

A close-up photograph of a pine cone, showing its textured, brown, scaly surface. The pine cone is surrounded by numerous long, thin, green needles that are slightly curved and have a fine texture. The background is dark and out of focus.

TRACHEIDS

GYMNOSPERMS



ANGIOSPERMS



ANGIOSPERMS



TRACHEIDS & VESSEL MEMBERS

ANGIOSPERMS



PHLOEM

NUCLEUS

SE

SUGAR

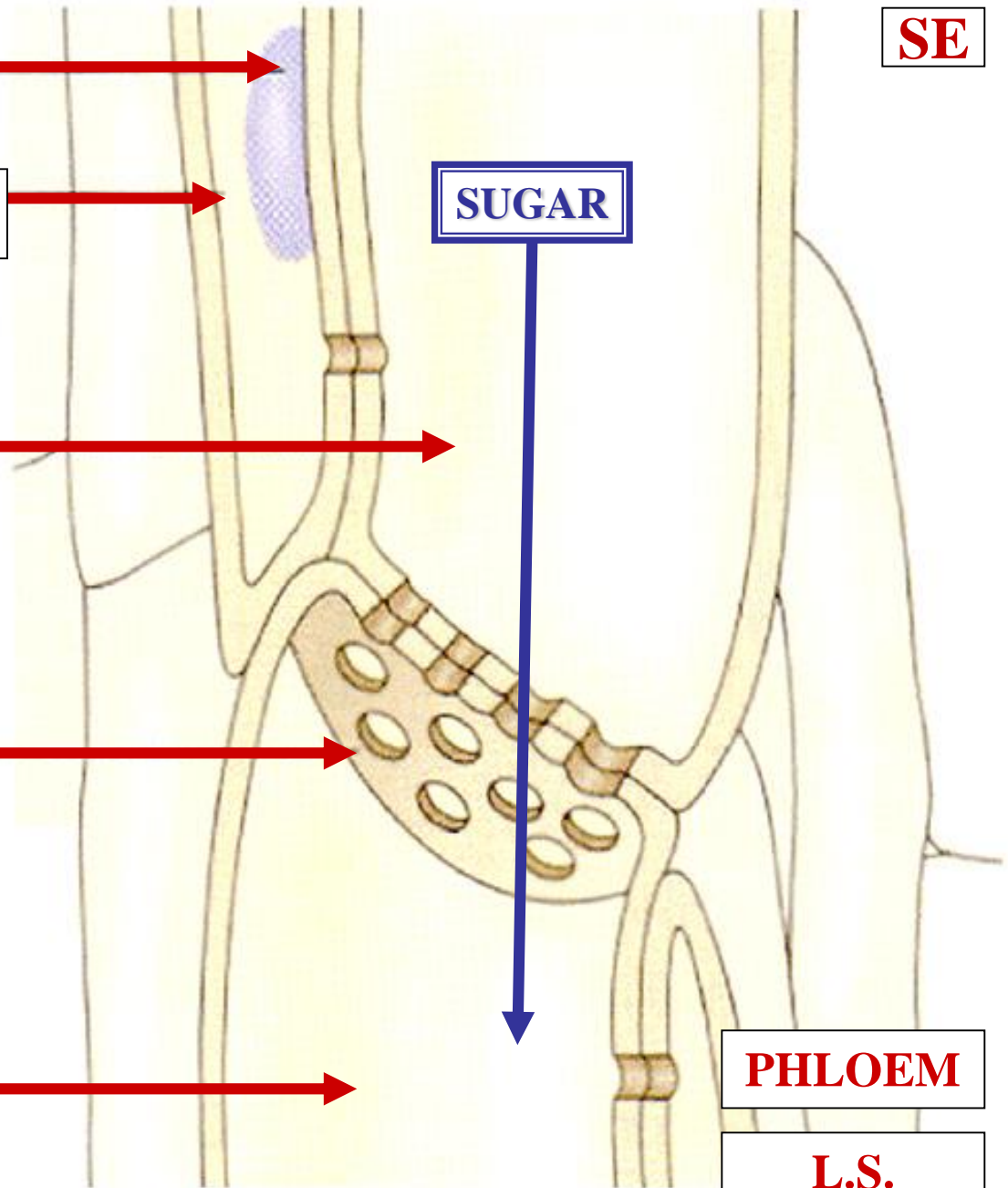
PHLOEM CELL

END WALL

PHLOEM CELL

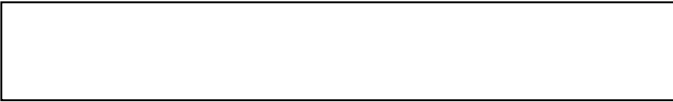
PHLOEM

L.S.



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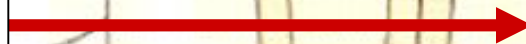
NUCLEUS



SUGAR



SIEVE ELEMENTS



END WALL

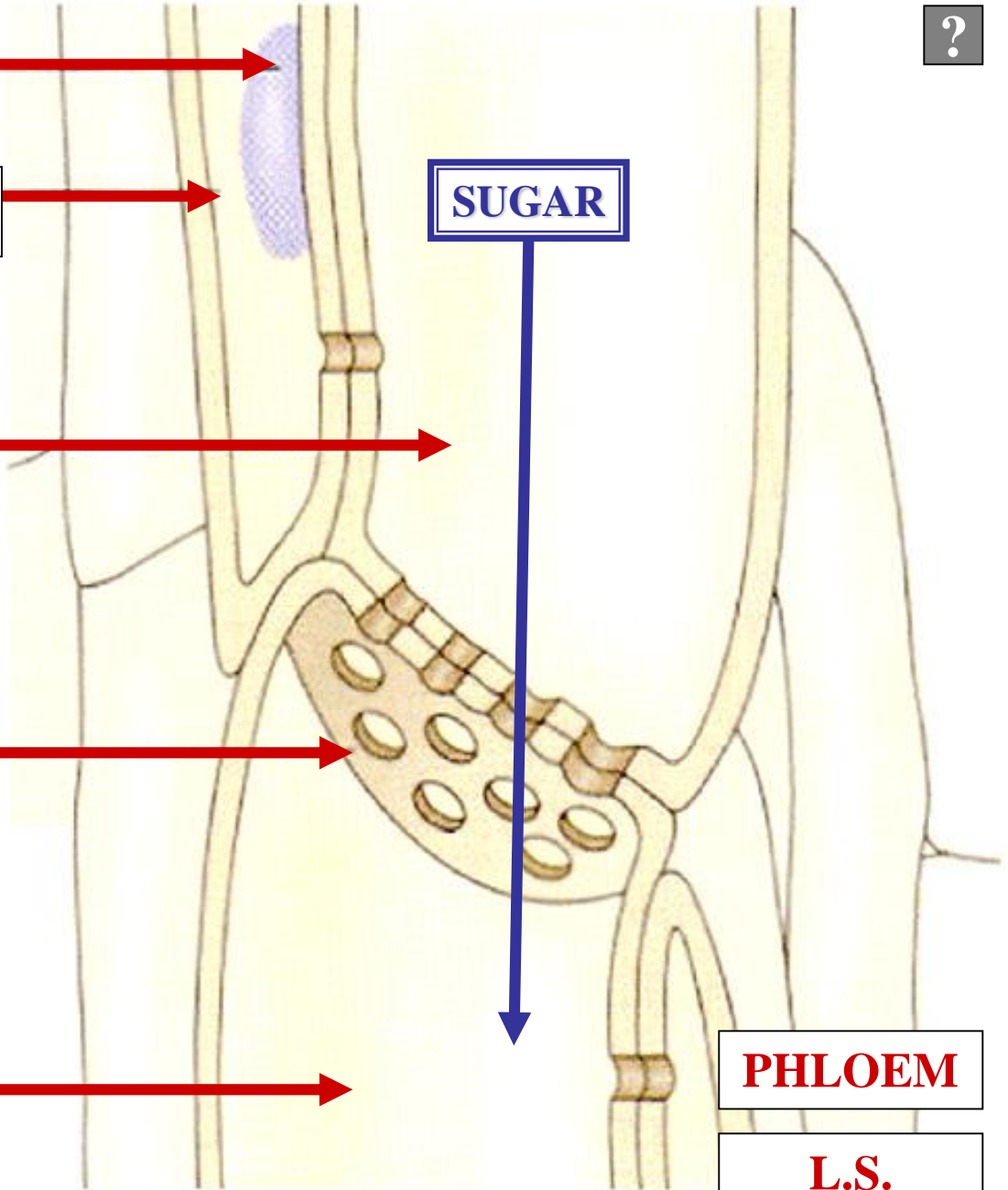


SIEVE ELEMENTS



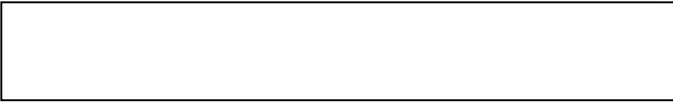
PHLOEM

L.S.



S

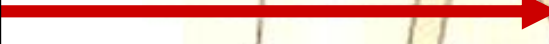
NUCLEUS



SUGAR

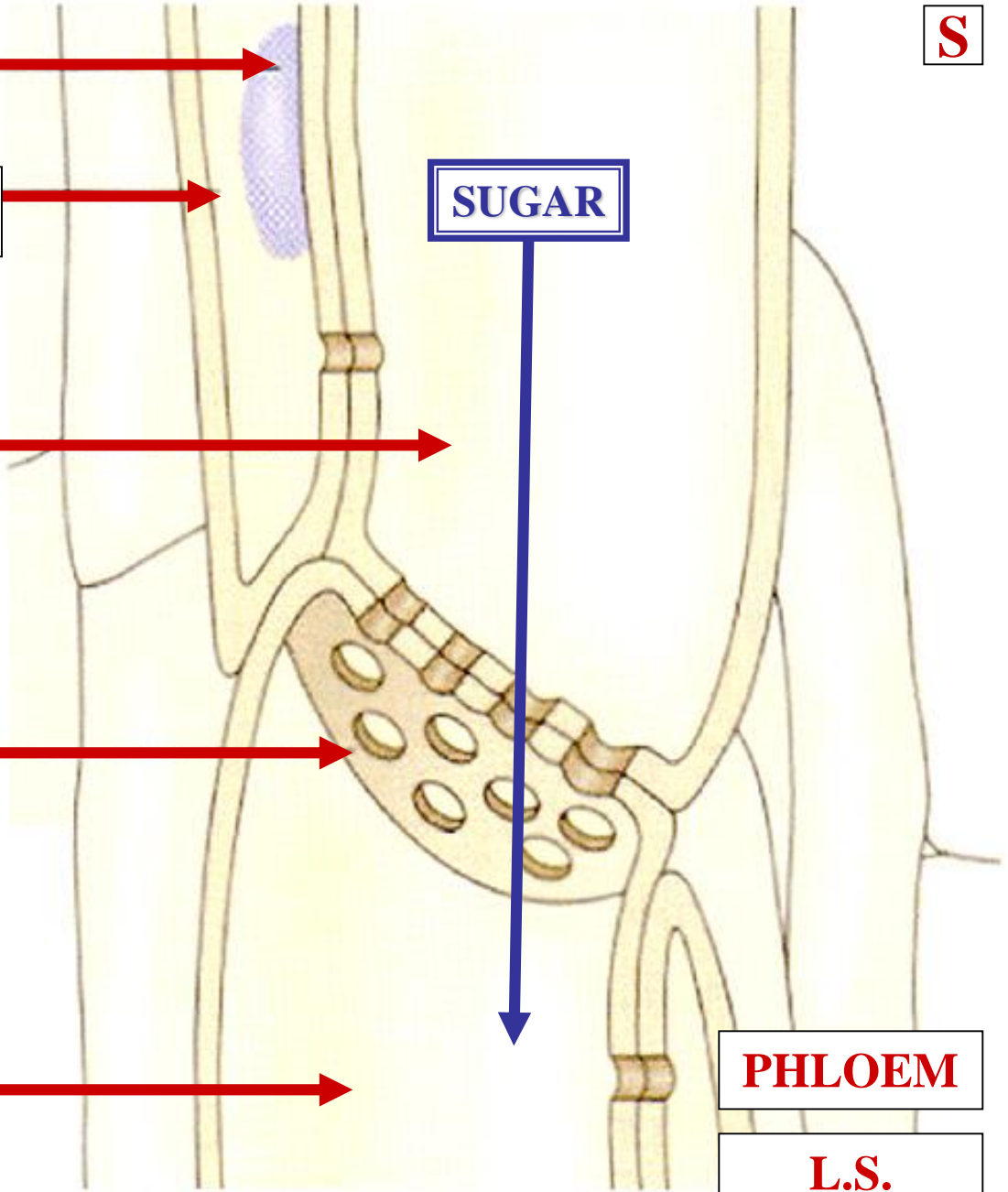


**SIEVE AREA
SMALL PORES**



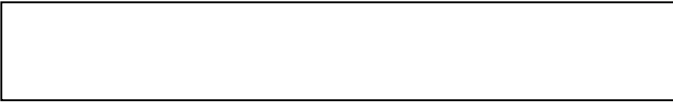
PHLOEM

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NUCLEUS



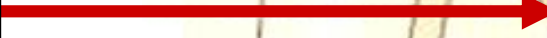
SUGAR



SIEVE CELL



**SIEVE AREA
SMALL PORES**

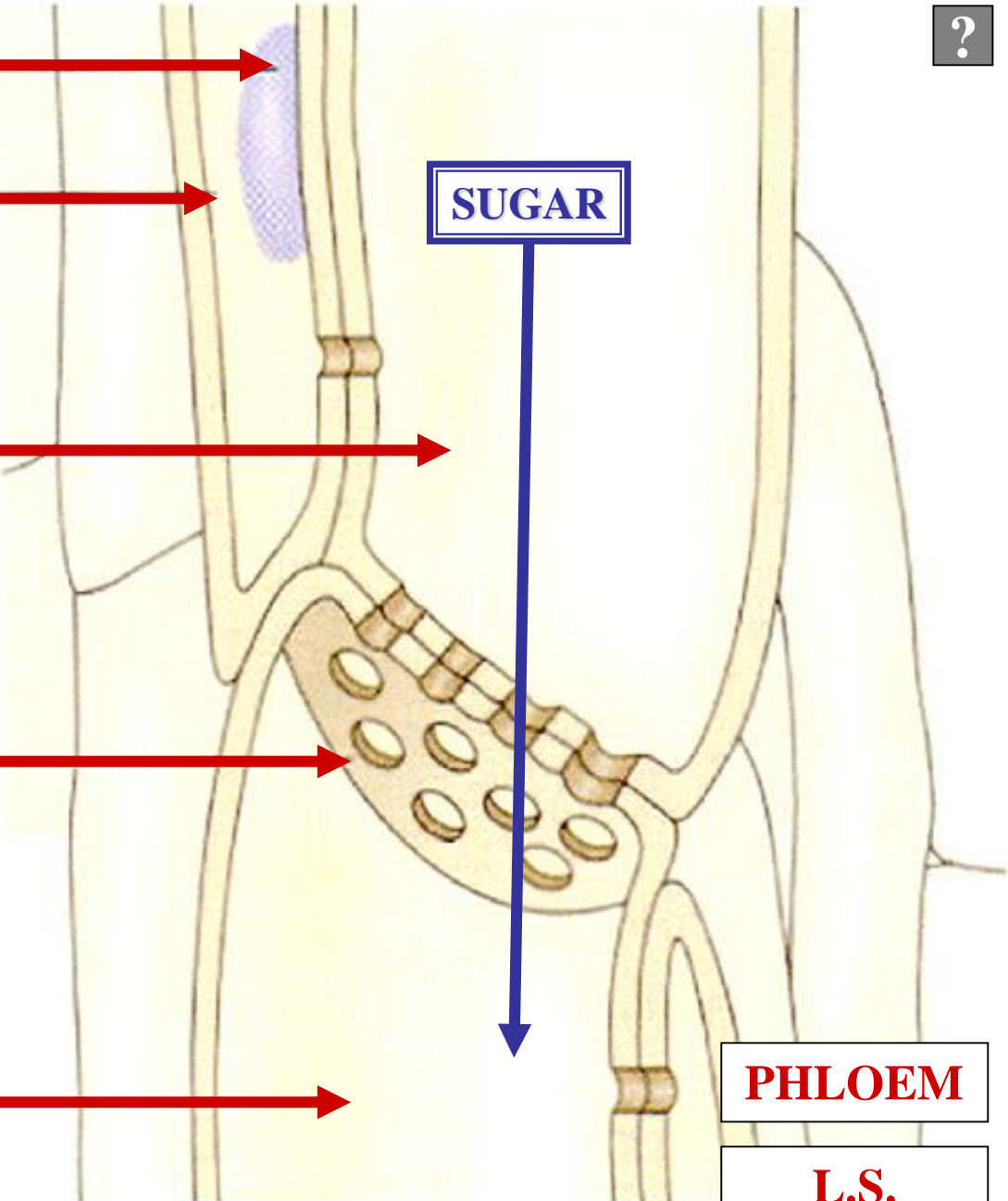


SIEVE CELL



PHLOEM

L.S.

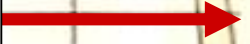


A

NUCLEUS



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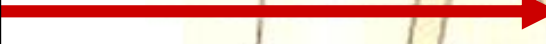
SUGAR



SIEVE CELL



**SIEVE AREA
SMALL PORES**

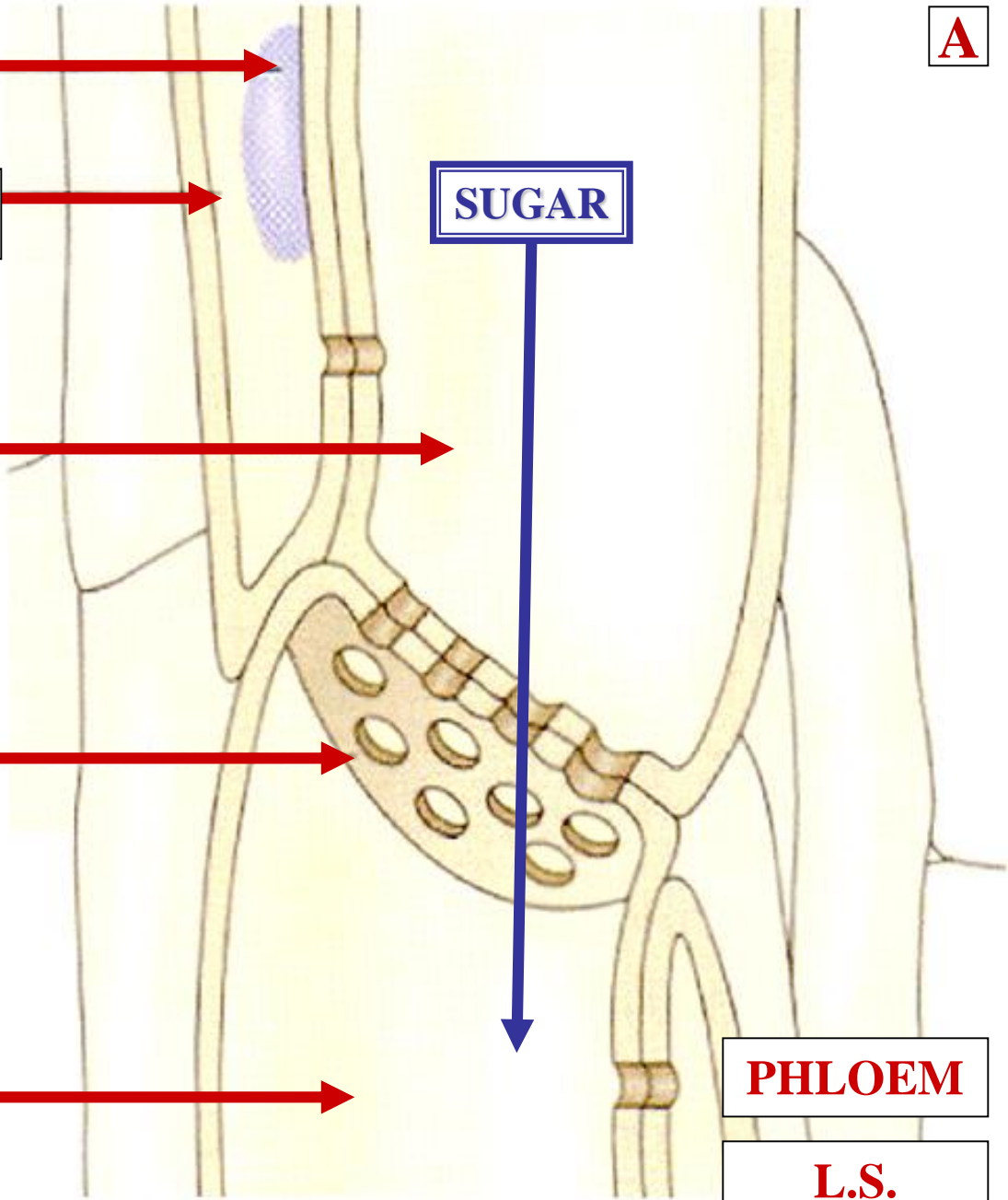


SIEVE CELL



PHLOEM

L.S.





NUCLEUS



ALBUMINOUS CELL



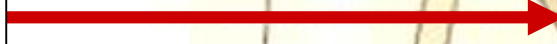
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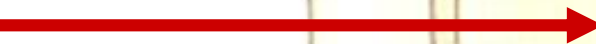
SIEVE CELL



**SIEVE AREA
SMALL PORES**

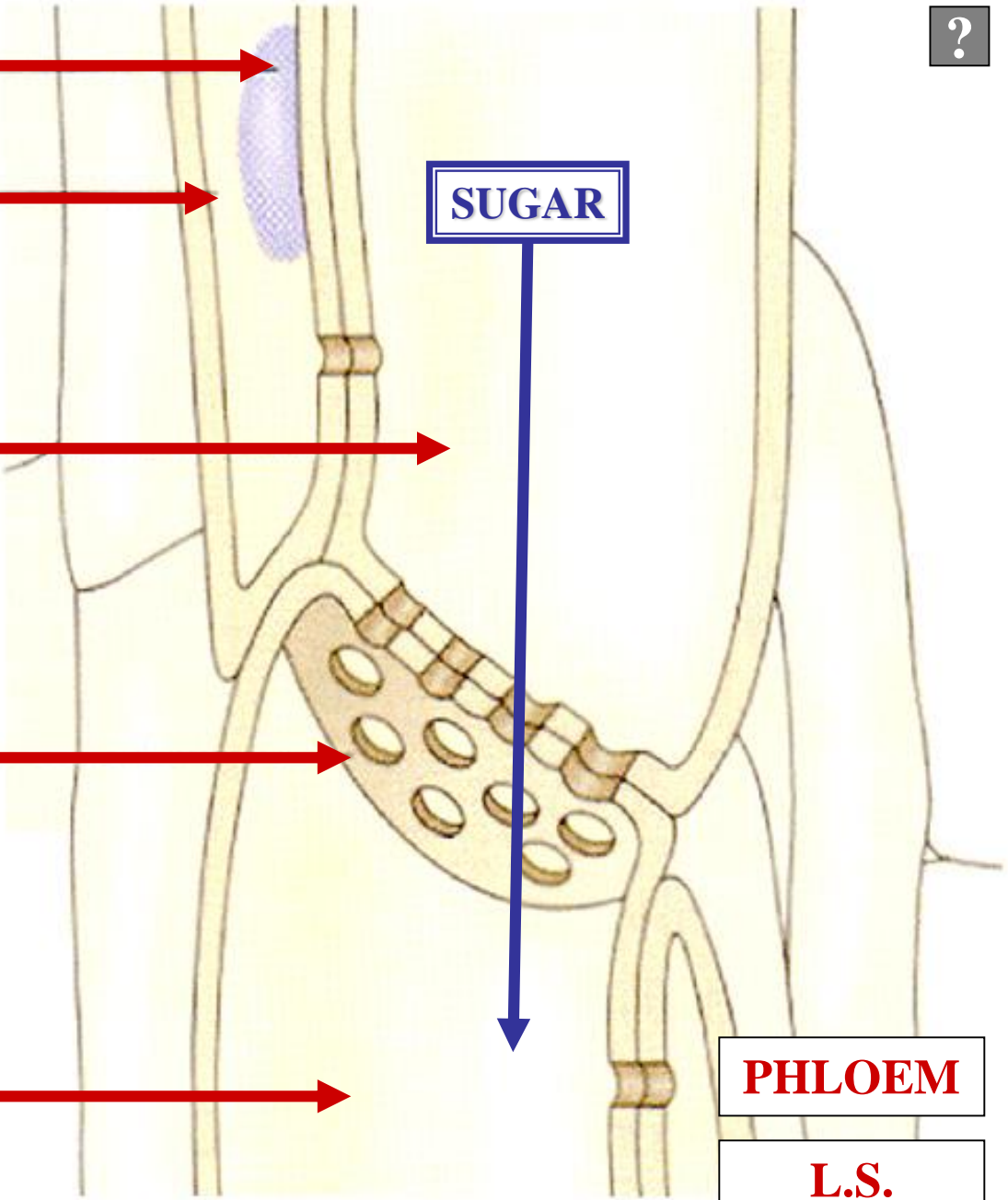


SIEVE CELL



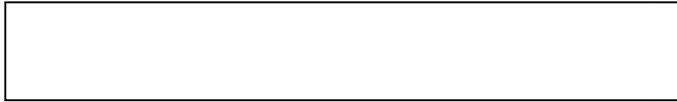
PHLOEM

L.S.



