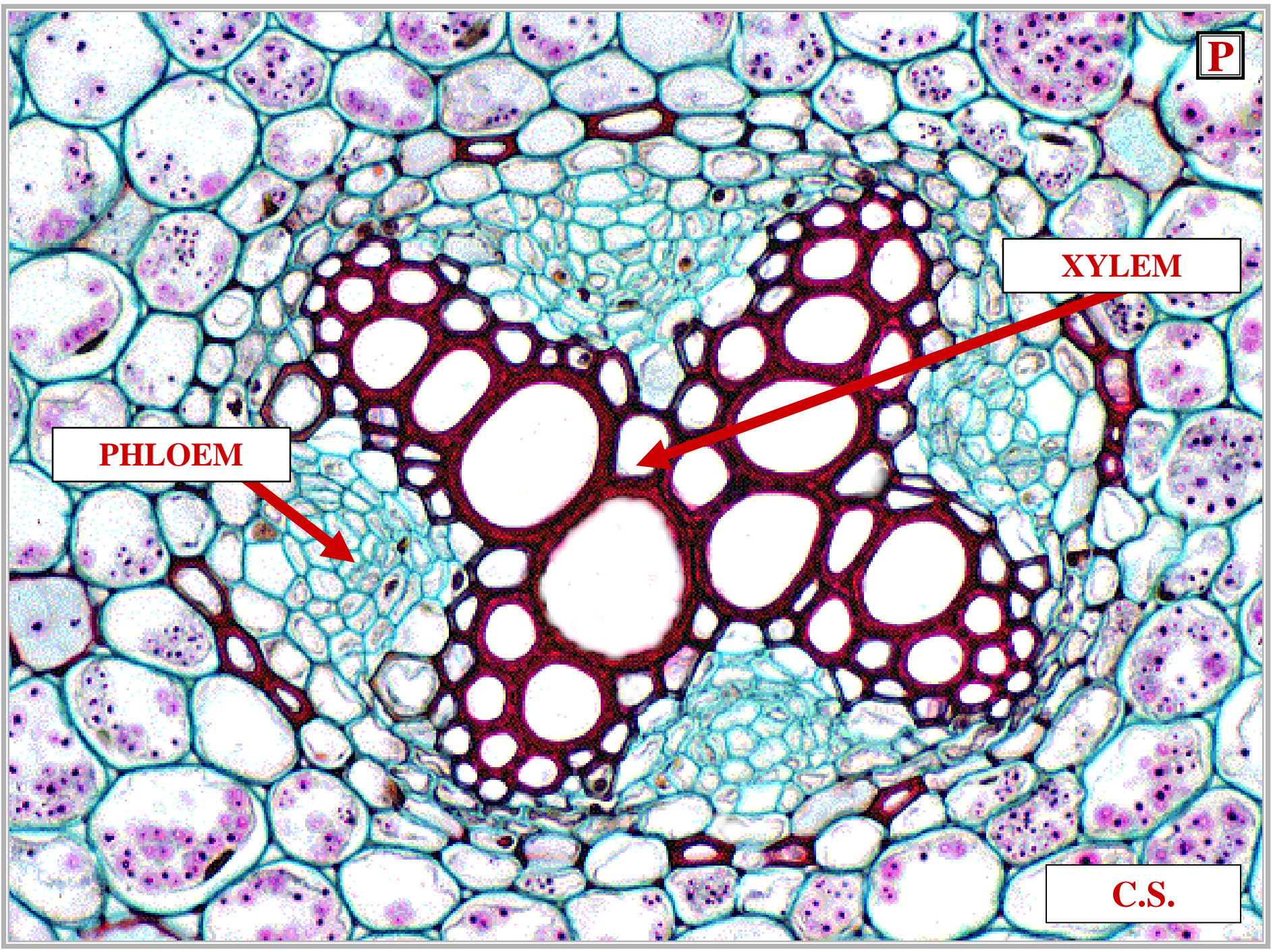


P

XYLEM

PHLOEM

C.S.

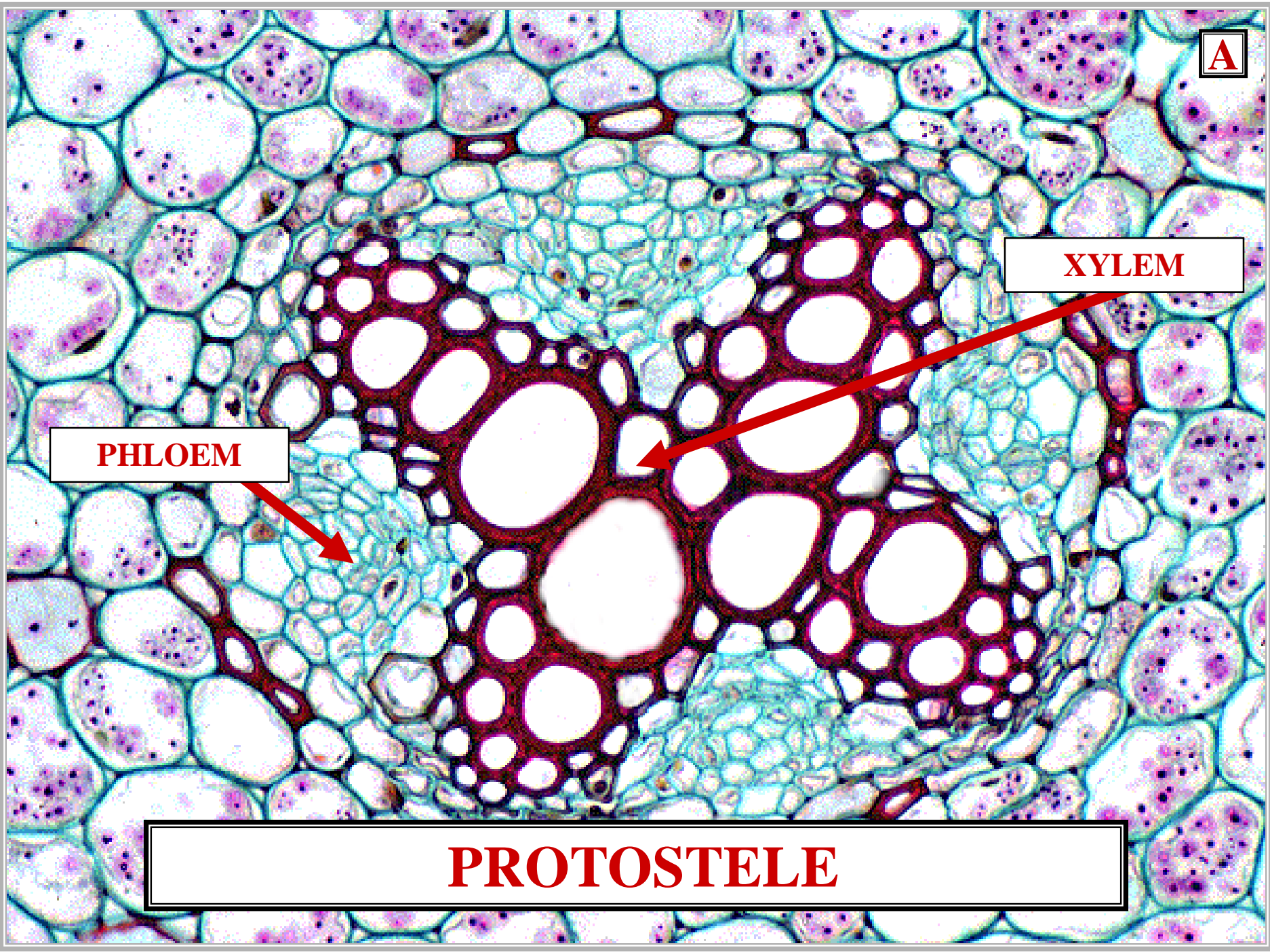


A

XYLEM

PHLOEM

PROTOSTELE

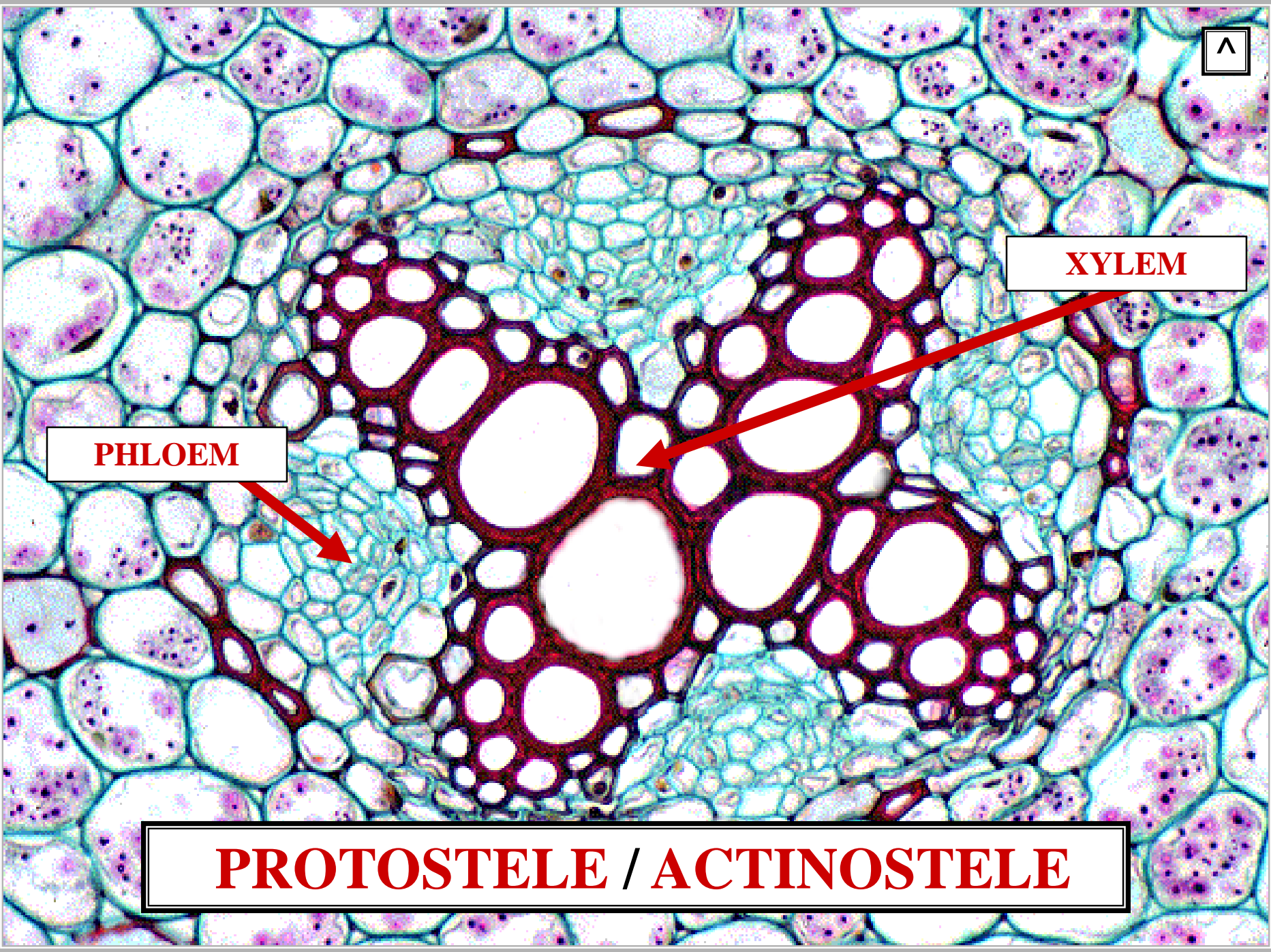




XYLEM

PHLOEM

PROTOSTELE / ACTINOSTELE

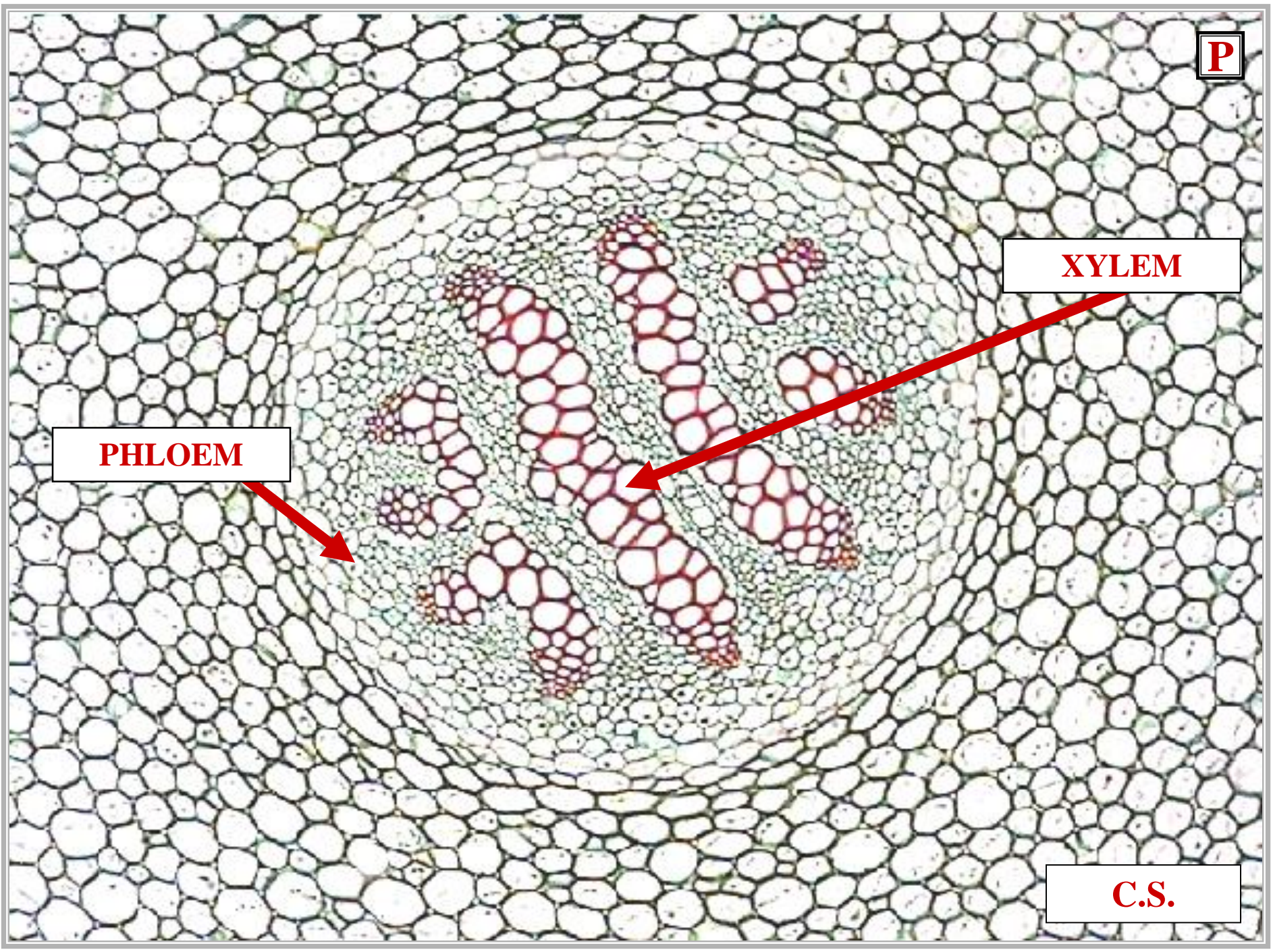


P

XYLEM

PHLOEM

C.S.

