

DERMAL TISSUE



DERMAL TISSUE

**OUTERMOST
PROTECTIVE TISSUE**

DERMAL TISSUE

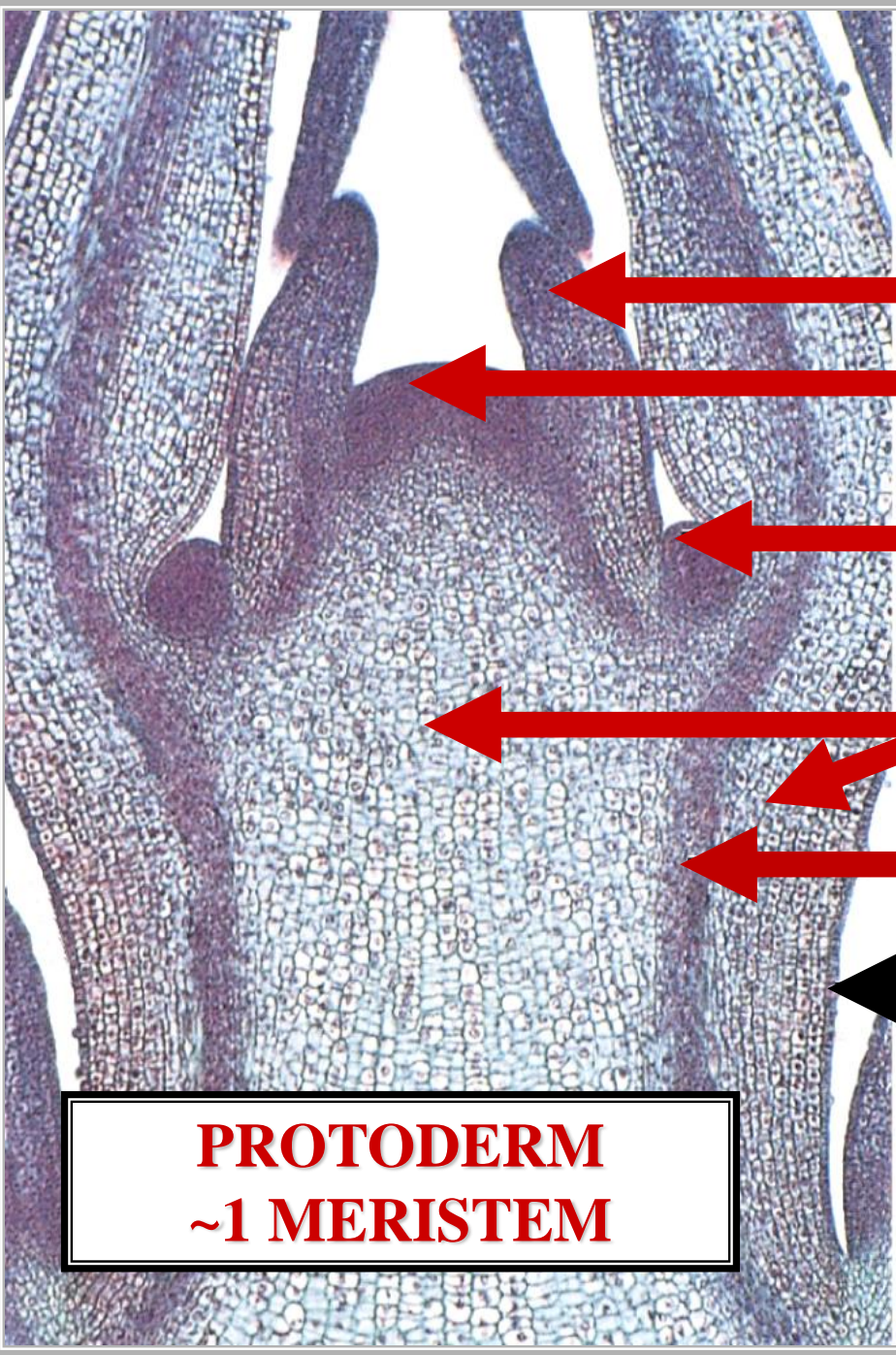


DERMAL TISSUE

PRIMARY

MERISTEM

ANGIOSPERM PRIMARY MERISTEMS



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**APICAL
MERISTEM**

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PROTODERM ~1 MERISTEM

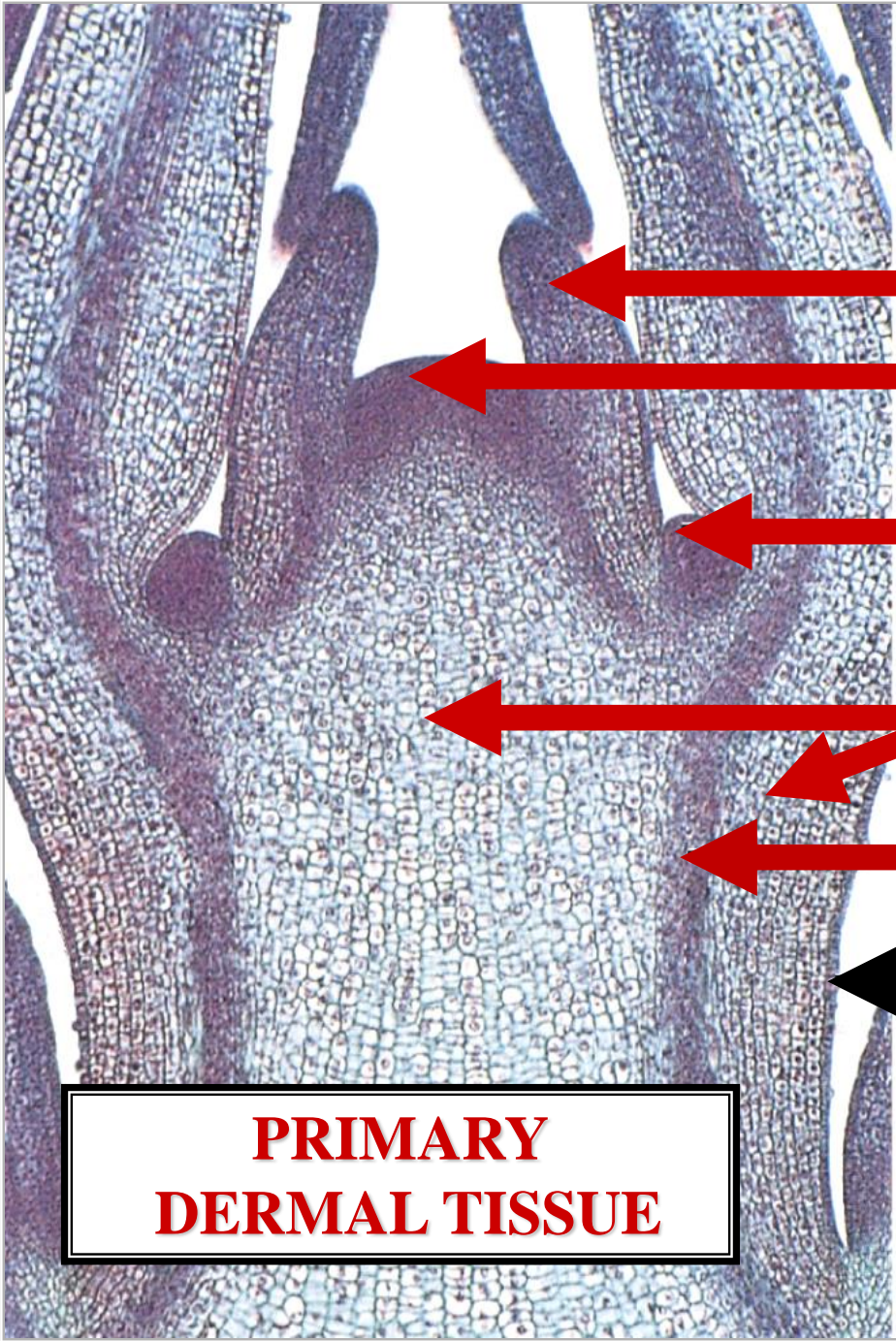
**PROTODERM
~1 MERISTEM**

STEM

L.S.



ANGIOSPERM PRIMARY MERISTEMS



[]

**APICAL
MERISTEM**

[]

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~1 DERMAL TISSUE

**PRIMARY
DERMAL TISSUE**

STEM

L.S.