SM

NUCLEUS



SUGAR

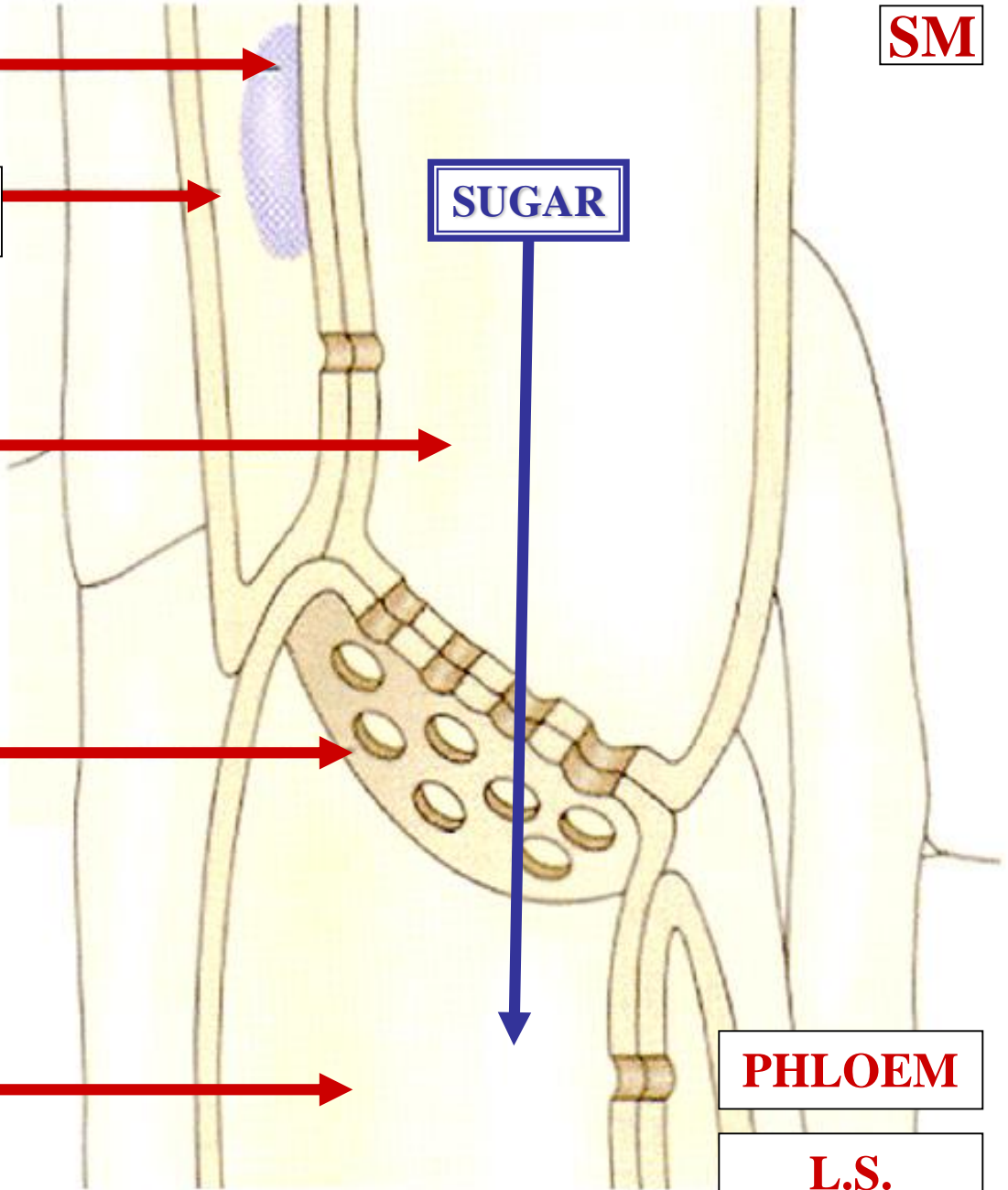


**SIEVE PLATE
LARGE PORES**



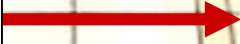
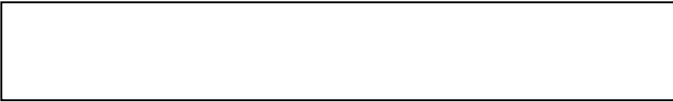
PHLOEM

L.S.





NUCLEUS



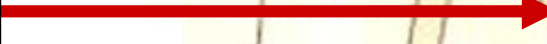
SUGAR



SIEVE MEMBER



**SIEVE PLATE
LARGE PORES**

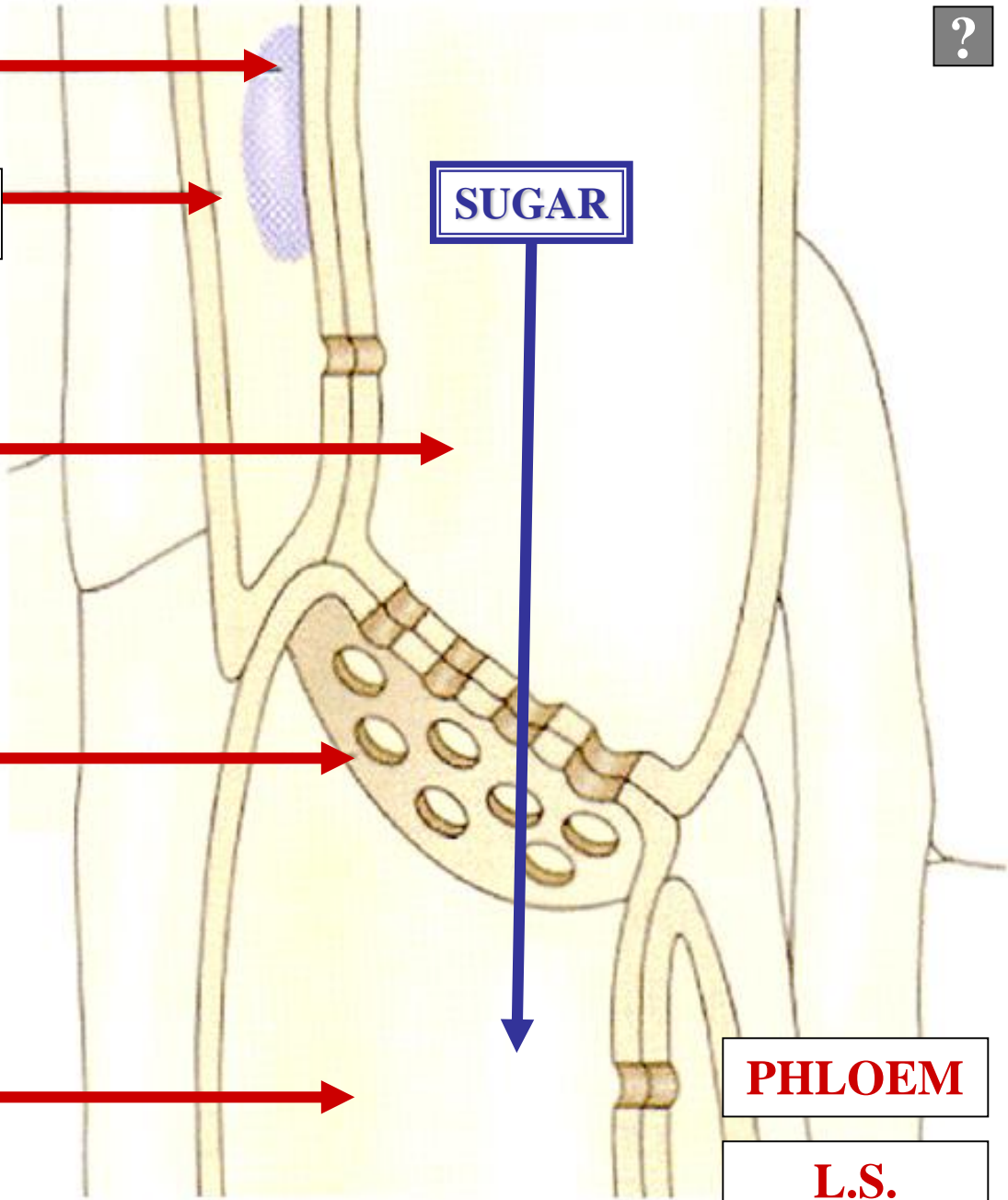


SIEVE MEMBER



PHLOEM

L.S.



C

NUCLEUS



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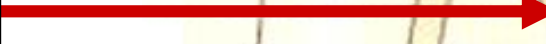
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SIEVE MEMBER



**SIEVE PLATE
LARGE PORES**

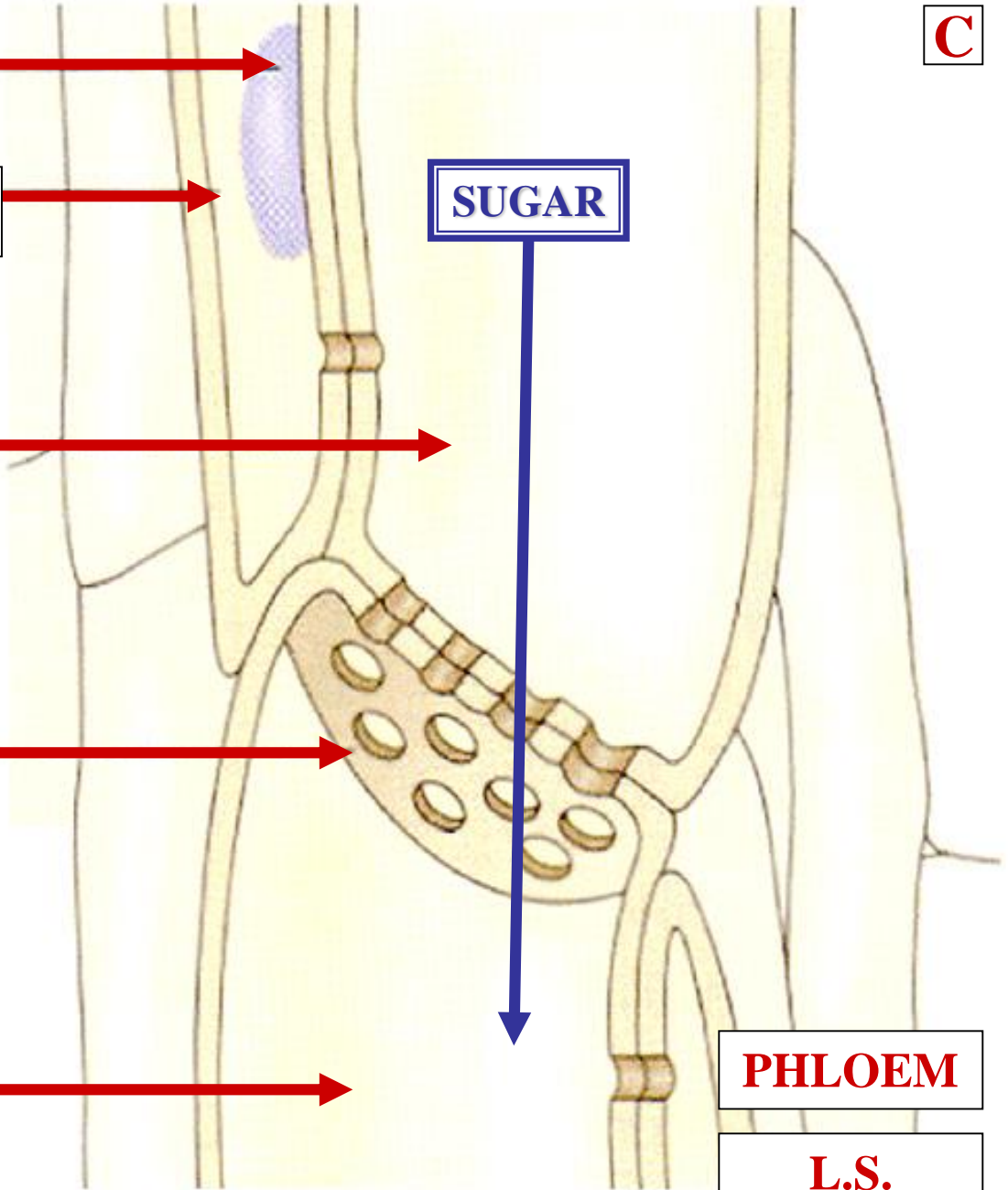


SIEVE MEMBER



PHLOEM

L.S.





NUCLEUS



CAMPANION CELL



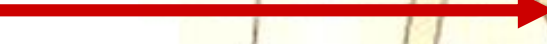
SUGAR



SIEVE MEMBER



**SIEVE PLATE
LARGE PORES**

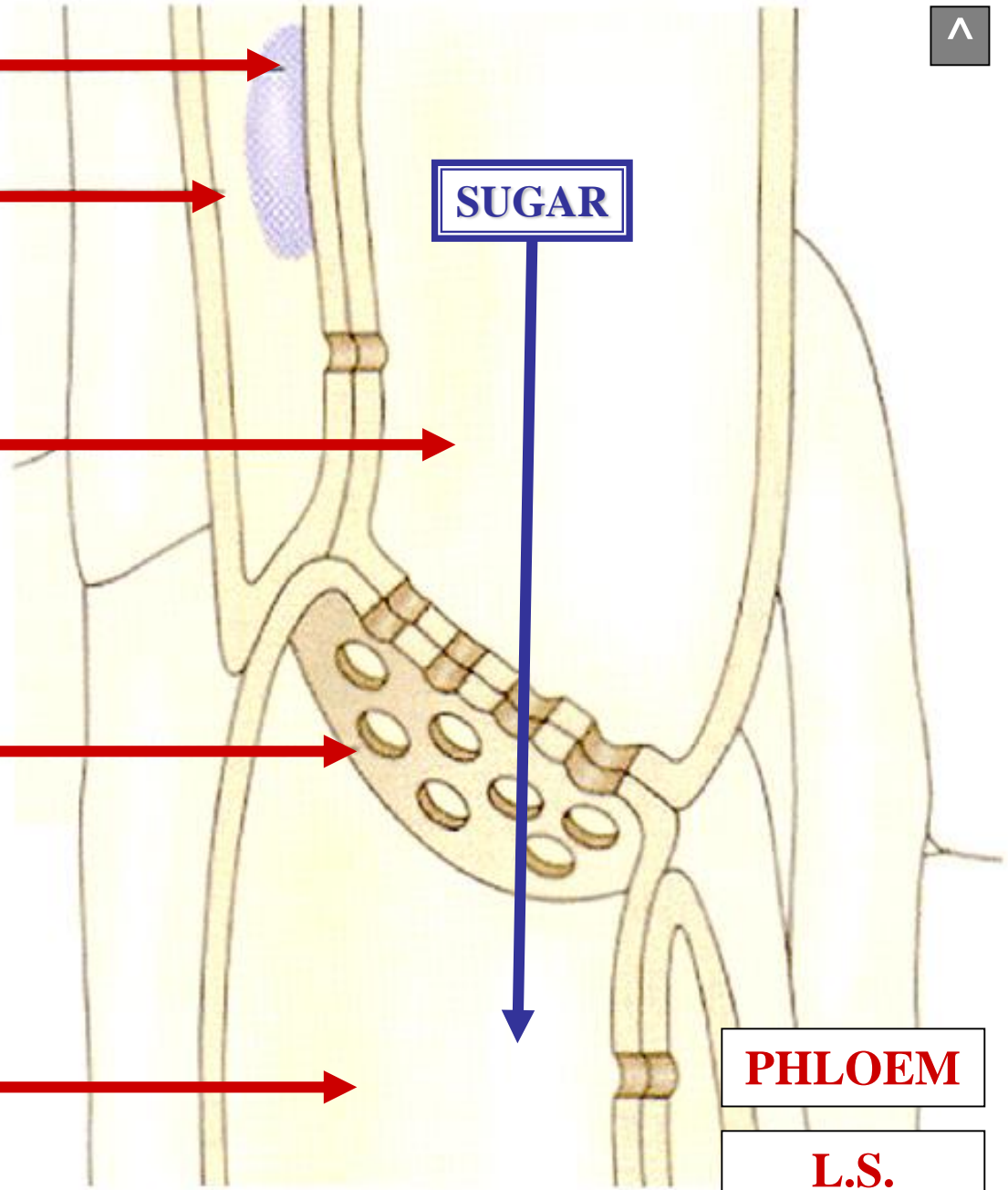


SIEVE MEMBER



PHLOEM

L.S.