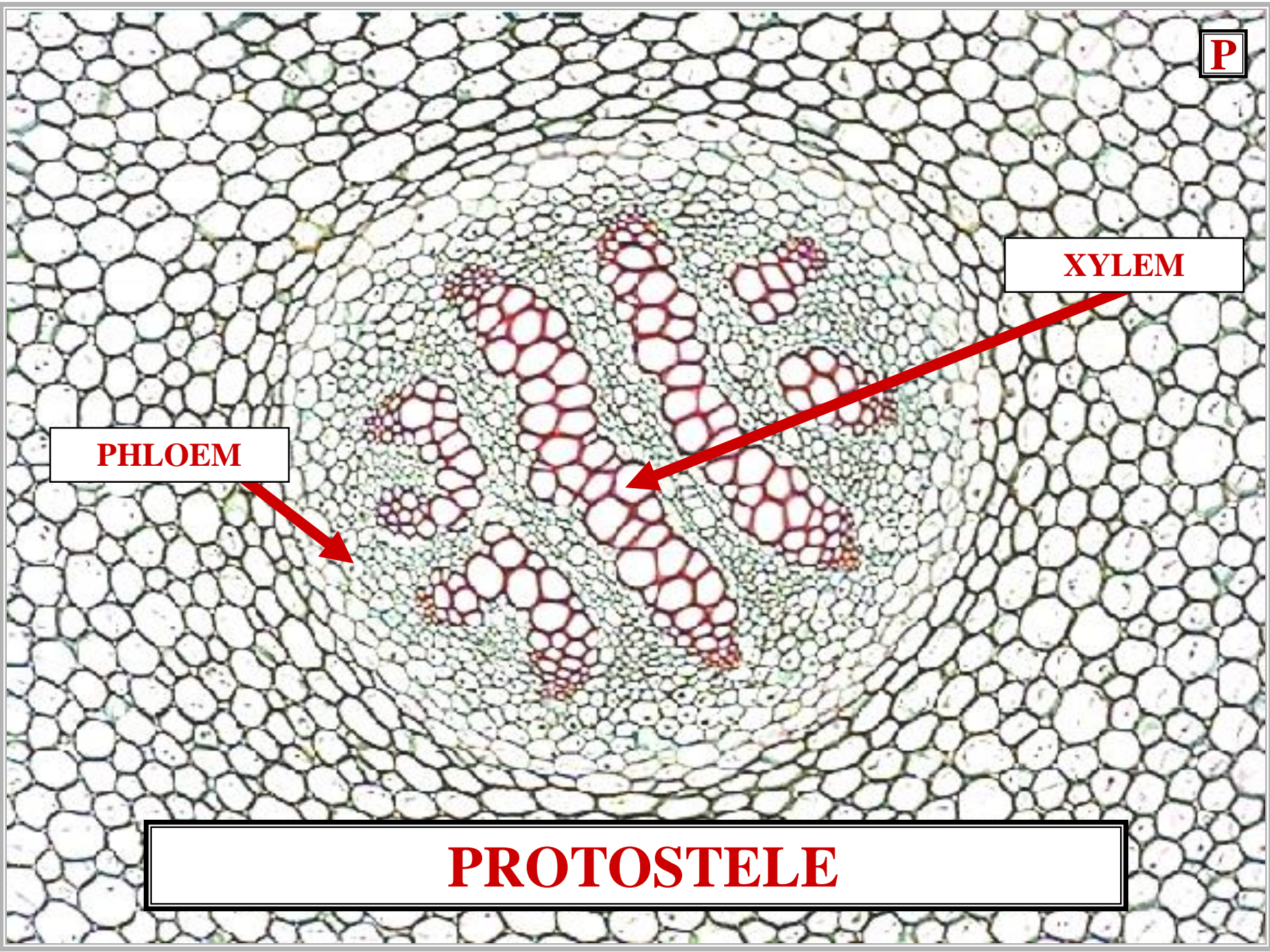


P

XYLEM

PHLOEM

PROTOSTELE

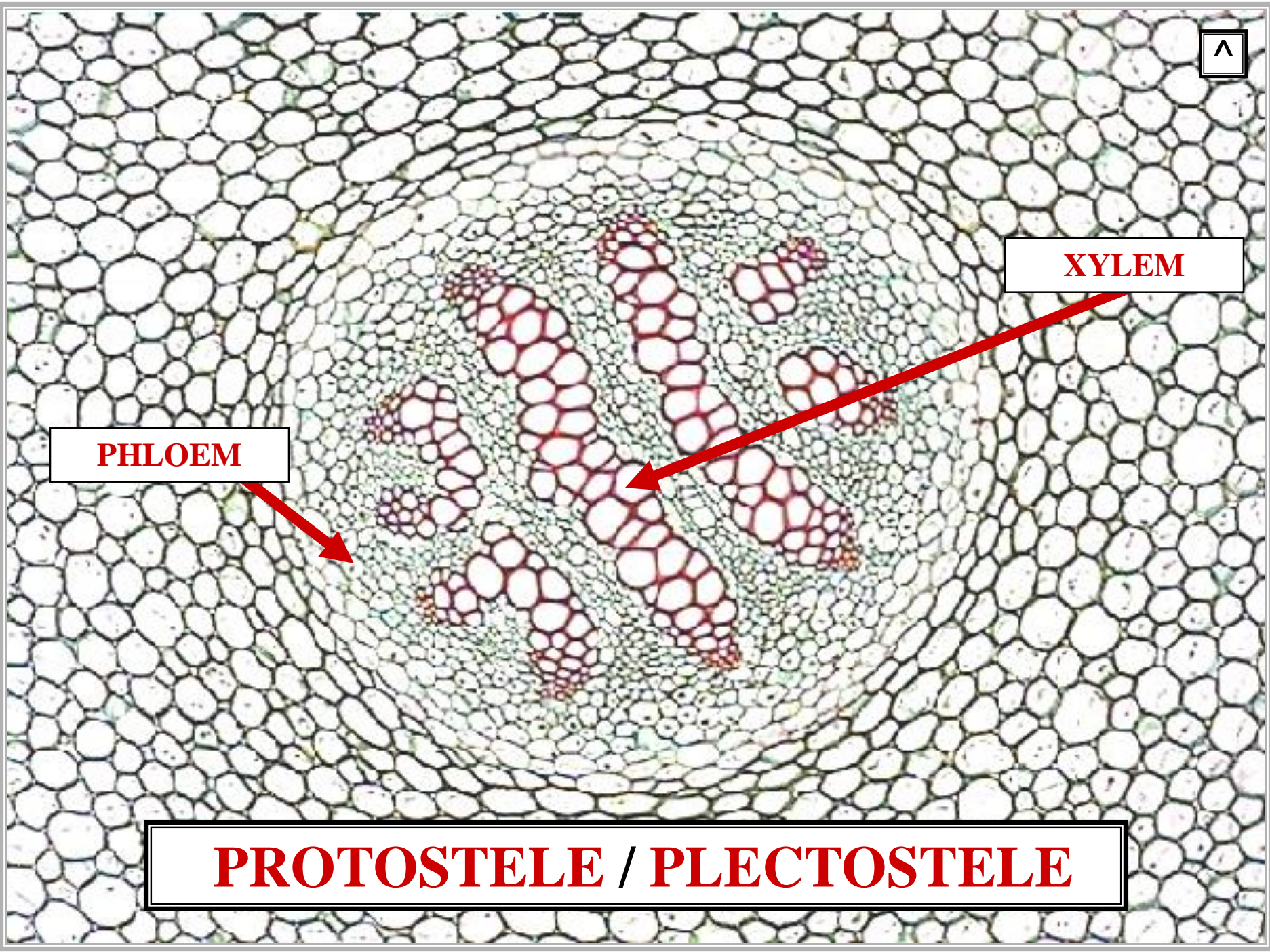




XYLEM

PHLOEM

PROTOSTELE / PLECTOSTELE



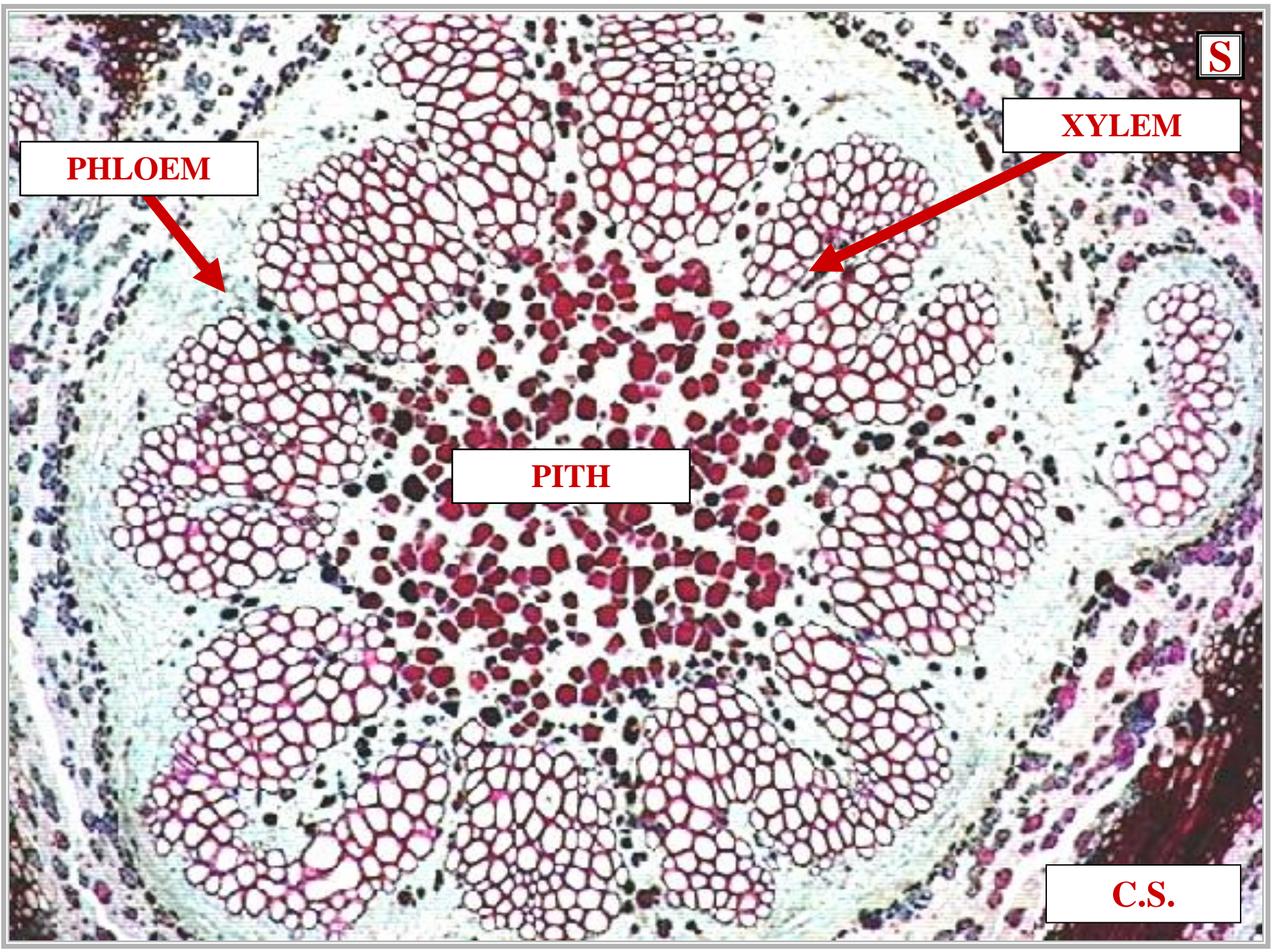
S

XYLEM

PHLOEM

PITH

C.S.



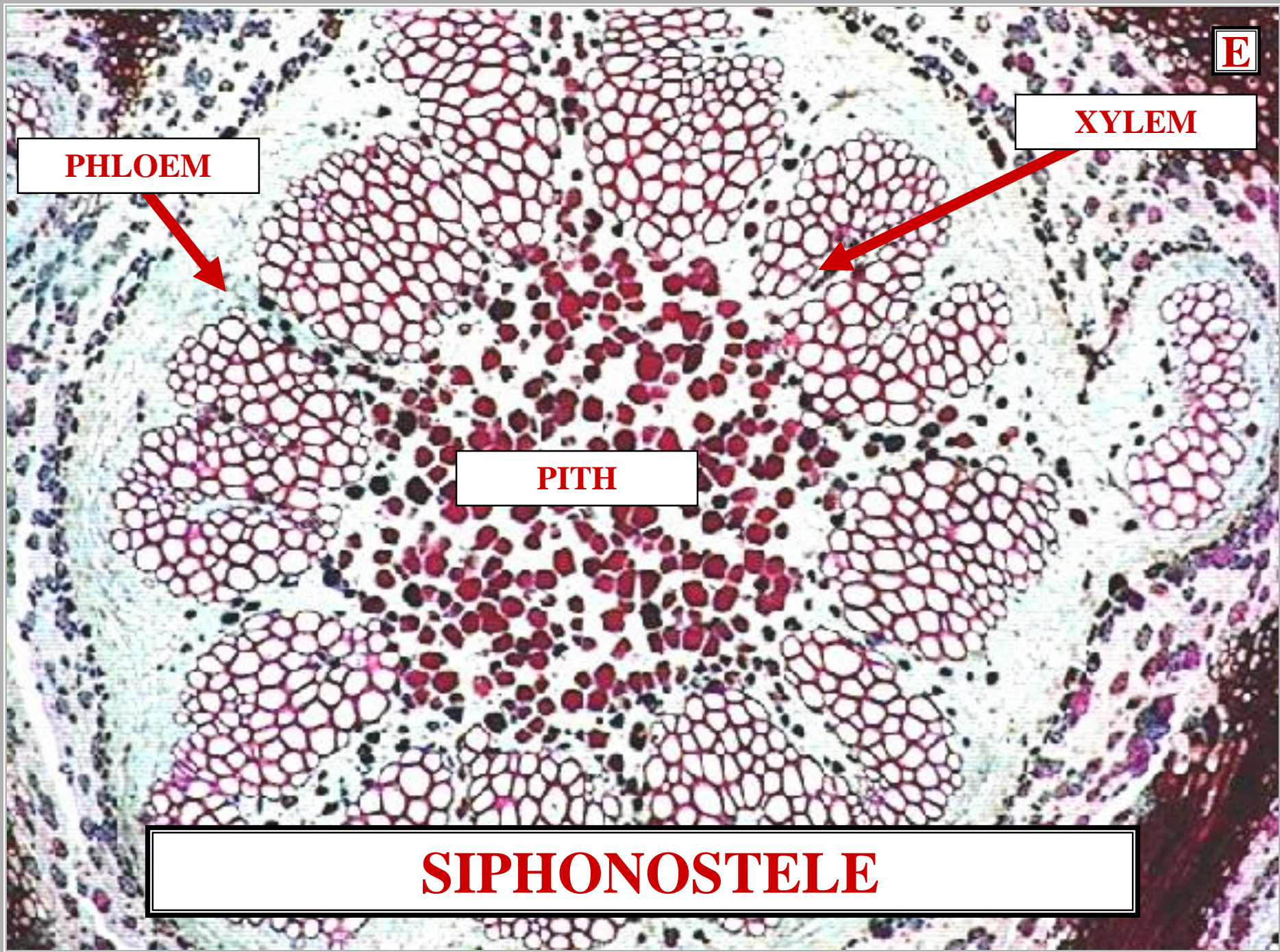
E

PHLOEM

XYLEM

PITH

SIPHONOSTELE



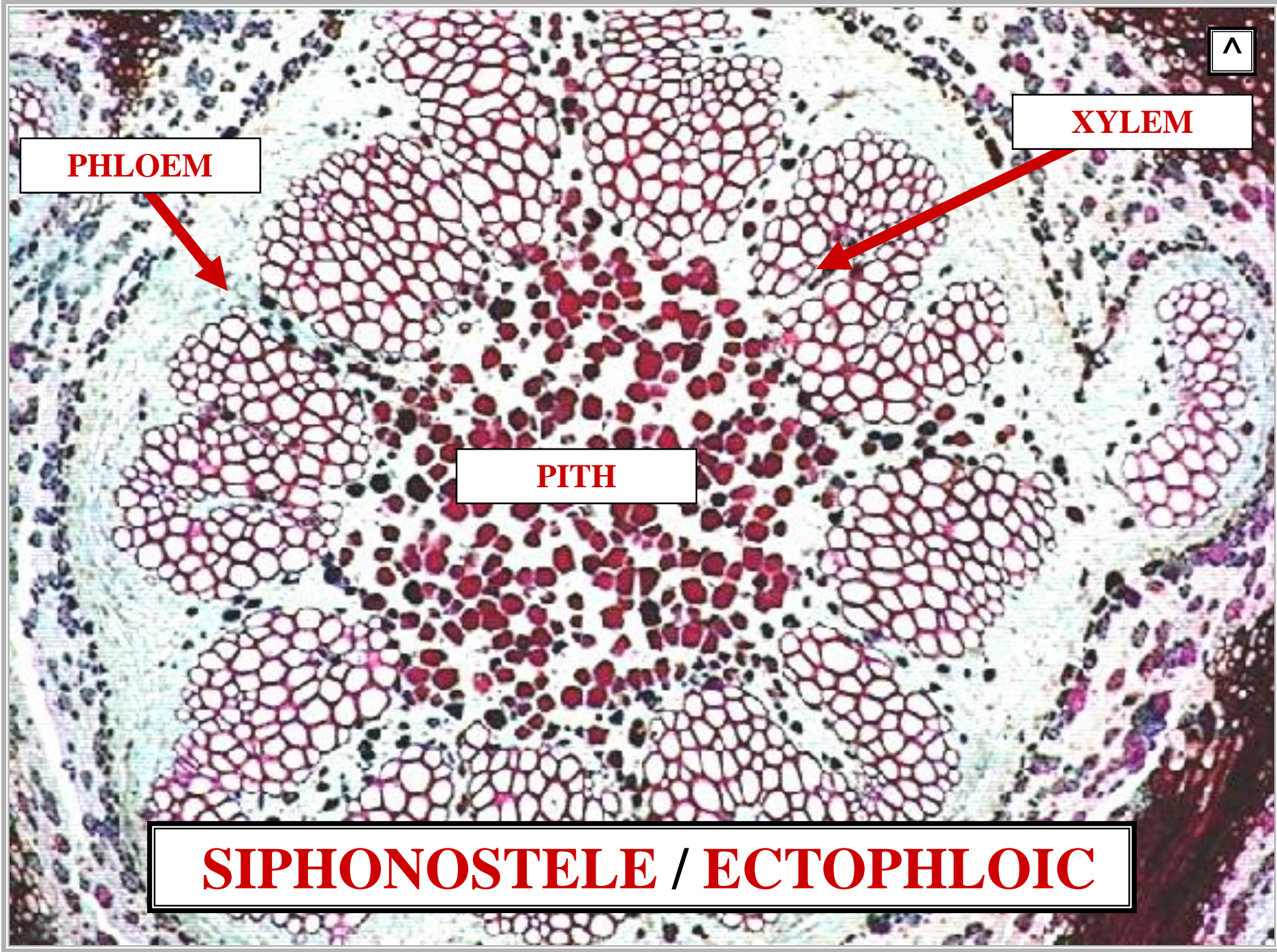


PHLOEM

XYLEM

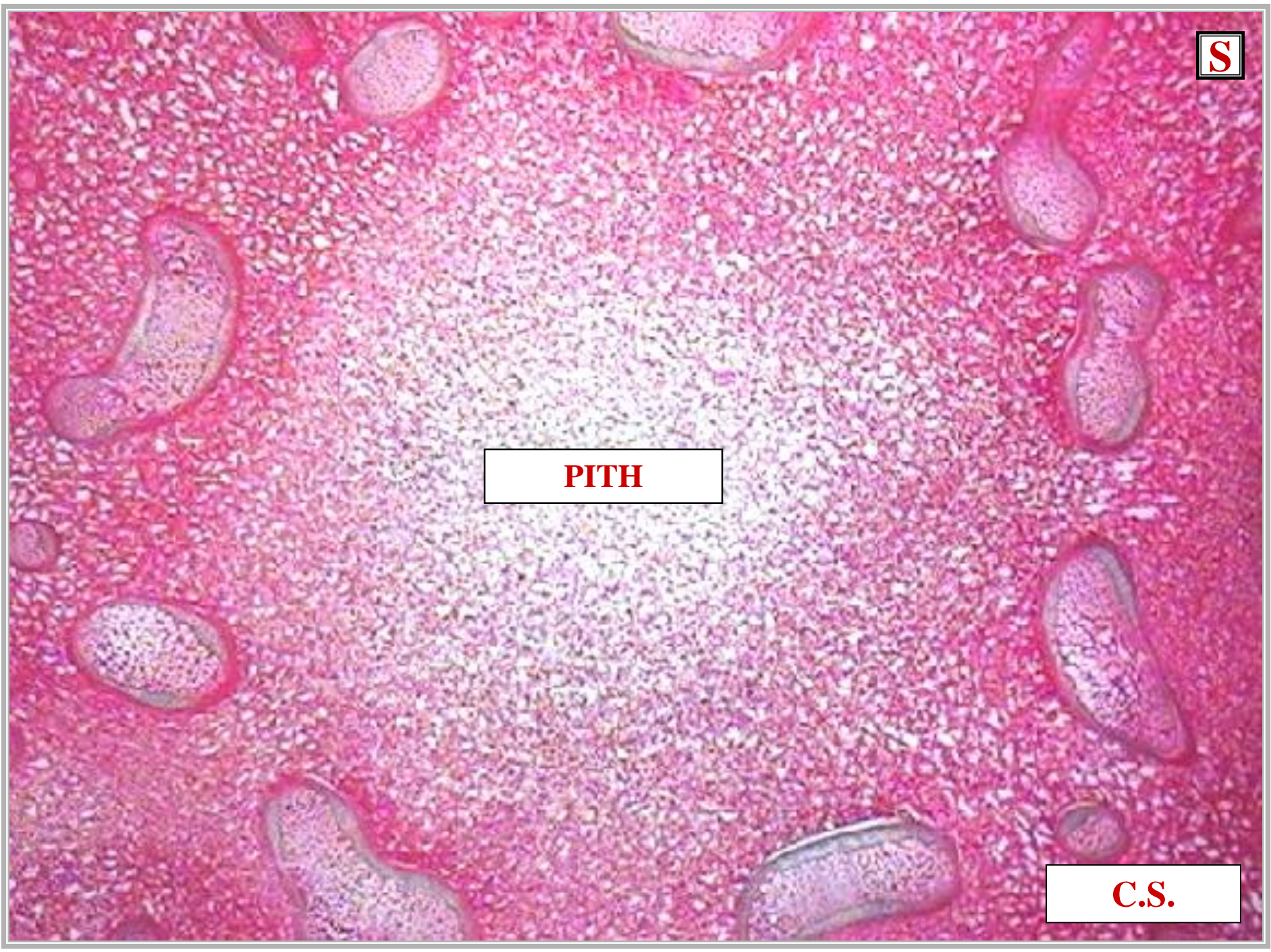
PITH

SIPHONOSTELE / ECTOPHLOIC



PITH

C.S.