DERMAL TISSUE TYPES

DERMAL TISSUE TYPES



EPIDERMIS

DERMAL TISSUE
TYPES

EPIDERMIS

EPIDERMIS

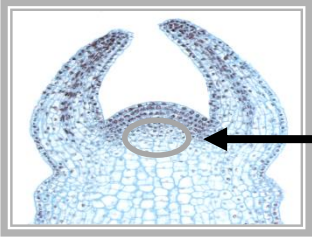


EPIDERMIS

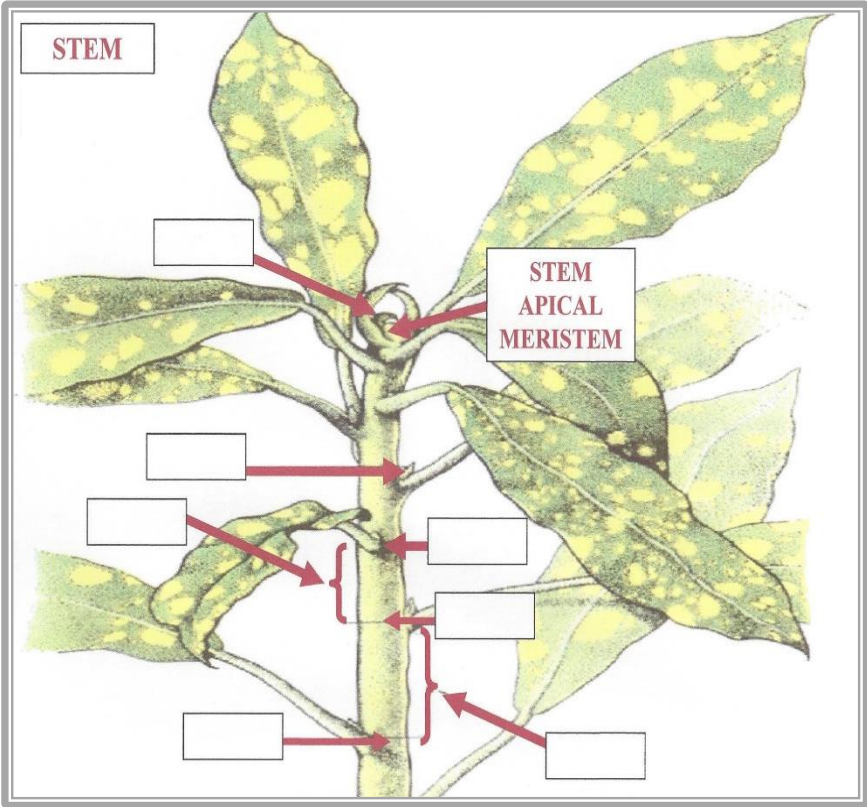
**OUTERMOST PROTECTIVE
CELL LAYER (S)
PRIMARY PLANT BODY**

EPIDERMIS

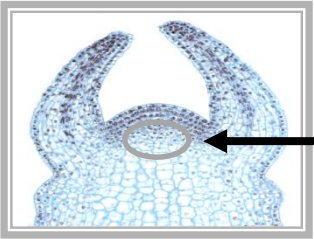
STEM APICAL MERISTEM



STEM APICAL MERISTEM



STEM APICAL MERISTEM

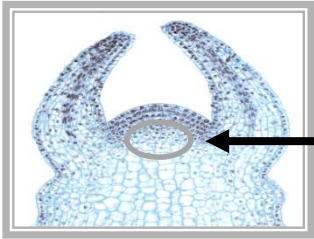


STEM APICAL MERISTEM



MERISTEM CELL INITIAL

STEM APICAL MERISTEM



STEM APICAL MERISTEM

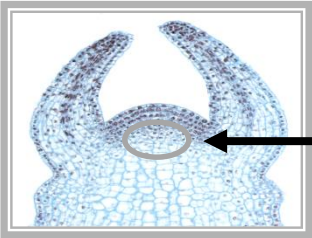


MERISTEM CELL INITIAL

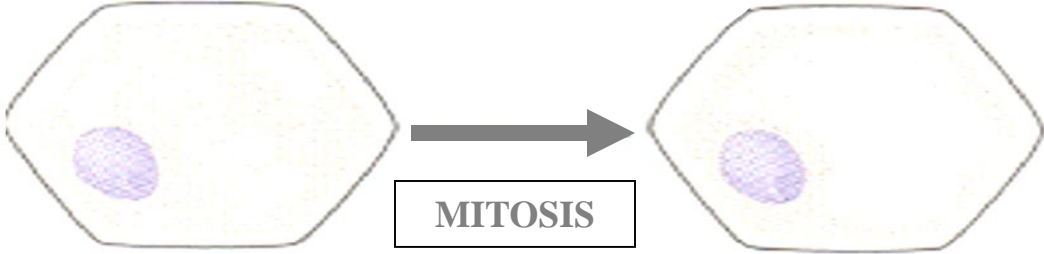
PARENCHYMA CELL

PARENCHYMA
BASIC
PLANT CELL

**STEM APICAL
MERISTEM**



STEM APICAL MERISTEM



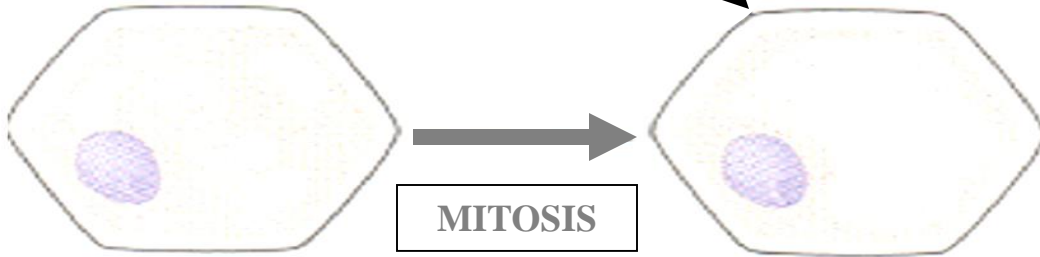
MERISTEM CELL INITIAL

PARENCHYMA CELL

**PARENCHYMA
BASIC
PLANT CELL**

**STEM APICAL
MERISTEM**

DERIVATIVE CELL



MERISTEM CELL INITIAL

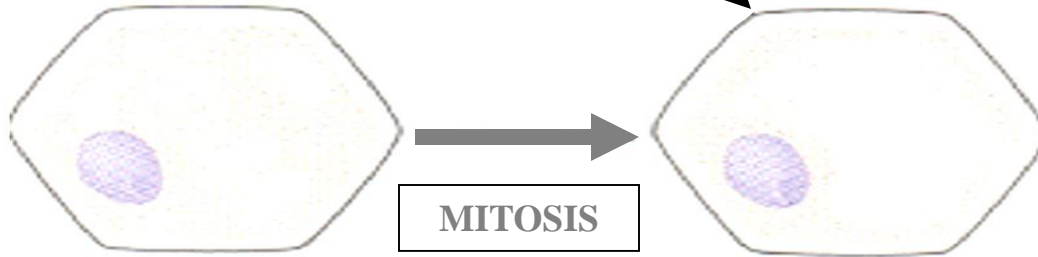
PARENCHYMA CELL

**PARENCHYMA
BASIC