GYMNOSPERMS

S

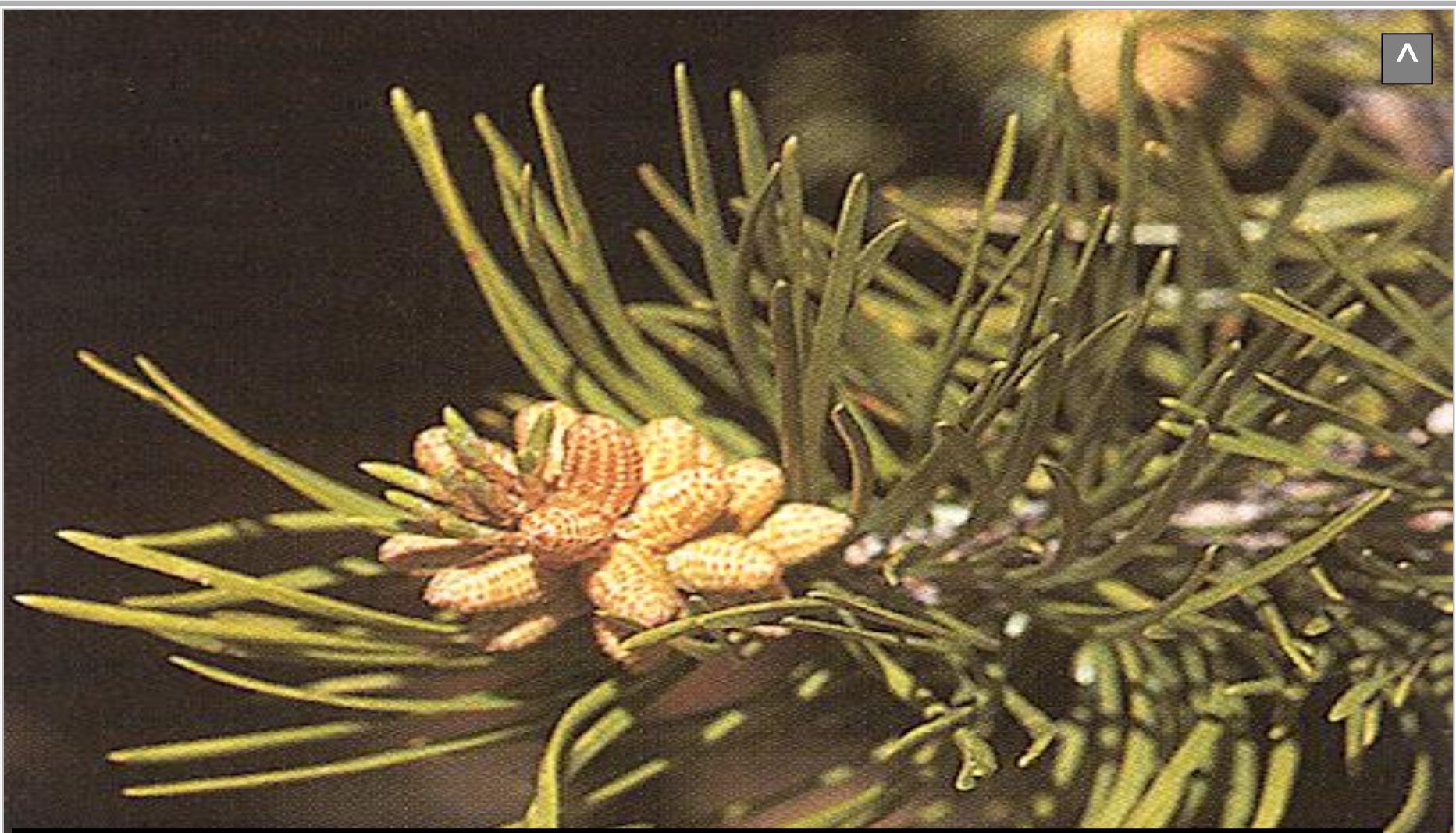


GYMNOSPERMS



SIEVE CELLS

GYMNOSPERMS



SIEVE CELLS & ALBUMINOUS CELLS

GYMNOSPERMS



ANGIOSPERMS



ANGIOSPERMS



SIEVE MEMBERS

ANGIOSPERMS



SIEVE MEMBERS & COMPANION CELLS

ANGIOSPERMS



**SIEVE MEMBERS
AND
COMPANION CELLS
DIAGNOSTIC
ANGIOSPERM
CHARACTERS**



ROOT



ROOT STELE



G

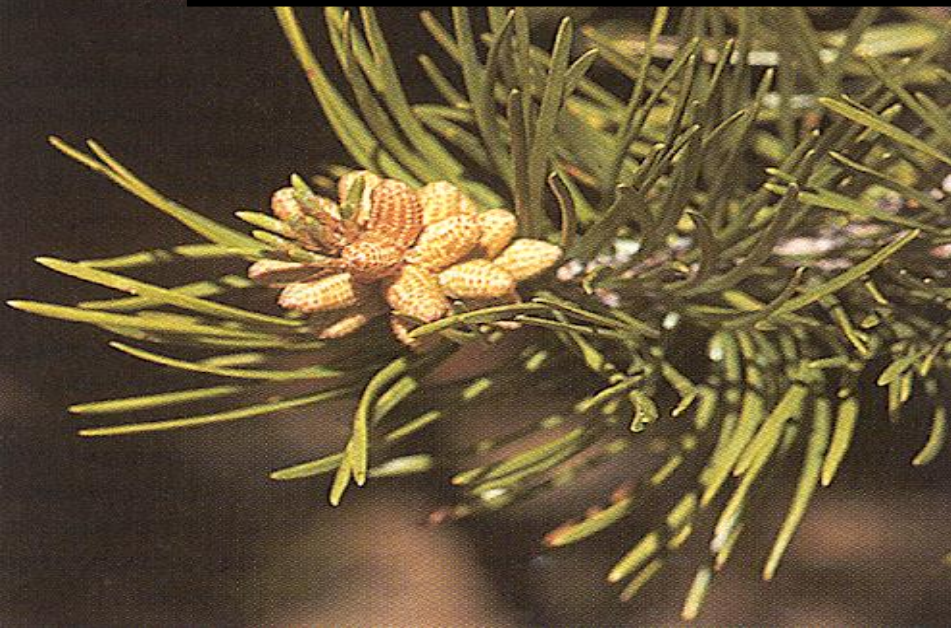
GYMNOSPERMS & DICOTS



D



GYMNOSPERMS

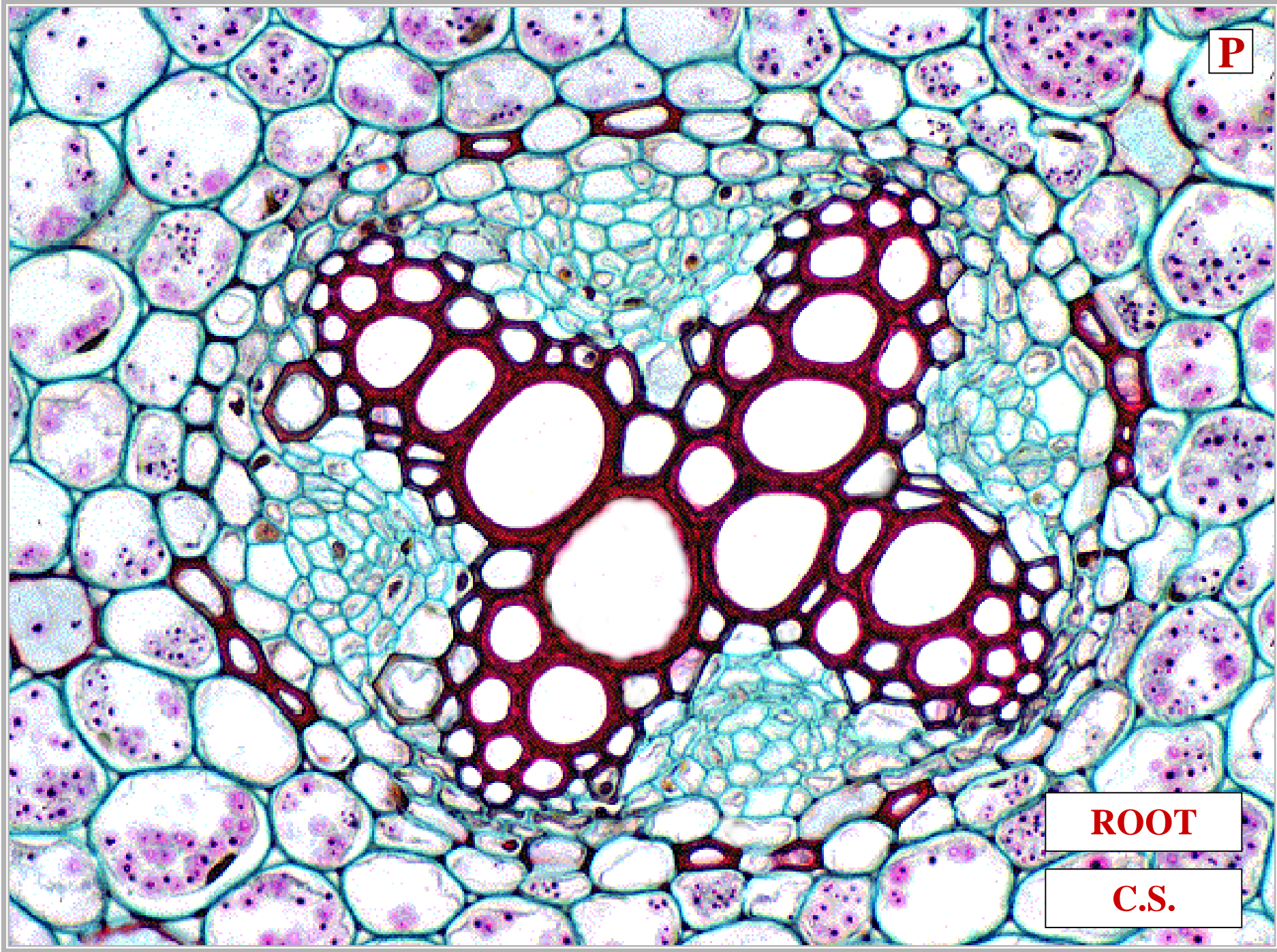




DICOTS



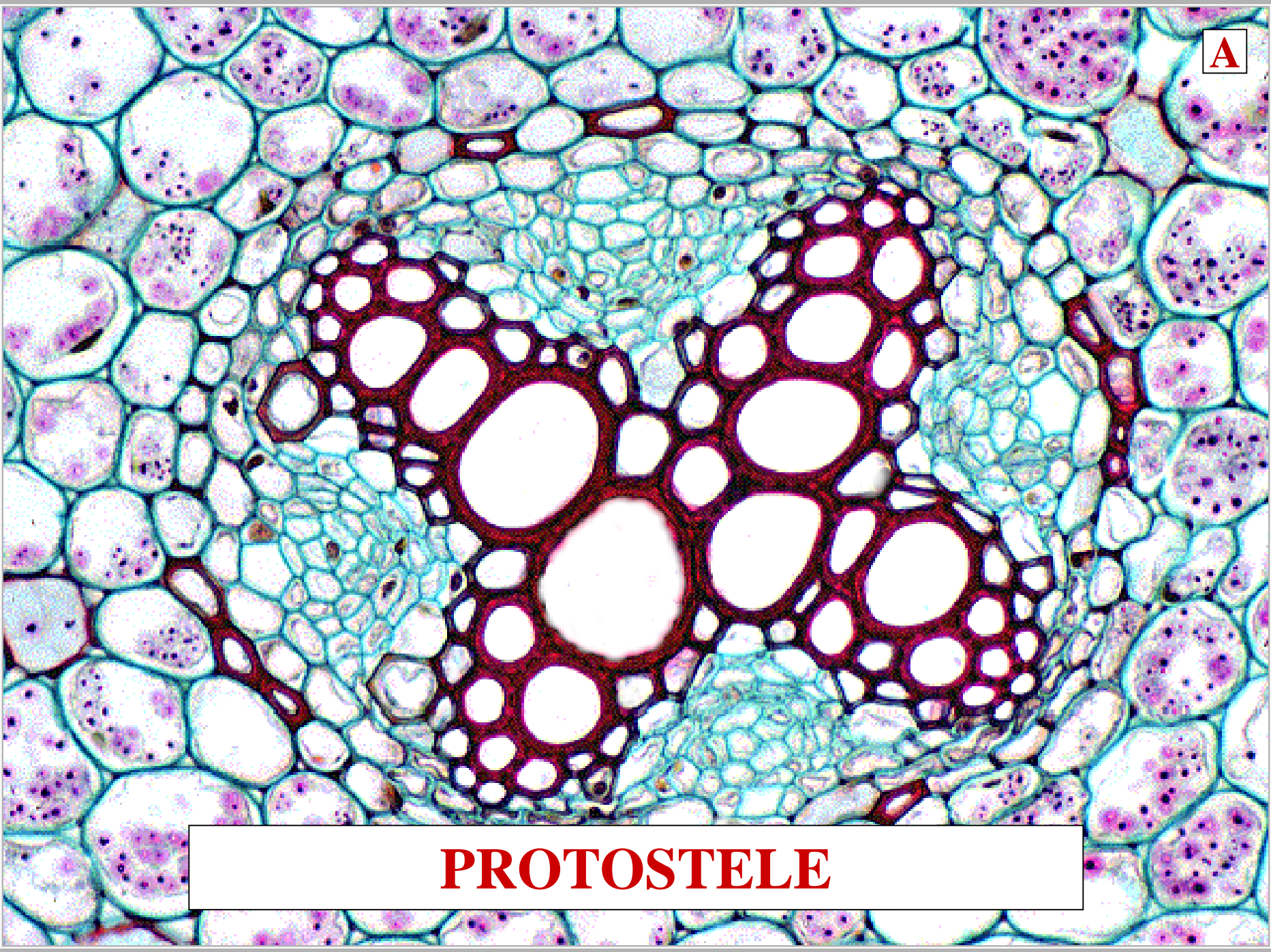
P



ROOT

C.S.

A



PROTOSTELE

A light micrograph of a plant stem cross-section showing a vascular bundle. The bundle is arranged in a ring-like pattern (actinostele) with large, clear vascular canals. The surrounding tissue consists of various cell types, including epidermal cells and mesophyll cells, stained with a blue-green dye. A small black square with a white upward-pointing arrow is located in the top right corner.

PROTOSTELE / ACTINOSTELE



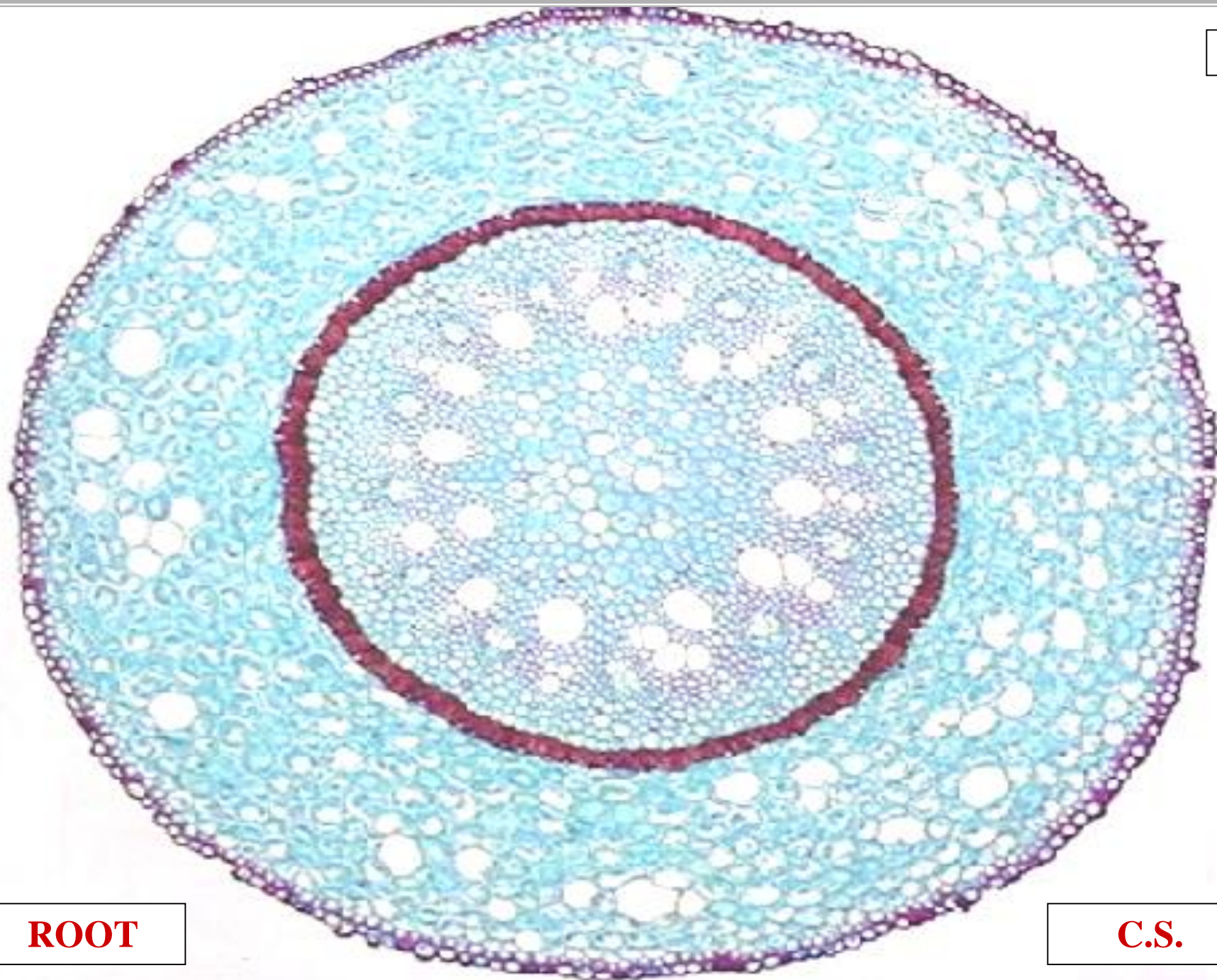
MONOCOTS



MONOCOTS

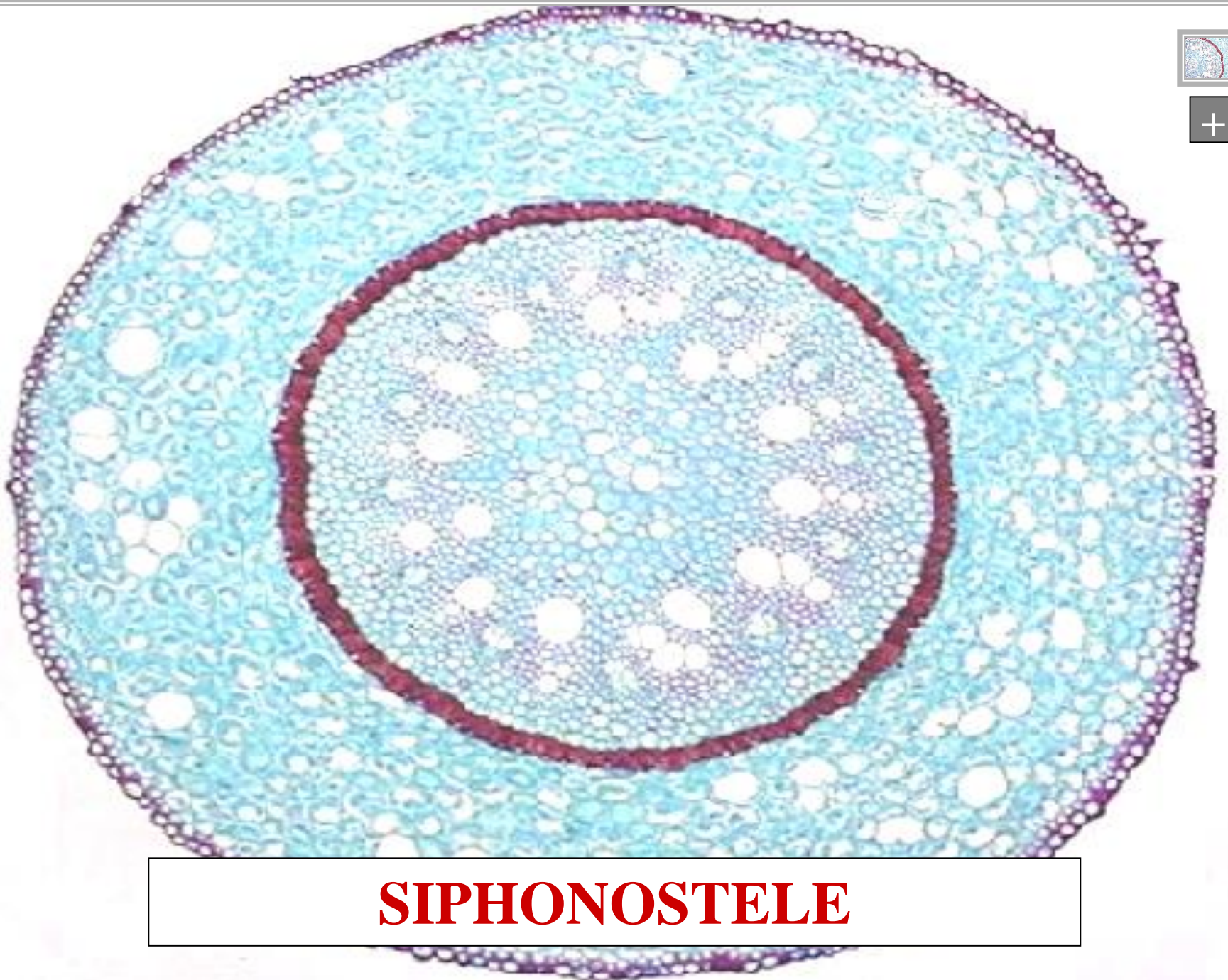


S



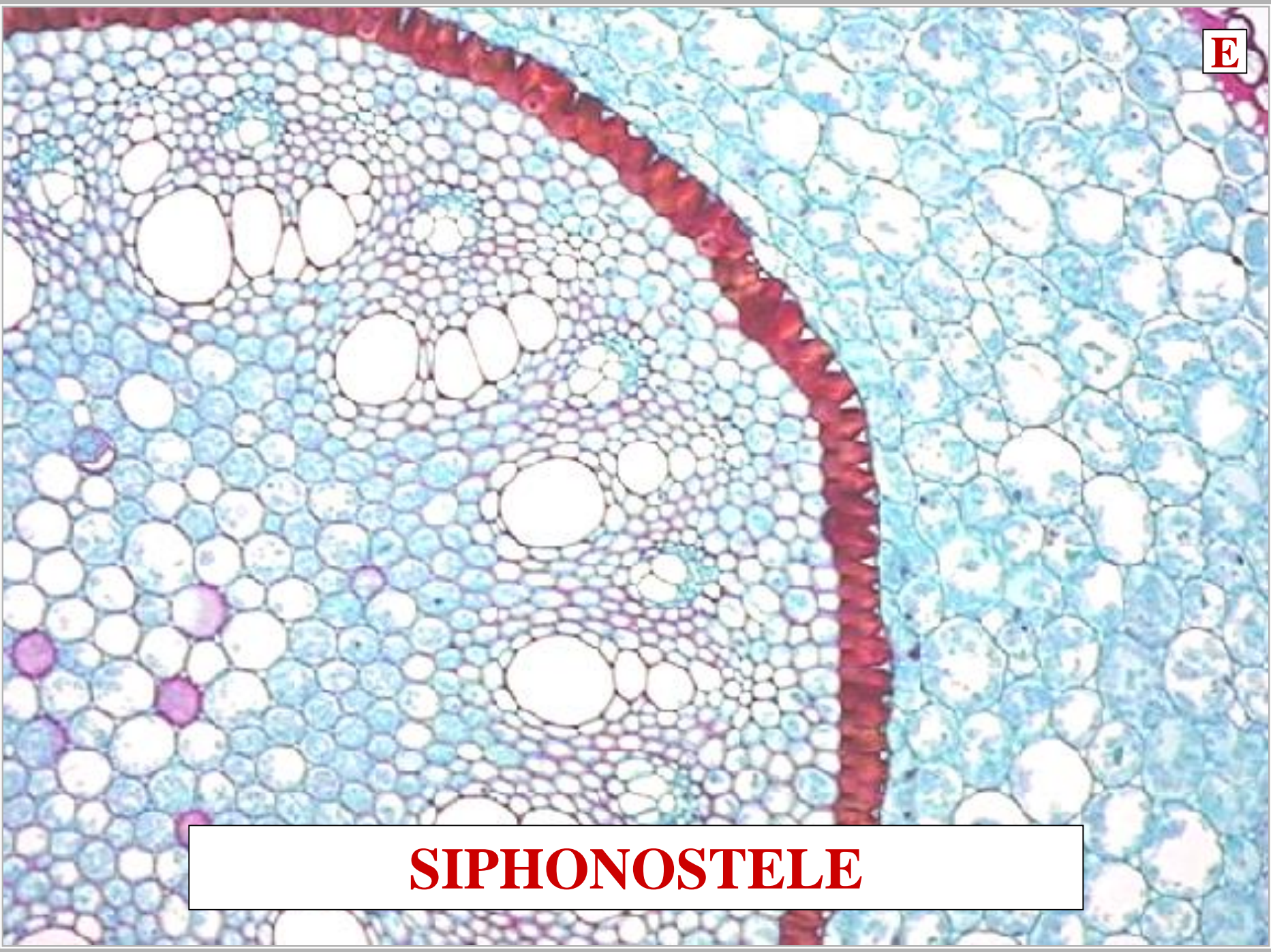
ROOT

C.S.