PITH

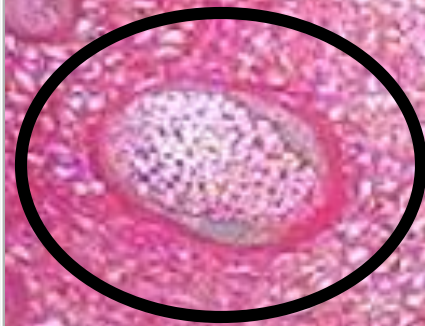
SIPHONOSTELE



PITH

VASCULAR TISSUE

SIPHONOSTELE



PITH

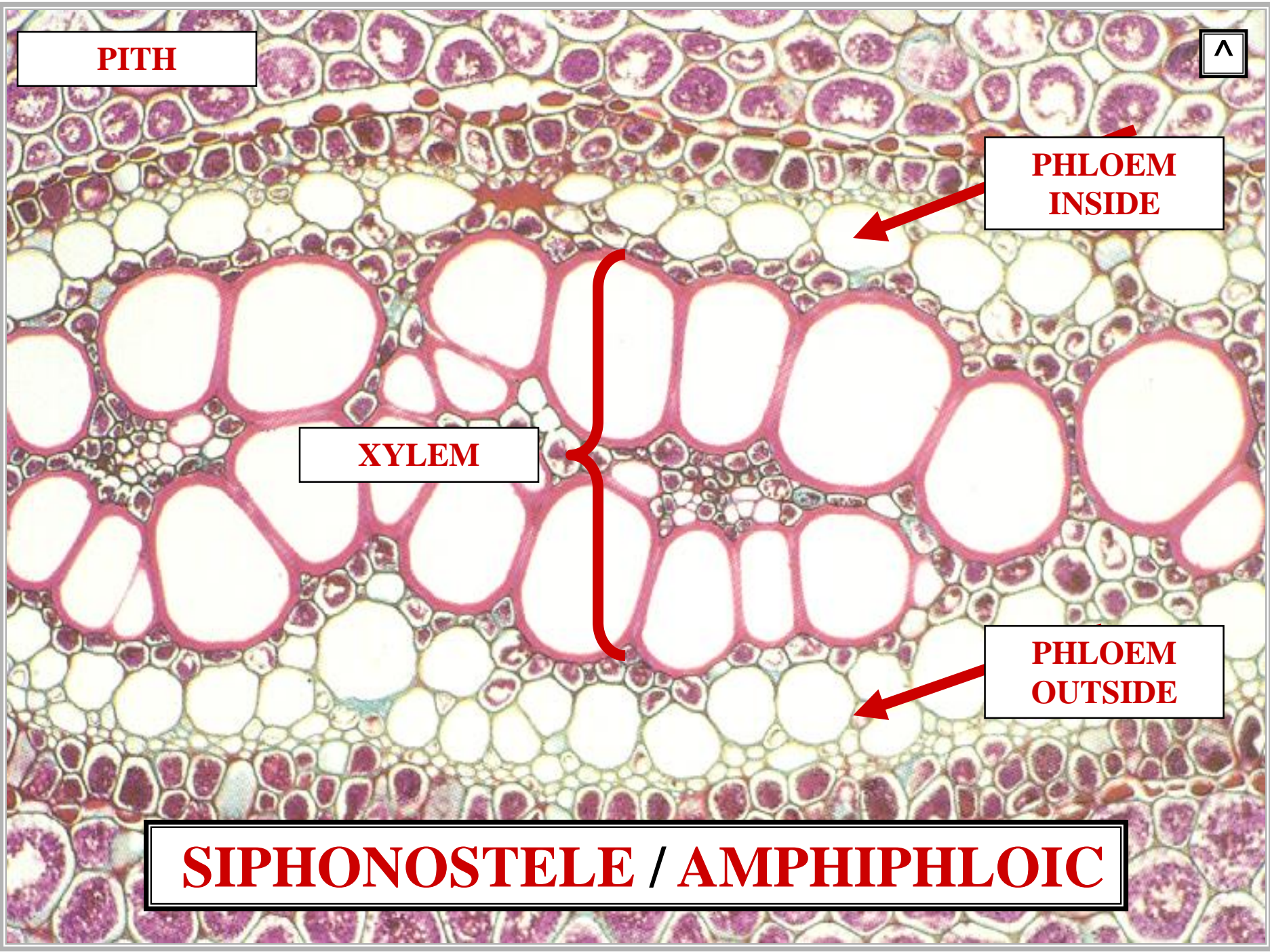
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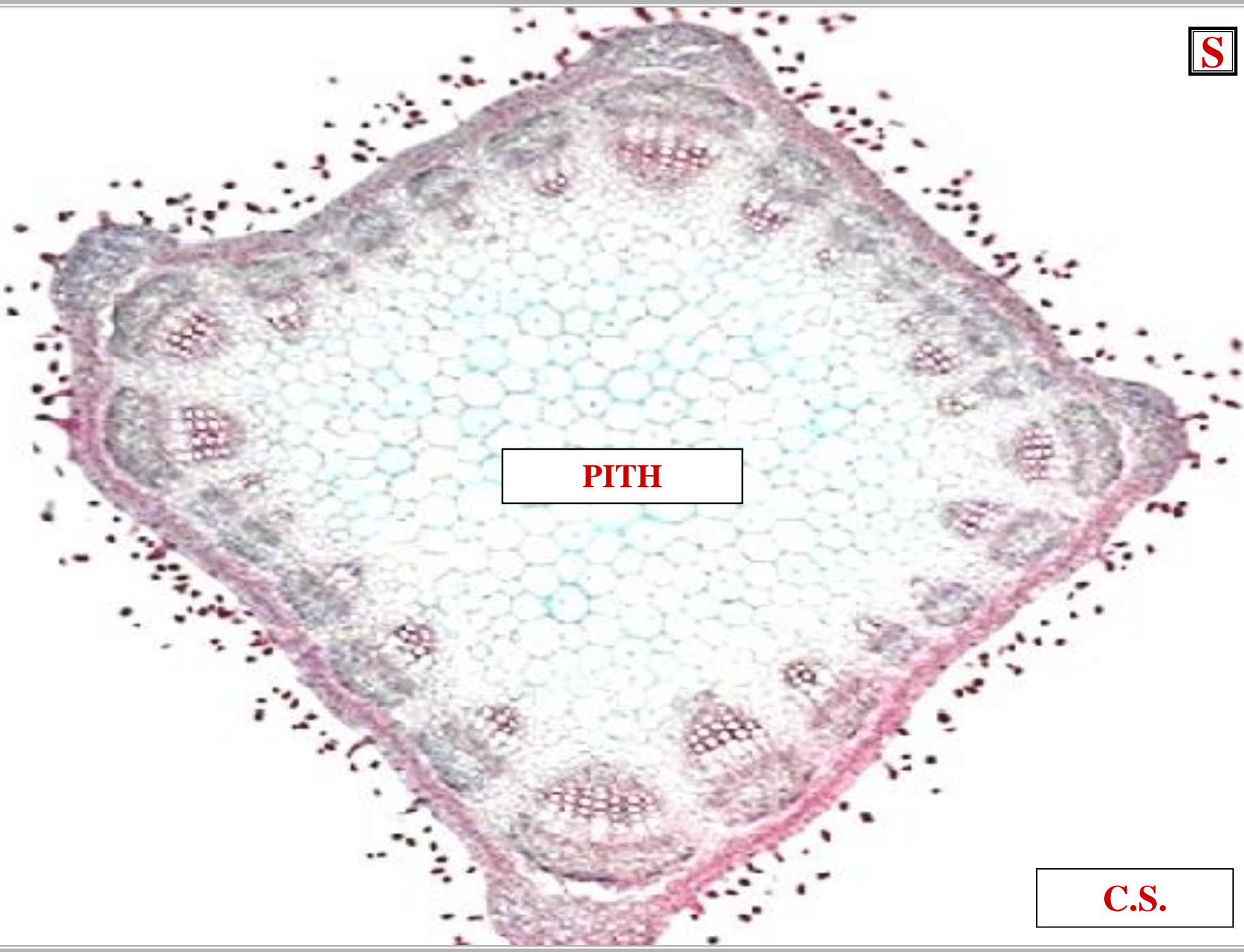
**PHLOEM
INSIDE**

XYLEM

**PHLOEM
OUTSIDE**

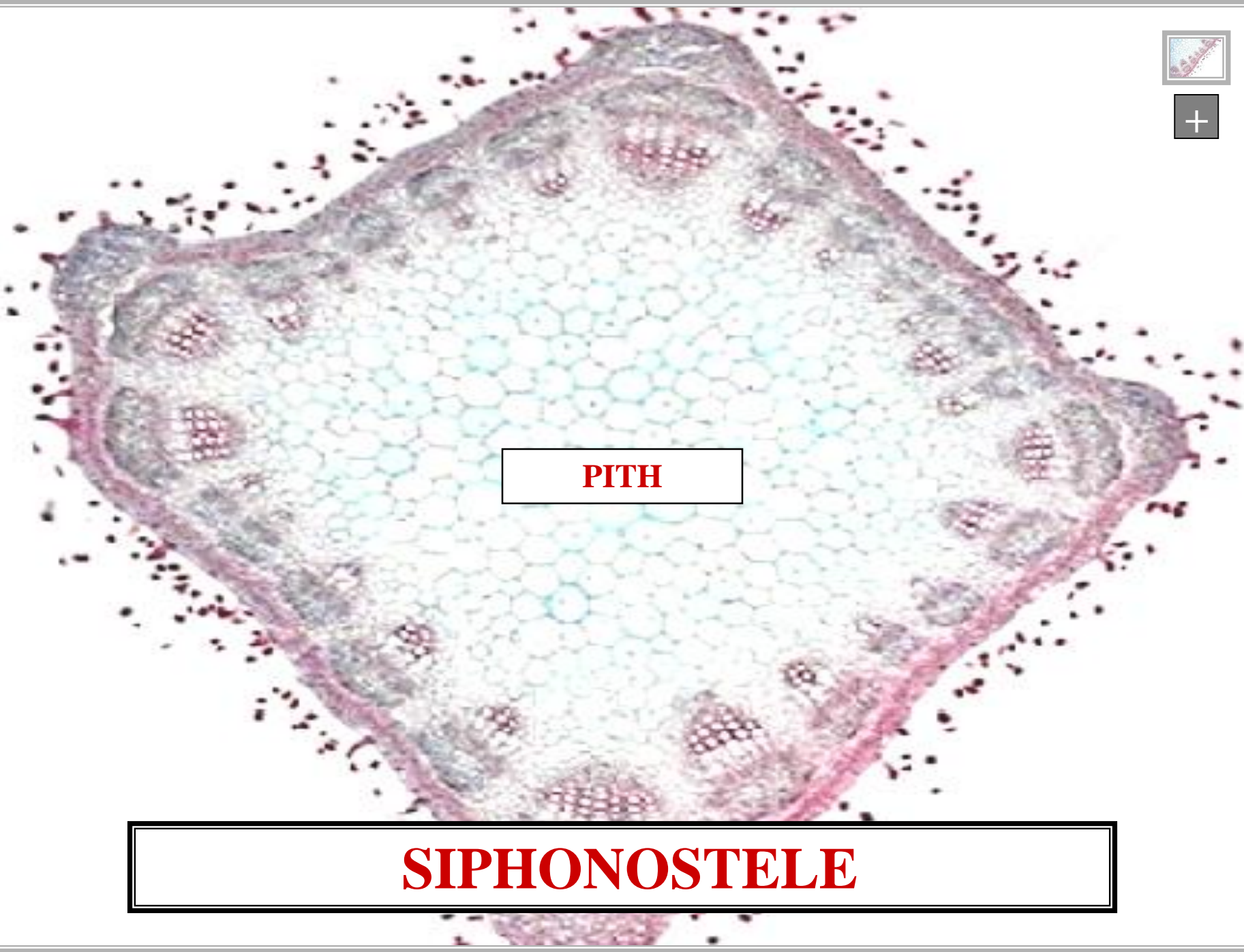
SIPHONOSTELE / AMPHIPHLOIC





PITH

C.S.



PITH

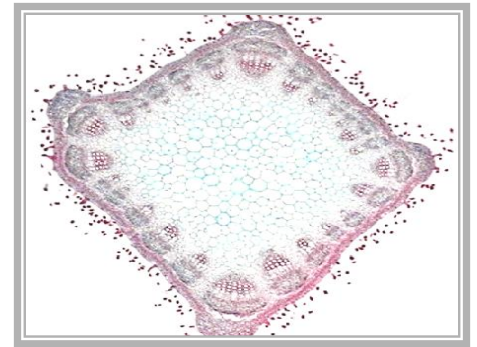
SIPHONOSTELE

SIPHONOSTELE

PITH

VASCULAR BUNDLE

E



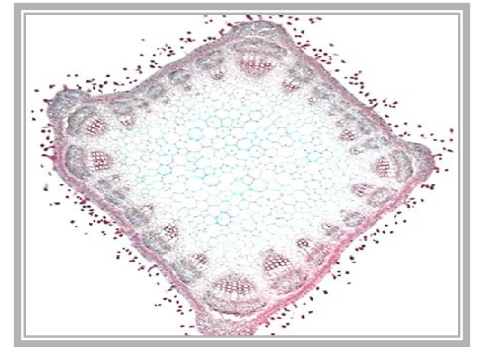
C.S.

SIPHONOSTELE / EUSTELE

PITH

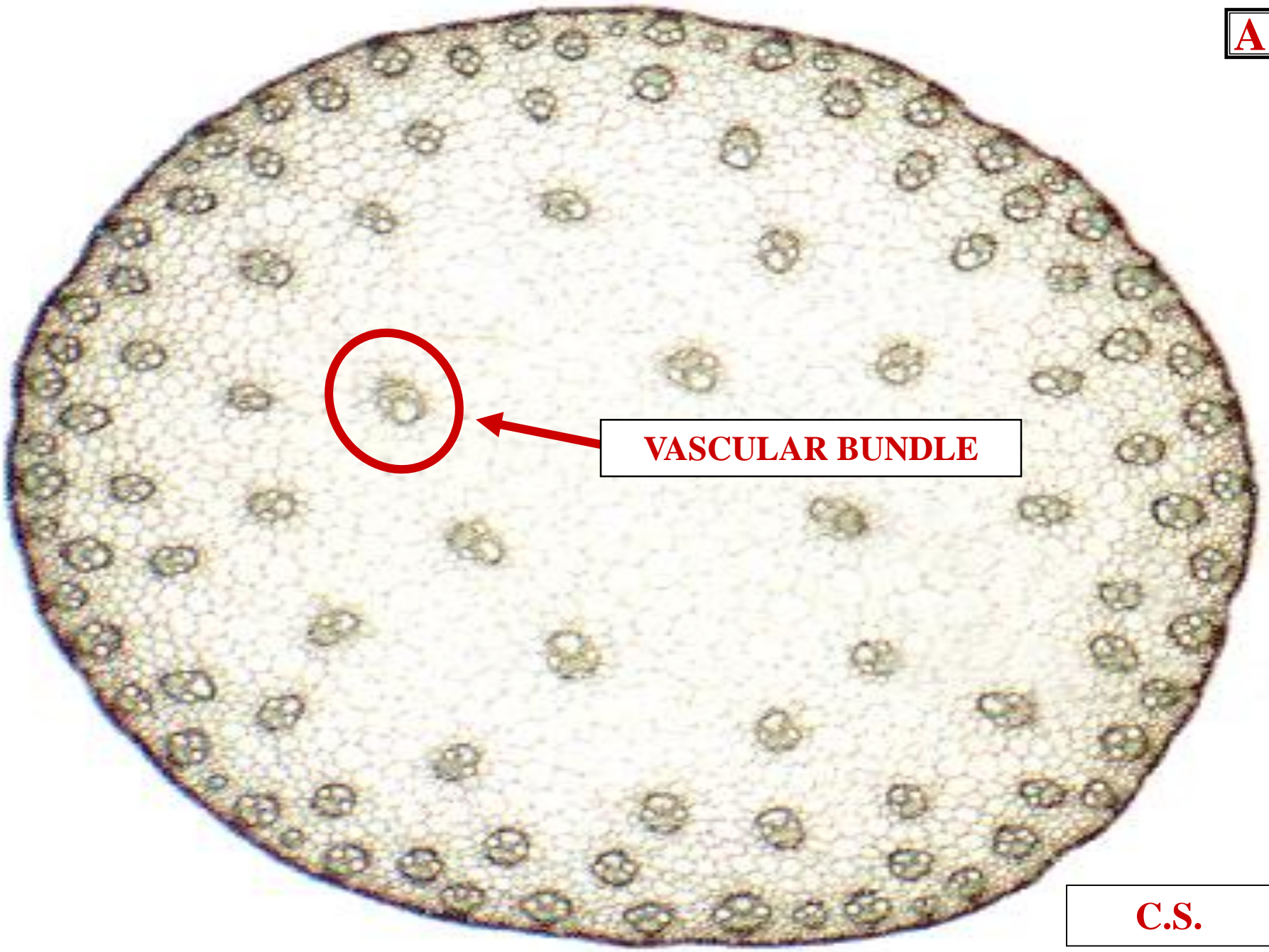
VASCULAR BUNDLE

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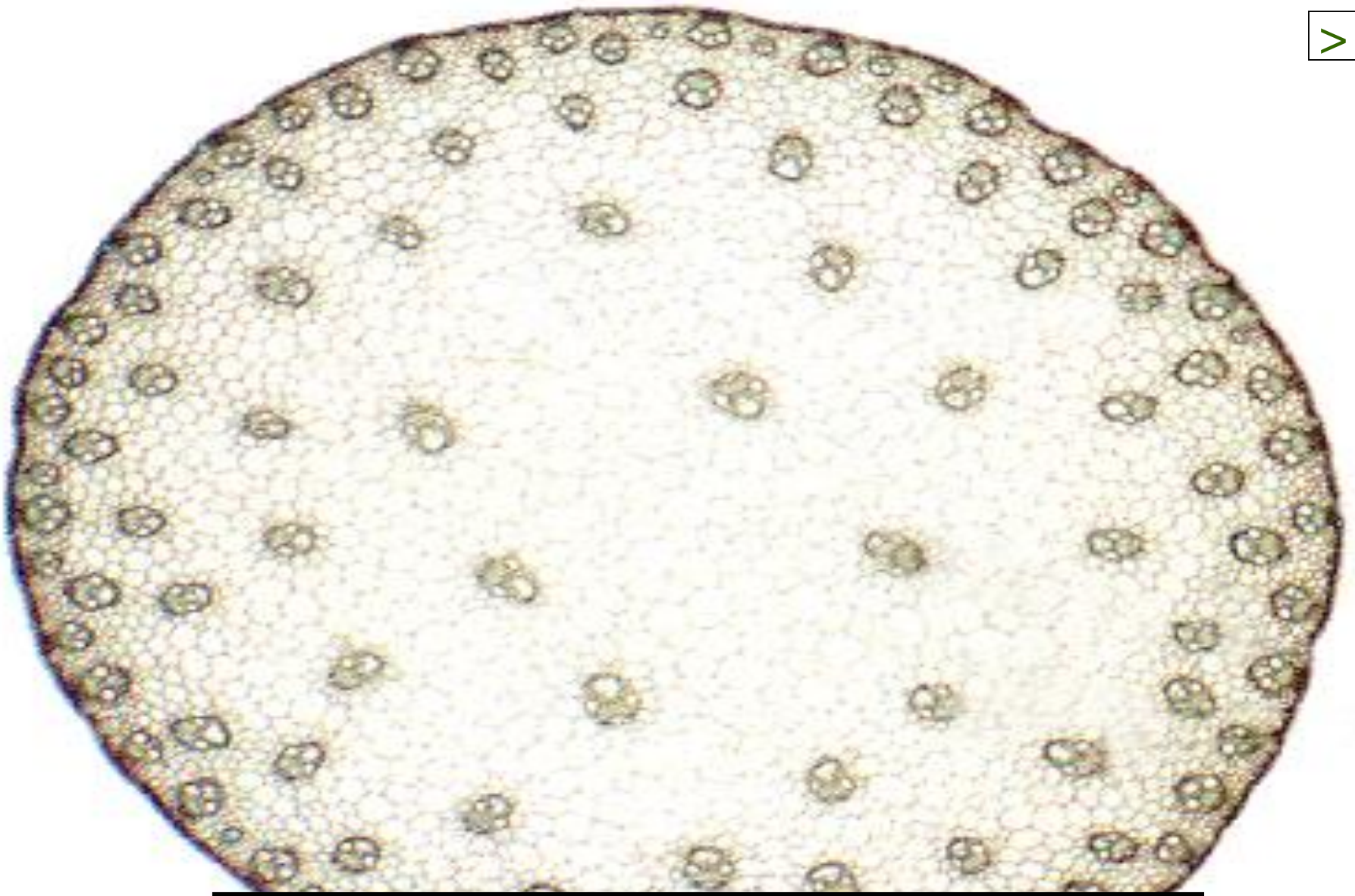
C.S.