PLANT CELL**

**STEM APICAL
MERISTEM**

DERIVATIVE CELL

PARENCHYMA CELL



MITOSIS

MERISTEM CELL INITIAL

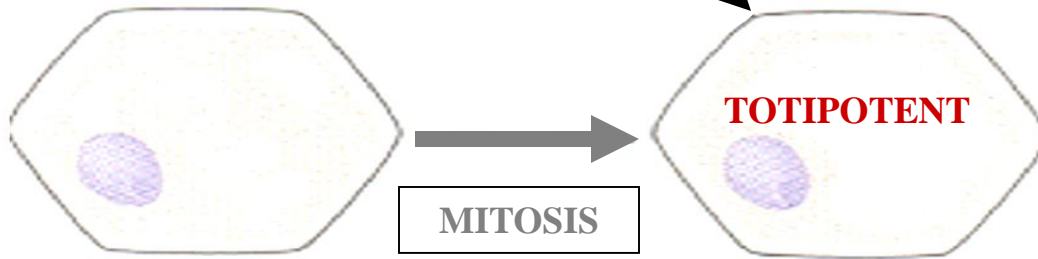
PARENCHYMA CELL

**PARENCHYMA
BASIC
PLANT CELL**

**STEM APICAL
MERISTEM**

DERIVATIVE CELL

PARENCHYMA CELL



**PARENCHYMA CELL
CAN POTENTIALLY
DIFFERENTIATE
INTO ANY PLANT CELL TYPE**

MERISTEM CELL INITIAL

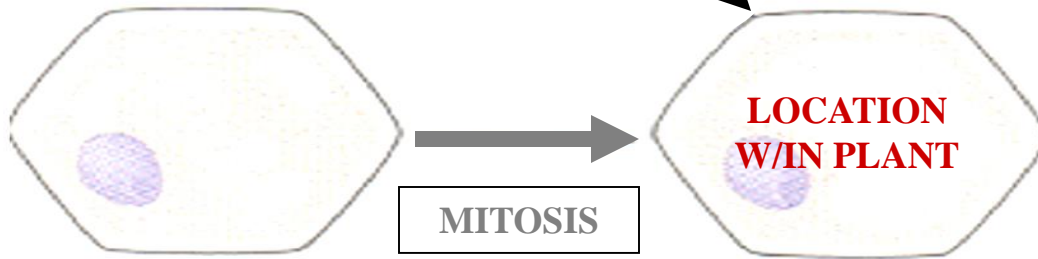
PARENCHYMA CELL

**PARENCHYMA
BASIC
PLANT CELL**

**STEM APICAL
MERISTEM**

DERIVATIVE CELL

PARENCHYMA CELL



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MERISTEM CELL INITIAL

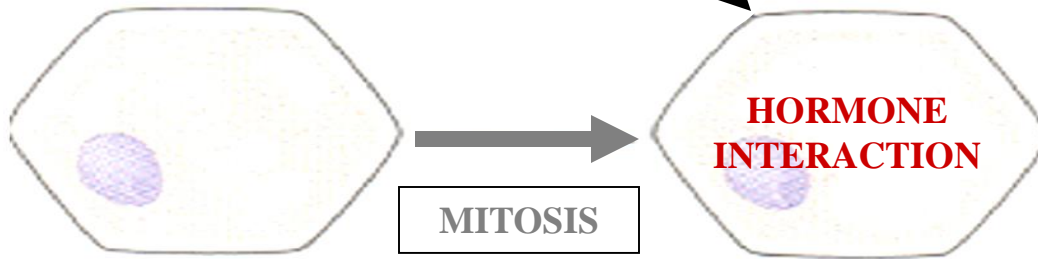
PARENCHYMA CELL

**PARENCHYMA
BASIC
PLANT CELL**

**STEM APICAL
MERISTEM**

DERIVATIVE CELL

PARENCHYMA CELL



**PARENCHYMA CELL
CAN POTENTIALLY
DIFFERENTIATE
INTO ANY PLANT CELL TYPE**

MERISTEM CELL INITIAL

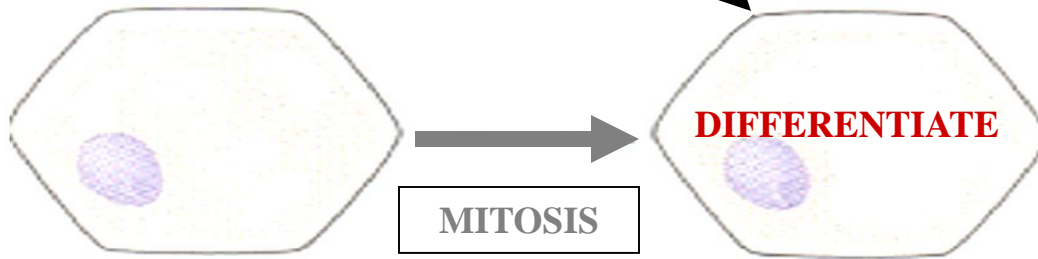
PARENCHYMA CELL

**PARENCHYMA
BASIC
PLANT CELL**

**STEM APICAL
MERISTEM**

DERIVATIVE CELL