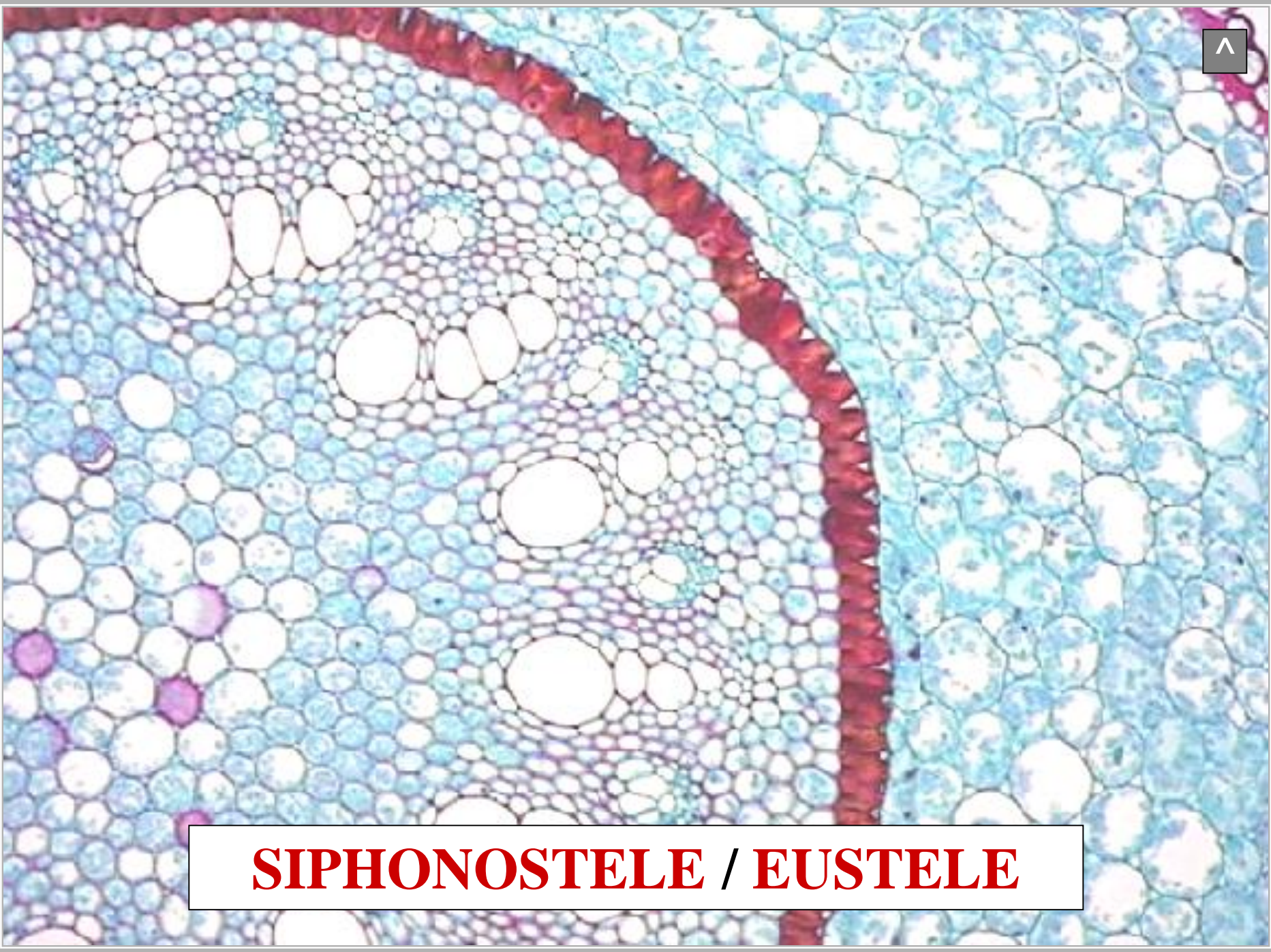


SIPHONOSTELE

E



SIPHONOSTELE



SIPHONOSTELE / EUSTELE



STEM



STEM STELE



G

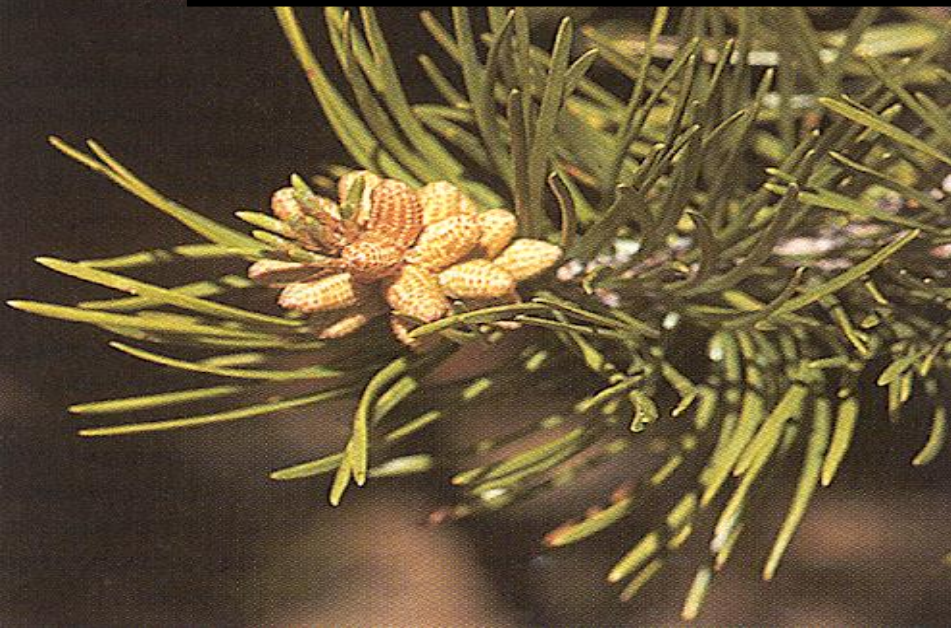
GYMNOSPERMS & DICOTS



D



GYMNOSPERMS

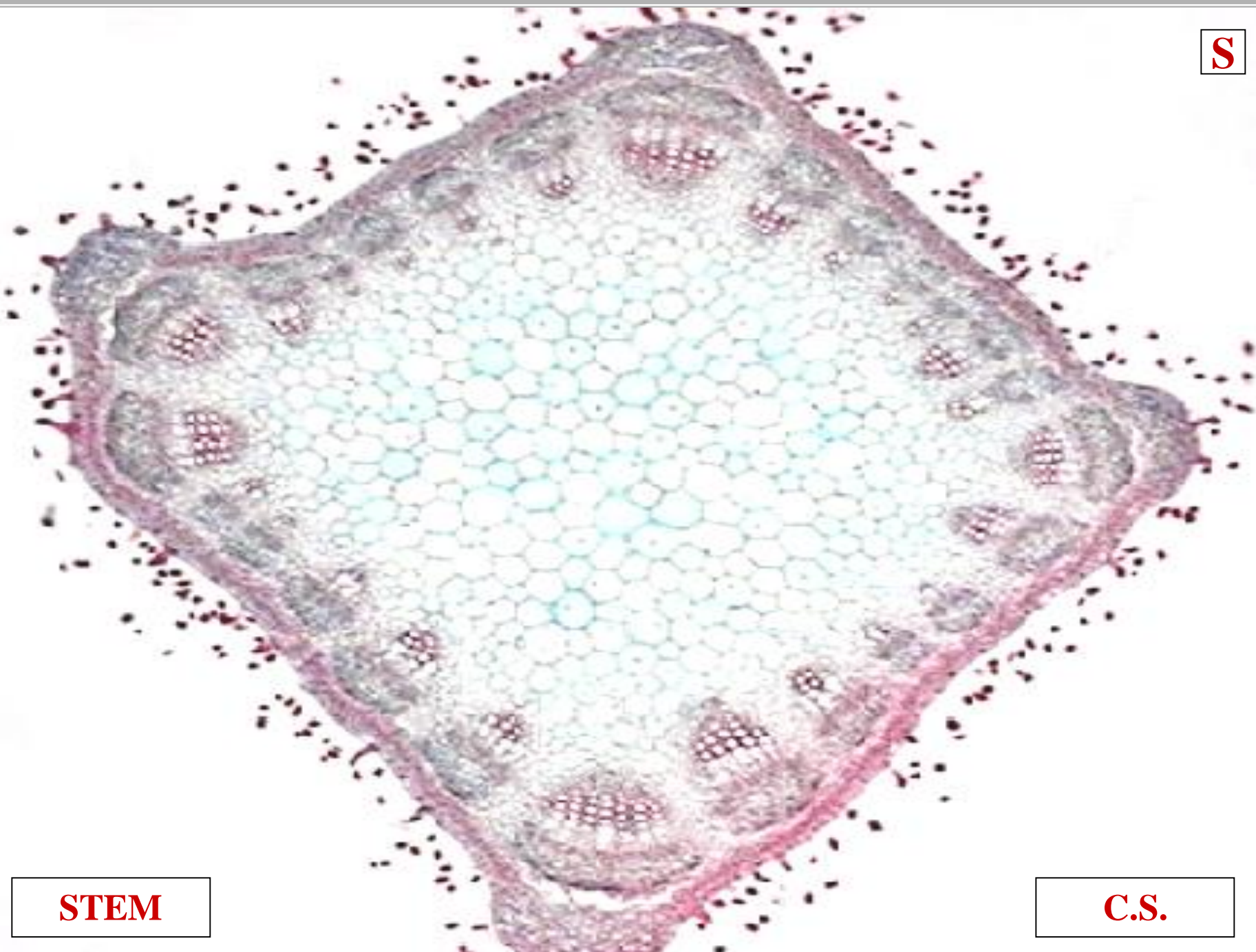




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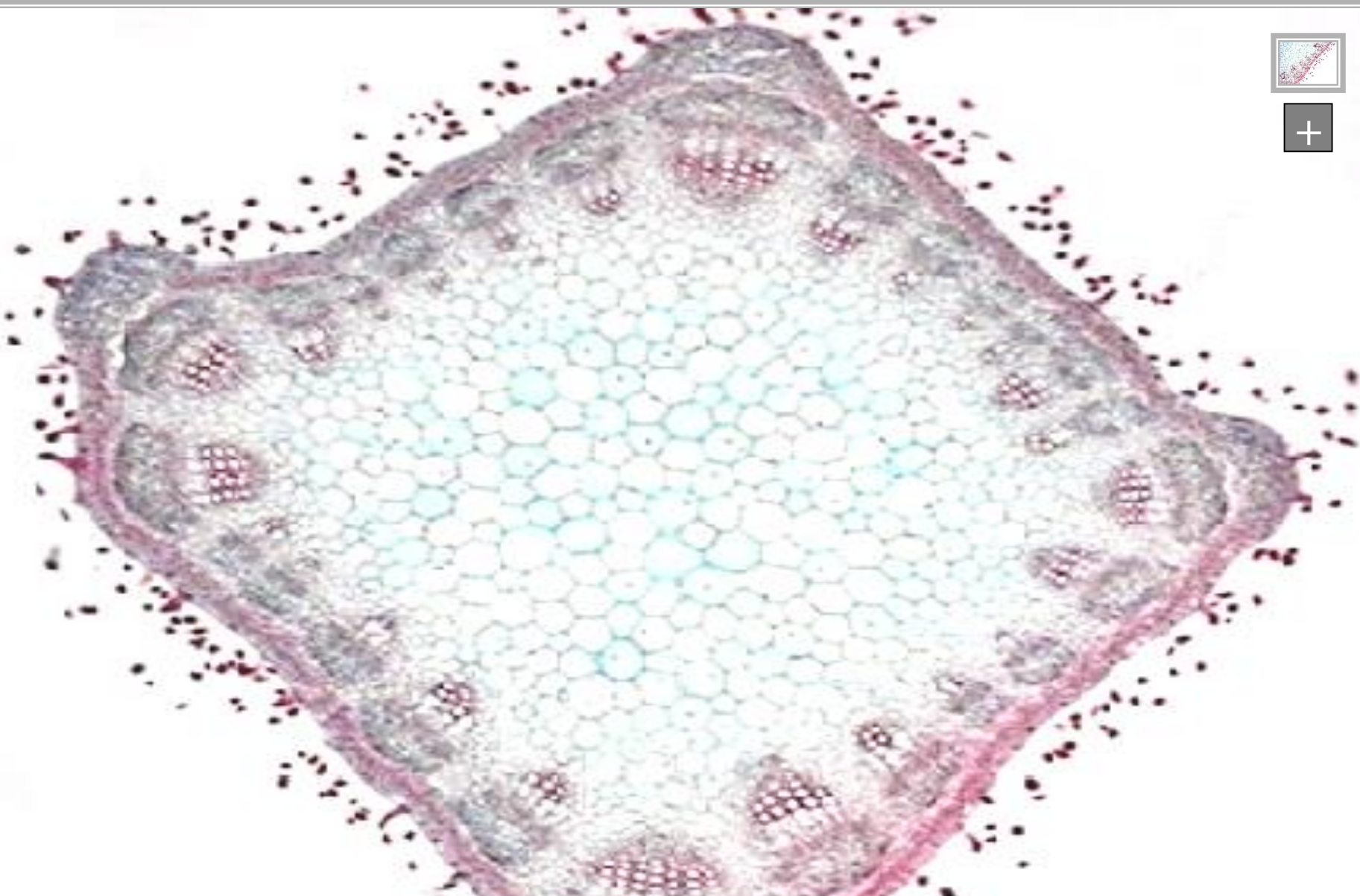


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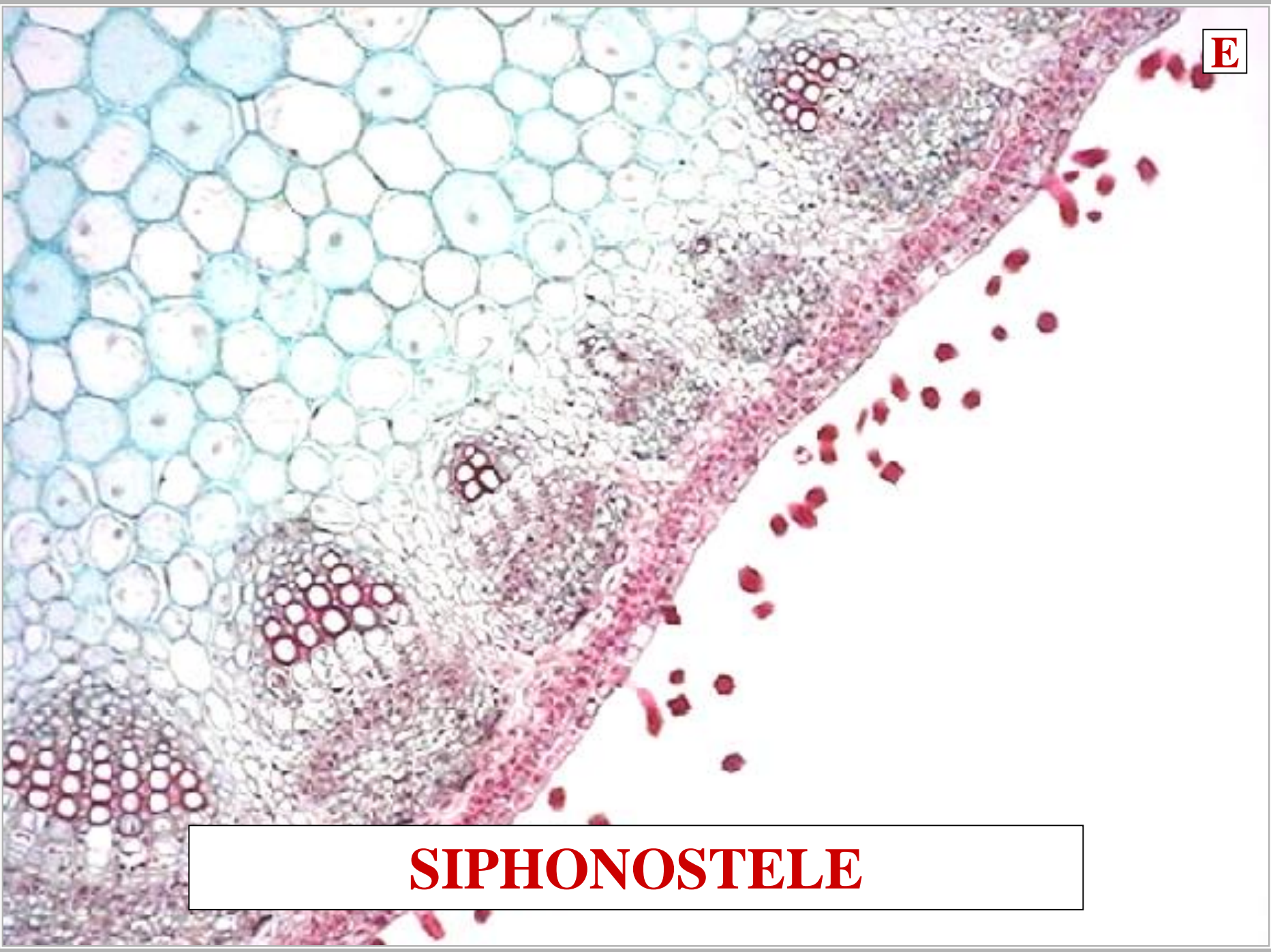
STEM

C.S.



SIPHONOSTELE

E



SIPHONOSTELE

I

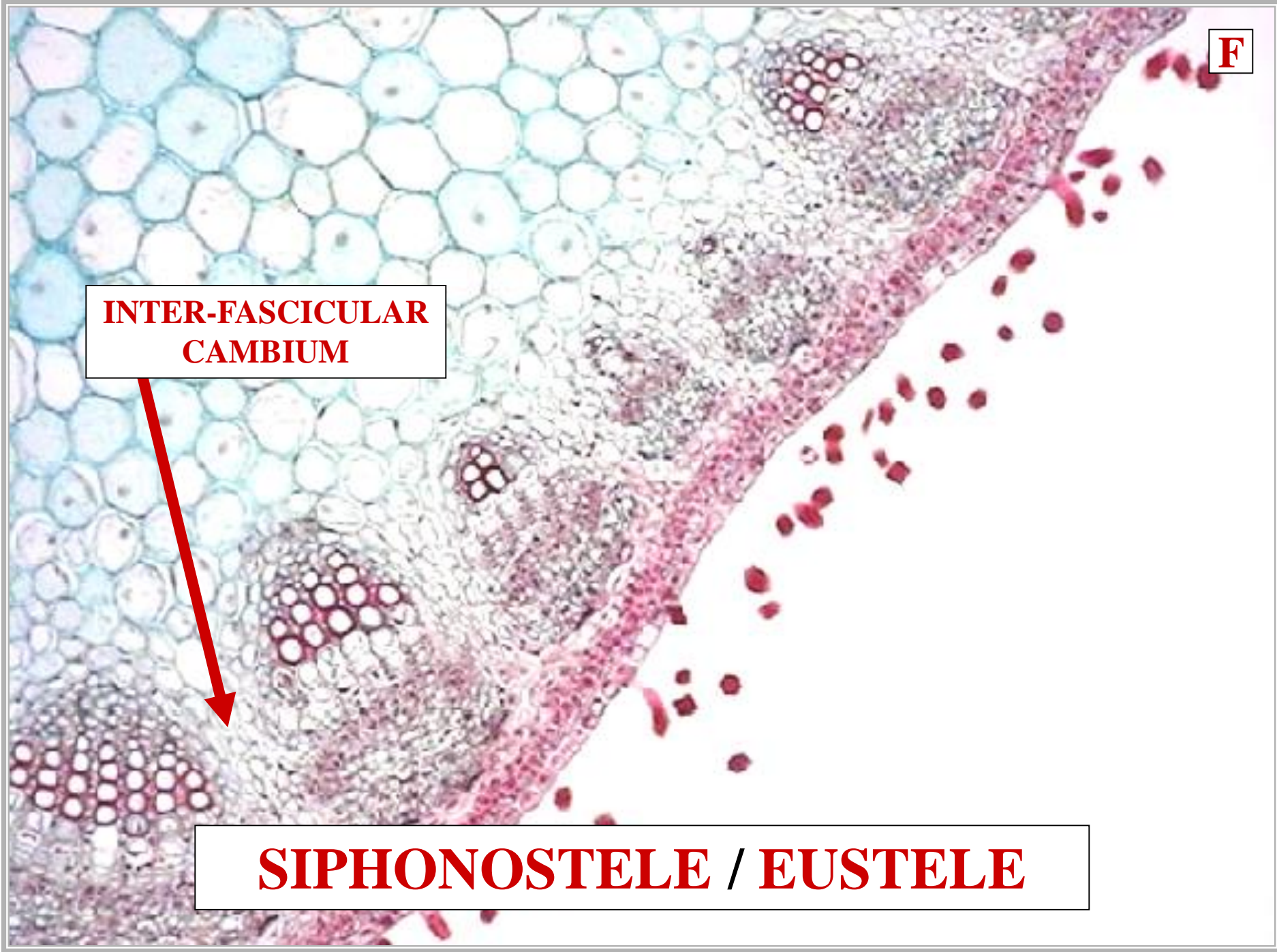


SIPHONOSTELE / EUSTELE

**INTER-FASCICULAR
CAMBIUM**



SIPHONOSTELE / EUSTELE



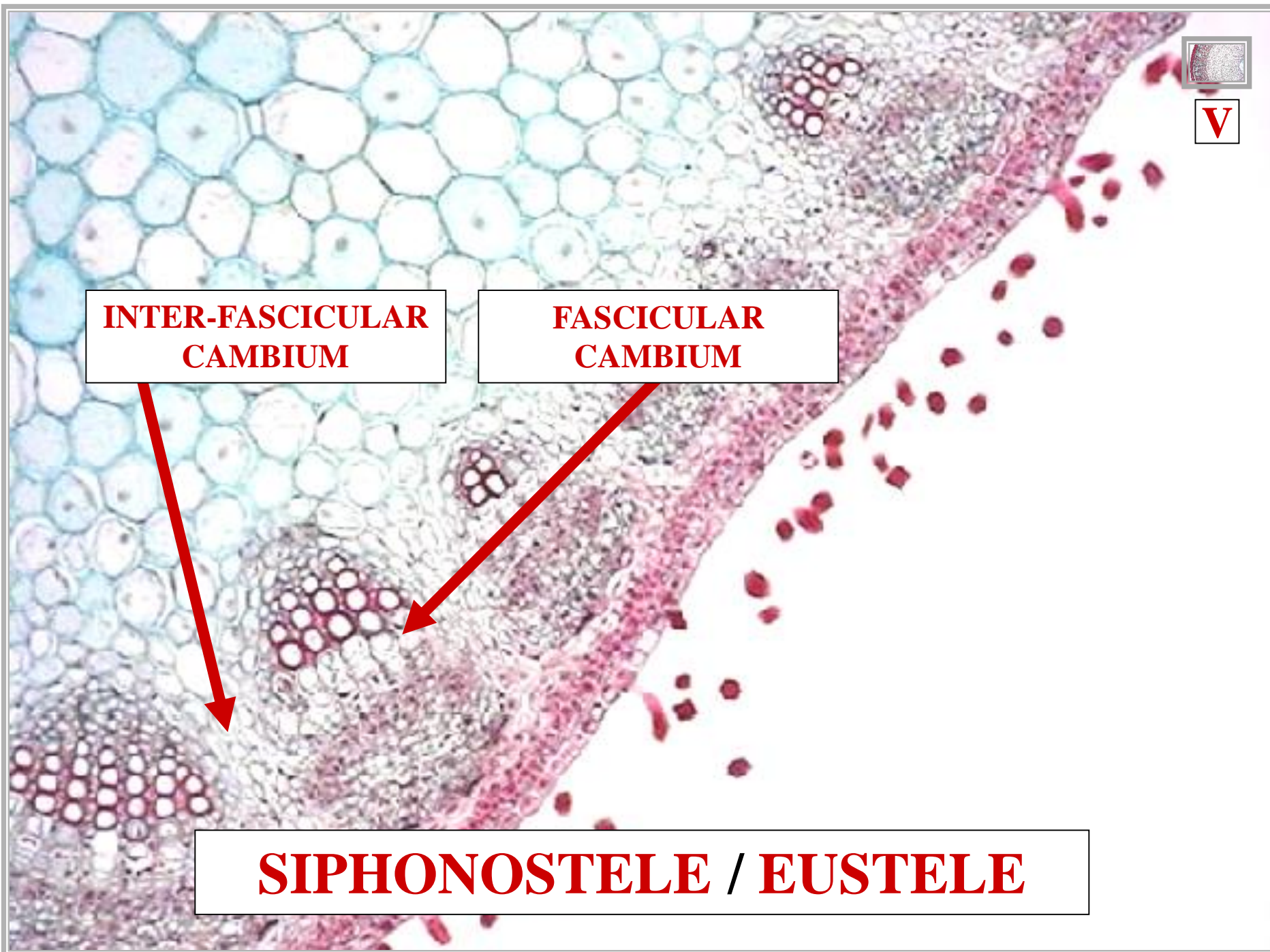


V

**INTER-FASCICULAR
CAMBIUM**

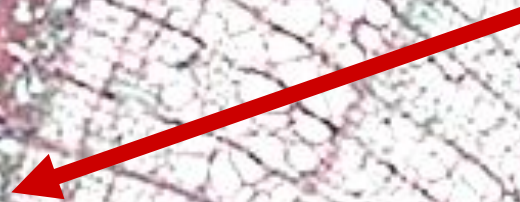
**FASCICULAR
CAMBIUM**

SIPHONOSTELE / EUSTELE



?

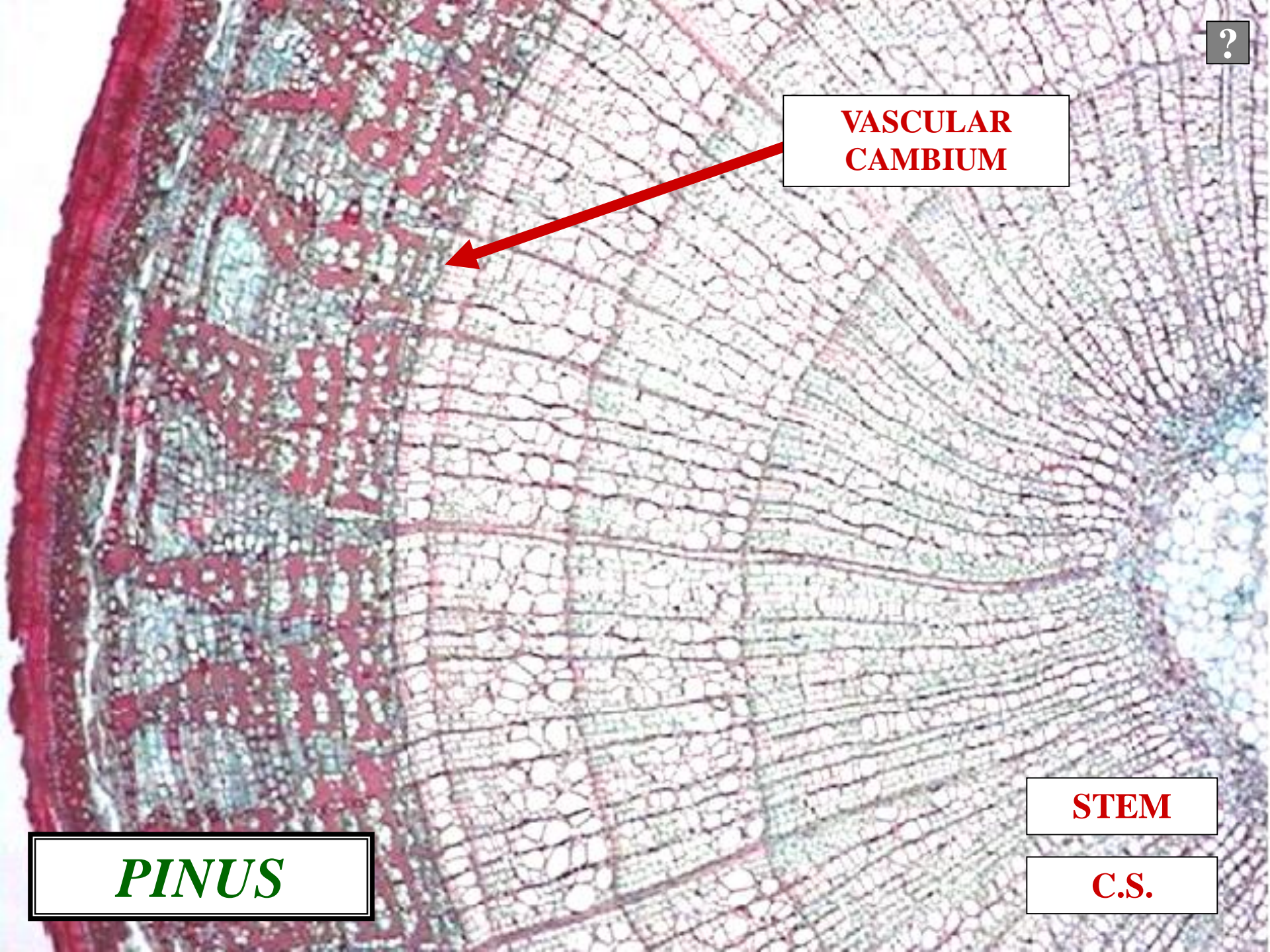
**VASCULAR
CAMBIUM**



STEM

C.S.

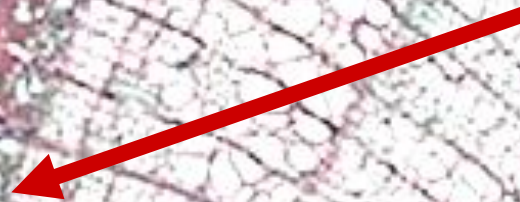
PINUS



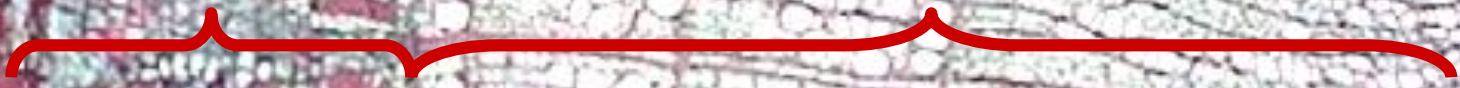
P

?