A



VASCULAR BUNDLE

C.S.



ATACTOSTELE



**RESPONSIBLE
STEEL TYPES
LECTURE
&
LABORATORY**



**RESPONSIBLE
STELE TYPES
GENERAL
&
SPECIFIC**



LECTURE QUIZ

**WEDNESDAY
2 FEBRUARY**



LECTURE QUIZ

**TRACHEOPHYTE
STELE TYPES**



LECTURE QUIZ

**FORMAT
FILL IN
QUESTIONS**



LECTURE QUIZ

**MUST
SPELL CORRECTLY
FOR FULL CREDIT**



XYLEM MATURATION

PRIMARY XYLEM MATURATION

**PRIMARY XYLEM
MATURATION**

PROTOXYLEM

**PRIMARY XYLEM
MATURATION**

**PRIMARY XYLEM
MATURATION**

**PROTOXYLEM
METAXYLEM**

**PRIMARY XYLEM
MATURATION**

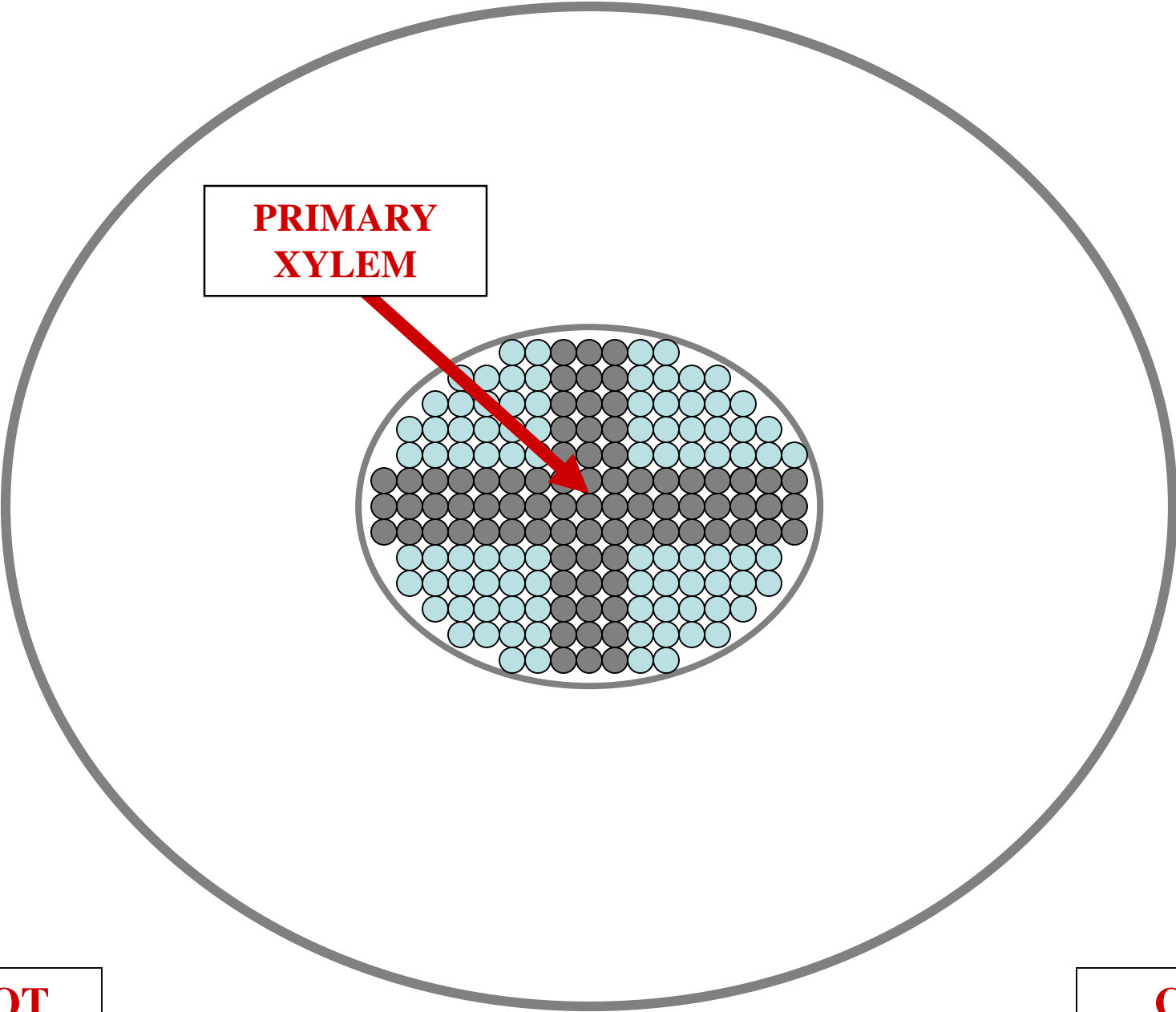
PROTOXYLEM

**PRIMARY XYLEM
PROTOXYLEM**

**MATURES
FIRST/BEFORE
METAXYLEM**

**PRIMARY XYLEM
PROTOXYLEM**

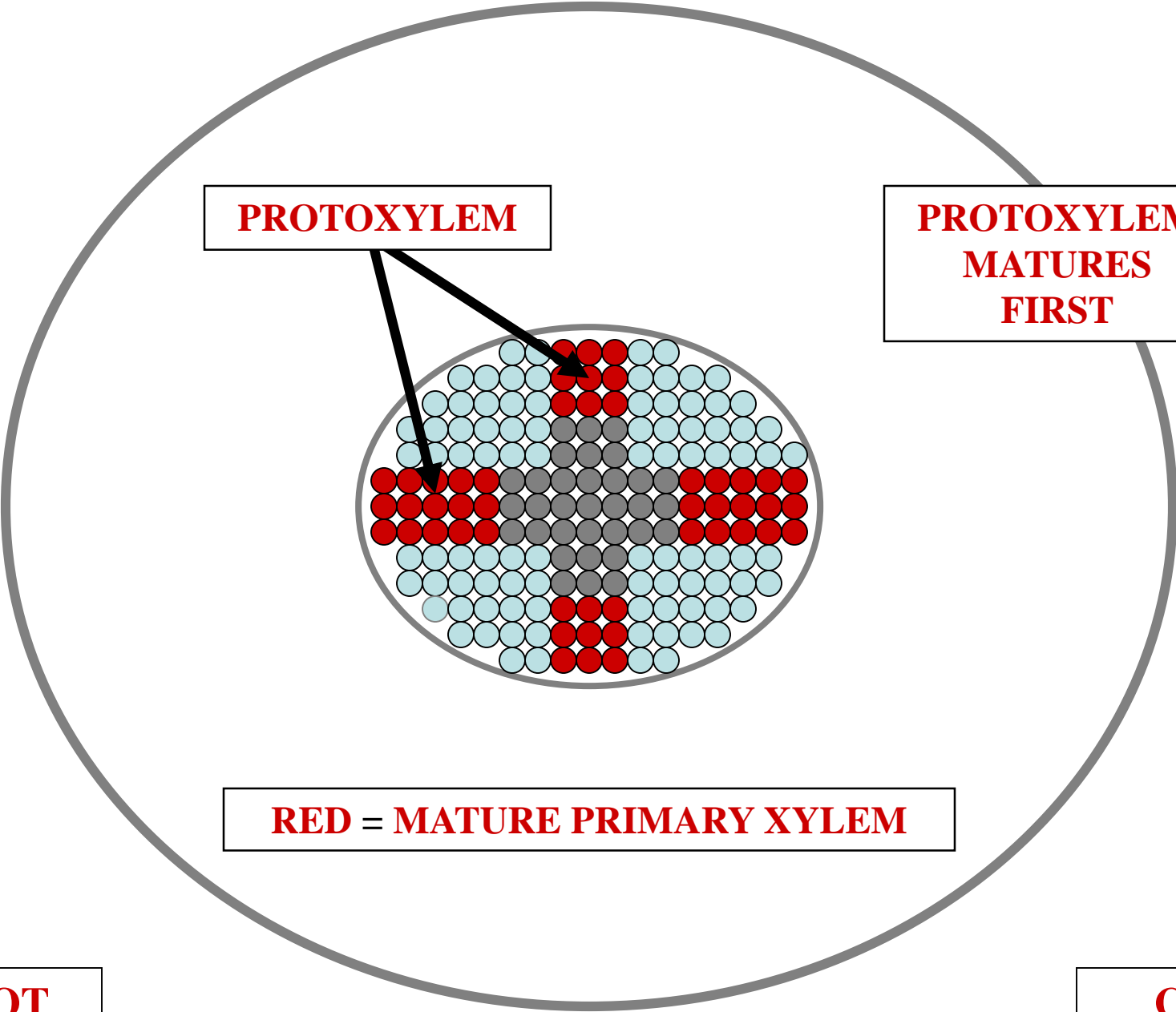




**PRIMARY
XYLEM**

ROOT

C.S.



PROTOXYLEM

**PROTOXYLEM
MATURES
FIRST**

RED = MATURE PRIMARY XYLEM

ROOT

C.S.

METAXYLEM

PRIMARY XYLEM

METAXYLEM

MATURES

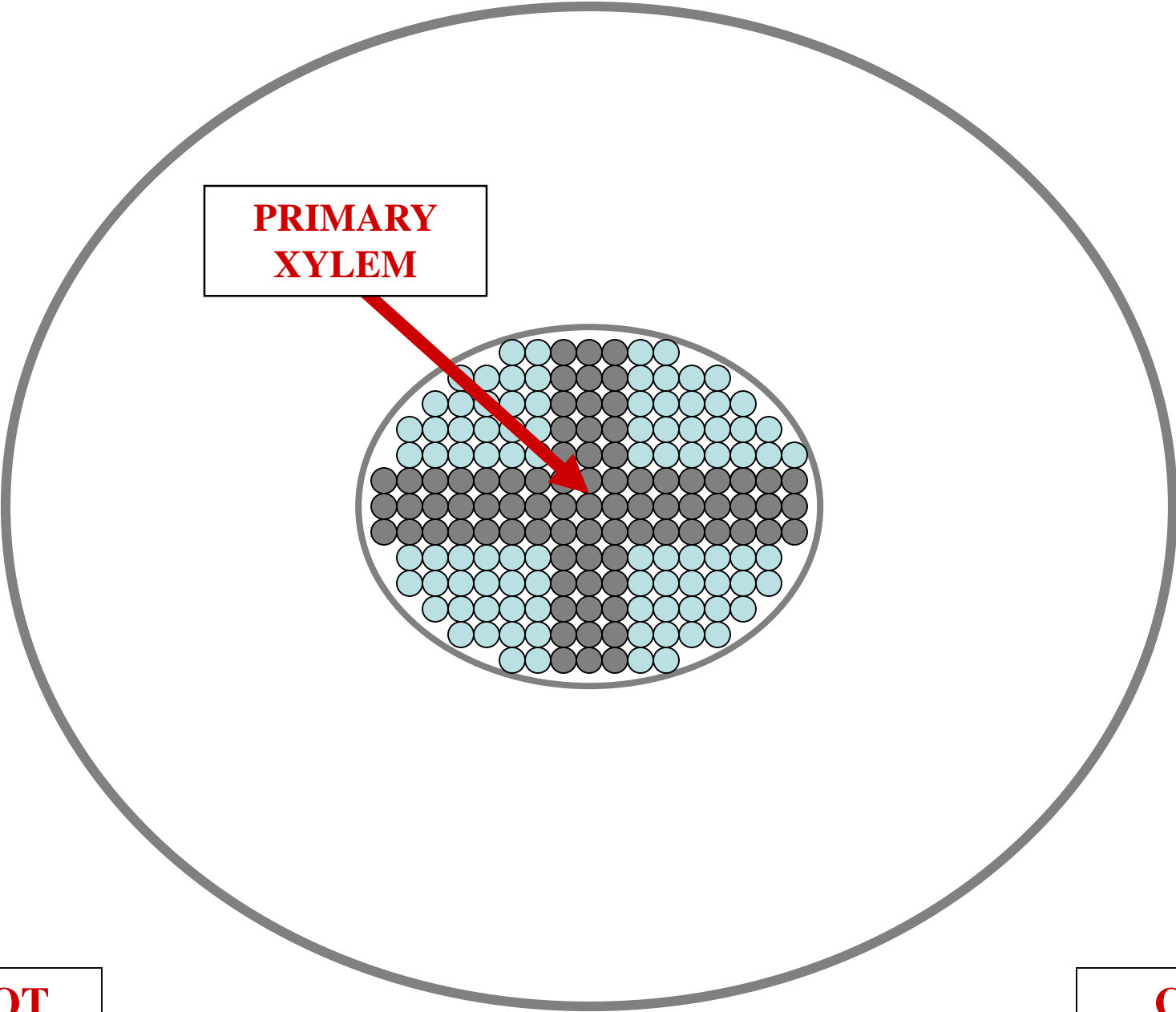
SECOND/AFTER

PROTOXYLEM

PRIMARY XYLEM

METAXYLEM

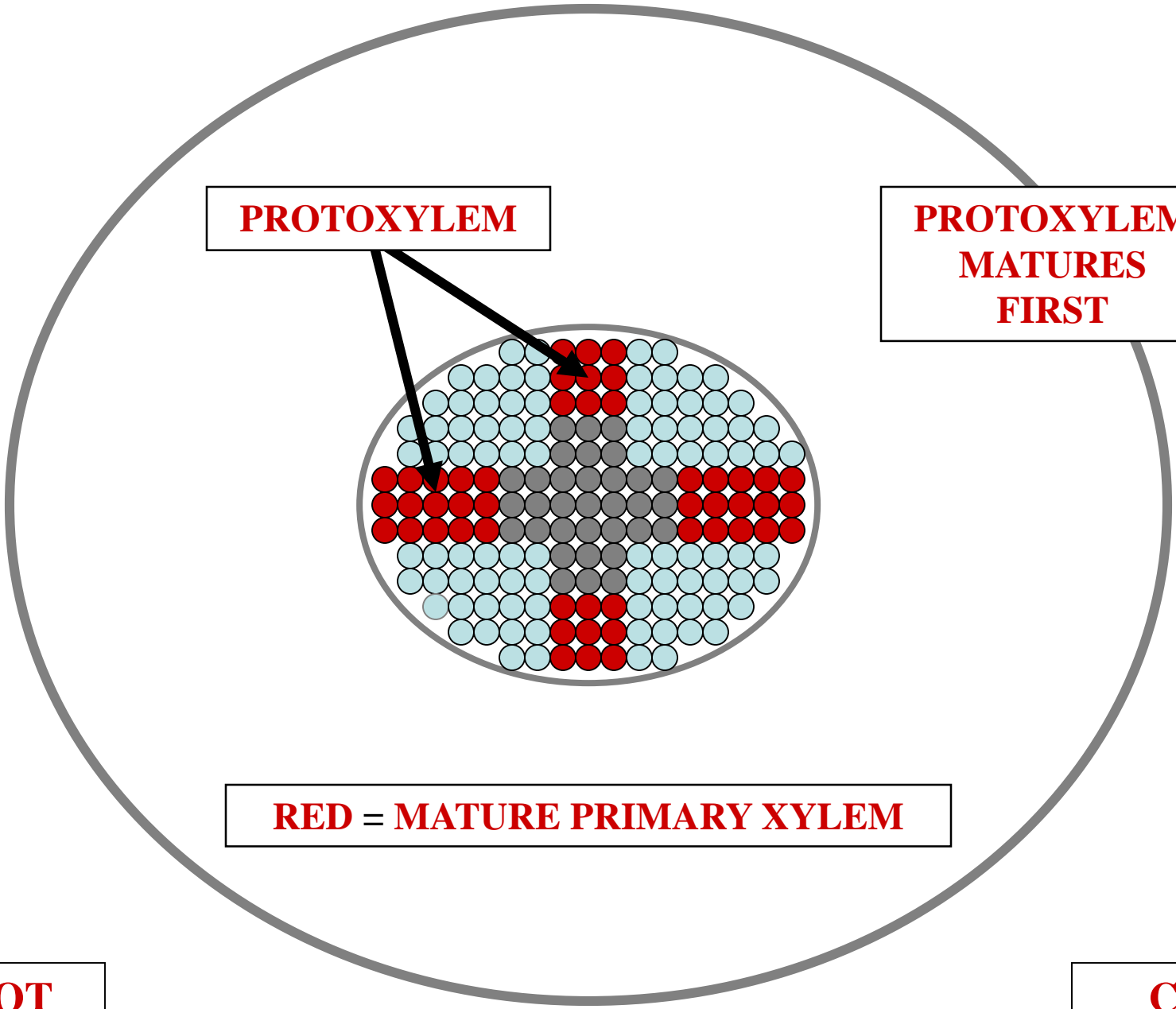




**PRIMARY
XYLEM**

ROOT

C.S.