PARENCHYMA CELL



**PARENCHYMA CELL
CAN POTENTIALLY
DIFFERENTIATE
INTO ANY PLANT CELL TYPE**

MERISTEM CELL INITIAL

PARENCHYMA CELL

**PARENCHYMA
BASIC
PLANT CELL**

**STEM APICAL
MERISTEM**

EPIDERMAL CELL

DERIVATIVE CELL

PARENCHYMA CELL

DIFFERENTIATE

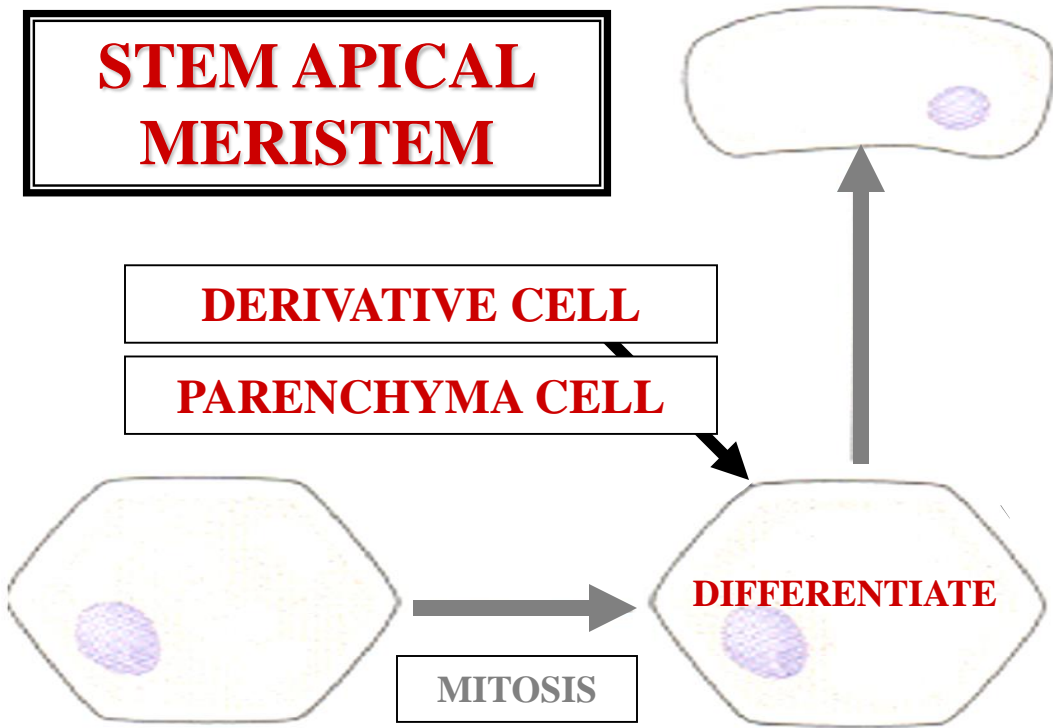
MITOSIS

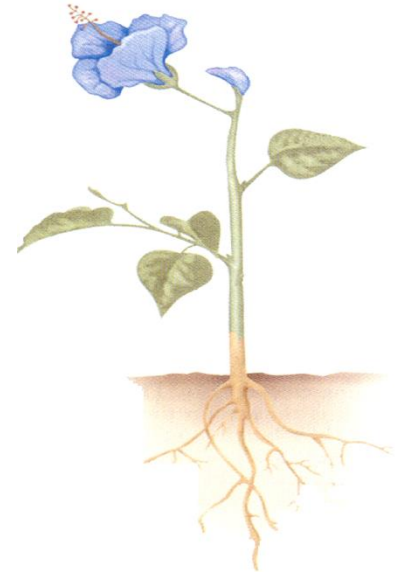
MERISTEM CELL INITIAL

PARENCHYMA CELL

**PARENCHYMA
BASIC
PLANT CELL**

**PARENCHYMA CELL
CAN POTENTIALLY
DIFFERENTIATE
INTO ANY PLANT CELL TYPE**



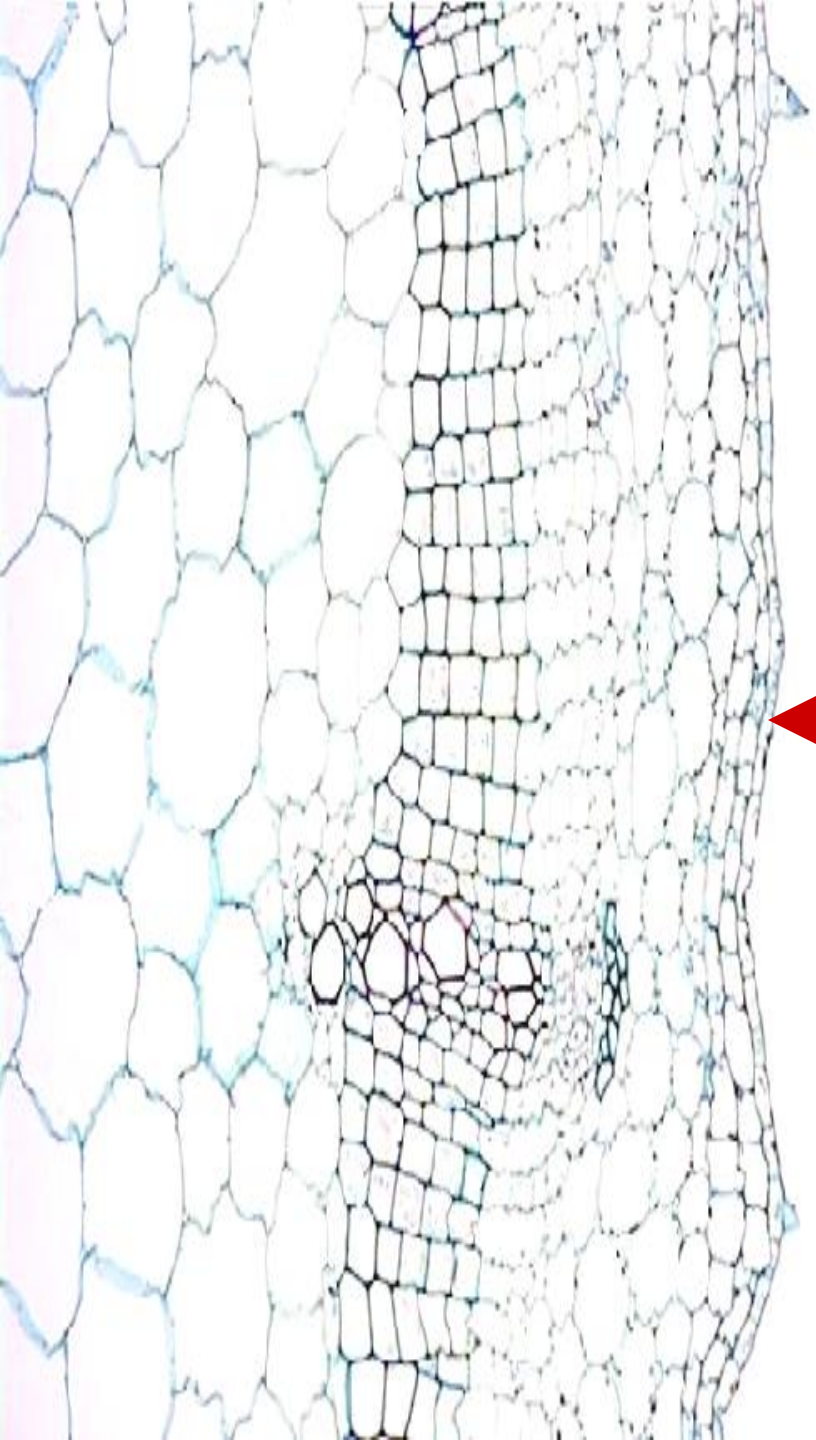


EPIDERMIS

**PRIMARY
PLANT BODY**

STEM

L.S.



**EPIDERMIS
PROVIDES
PROTECTION
FROM**



HERBIVORES





EPIDERMIS
PLANT HAIR



T

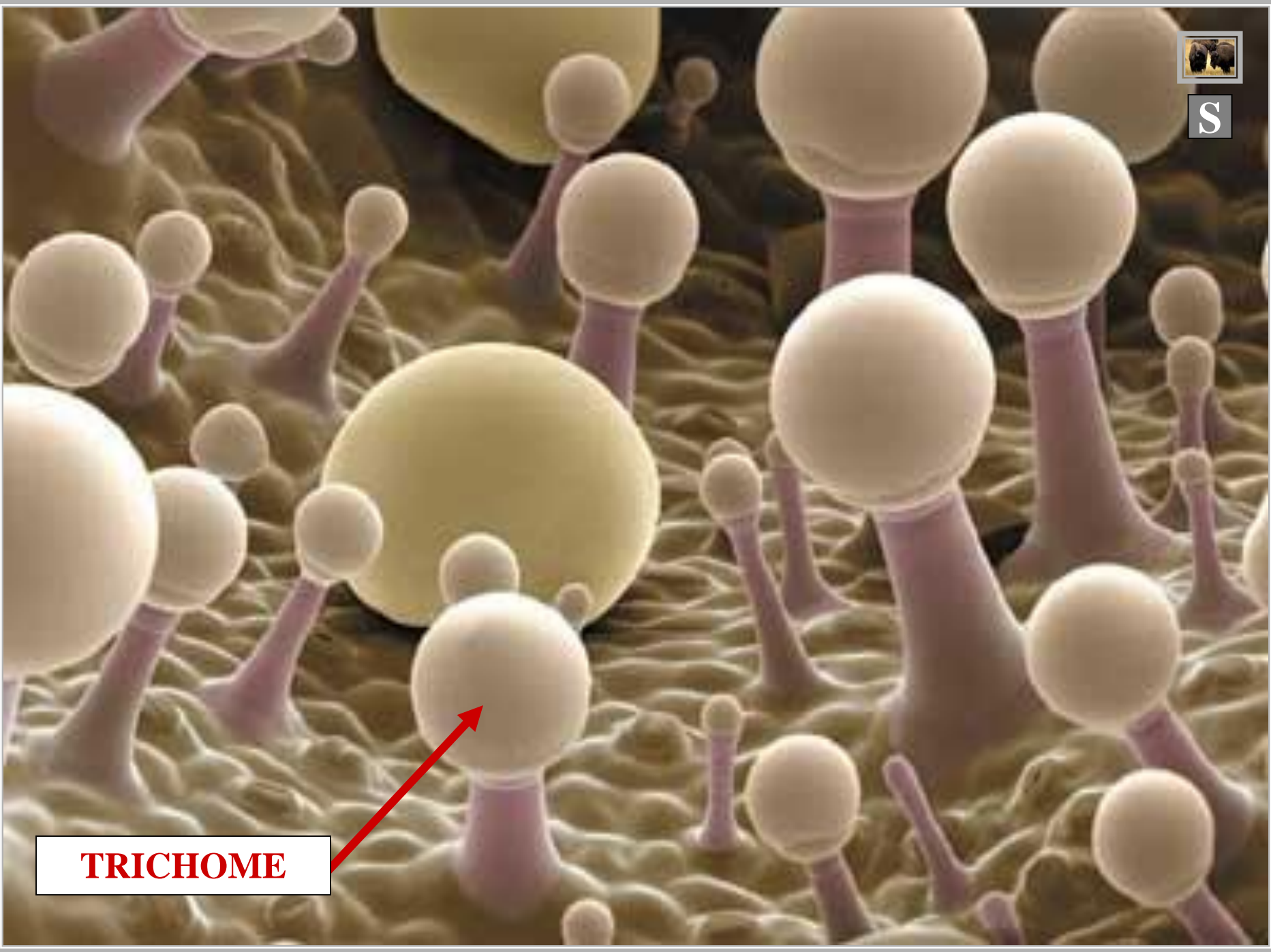
+



**EPIDERMIS
PLANT HAIR**



S



TRICHOME

A photograph of a herd of bison in a grassy field. Two bison are in the foreground, facing each other. The background shows more bison and tall grass. The lighting is warm, suggesting late afternoon or early morning.