VASCULAR
CAMBIUM



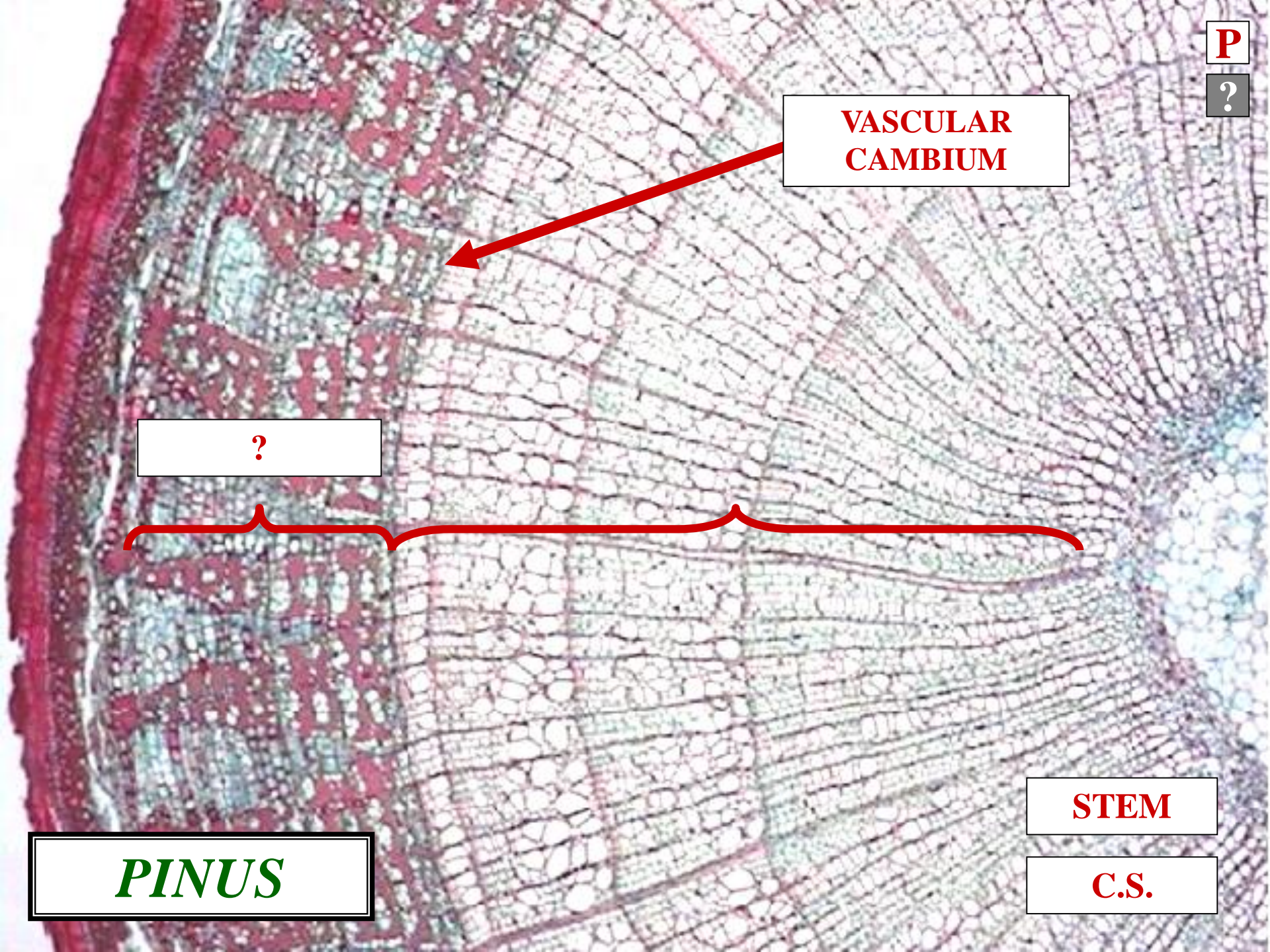
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STEM

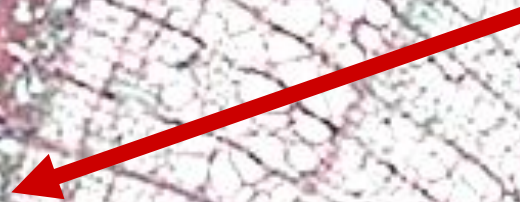
C.S.

PINUS



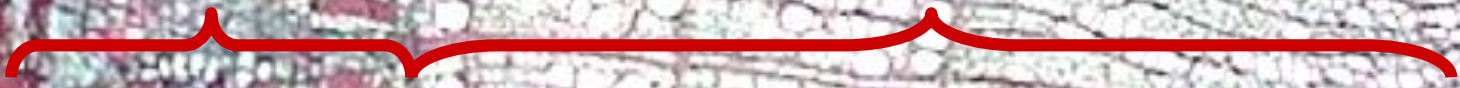
X

VASCULAR
CAMBIUM



~2 PHLOEM

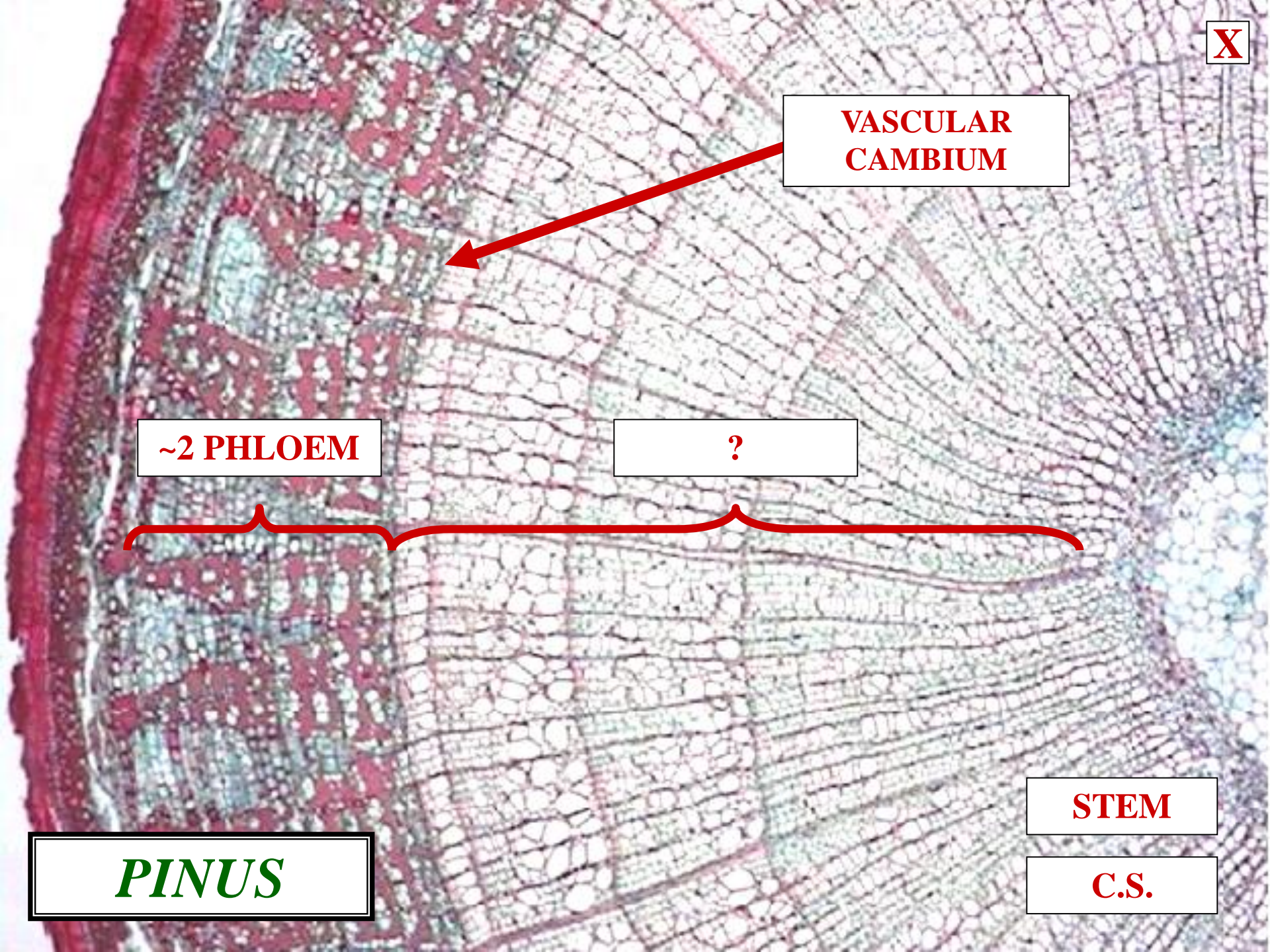
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STEM

C.S.

PINUS



?

**VASCULAR
CAMBIUM**

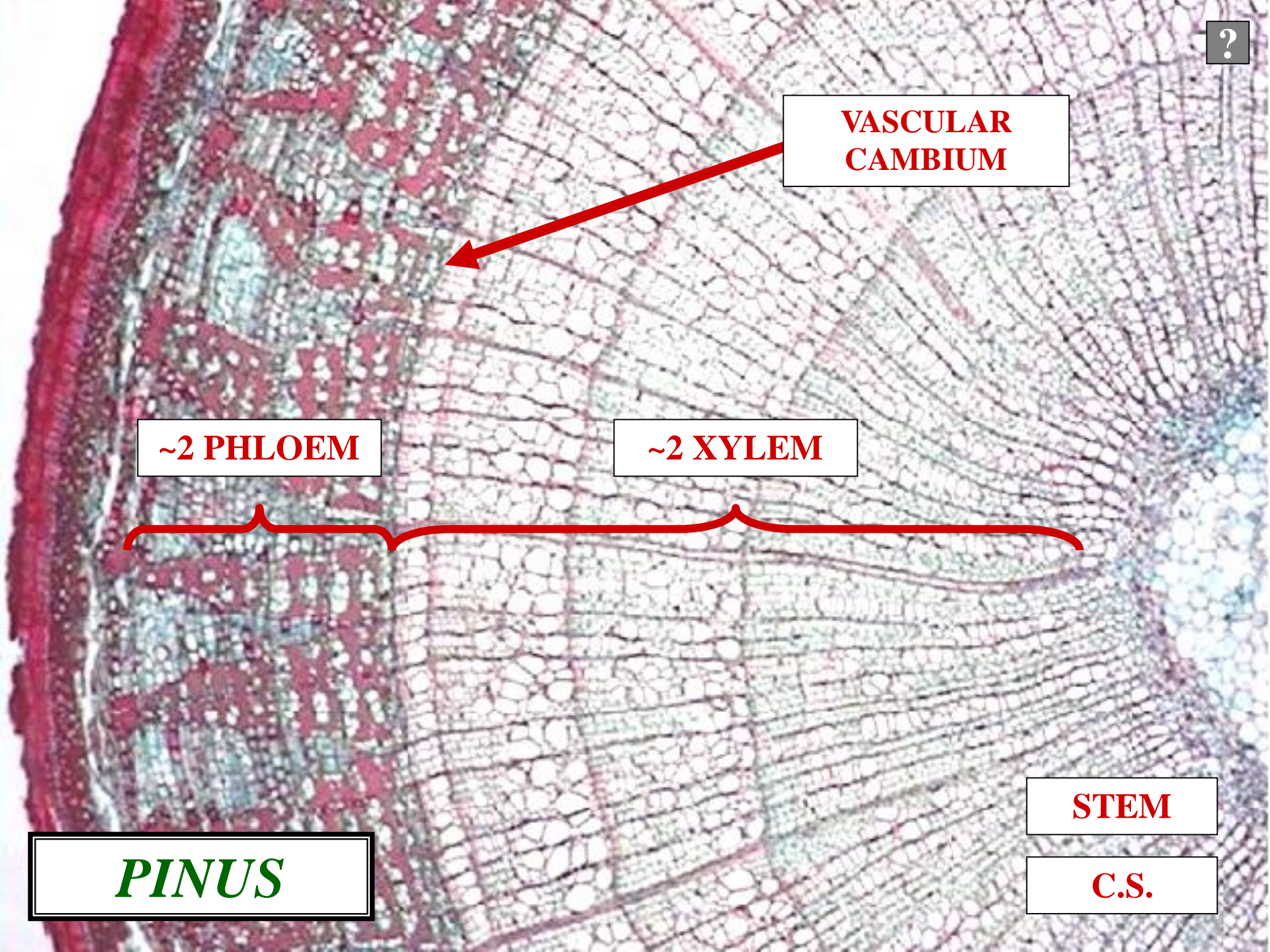
~2 PHLOEM

~2 XYLEM

STEM

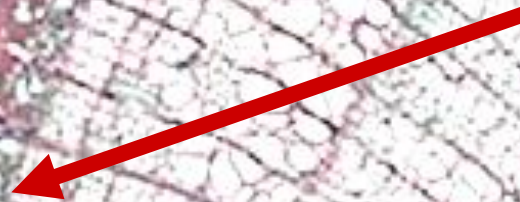
C.S.

PINUS



S

VASCULAR
CAMBIUM



~2 PHLOEM

~2 XYLEM

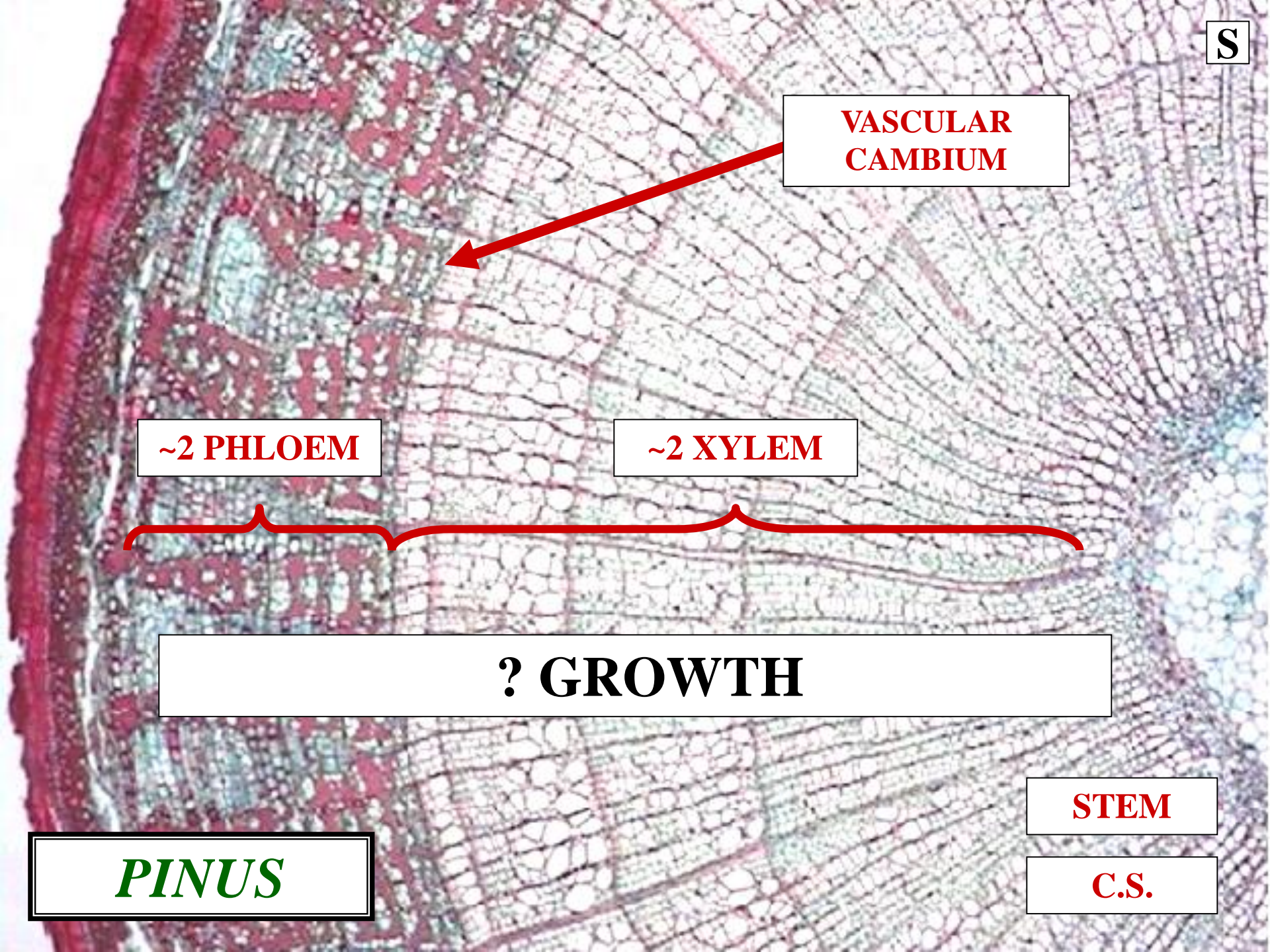


? GROWTH

STEM

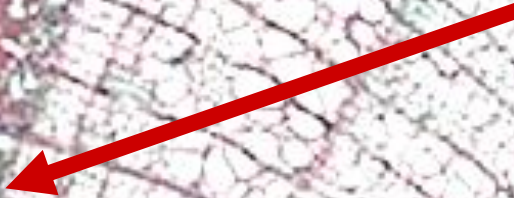
C.S.

PINUS





**VASCULAR
CAMBIUM**



~2 PHLOEM

~2 XYLEM



~2 GROWTH: PRESENT

STEM

C.S.

PINUS



M

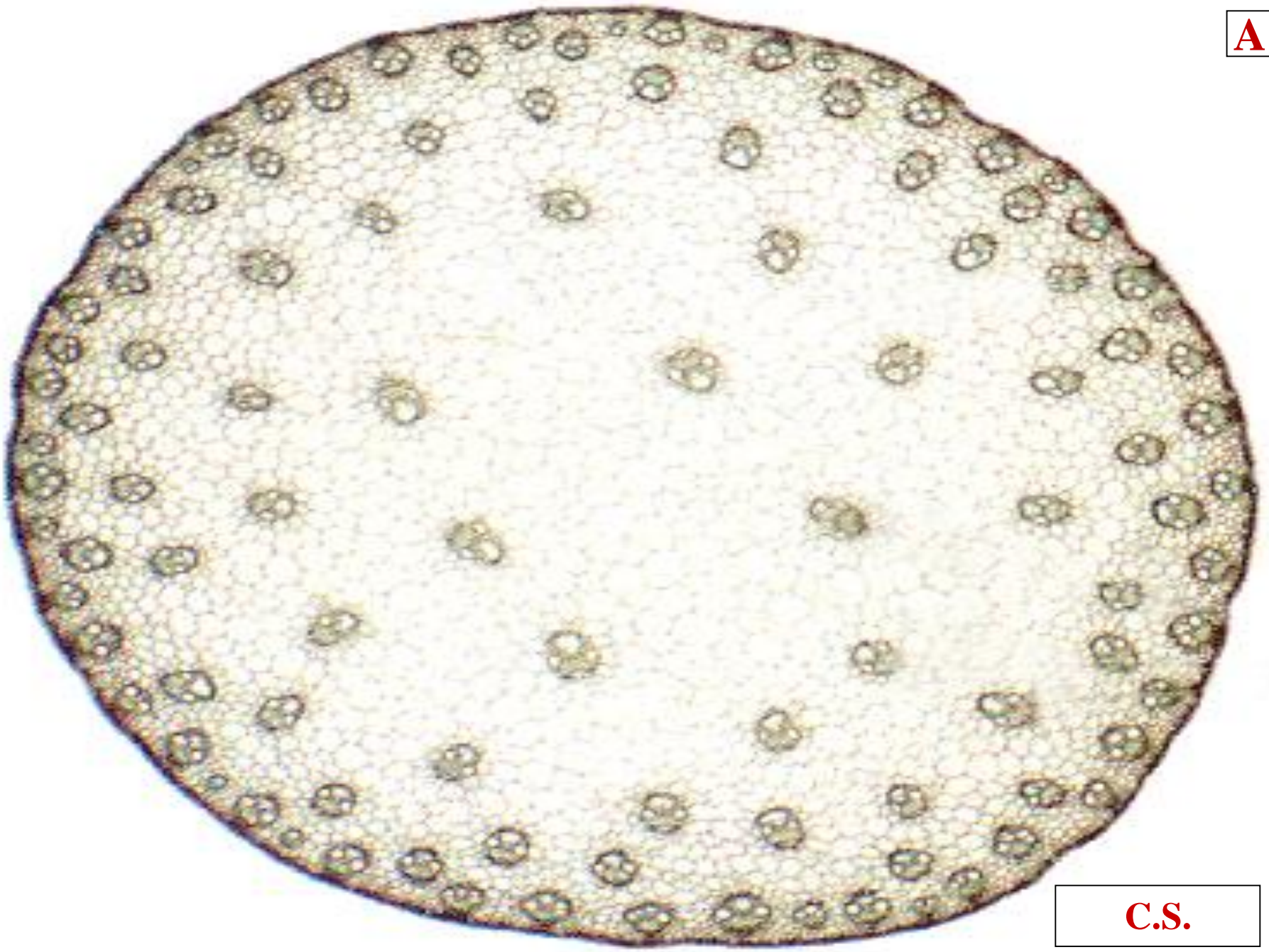
MONOCOTS



MONOCOTS

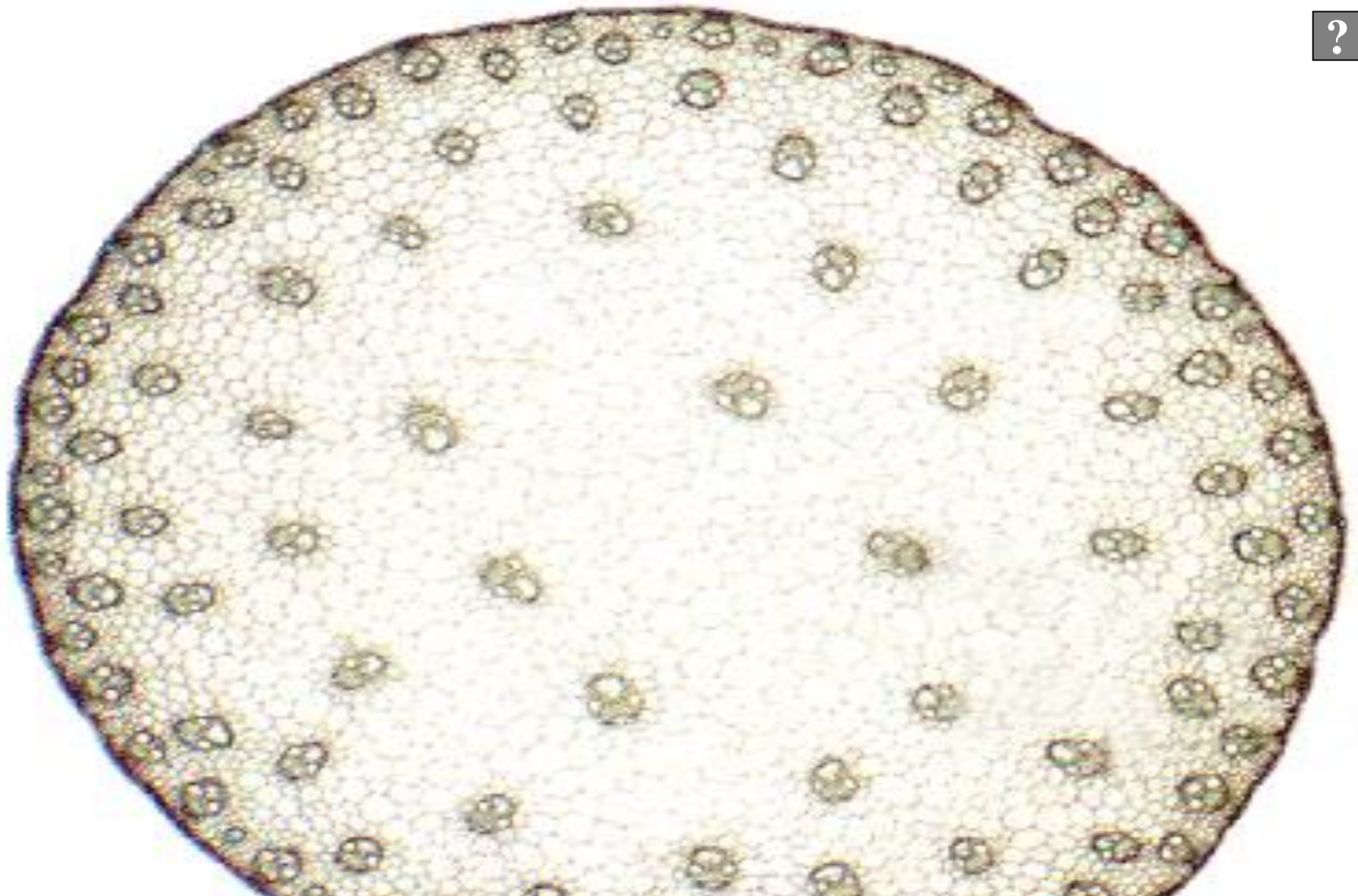


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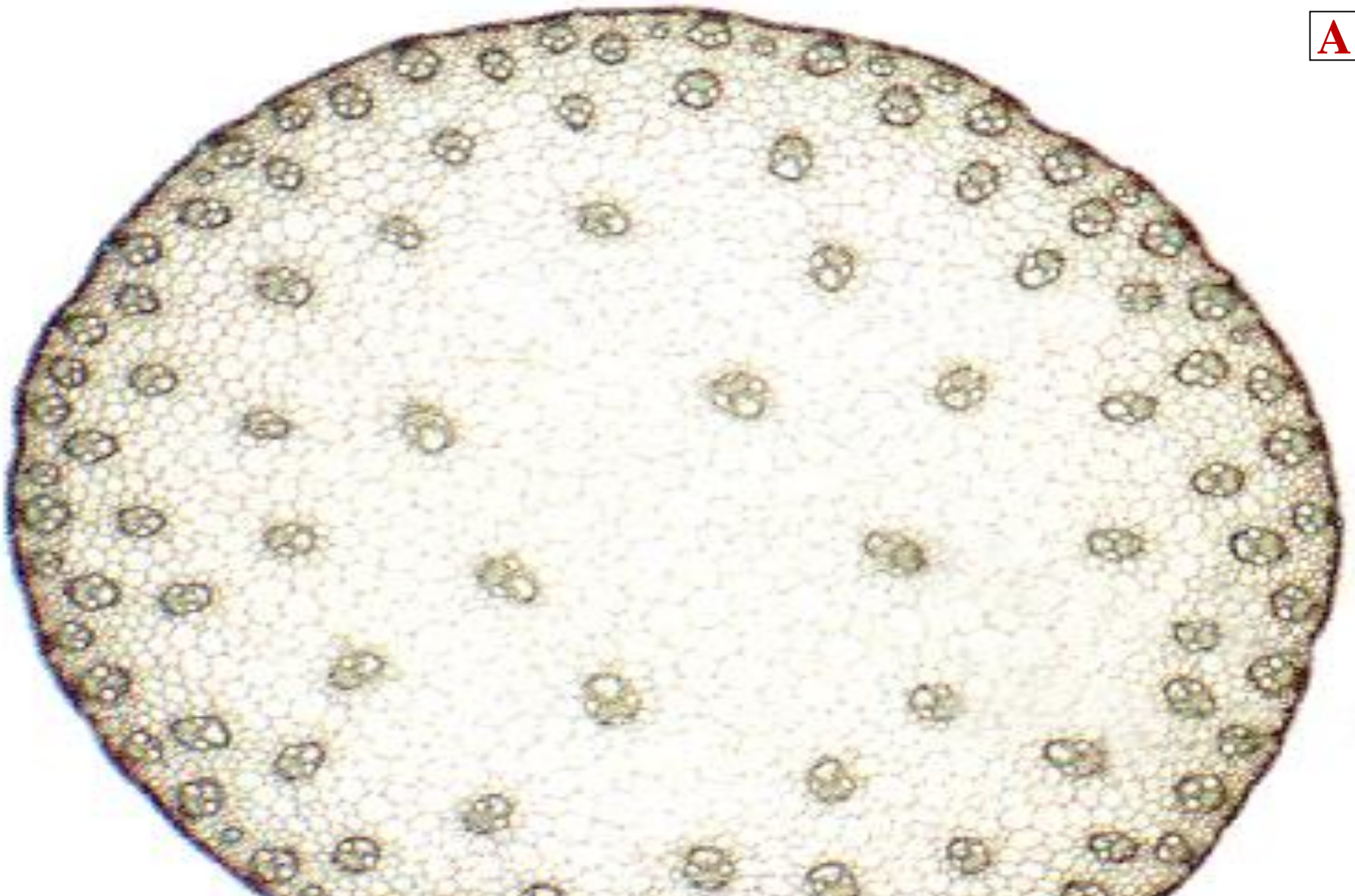
C.S.