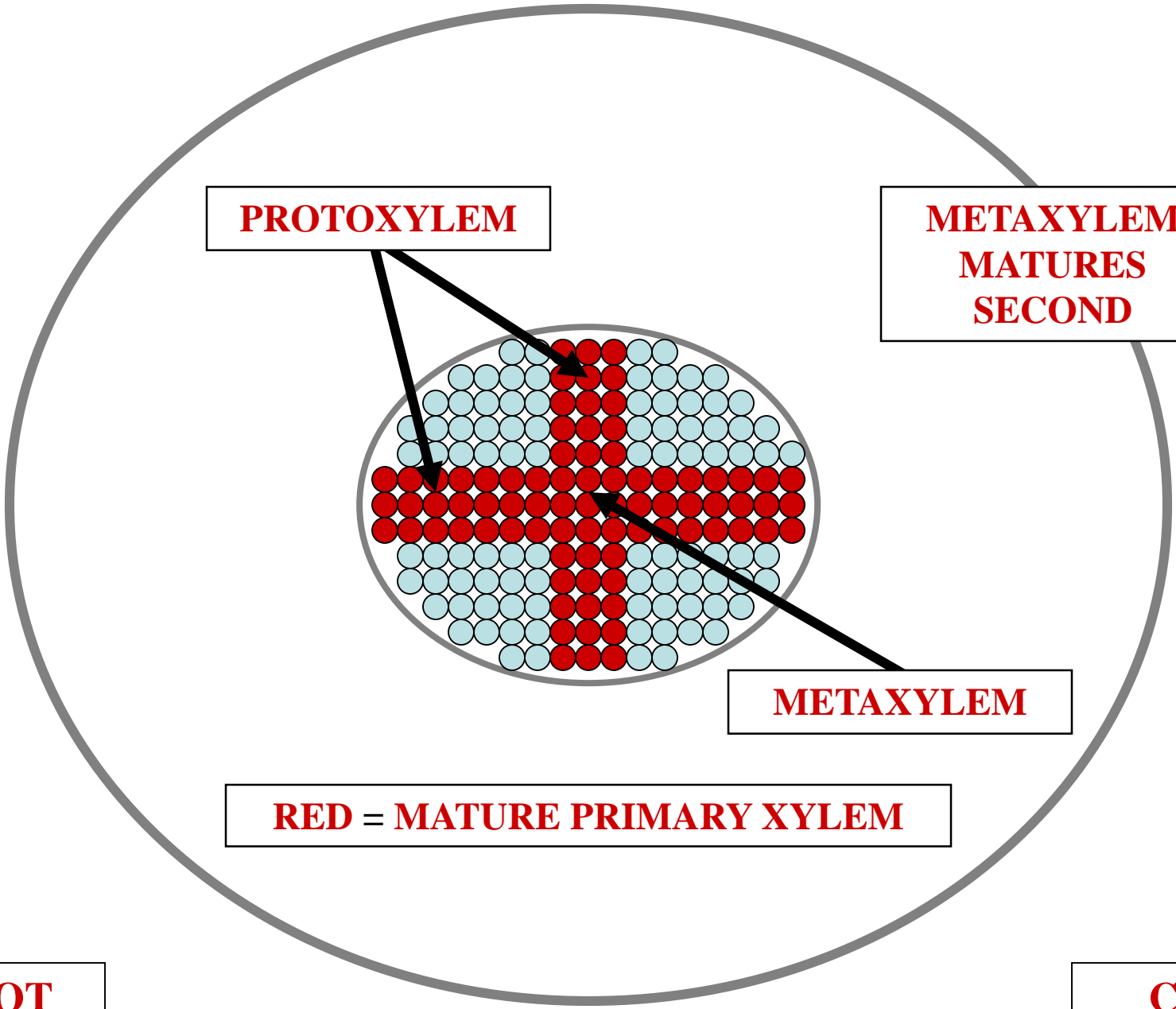
PROTOXYLEM

**PROTOXYLEM
MATURES
FIRST**

RED = MATURE PRIMARY XYLEM

ROOT

C.S.



PROTOXYLEM

**METAXYLEM
MATURES
SECOND**

METAXYLEM

RED = MATURE PRIMARY XYLEM

ROOT

C.S.

PRIMARY XYLEM MATURATION PATTERNS

**PRIMARY XYLEM
MATURATION PATTERNS**

EXARCH

**PRIMARY XYLEM
MATURATION PATTERNS**

**PRIMARY XYLEM
MATURATION PATTERNS**

EXARCH

ENDARCH

**PRIMARY XYLEM
MATURATION PATTERNS**

PRIMARY XYLEM MATURATION PATTERNS

EXARCH

ENDARCH

MESARCH

PRIMARY XYLEM MATURATION PATTERNS

EXARCH MATURATION

**PRIMARY XYLEM
EXARCH MATURATION**

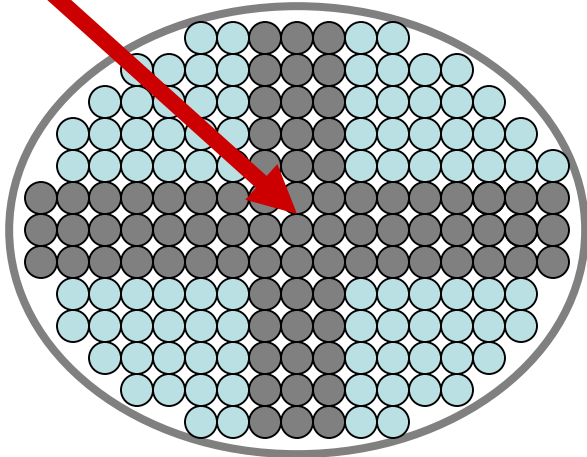


**INWARD
MATURATION PATTERN**

**PRIMARY XYLEM
EXARCH MATURATION**

EXARCH MATURATION

**PRIMARY
XYLEM**

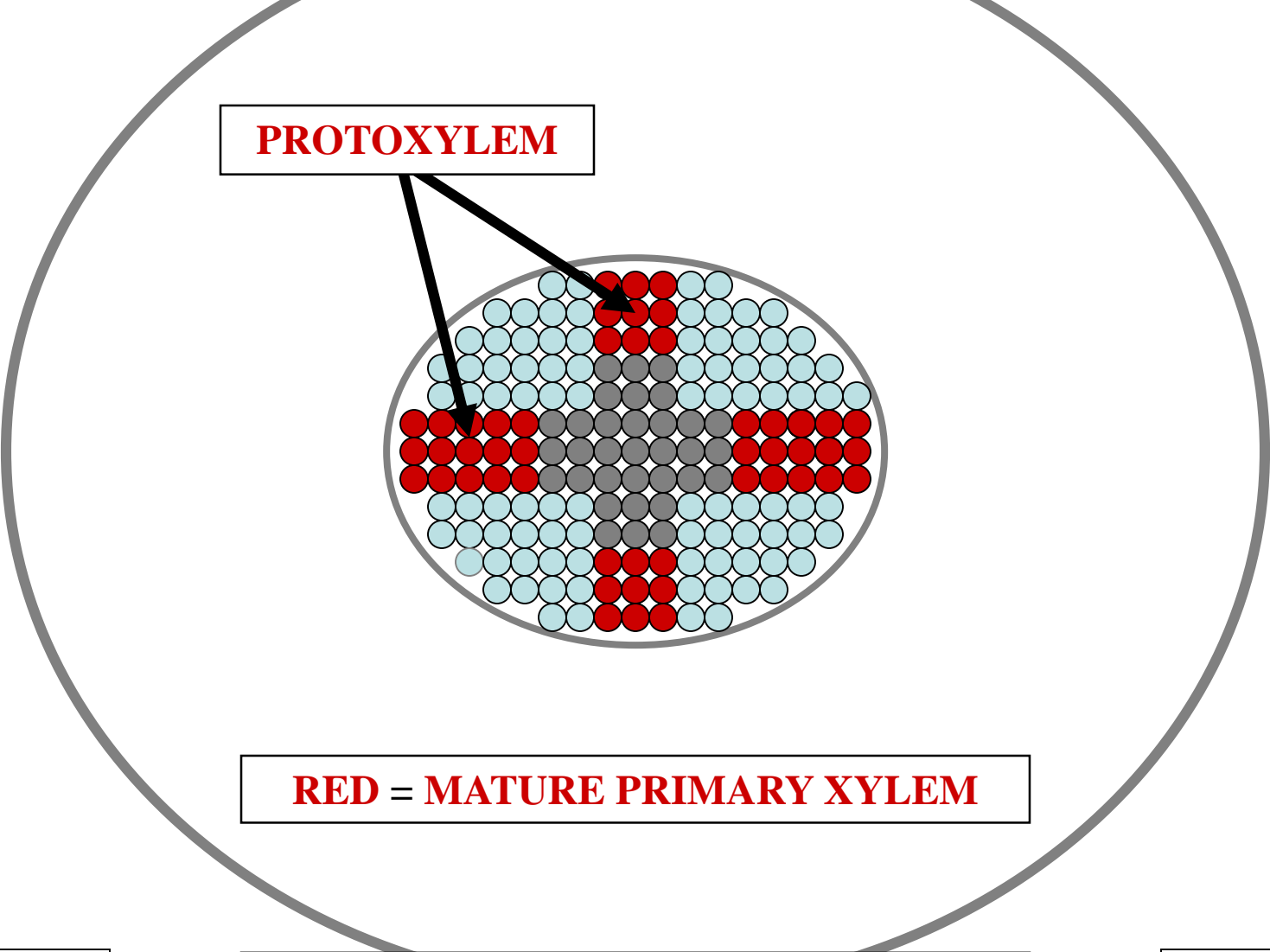


ROOT

INWARD ~1 XYLEM MATURATION

C.S.

EXARCH MATURATION



PROTOXYLEM

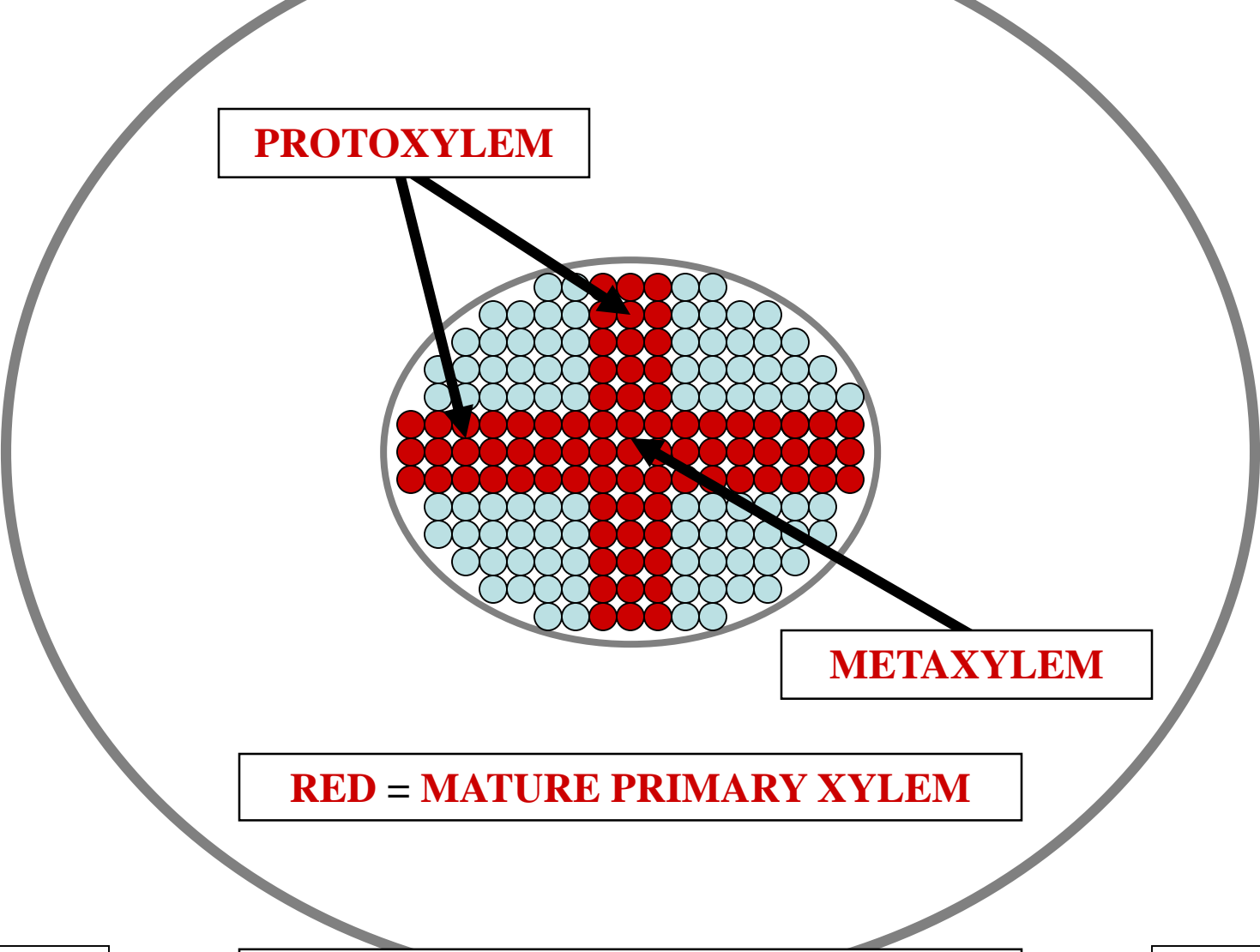
RED = MATURE PRIMARY XYLEM

ROOT

INWARD ~1 XYLEM MATURATION

C.S.

EXARCH MATURATION



PROTOXYLEM

METAXYLEM

RED = MATURE PRIMARY XYLEM

ROOT

INWARD ~1 XYLEM MATURATION

C.S.

ENDARCH MATURATION

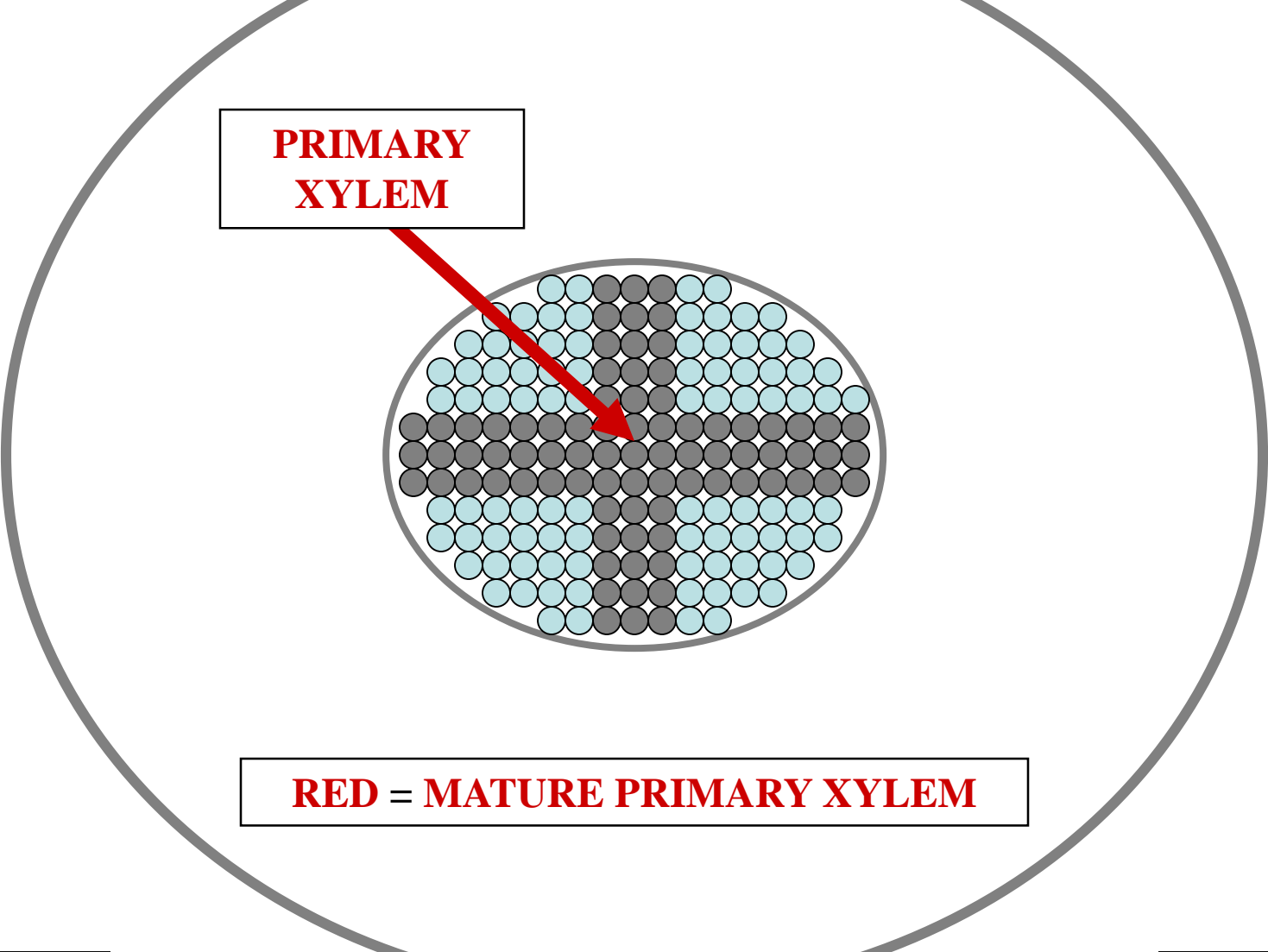
PRIMARY XYLEM
ENDARCH MATURATION



OUTWARD
MATURATION PATTERN

PRIMARY XYLEM
ENDARCH MATURATION

ENDARCH MATURATION



PRIMARY XYLEM

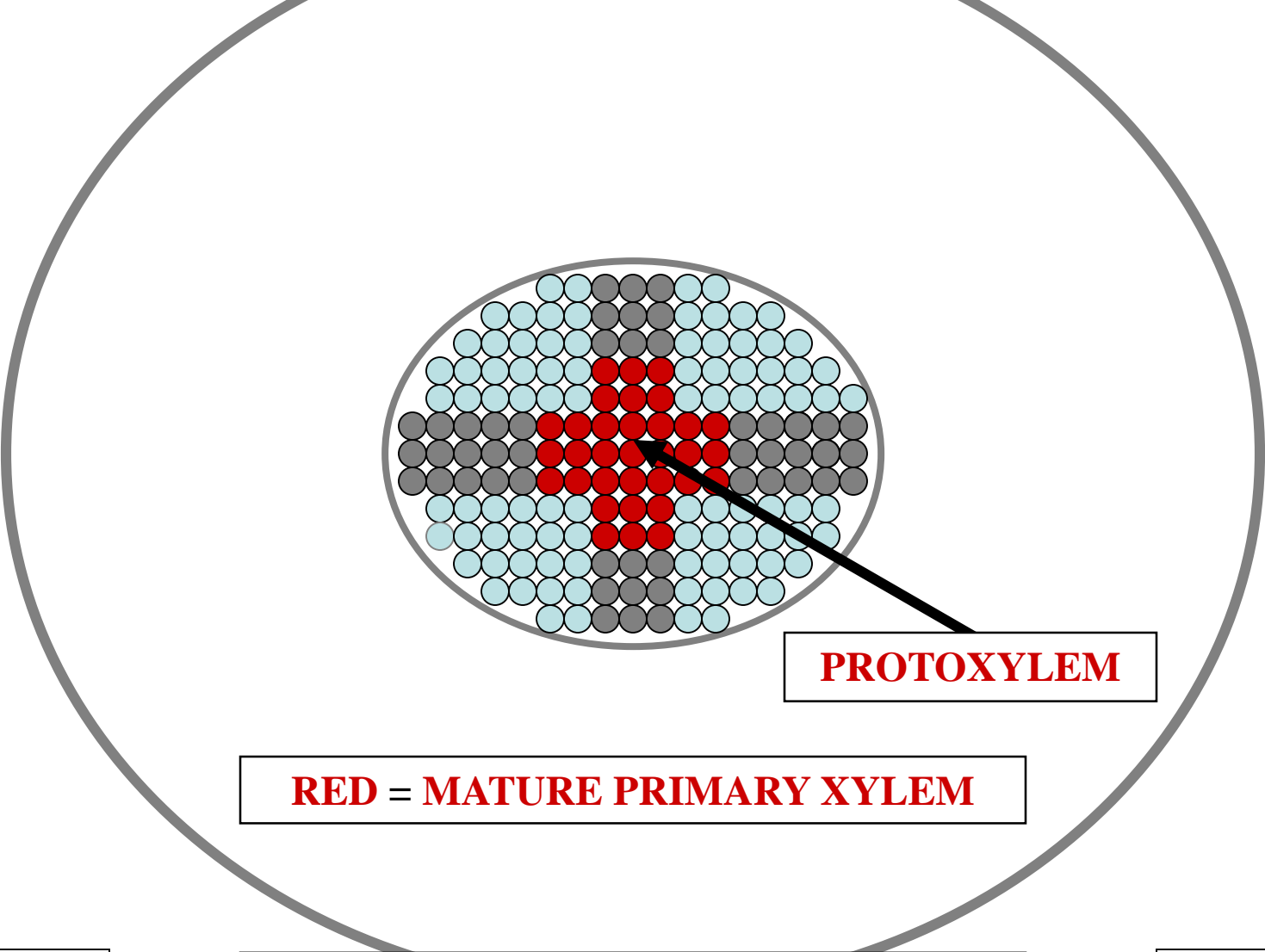
RED = MATURE PRIMARY XYLEM

ROOT

OUTWARD ~1 XYLEM MATURATION

C.S.