*

E

EPIDERMIS INHIBITS HERBIVORES

**EPIDERMIS
PROVIDES
PROTECTION
FROM**



PATHOGENS

PATHOGENS



DISEASE AGENTS

PATHOGENS



SD

SOYBEANS

SUDDEN DEATH SYNDROME



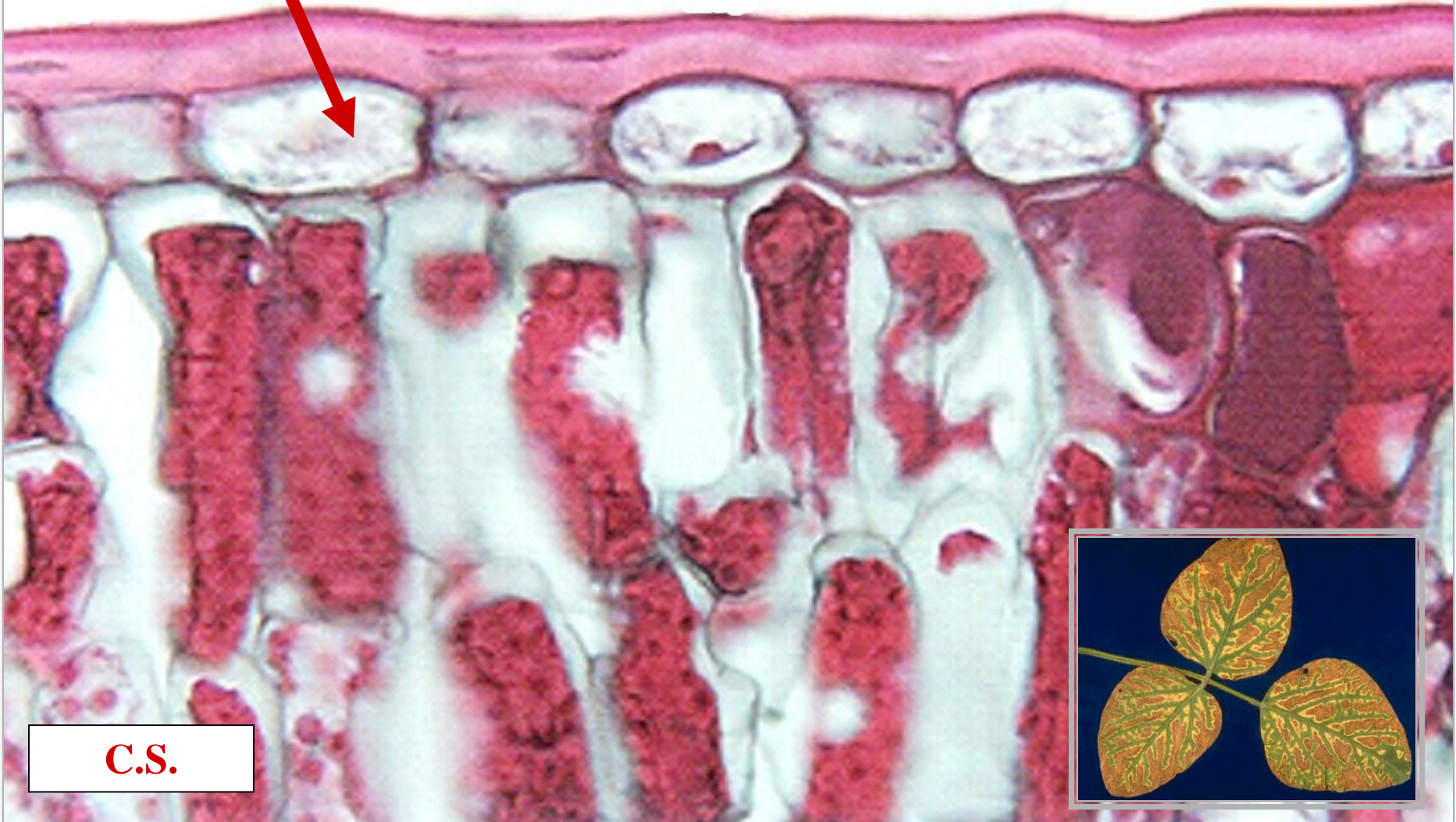
SOYBEANS

ATMOSPHERE

VIRUS

V

EPIDERMIS



C.S.



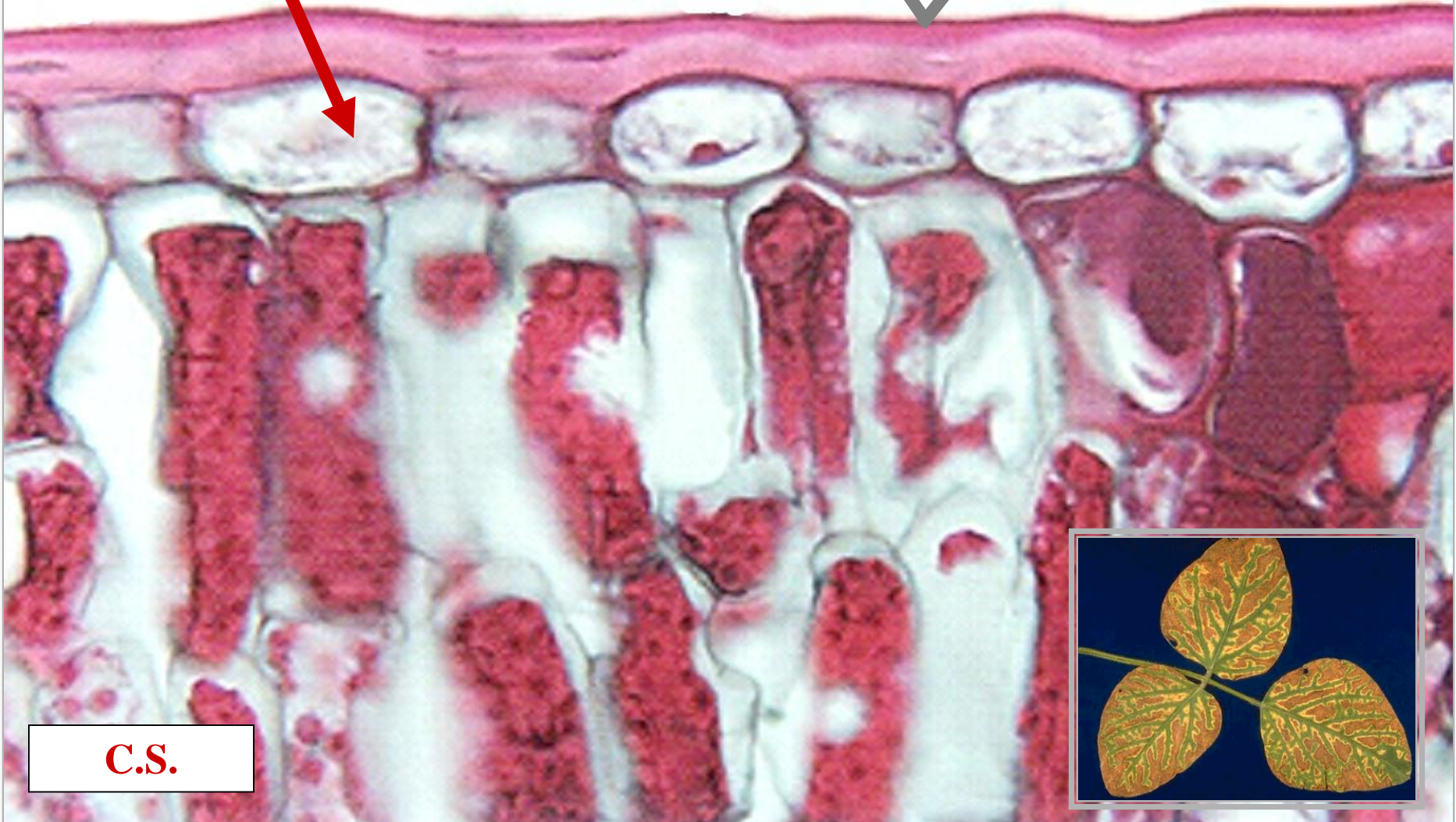
ATMOSPHERE

VIRUS

VIRUS

S

EPIDERMIS



C.S.