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ATACTOSTELE

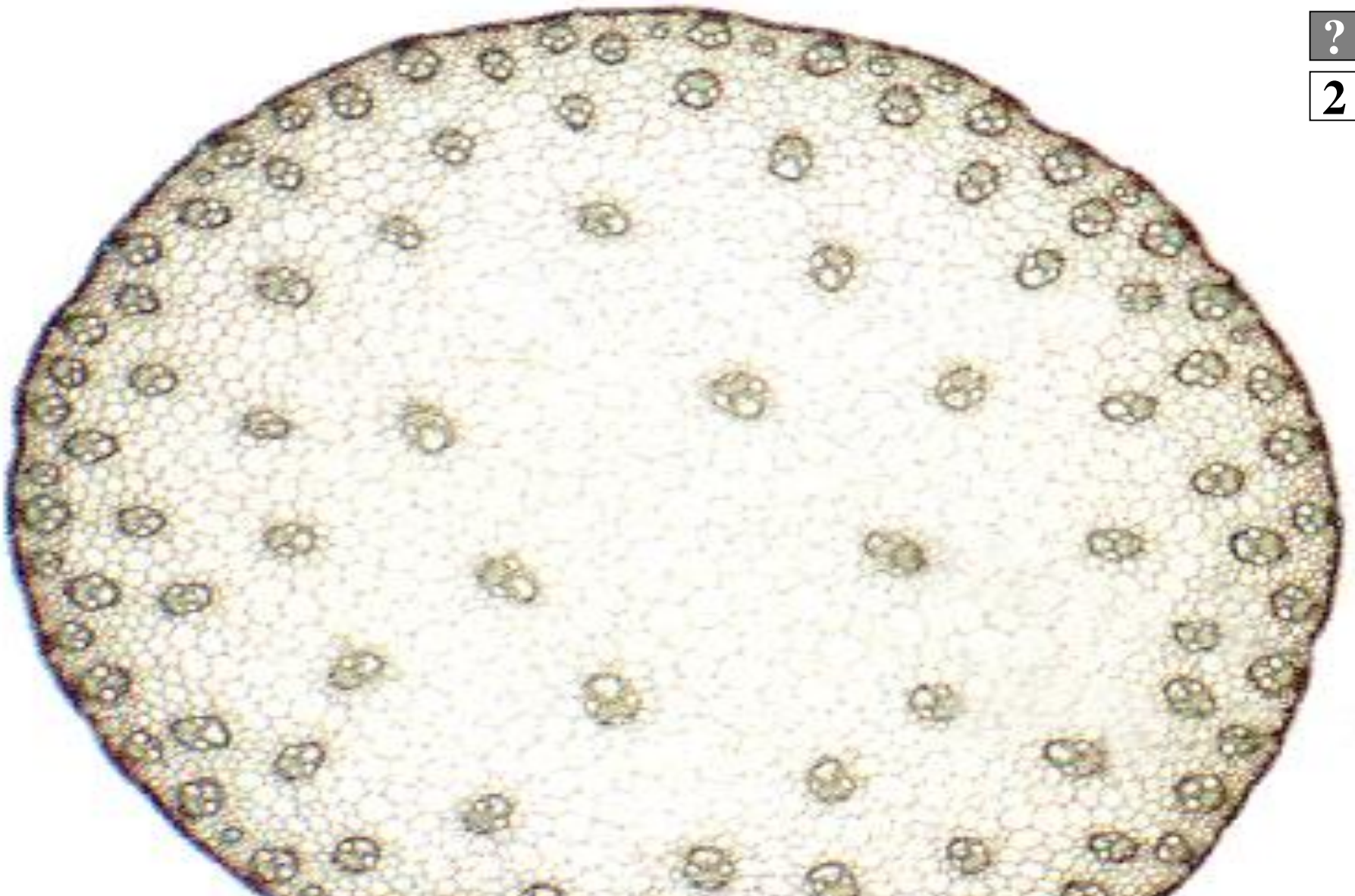
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VASCULAR CAMBIUM: ?

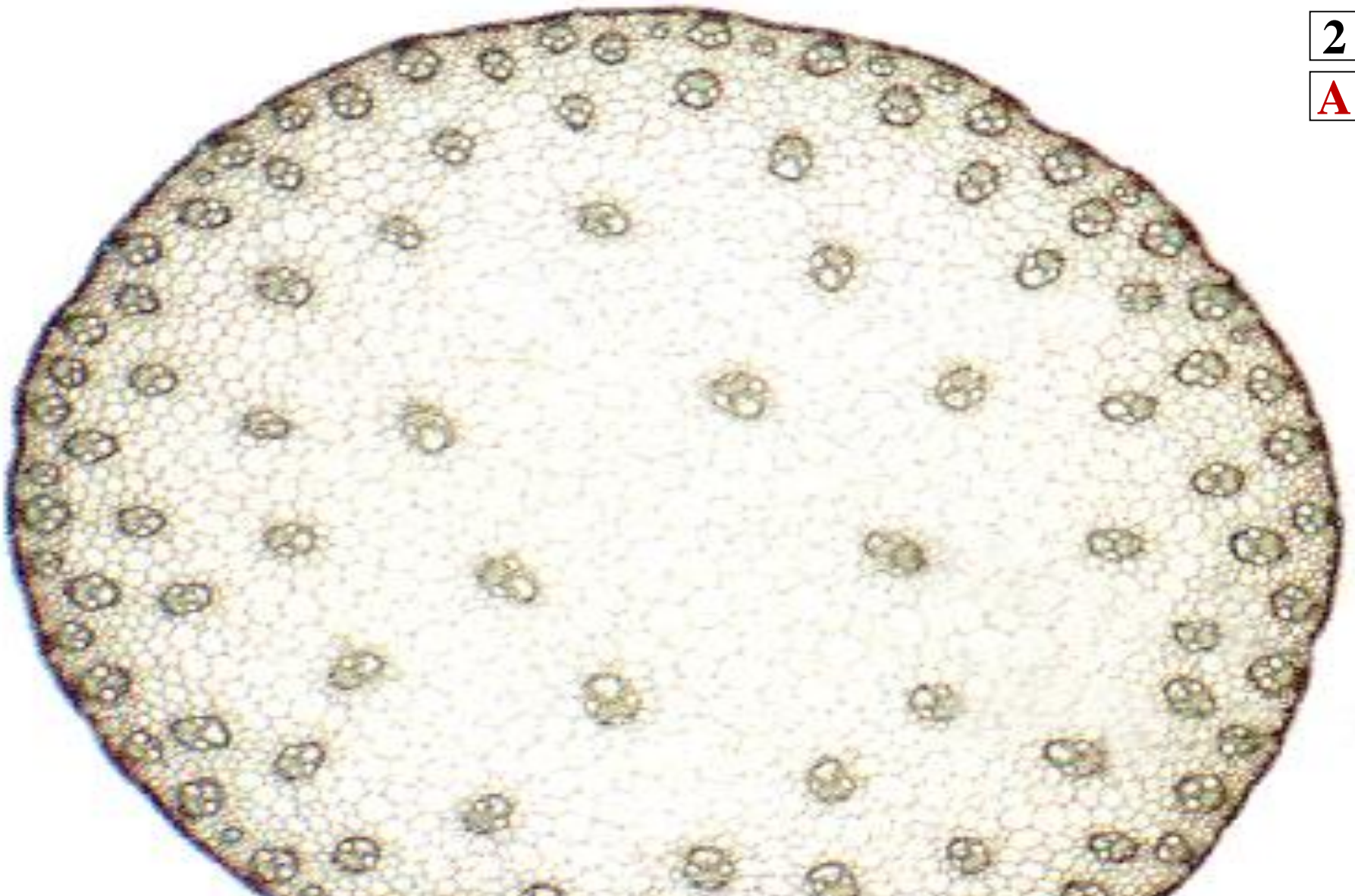
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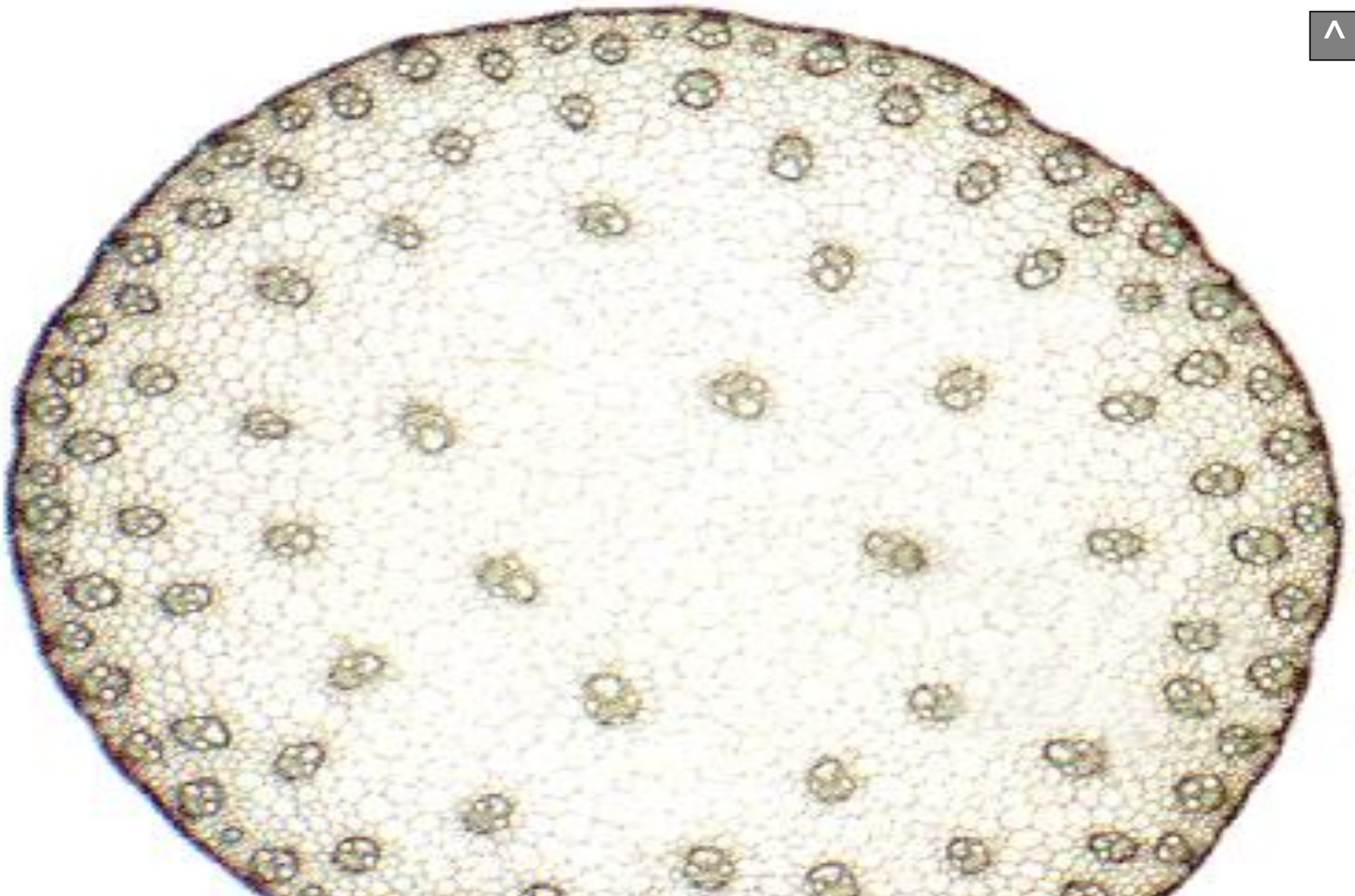


VASCULAR CAMBIUM: ABSENT

2
A



SECONDARY GROWTH: ?



SECONDARY GROWTH: ABSENT



LEAF



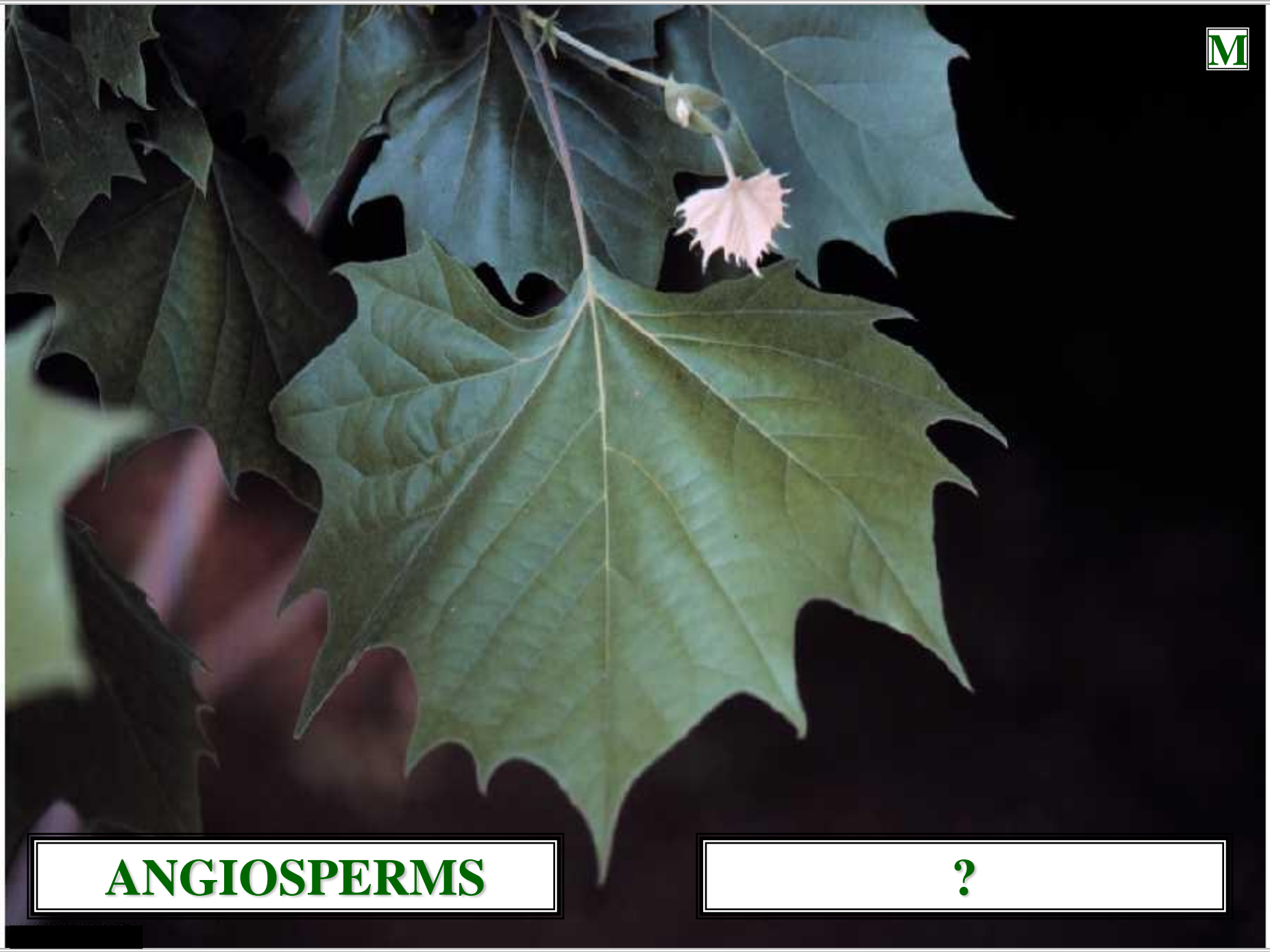
GYMNOSPERMS

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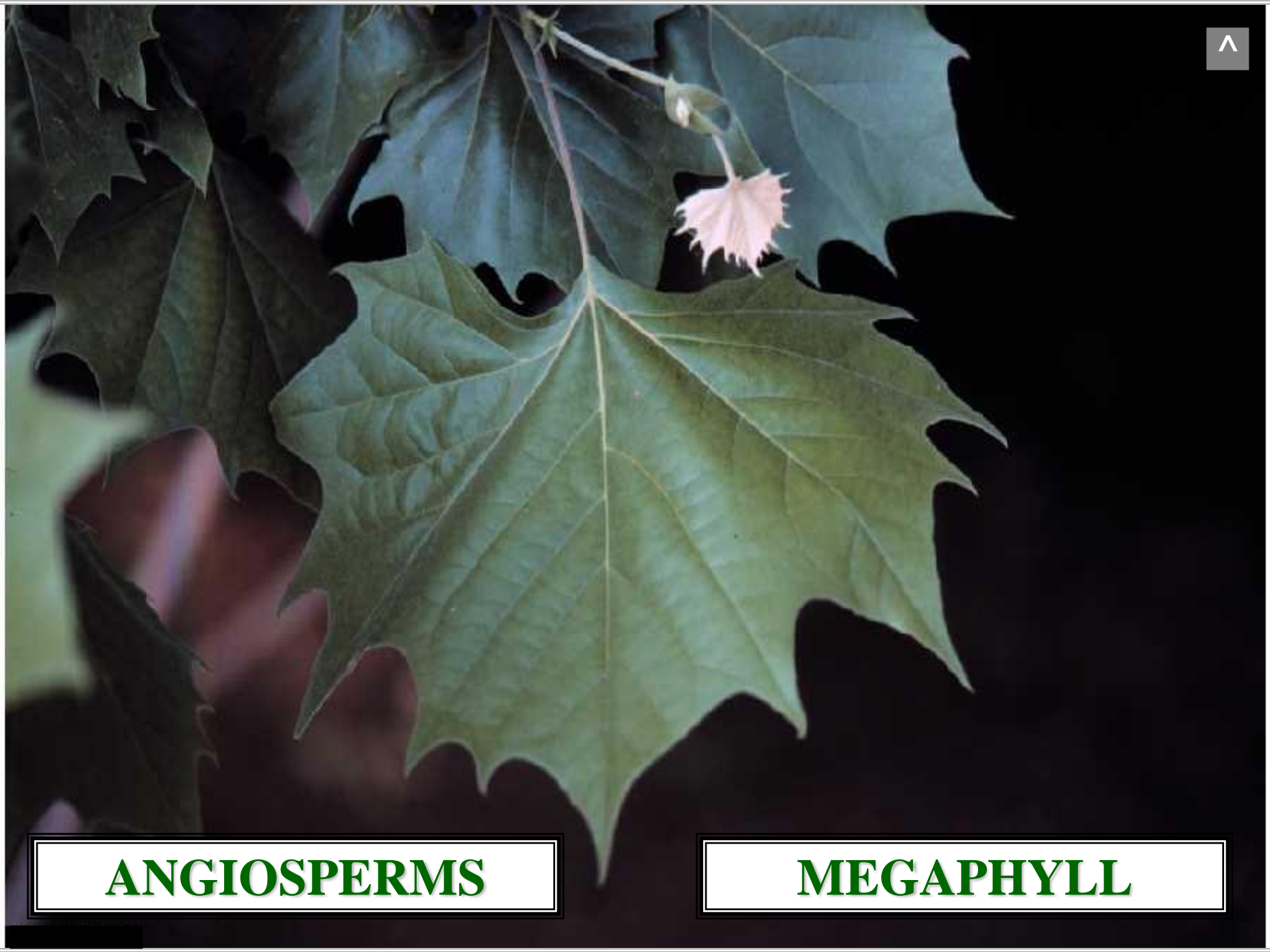
GYMNOSPERMS

MEGAPHYLL



ANGIOSPERMS

?