ENDARCH MATURATION



PROTOXYLEM

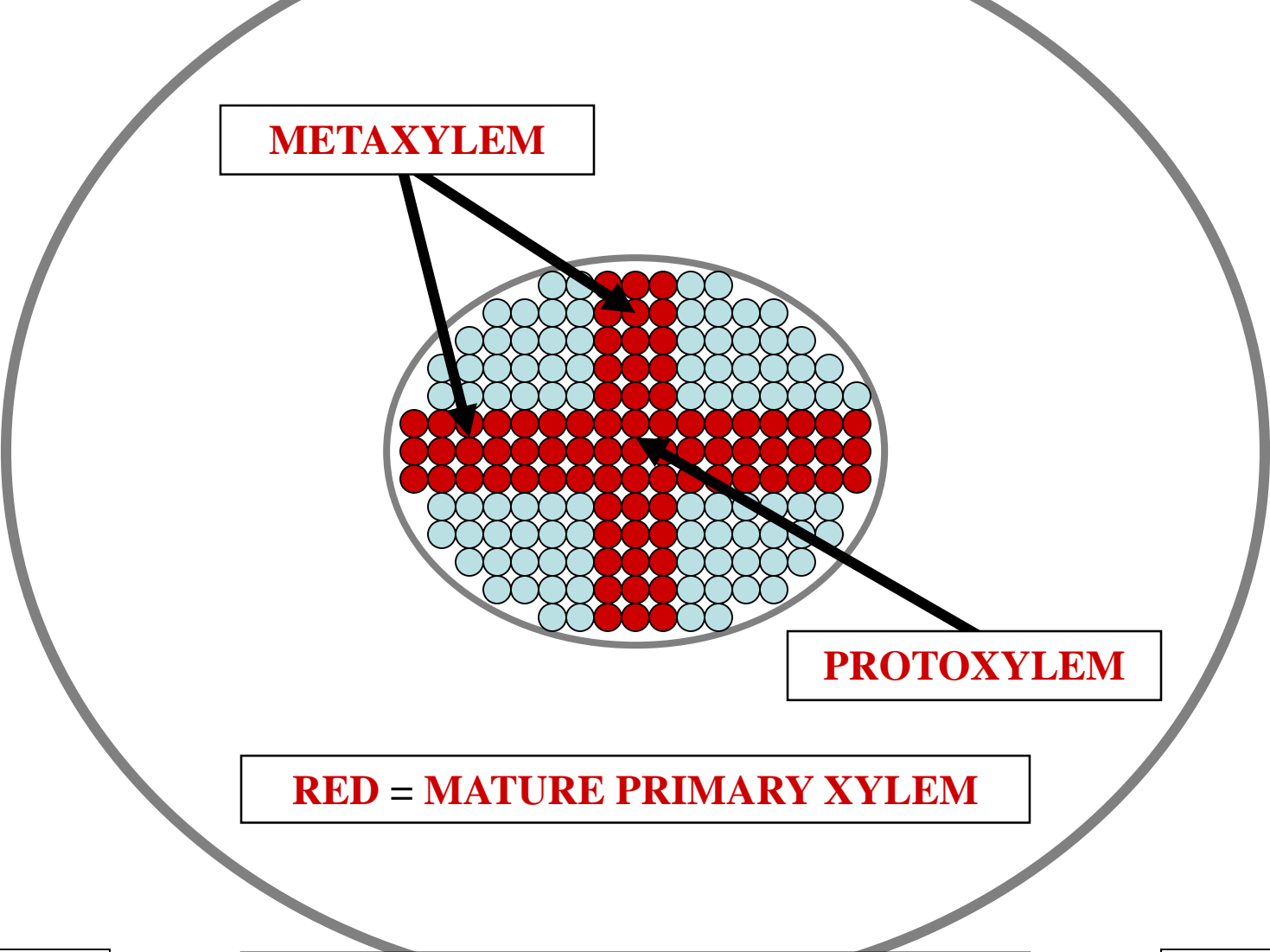
RED = MATURE PRIMARY XYLEM

ROOT

OUTWARD ~1 XYLEM MATURATION

C.S.

ENDARCH MATURATION



METAXYLEM

PROTOXYLEM

RED = MATURE PRIMARY XYLEM

ROOT

OUTWARD ~1 XYLEM MATURATION

C.S.

MESARCH MATURATION

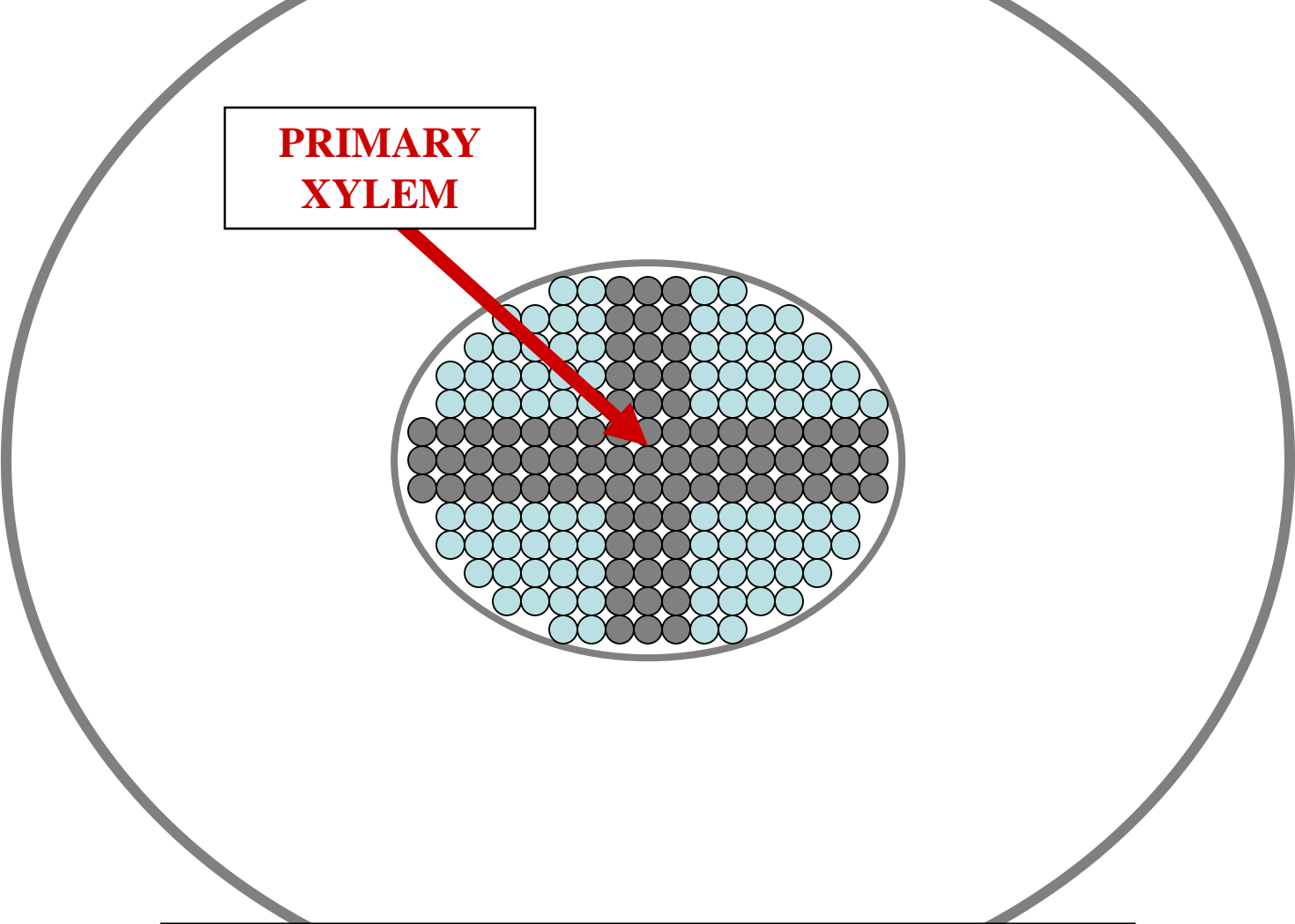


**PRIMARY XYLEM
MESARCH MATURATION**

**INWARD & OUTWARD
MATURATION PATTERN**

**PRIMARY XYLEM
MESARCH MATURATION**

MESARCH MATURATION



**PRIMARY
XYLEM**

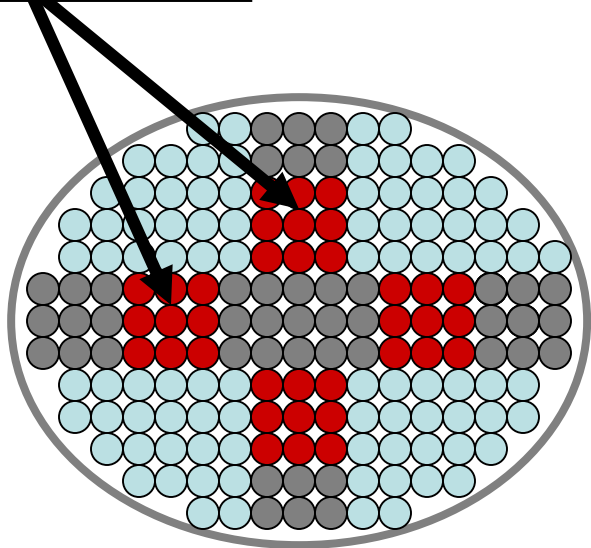
ROOT

**INWARD & OUTWARD
~1 XYLEM MATURATION**

C.S.

MESARCH MATURATION

PROTOXYLEM



RED = MATURE PRIMARY XYLEM

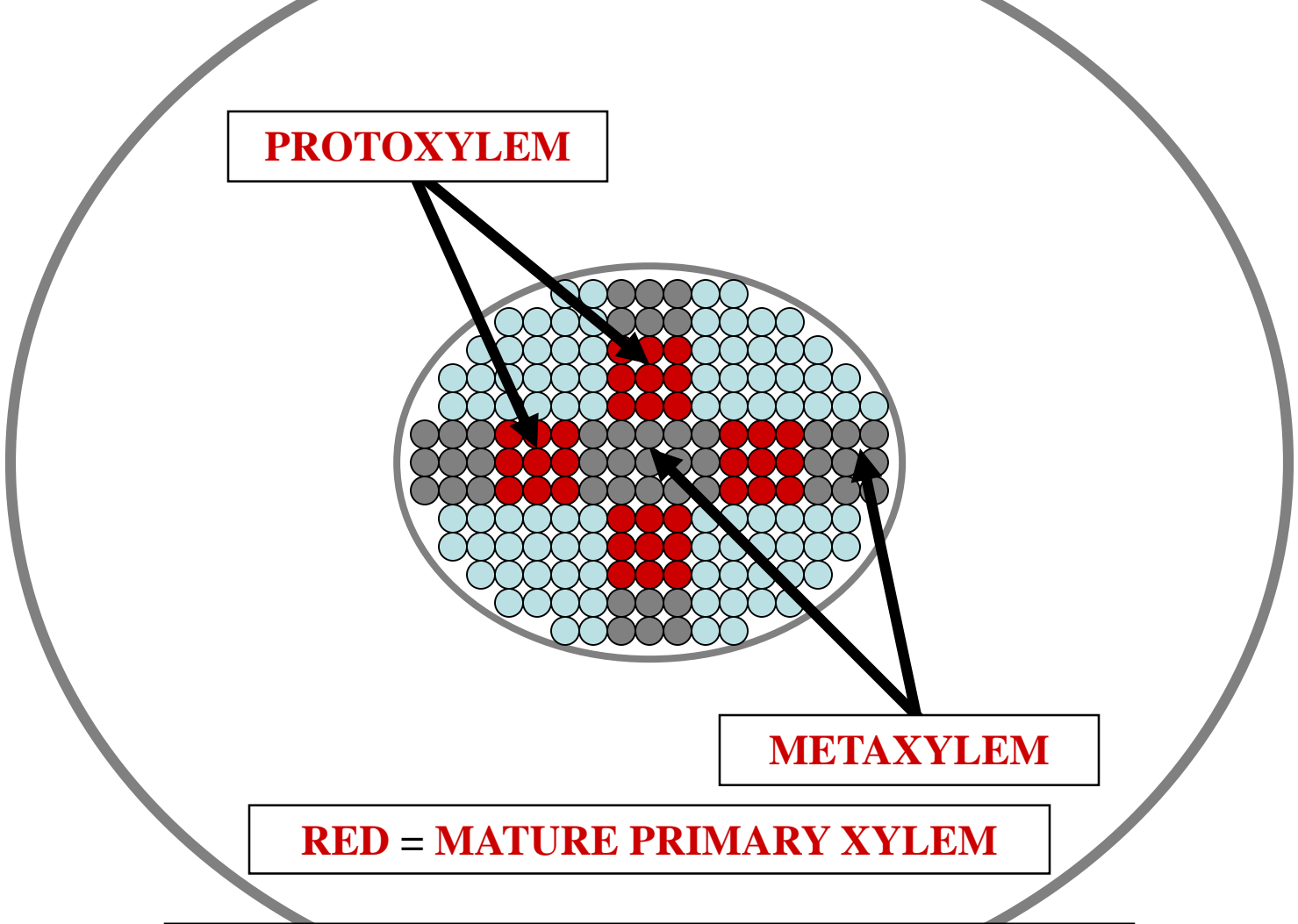
INWARD & OUTWARD
~1 XYLEM MATURATION

ROOT

C.S.

MESARCH MATURATION

PROTOXYLEM



METAXYLEM

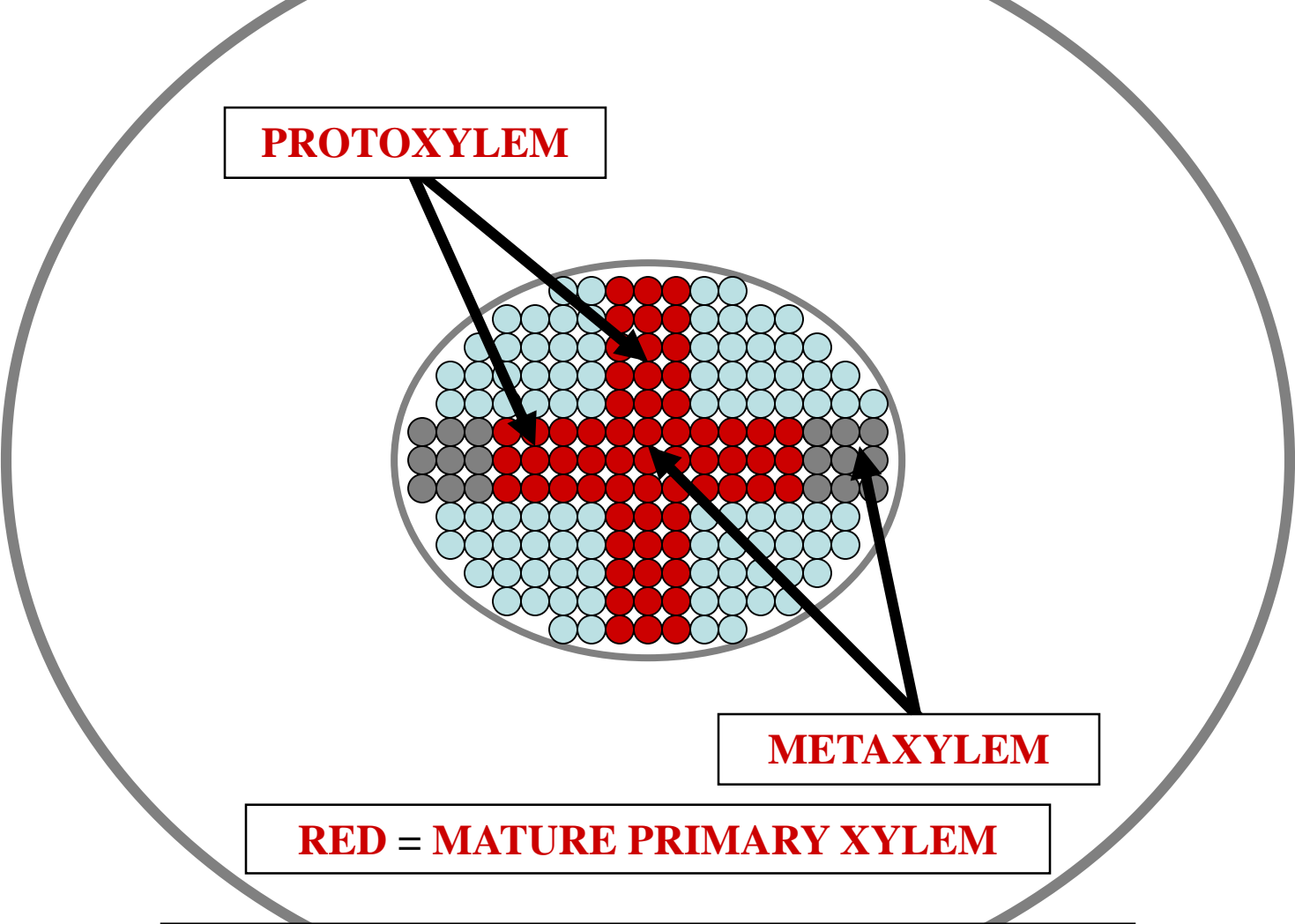
RED = MATURE PRIMARY XYLEM

ROOT

INWARD & OUTWARD
~1 XYLEM MATURATION

C.S.