ATMOSPHERE

VIRUS

VIRUS

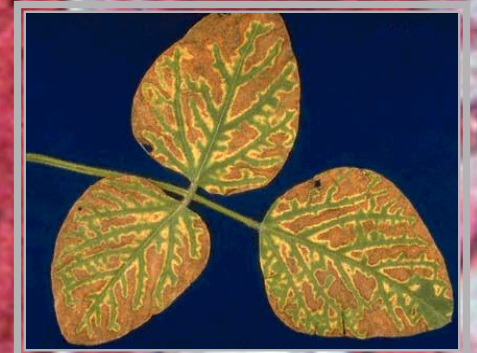
E

EPIDERMIS



EPIDERMIS INHIBITS PATHOGENS

C.S.



**EPIDERMIS
PROVIDES
PROTECTION
FROM**

DESICCATION

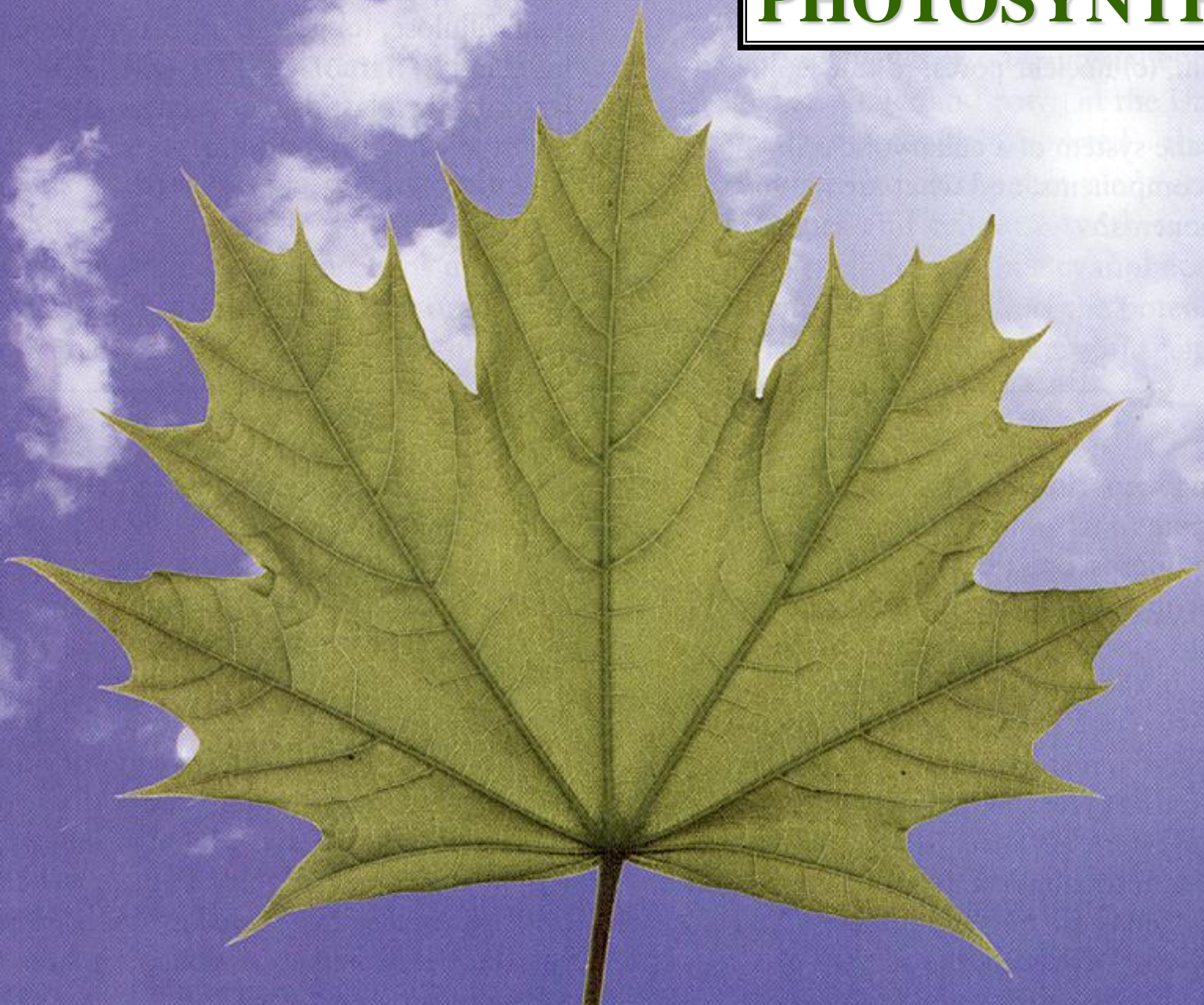


DESICCATION

WATER LOSS

DESICCATION

PHOTOSYNTHESIS



PHOTOSYNTHESIS



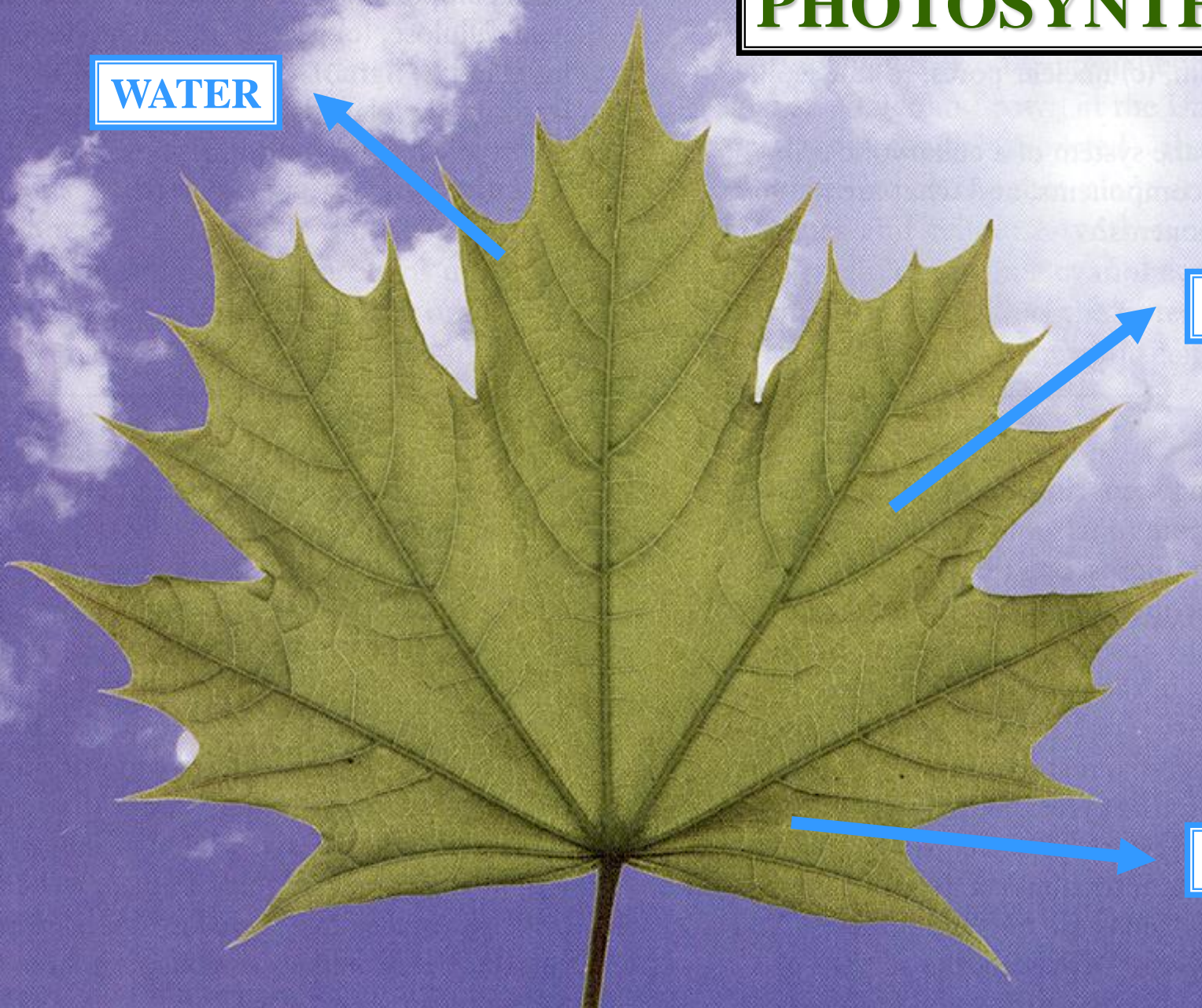
WATER



WATER



WATER



ATMOSPHERE

?