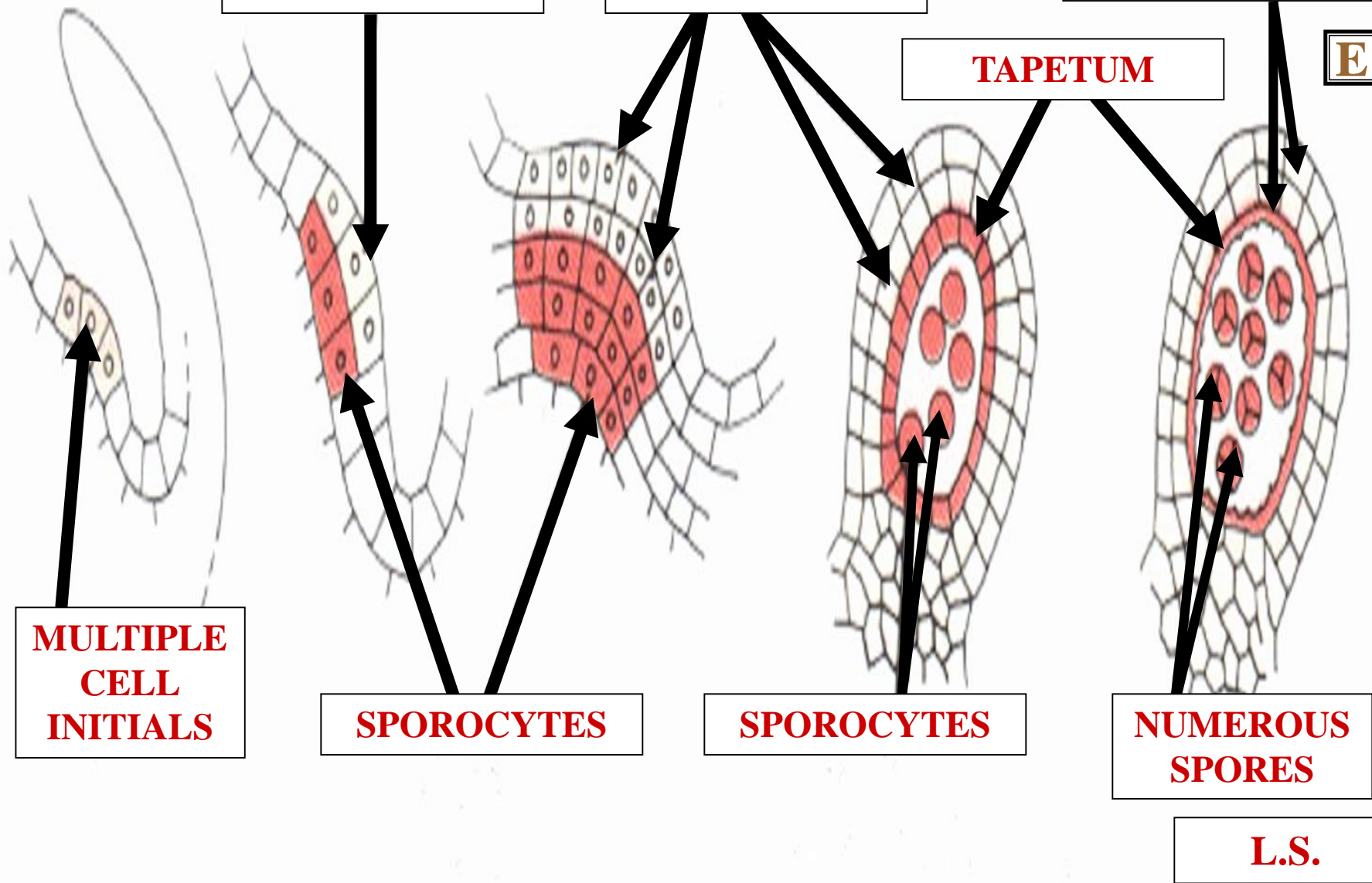


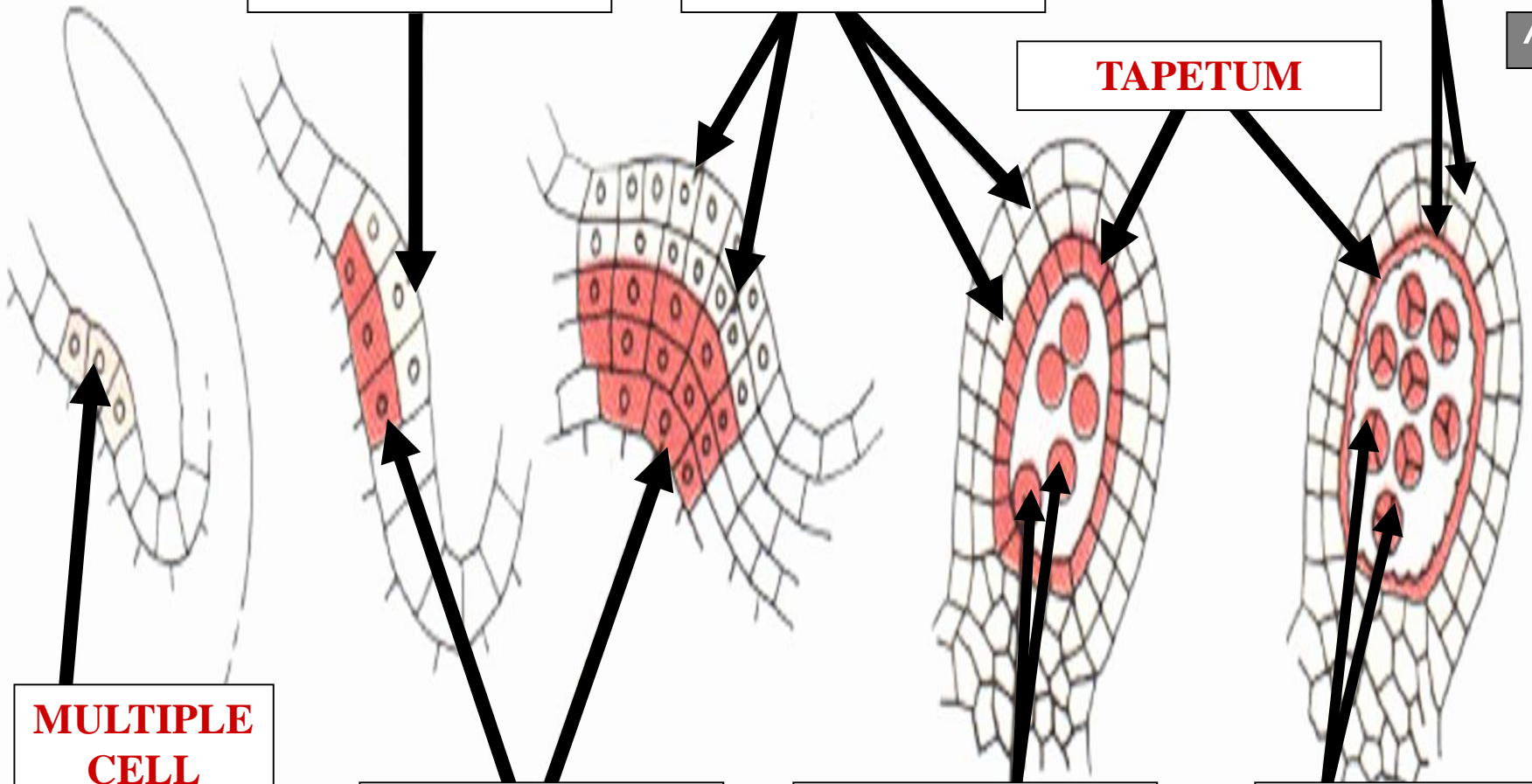
ANGIOSPERMS

MEGAPHYLL



SPORANGIUM





WALL CELLS

WALL CELLS

LARGE SIZE

THICK WALL



TAPETUM

**MULTIPLE
CELL
INITIALS**

SPOROCTES

SPOROCTES

**NUMEROUS
SPORES**

EUSPORANGIUM

L.S.



MICROSPORANGIUM

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PINUS

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PINUS

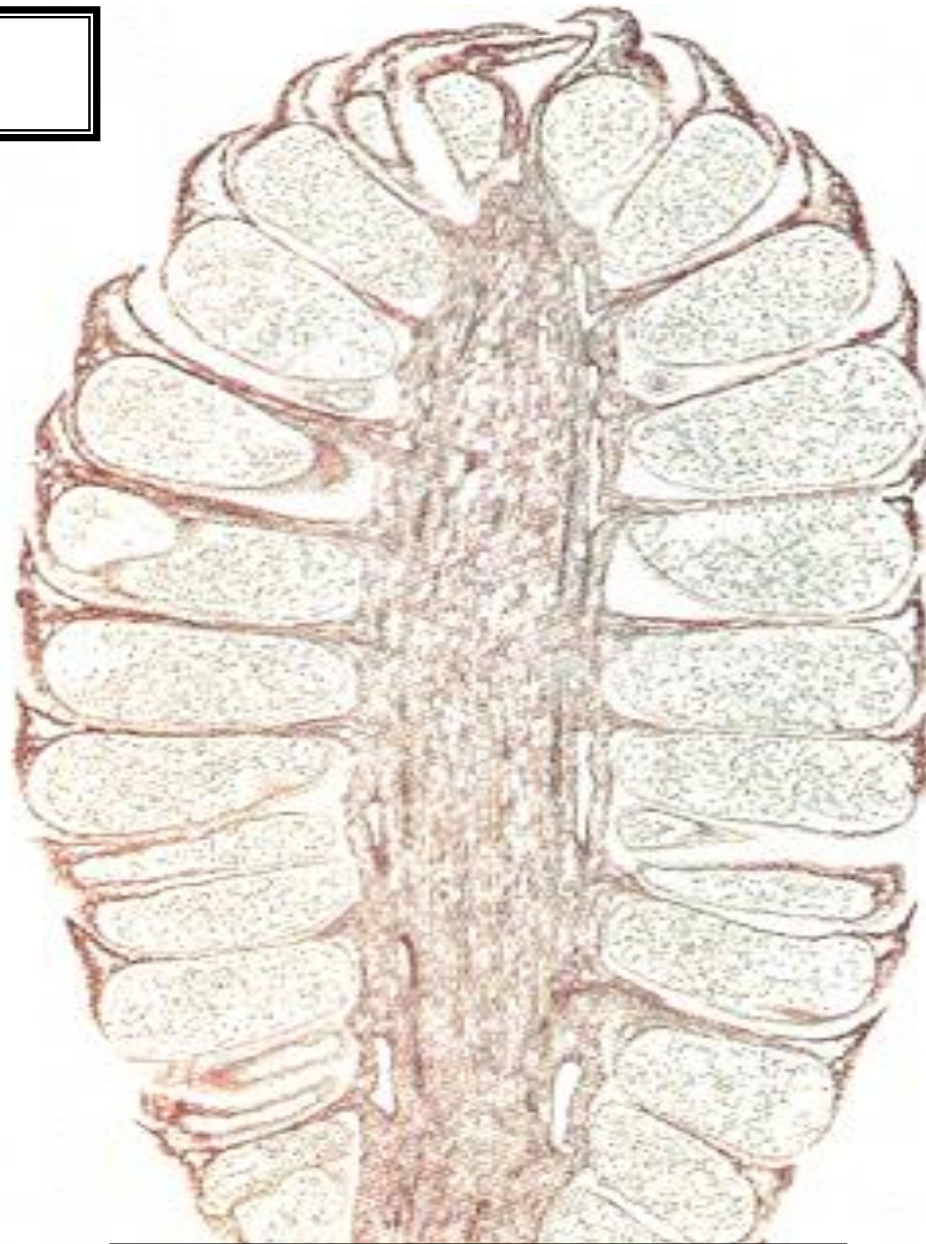


MICROSTROBILI



PINUS

PINUS



MICROSTROBILUS



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L.S.

PINUS

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?



MICROSTROBILUS

L.S.

PINUS

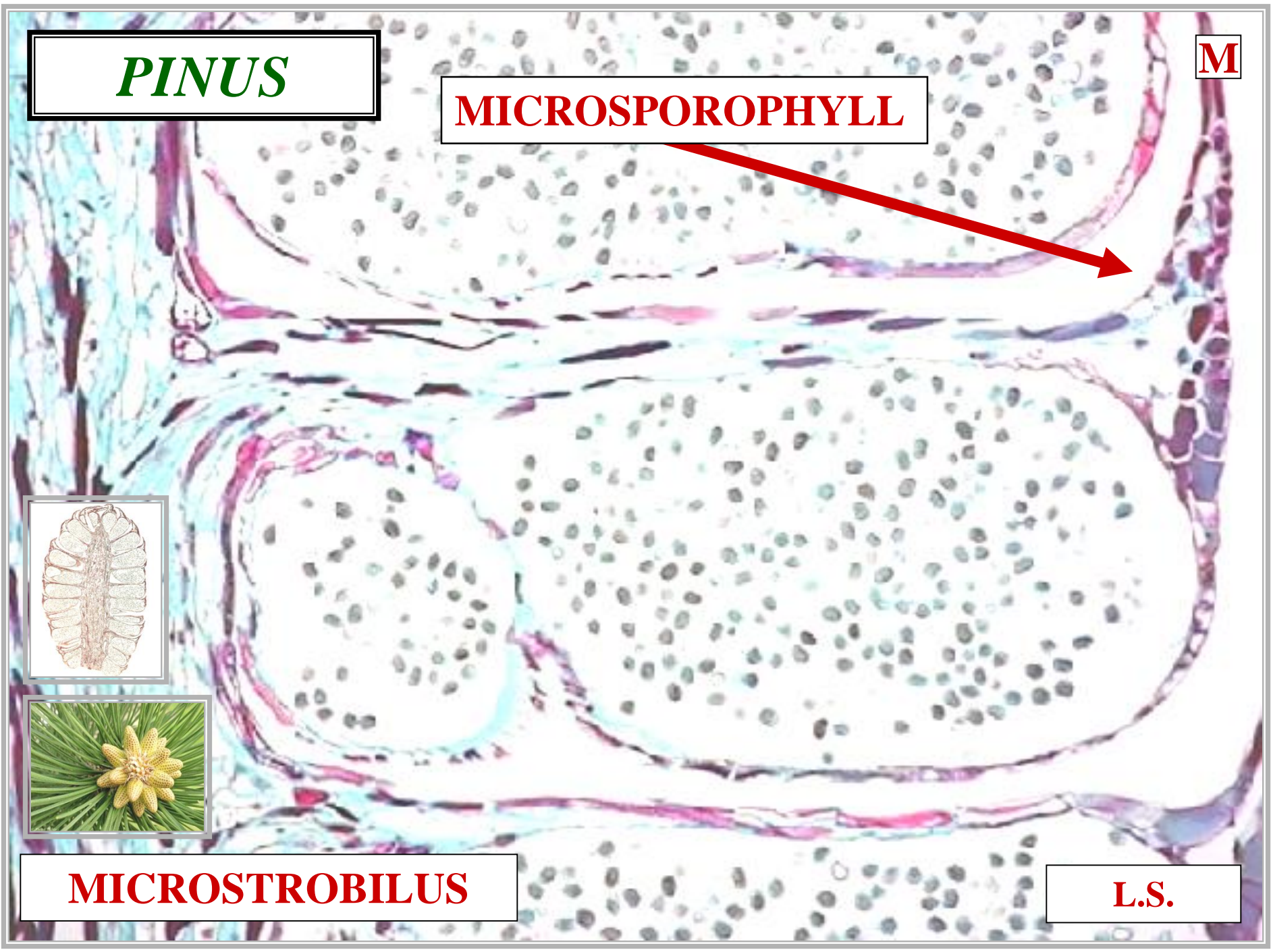
MICROSPOROPHYLL

M



MICROSTROBILUS

L.S.



PINUS

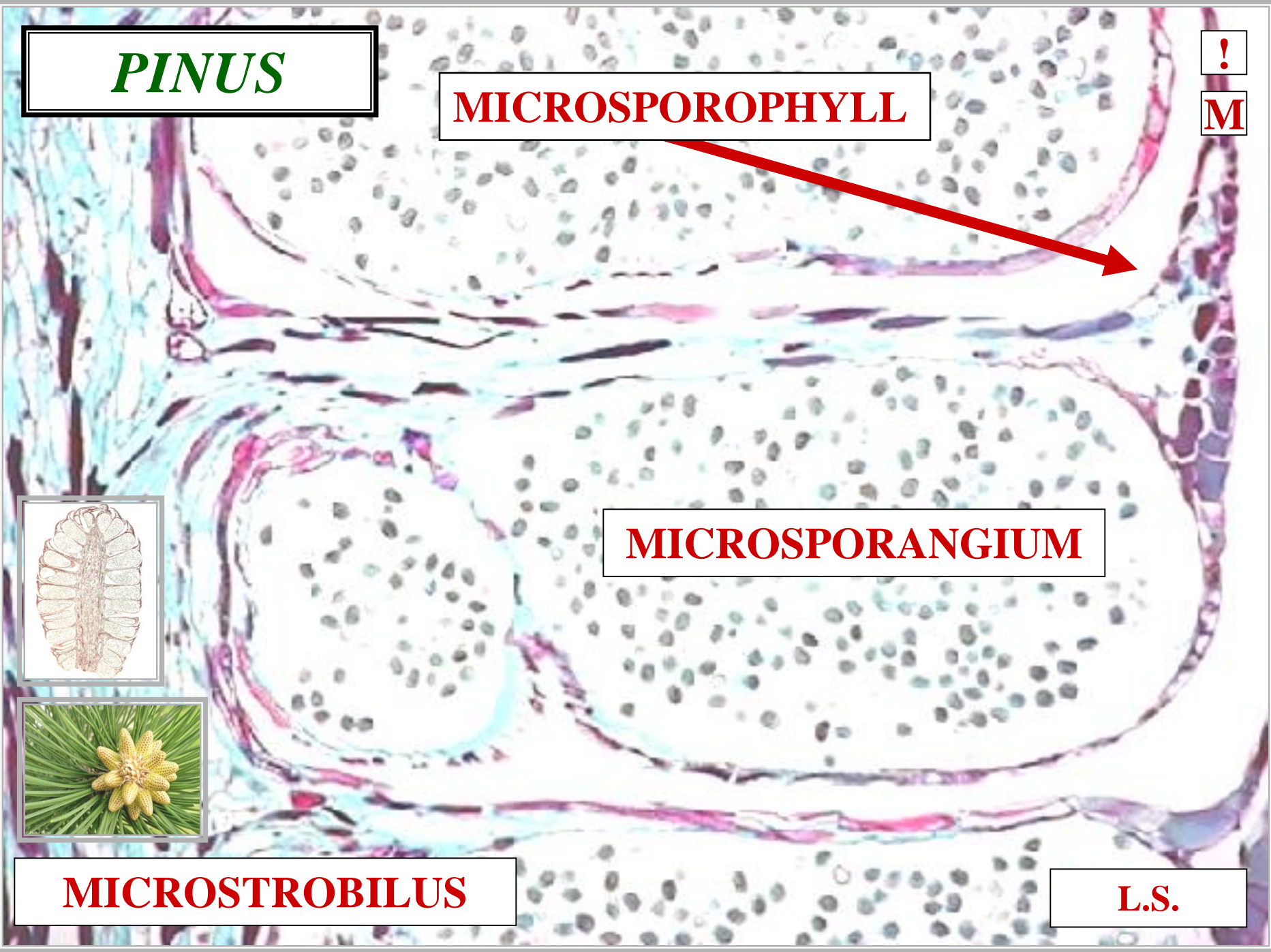
MICROSPOROPHYLL

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MICROSPORANGIUM

MICROSTROBILUS

L.S.



PINUS

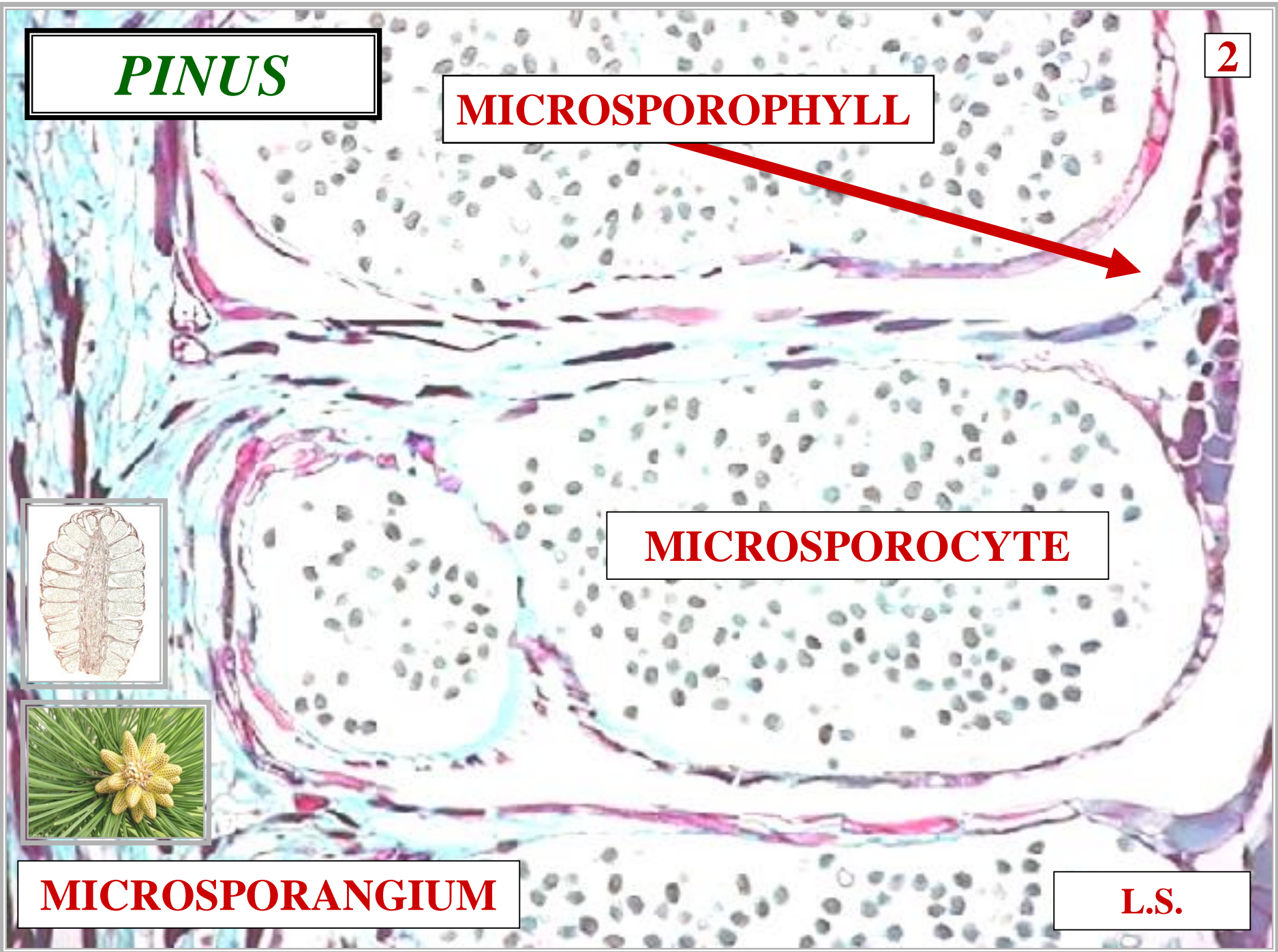
MICROSPOROPHYLL

2

MICROSPOROCTE

MICROSPORANGIUM

L.S.



PINUS

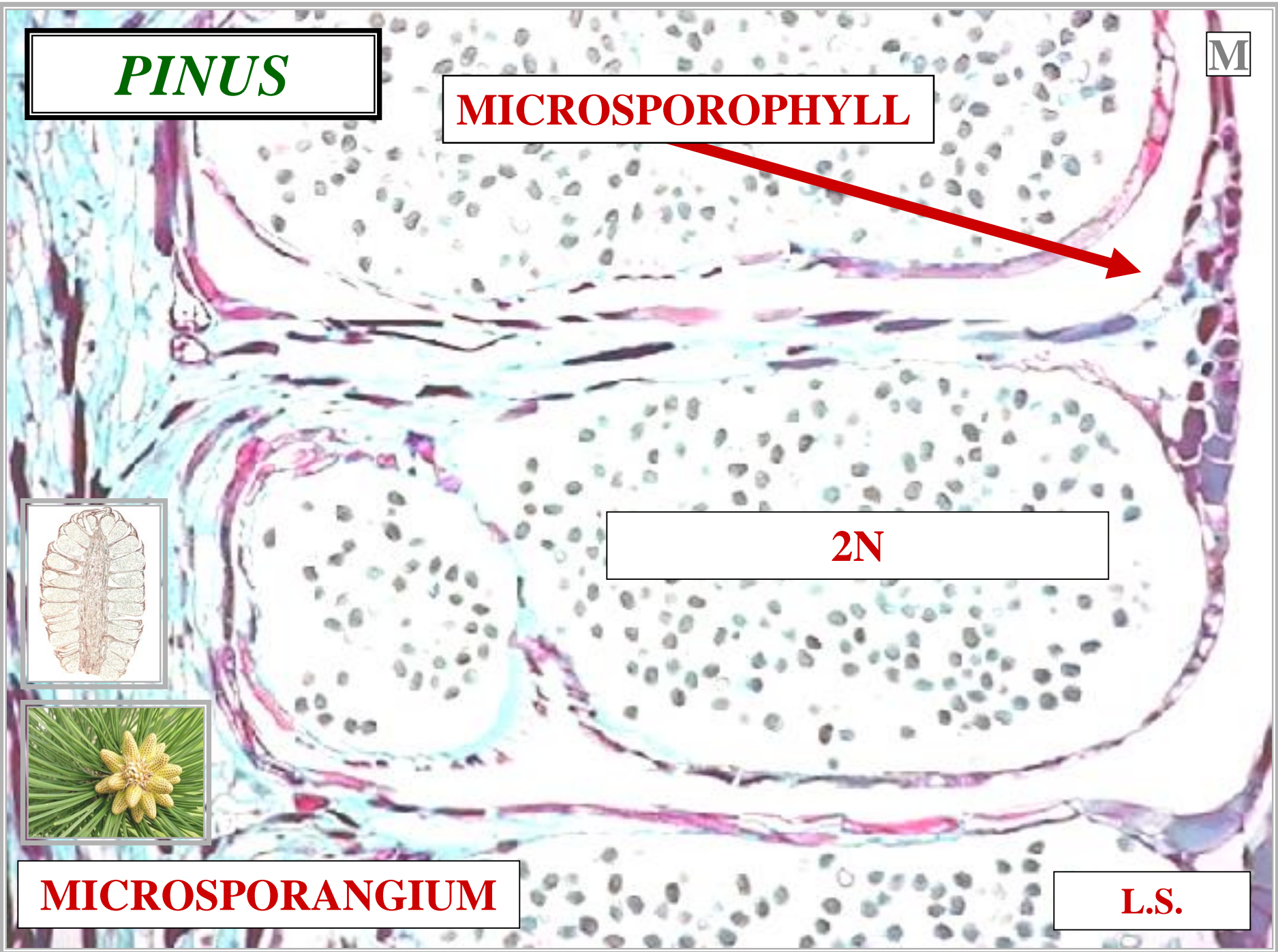
MICROSPOROPHYLL

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2N

MICROSPORANGIUM

L.S.