MESARCH MATURATION



PROTOXYLEM

METAXYLEM

RED = MATURE PRIMARY XYLEM

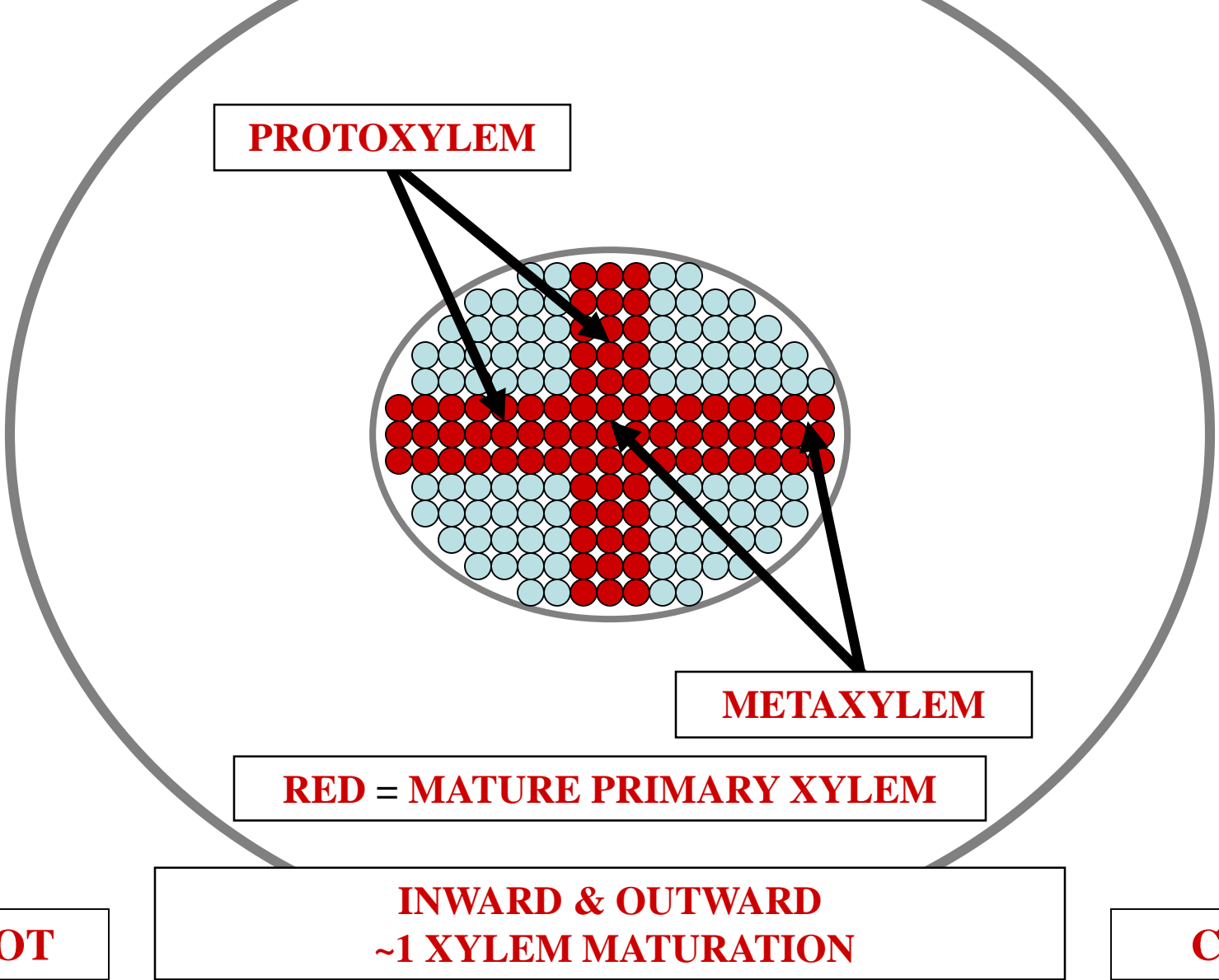
ROOT

**INWARD & OUTWARD
~1 XYLEM MATURATION**

C.S.



MESARCH MATURATION



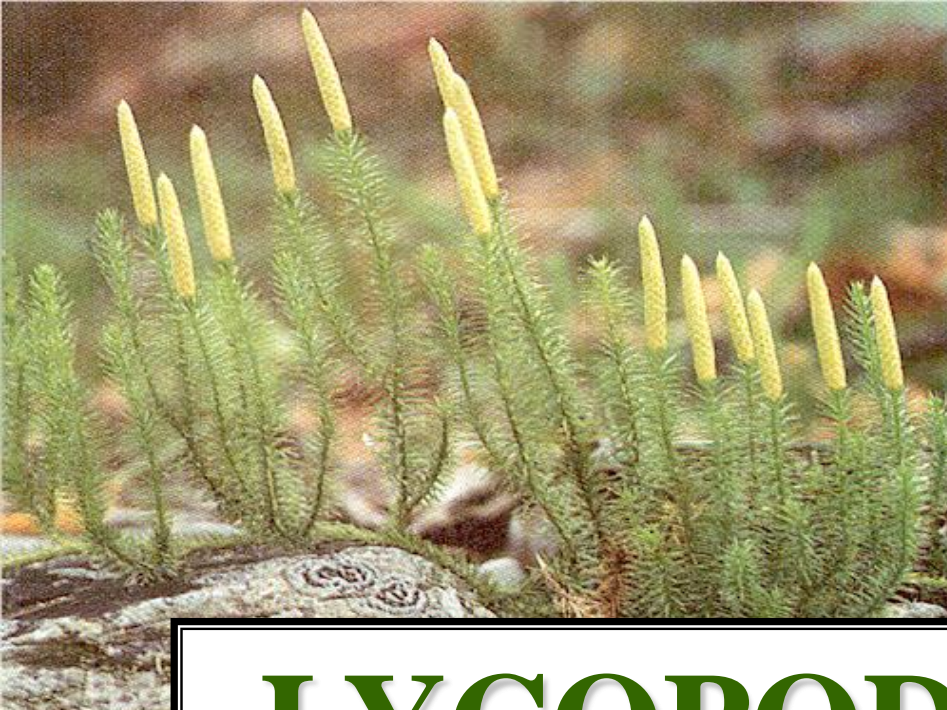
PRIMARY XYLEM

MATURATION

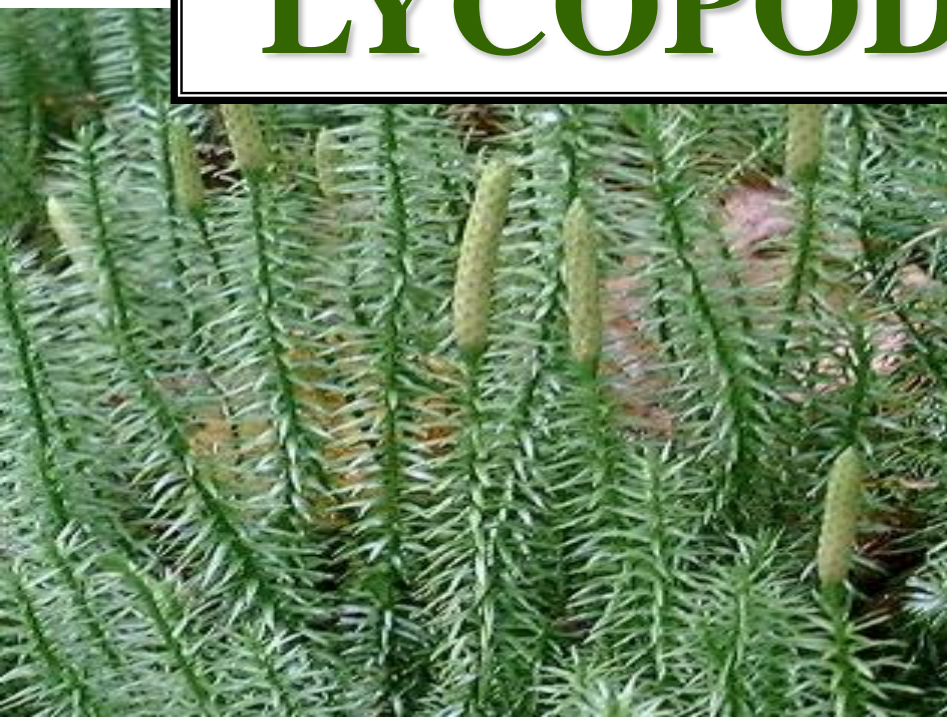
TRACHEOPHYTE

PHYLUM

CHARACTER

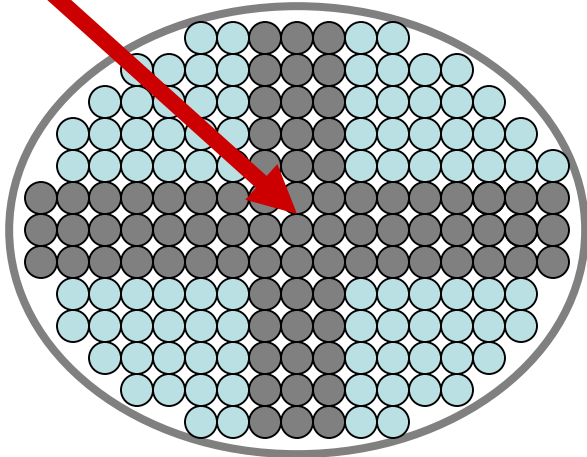


LYCOPODIOPHYTA



EXARCH MATURATION

PRIMARY
XYLEM



LYCOPODIOPHYTA

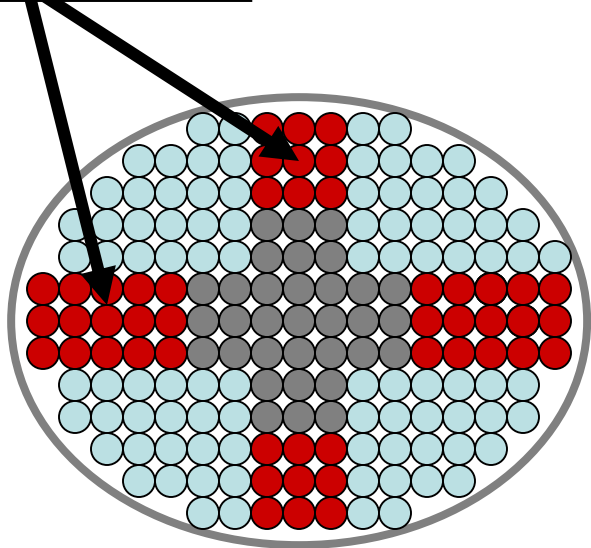
ROOT

INWARD ~1 XYLEM MATURATION

C.S.

EXARCH MATURATION

PROTOXYLEM



RED = MATURE PRIMARY XYLEM

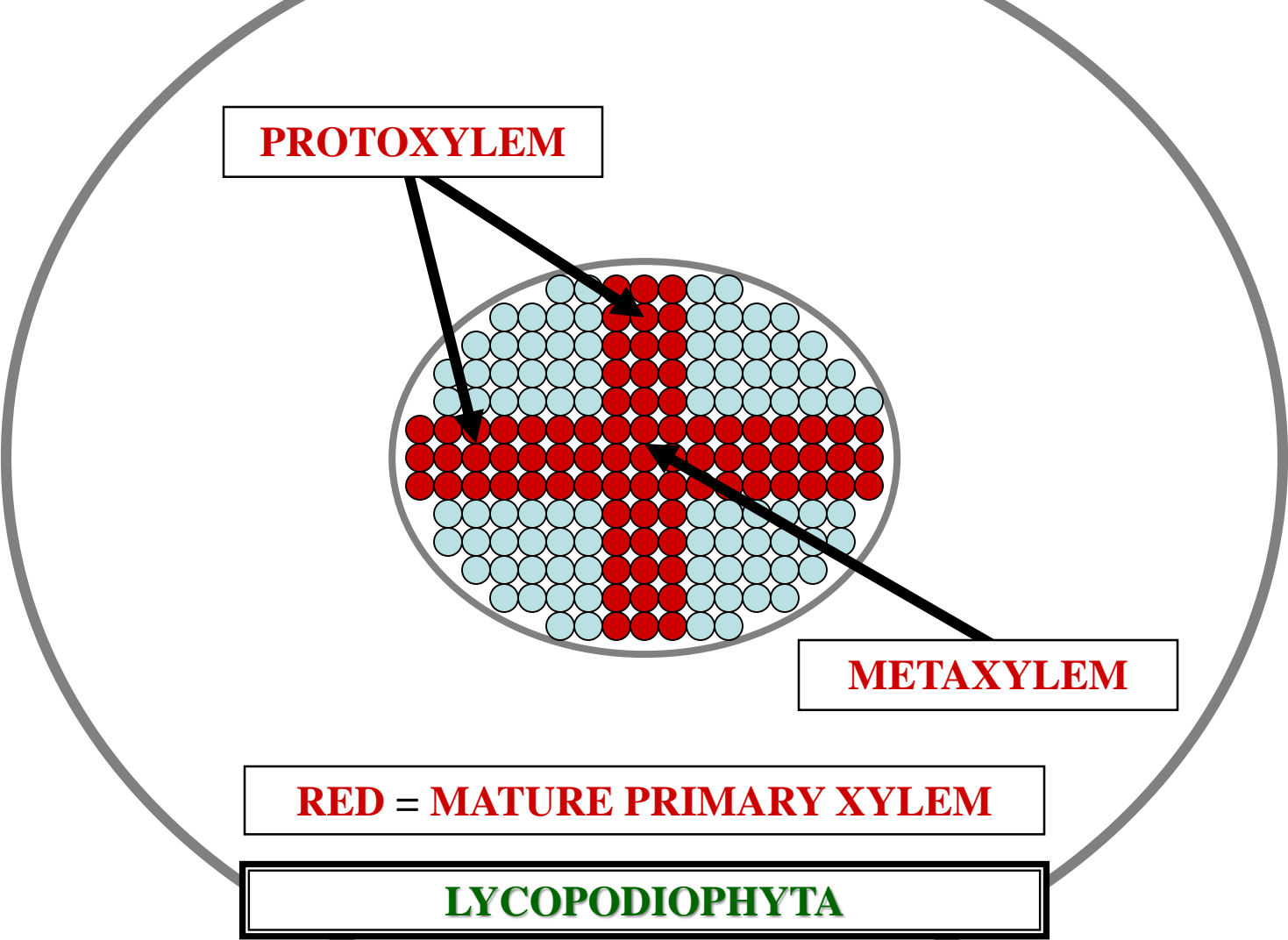
LYCOPODIOPHYTA

ROOT

INWARD ~1 XYLEM MATURATION

C.S.

EXARCH MATURATION



PROTOXYLEM

METAXYLEM

RED = MATURE PRIMARY XYLEM

LYCOPODIOPHYTA

ROOT

INWARD ~1 XYLEM MATURATION

C.S.

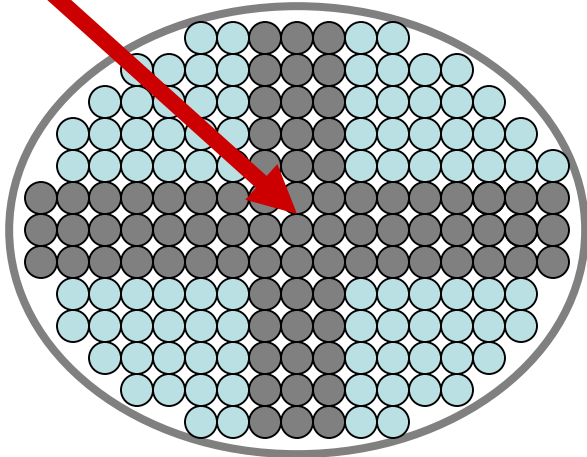


PTERIDOPHYTA



ENDARCH MATURATION

PRIMARY
XYLEM



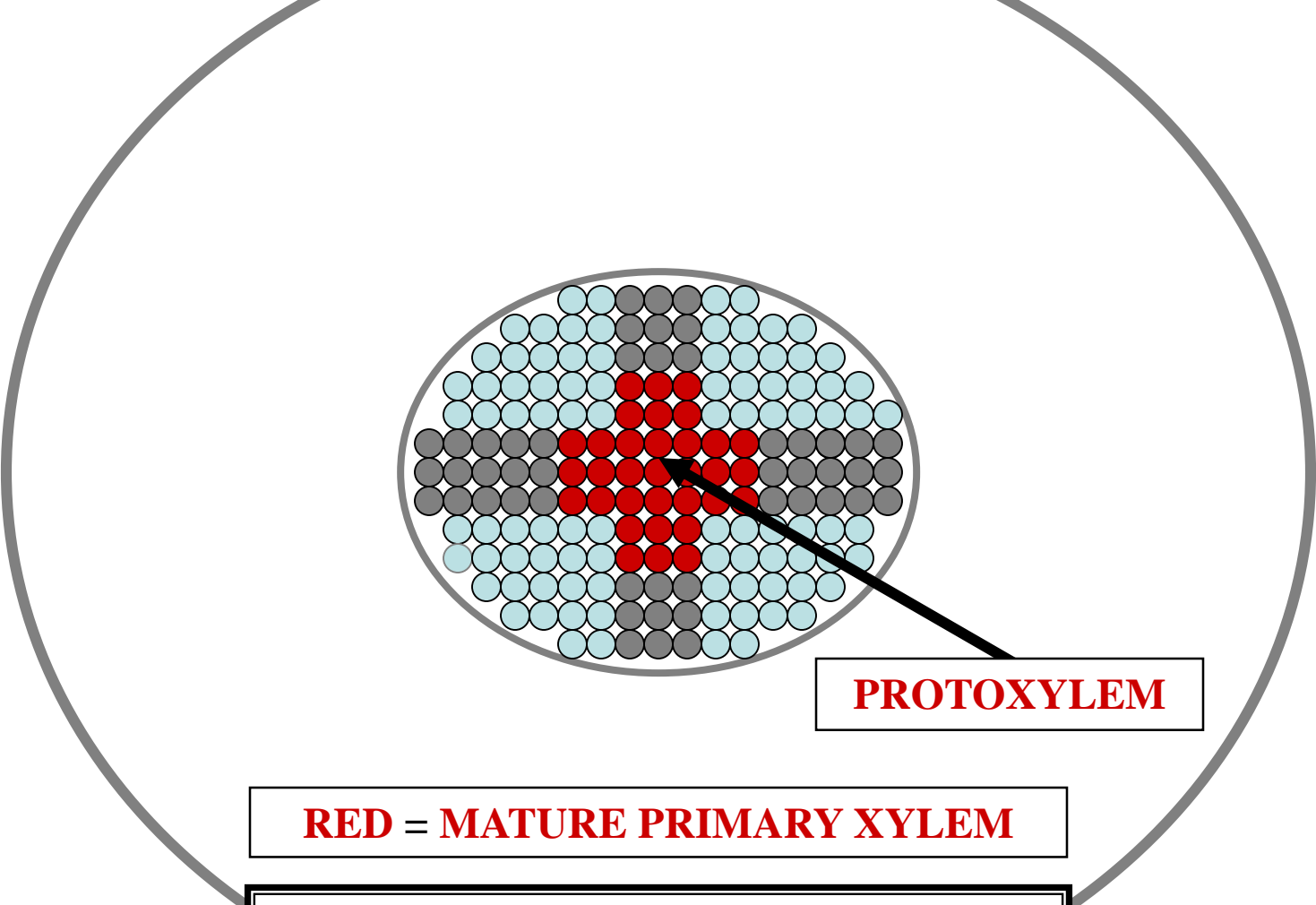
PTERIDOPHYTA

ROOT

OUTWARD ~1 XYLEM MATURATION

C.S.