EPIDERMIS



LEAF

C.S.

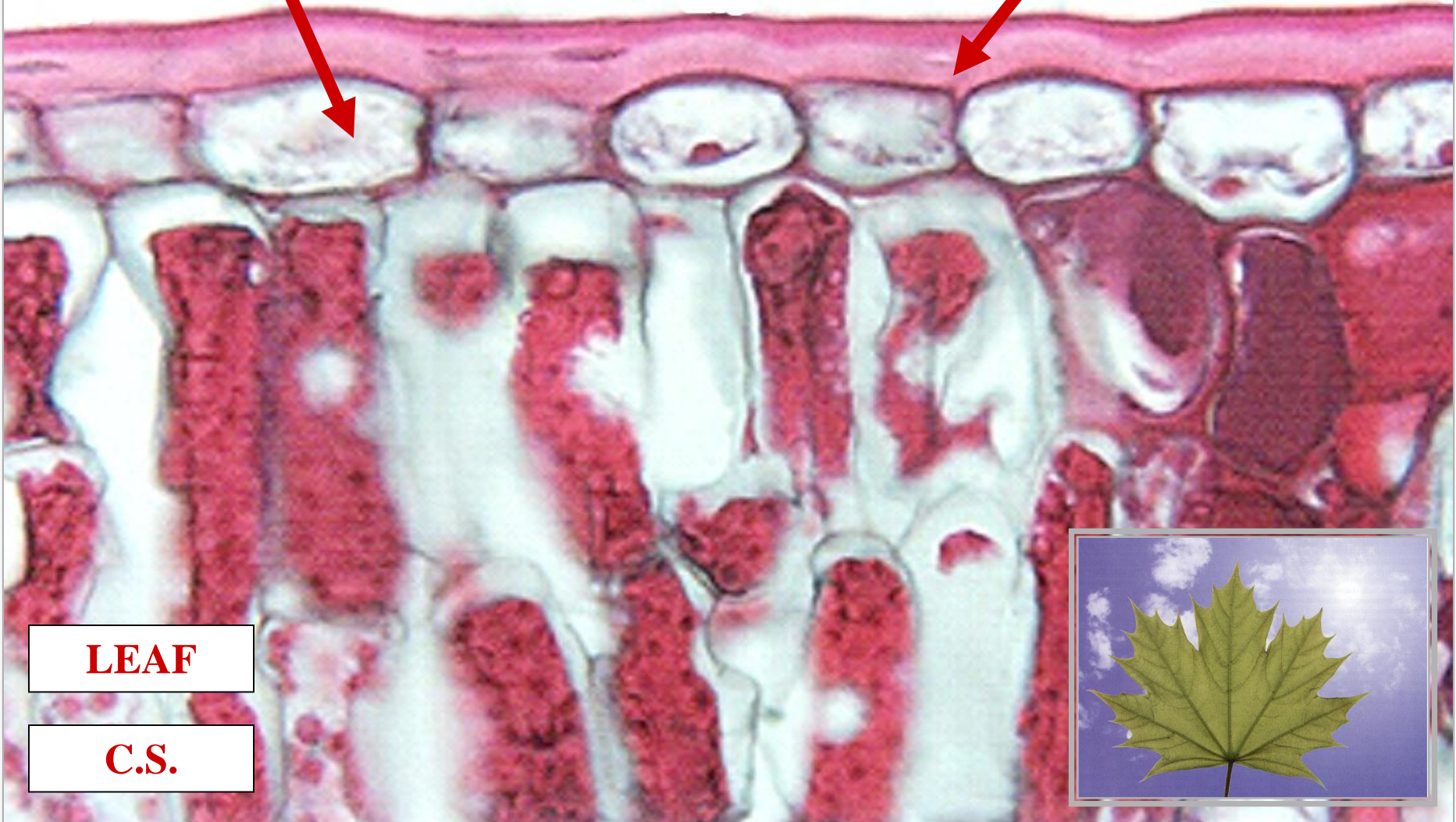


ATMOSPHERE

C

EPIDERMIS

?



LEAF

C.S.

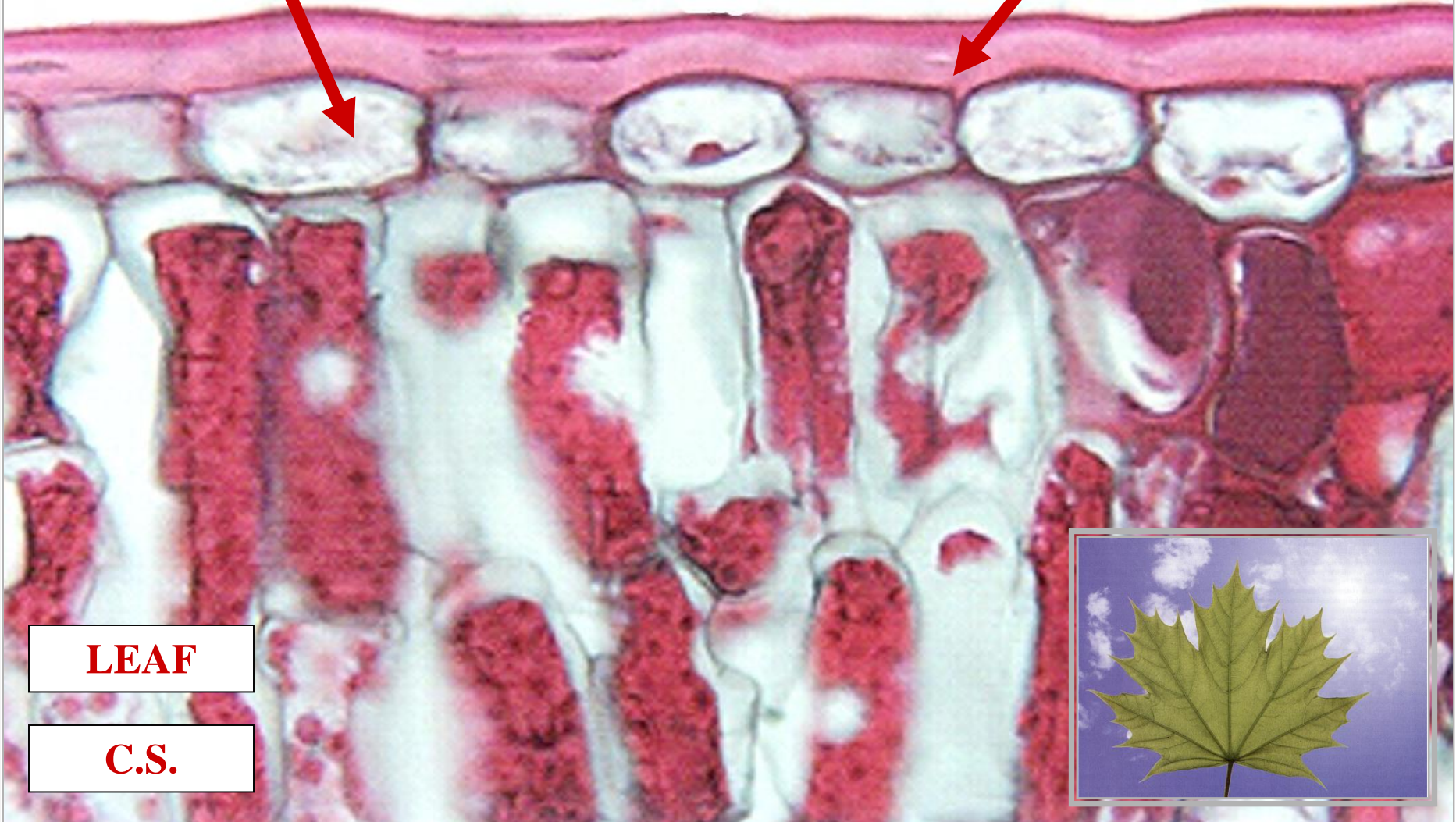


ATMOSPHERE

C

EPIDERMIS

CUTICLE



LEAF

C.S.