PINUS

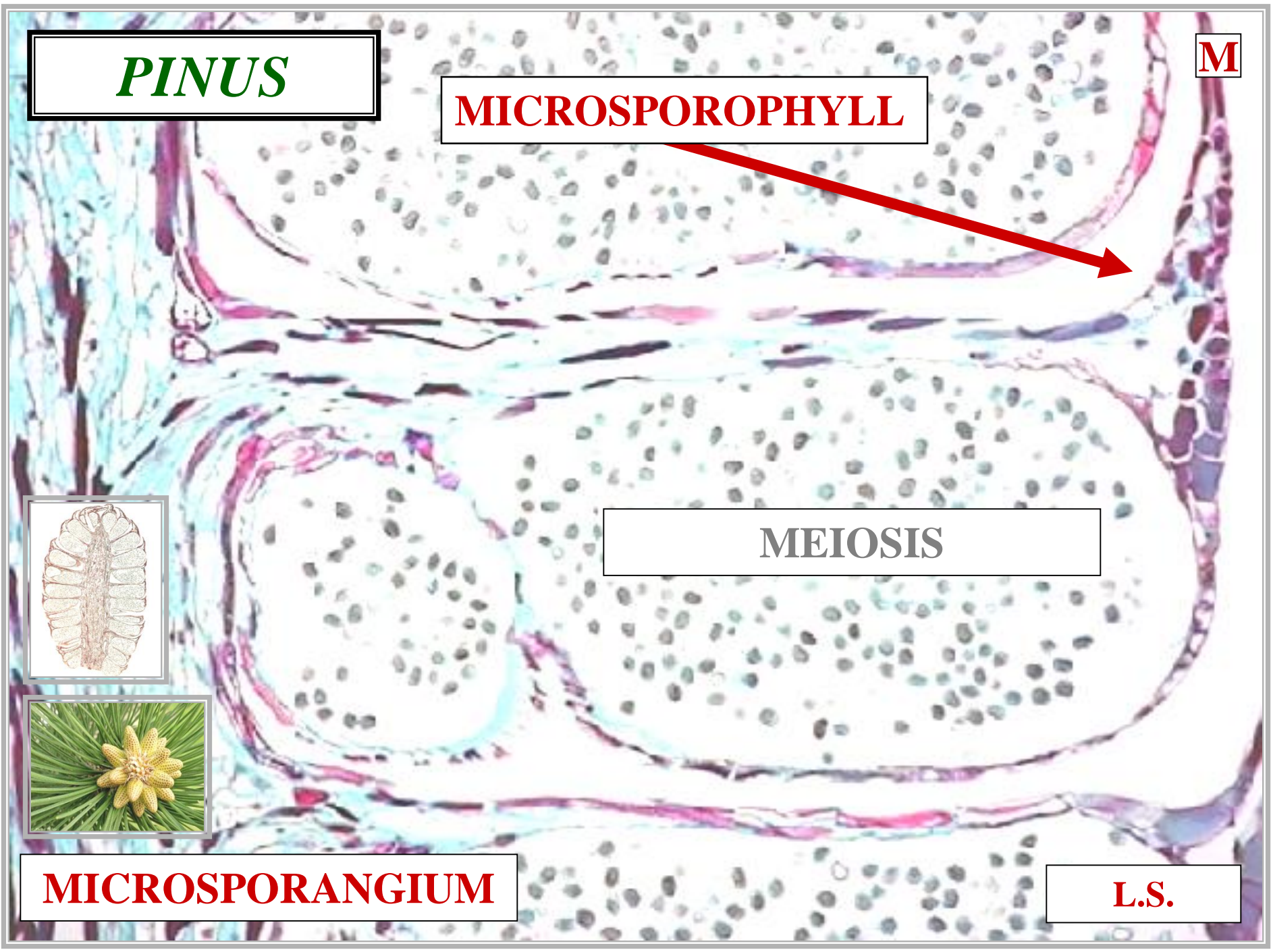
MICROSPOROPHYLL

M

MEIOSIS

MICROSPORANGIUM

L.S.



PINUS

MICROSPOROPHYLL

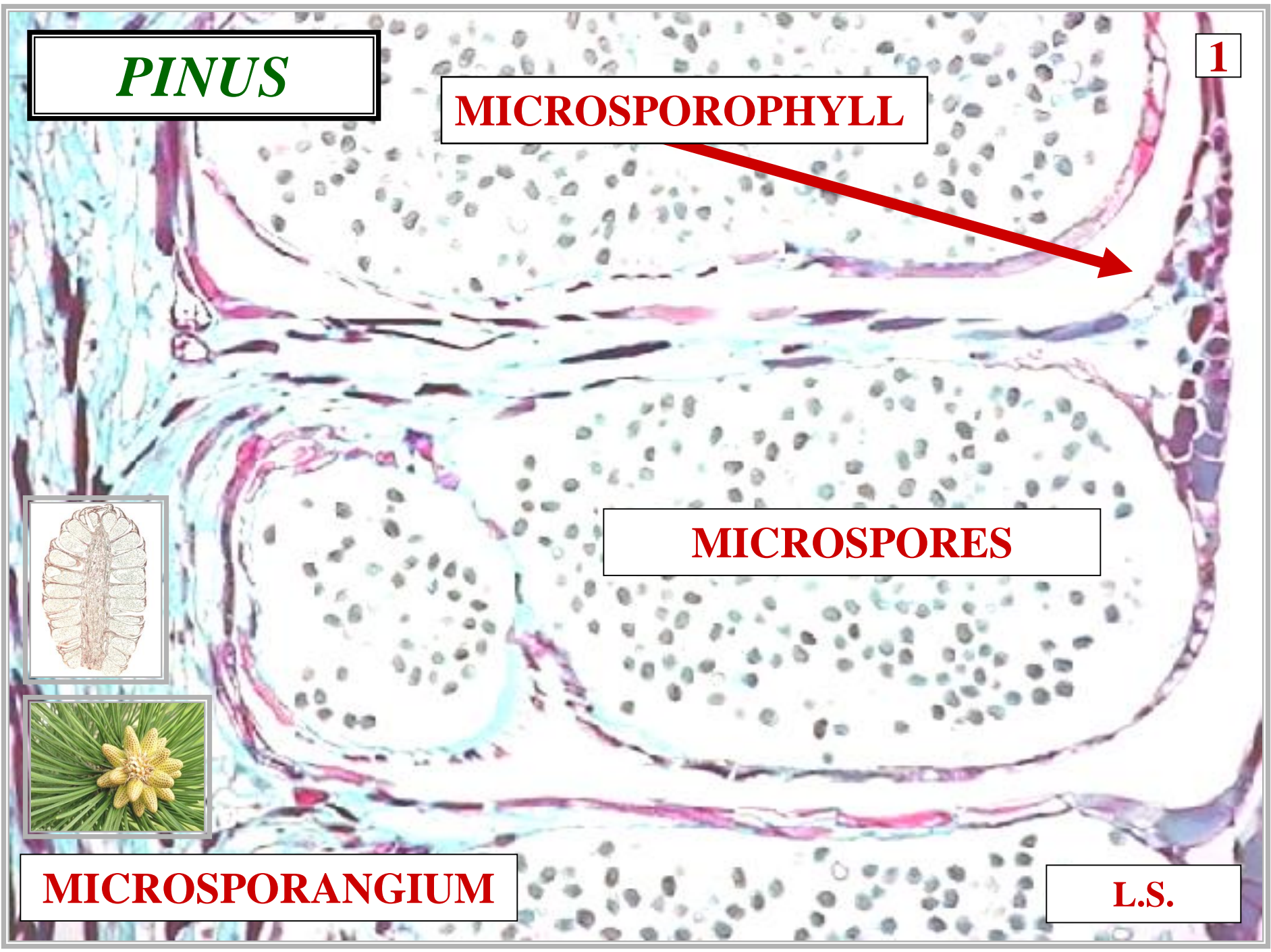
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MICROSPORES



MICROSPORANGIUM

L.S.



PINUS

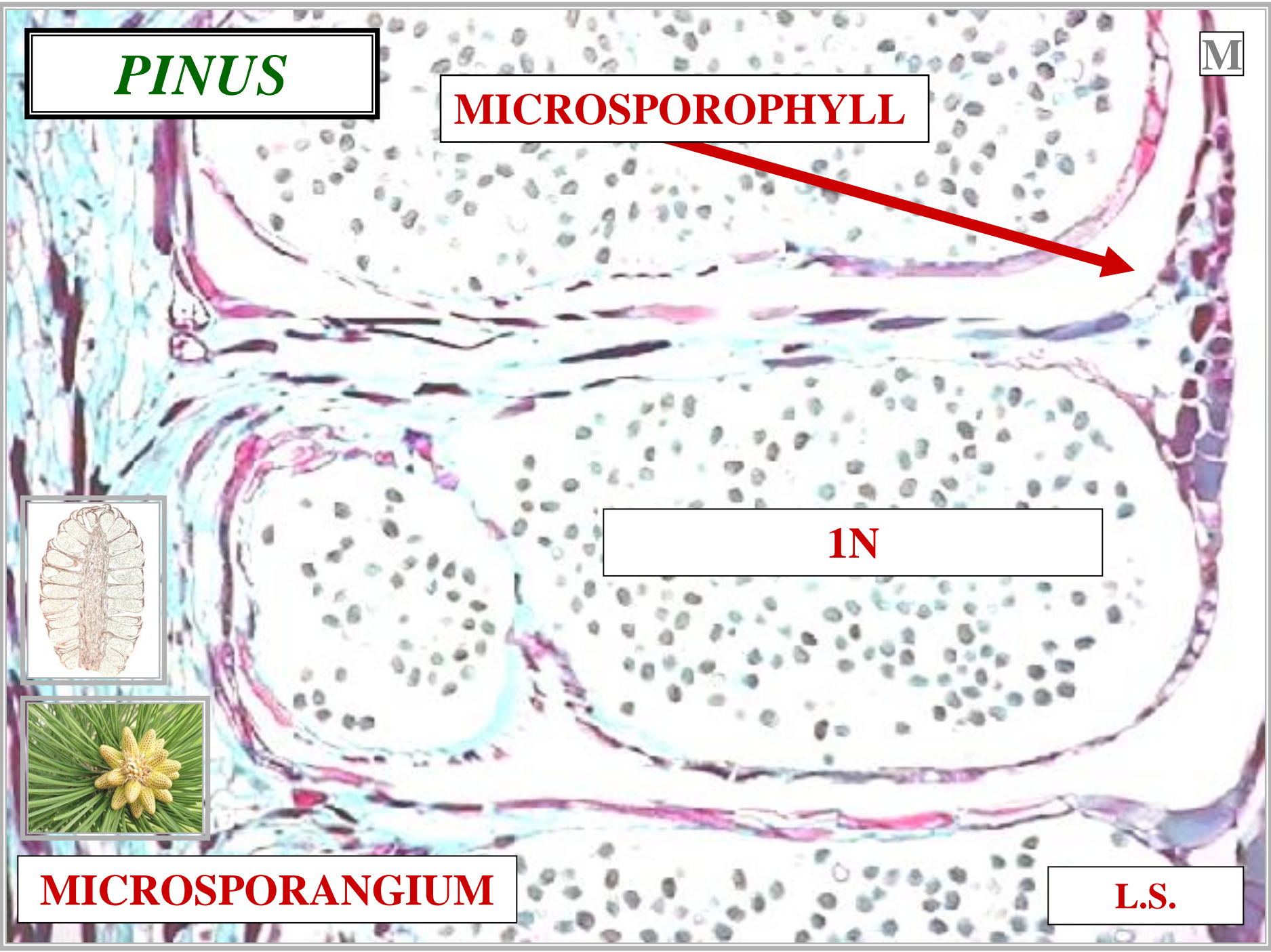
MICROSPOROPHYLL

M

1N

MICROSPORANGIUM

L.S.

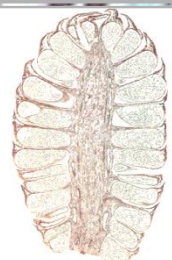


PINUS

MICROSPOROPHYLL

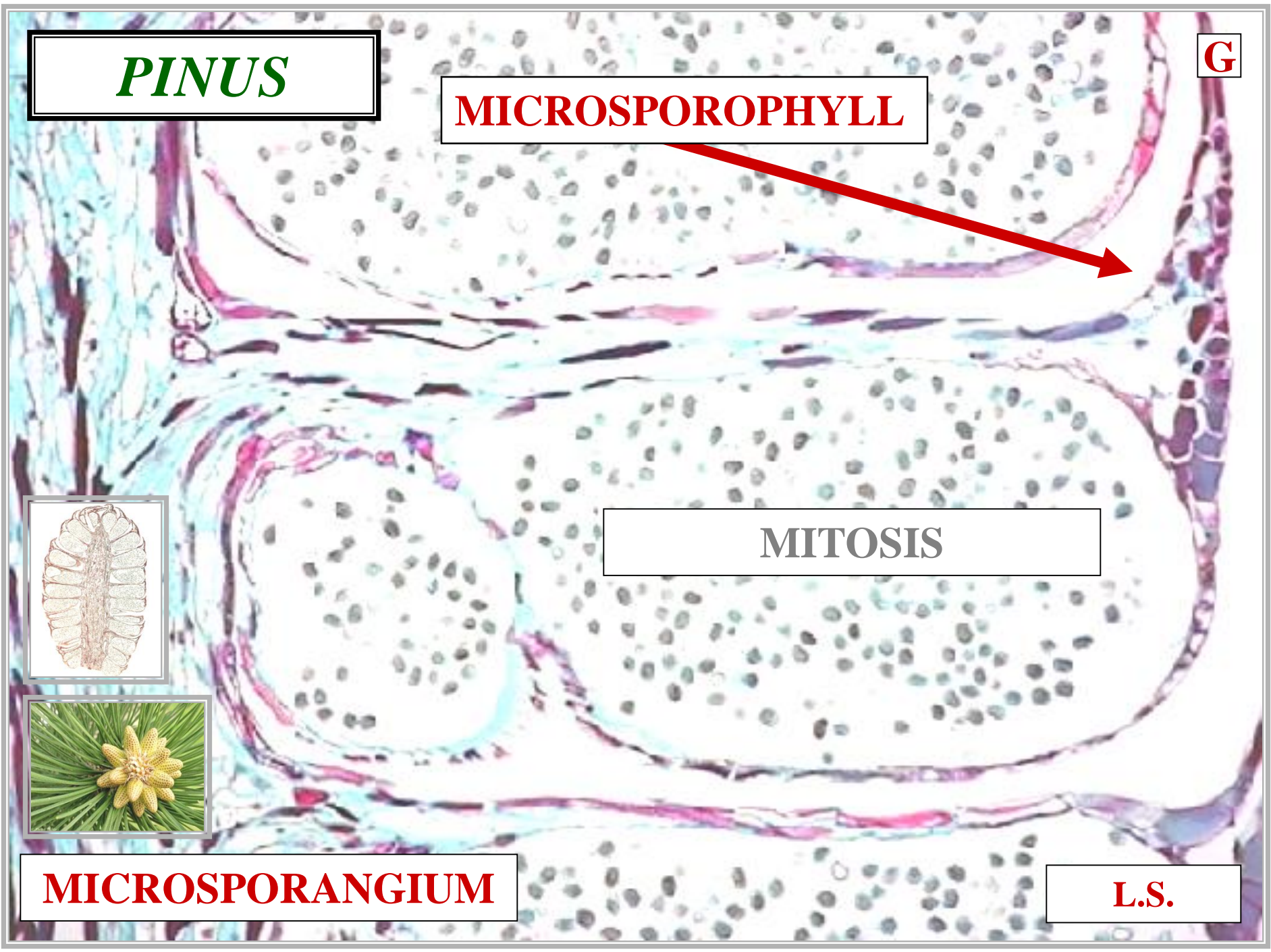
G

MITOSIS



MICROSPORANGIUM

L.S.

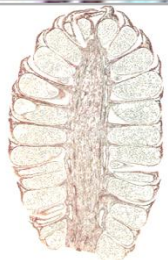


PINUS

MICROSPOROPHYLL

=
P

MICROGAMETOPHYTE



MICROSPORANGIUM

L.S.



PINUS

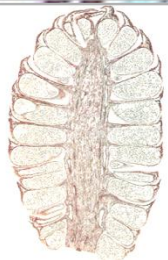
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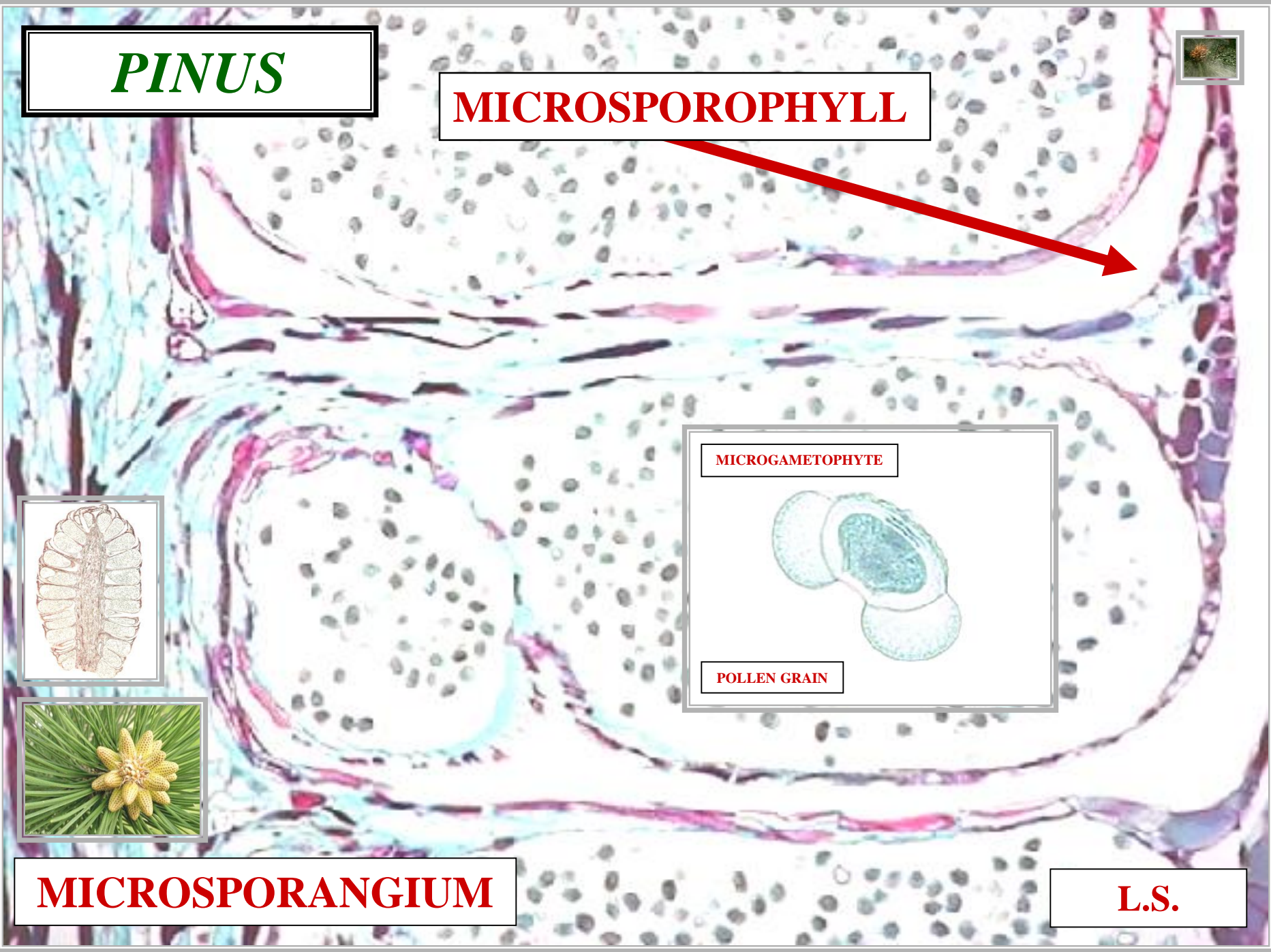


POLLEN GRAIN



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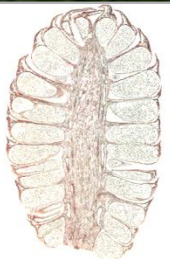
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MICROSPORANGIUM**

**SPORANGIUM OPENS
POLLIN GRAINS
RELEASED**

**DEHISCENT
MICRSPORANGIUM**

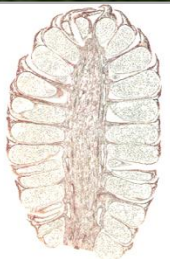


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POLLEN GRAIN

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POLLEN GRAINS RELEASED

DEHISCENT

MICROSPORANGIUM

PINUS

MICROGAMETOPHYTE



POLLEN GRAIN



POLLINATION

DEHISCENT

MICROSPORANGIUM



MEGASPORANGIUM



SYNONYM



MEGASPORANGIUM

SYNONYMOUS

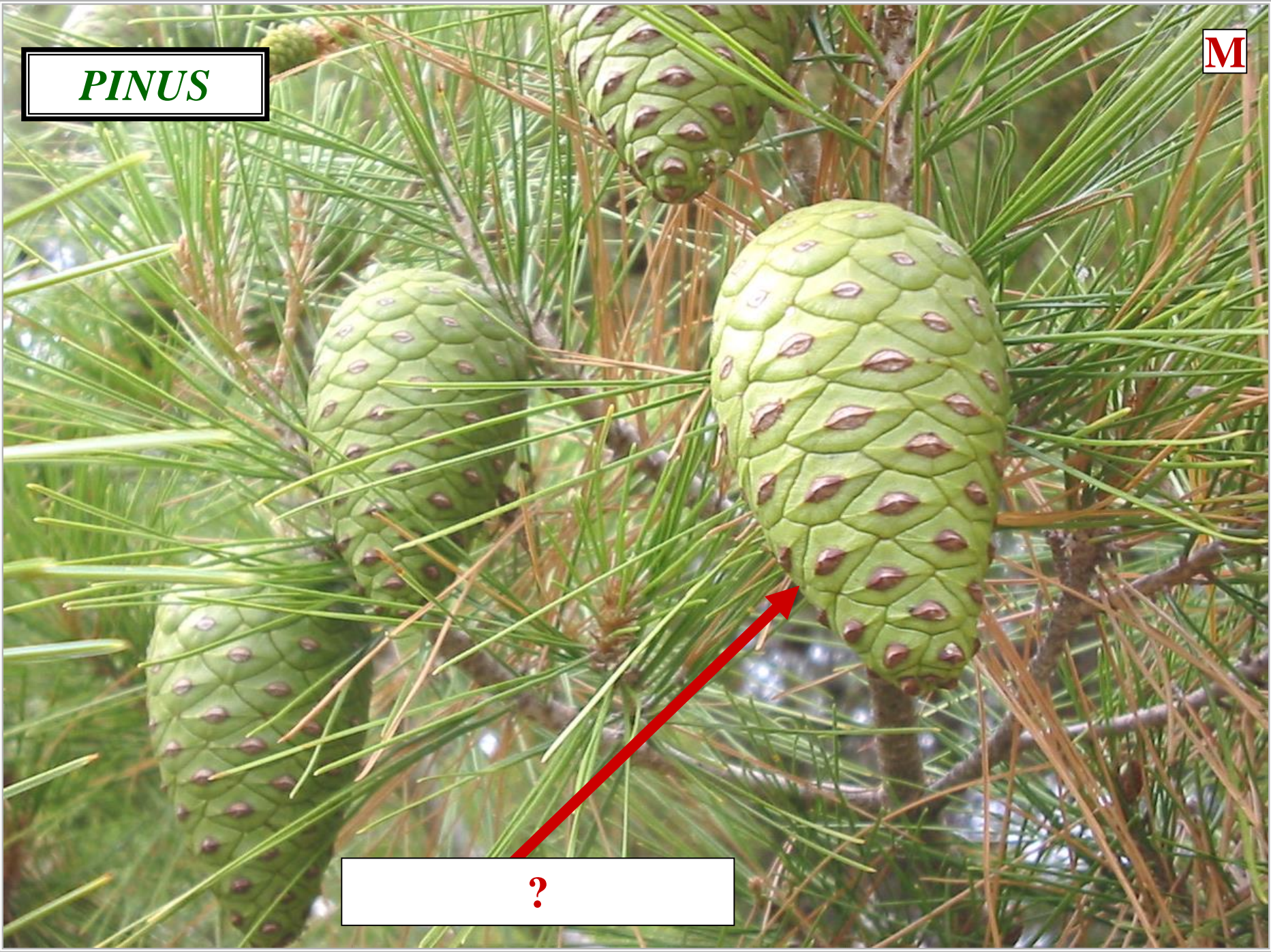
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MEGASTROBIUS



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