ENDARCH MATURATION



PROTOXYLEM

RED = MATURE PRIMARY XYLEM

PTERIDOPHYTA

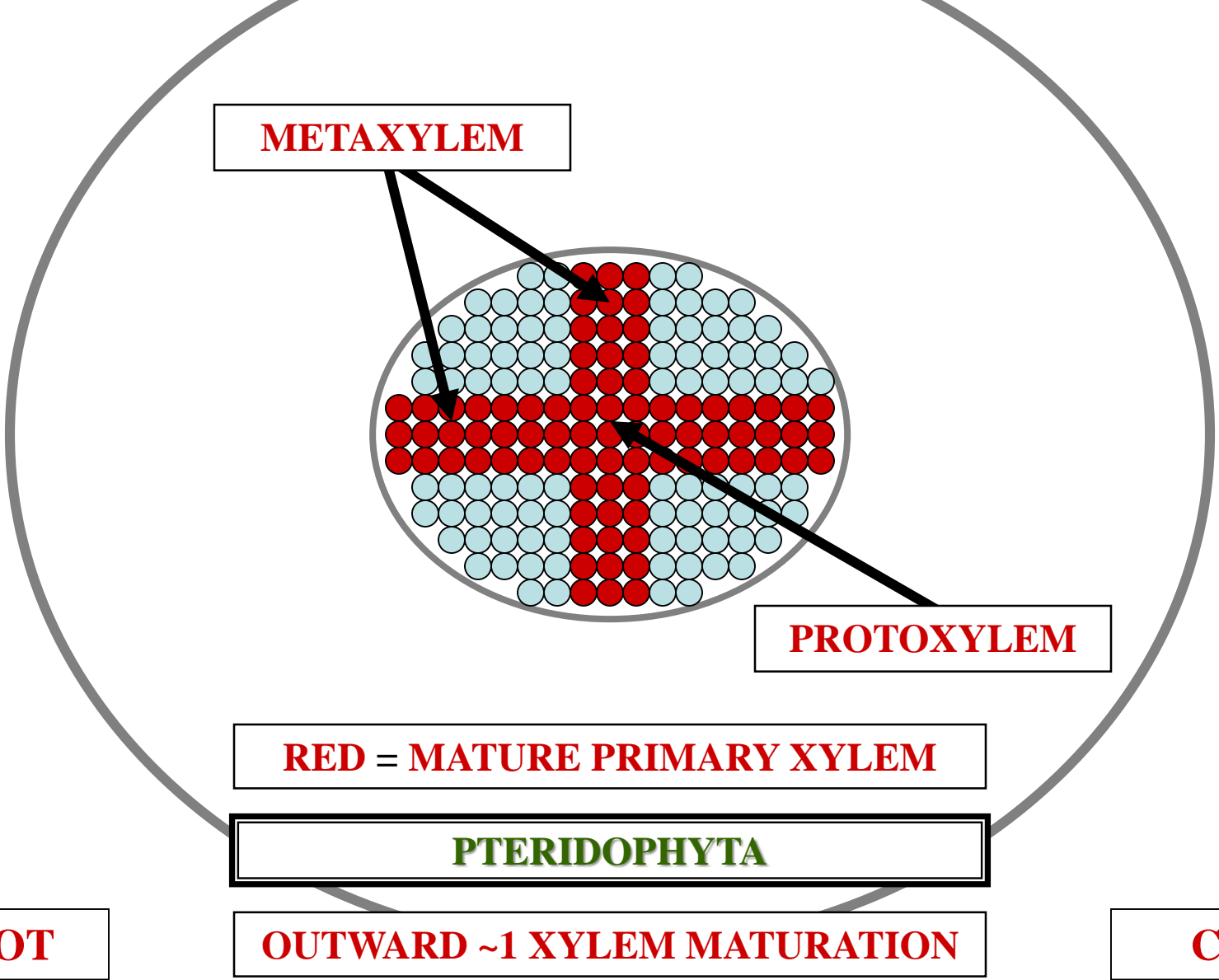
ROOT

OUTWARD ~1 XYLEM MATURATION

C.S.



ENDARCH MATURATION





PRIMARY XYLEM

MATURATION

TRACHEOPHYTE

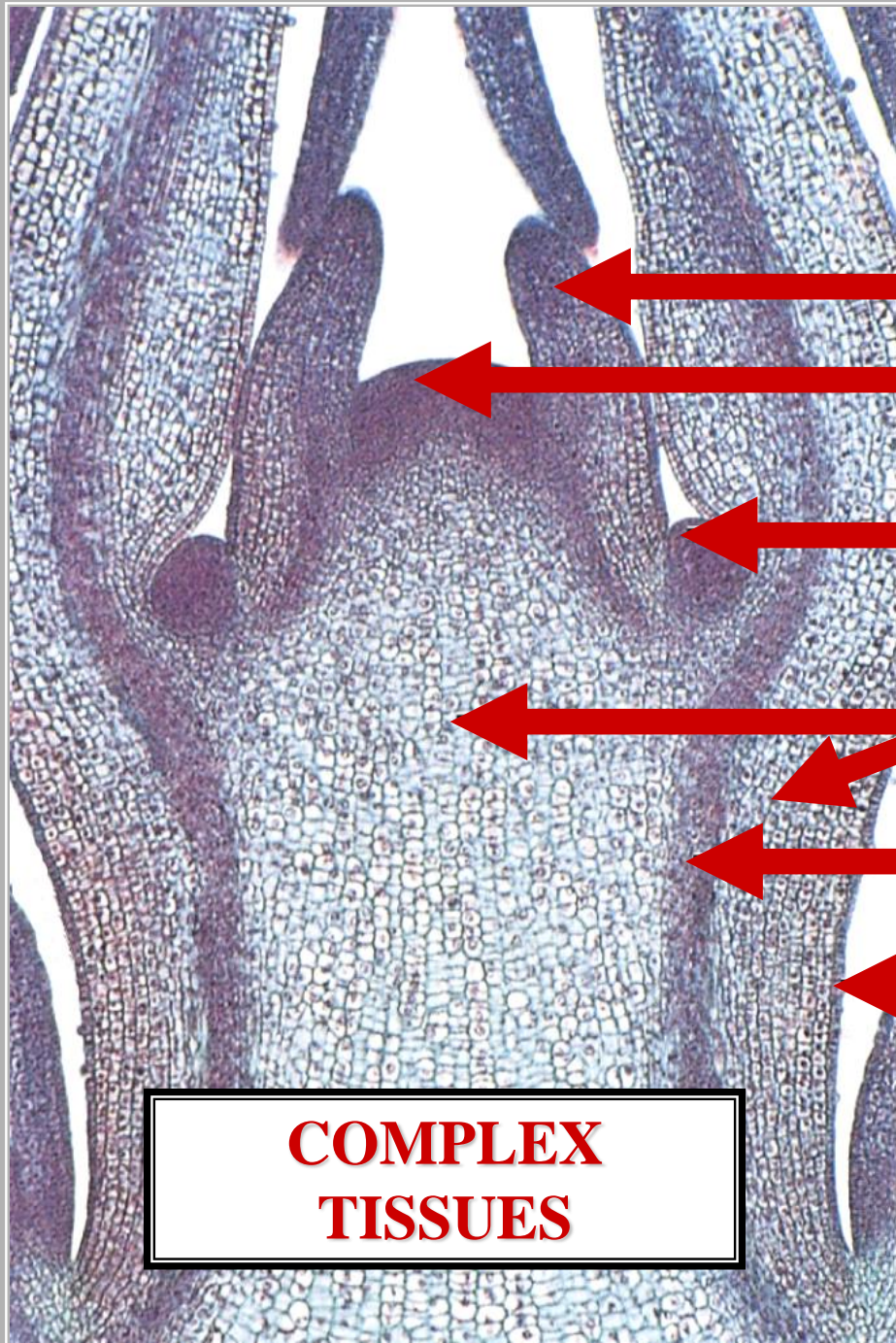
PHYLUM

CHARACTER



ANGIOSPERM COMPLEX TISSUES SUMMARY

ANGIOSPERM COMPLEX TISSUES



[]

**APICAL
MERISTEM**

[]

[]

[]

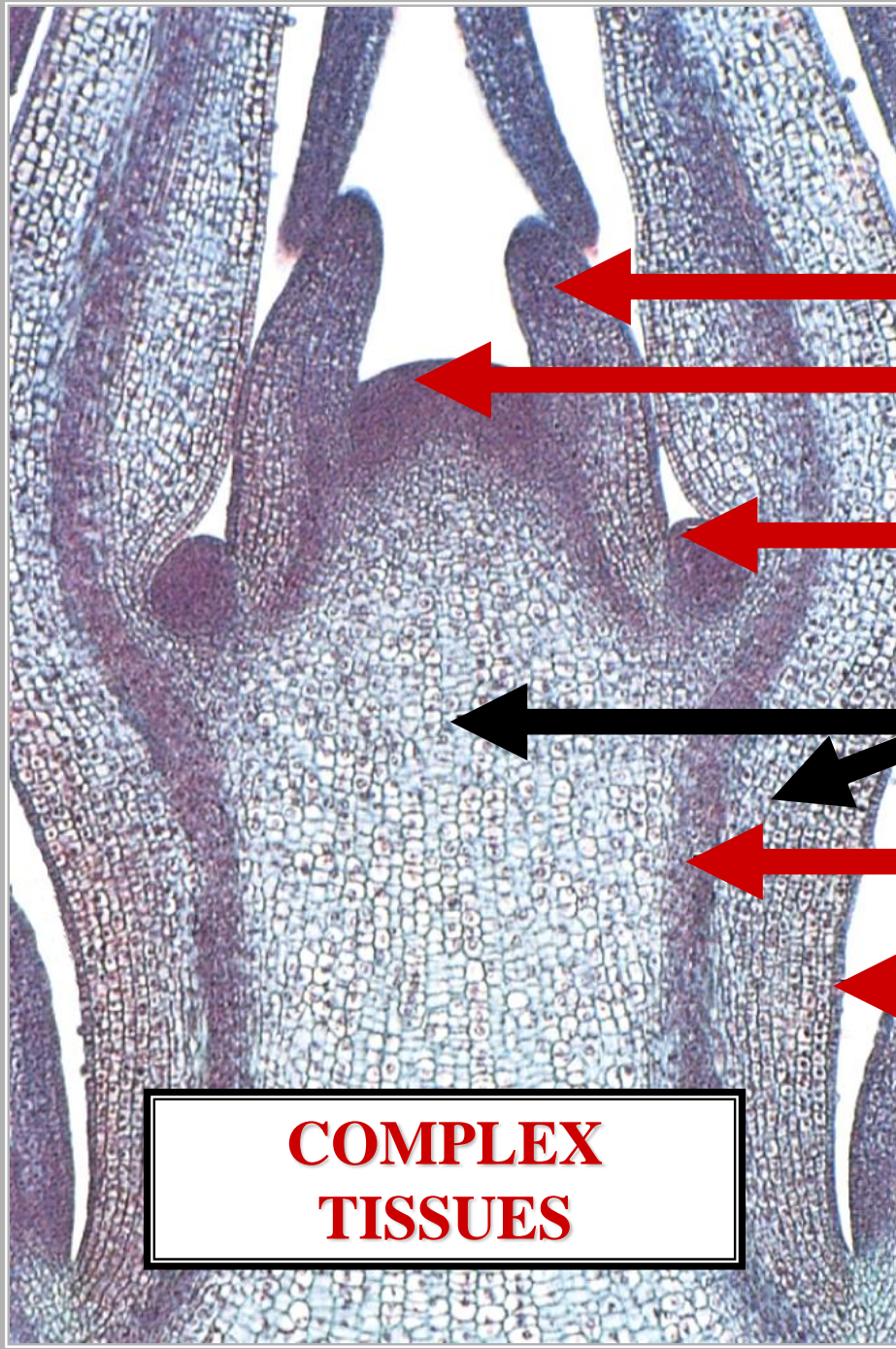
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**COMPLEX
TISSUES**

STEM

L.S.

ANGIOSPERM COMPLEX TISSUES



[]

**APICAL
MERISTEM**

[]

GROUND TISSUE

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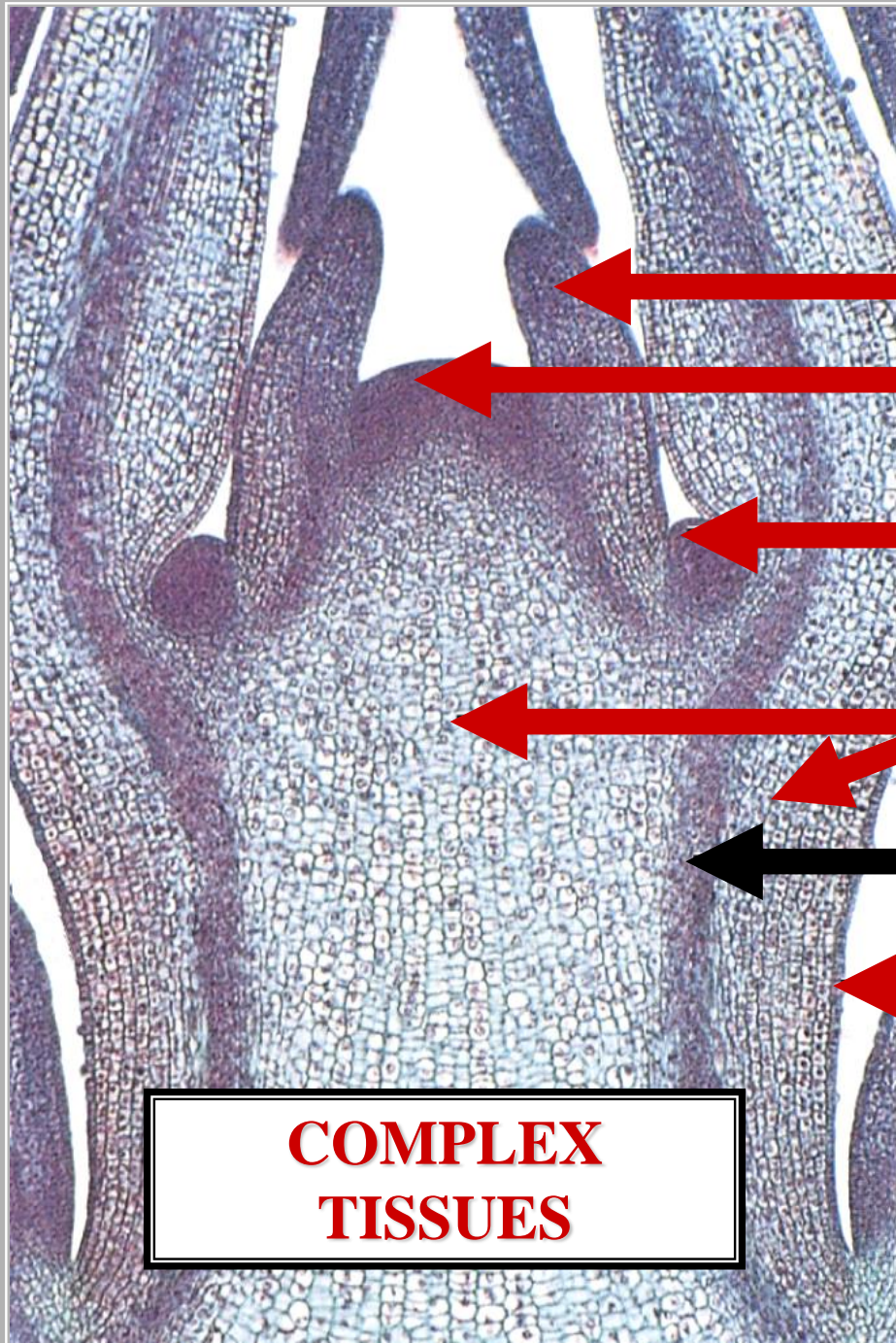
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STEM

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**APICAL
MERISTEM**

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GROUND TISSUE

VASCULAR TISSUE

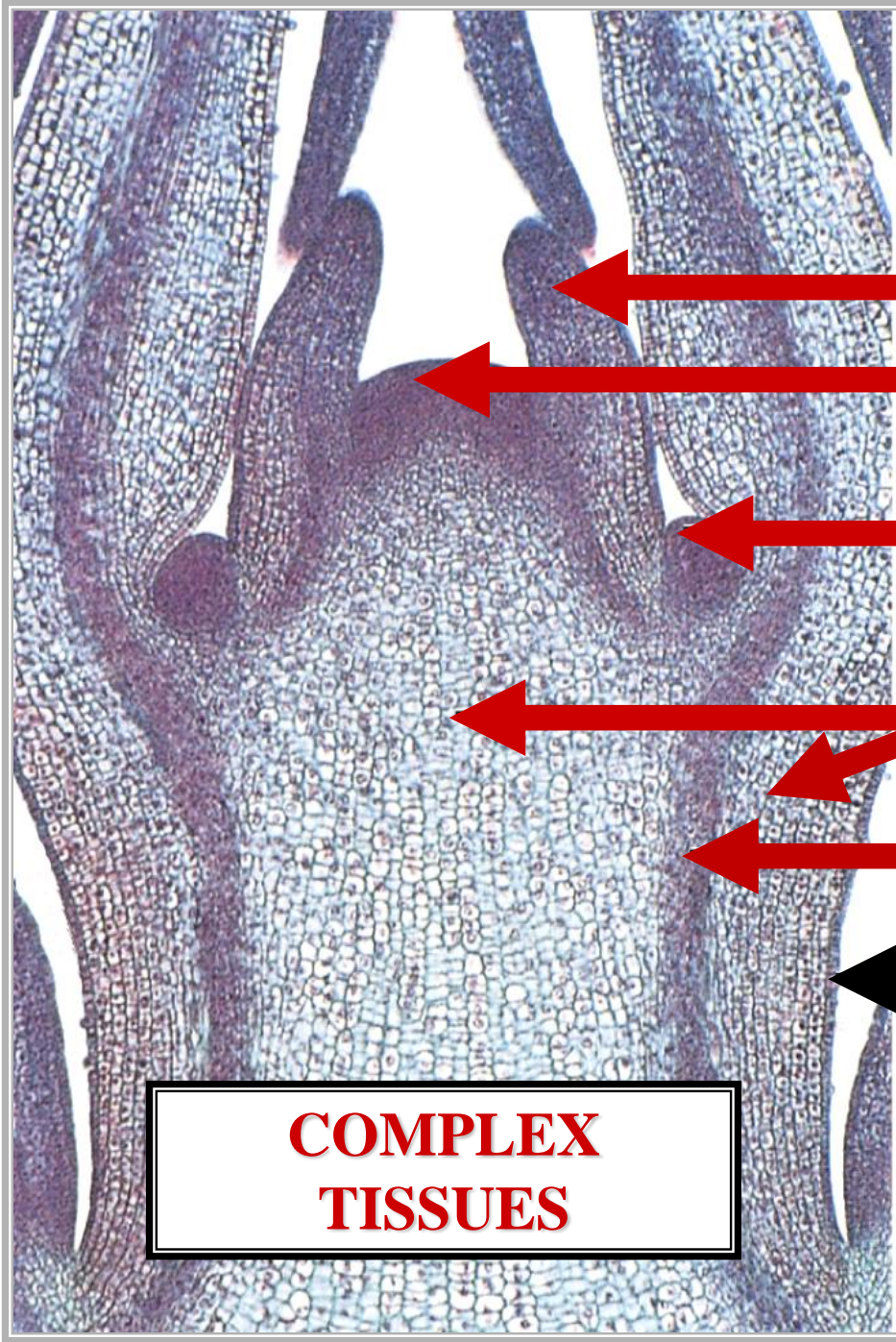
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**COMPLEX
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**APICAL
MERISTEM**

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GROUND TISSUE

VASCULAR TISSUE

DERMAL TISSUE

STEM

L.S.

**COMPLEX
TISSUES**

DERMAL TISSUE