CUTICLE



CUTICLE

WAX-LIKE LIPID LAYER

CUTICLE



CUTICLE

WAX-LIKE LIPID LAYER

INHIBITS DESICCATION

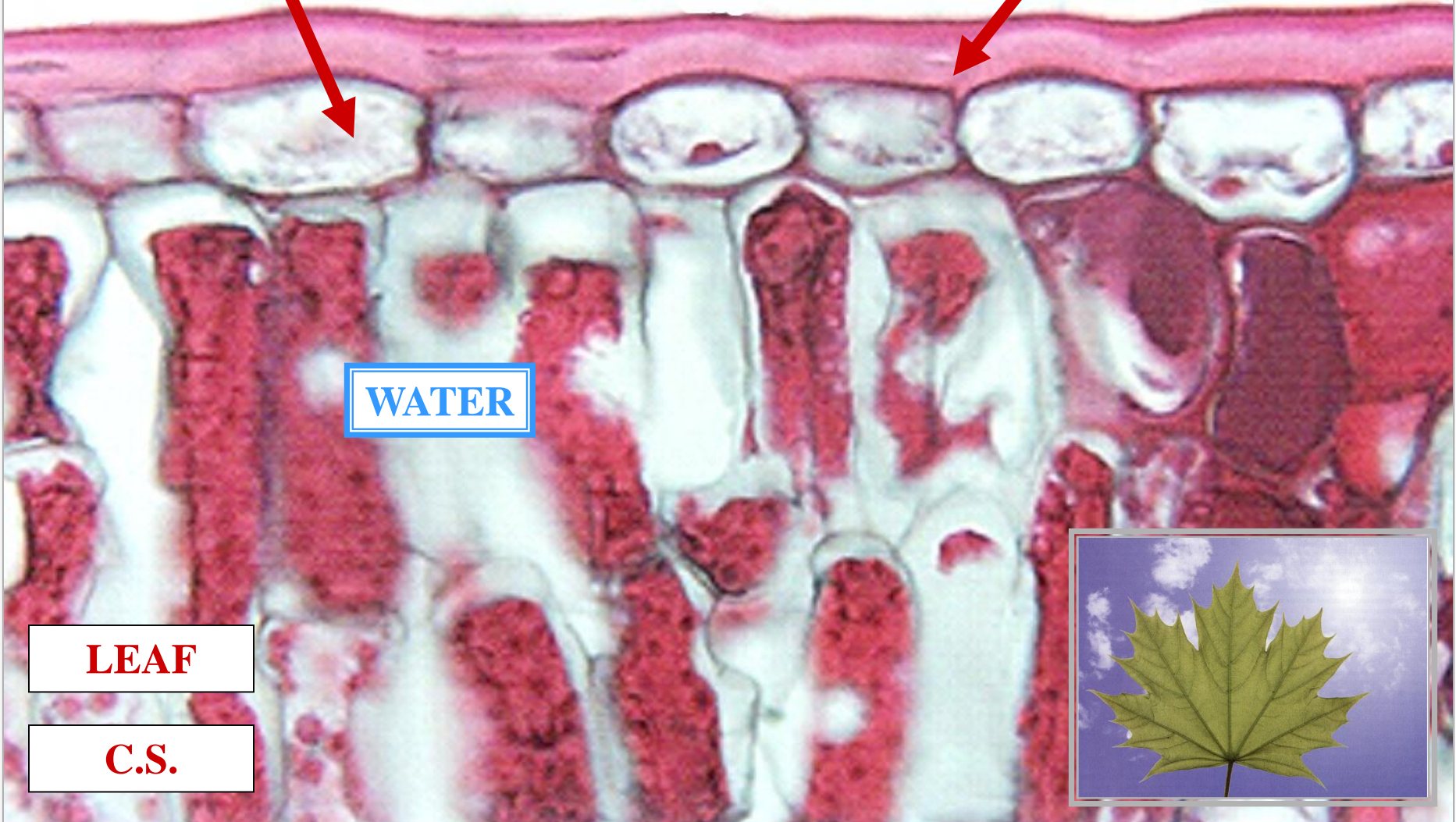
CUTICLE



ATMOSPHERE

EPIDERMIS

CUTICLE



WATER

LEAF

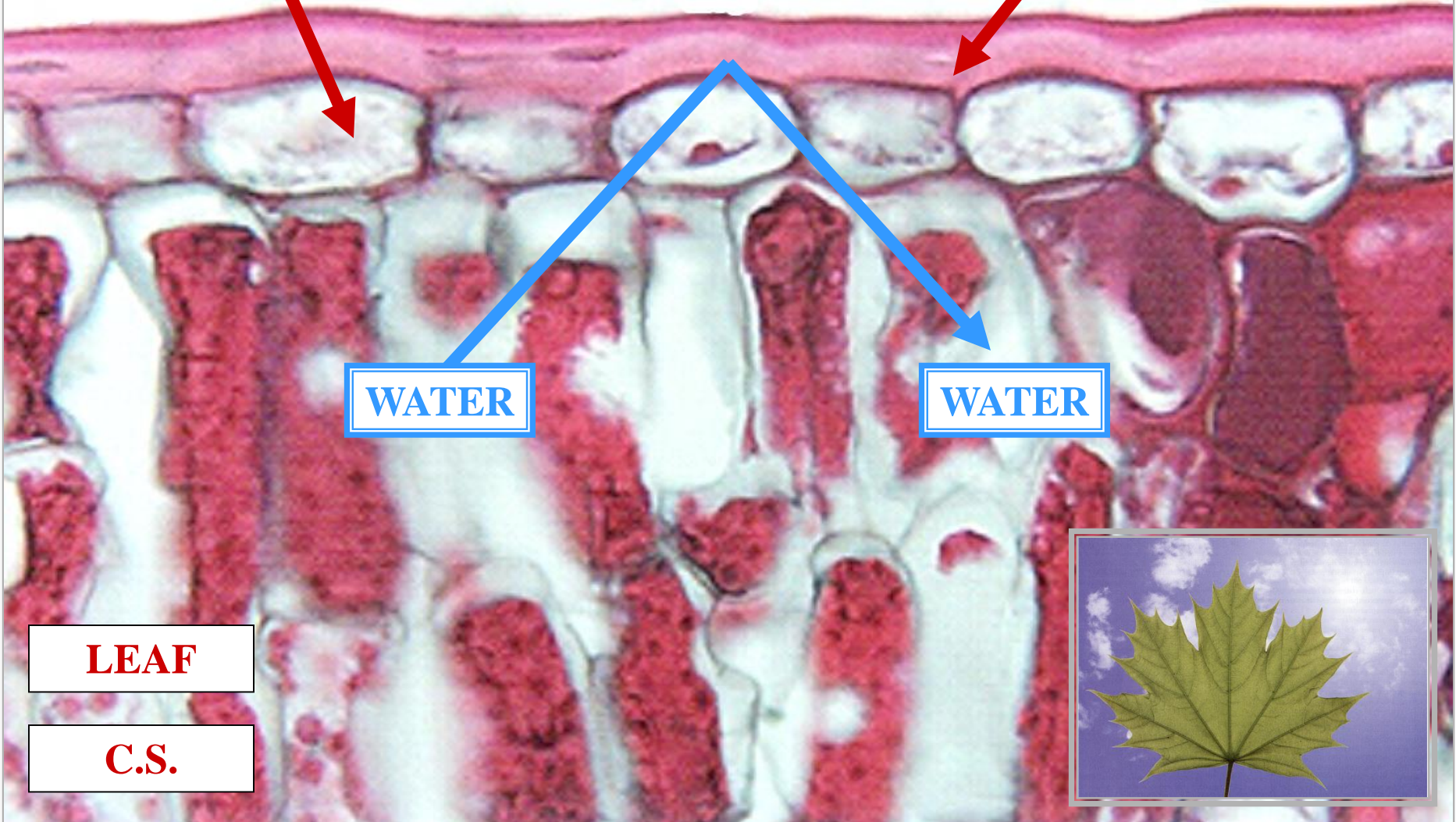
C.S.



ATMOSPHERE

EPIDERMIS

CUTICLE



WATER

WATER

LEAF

C.S.

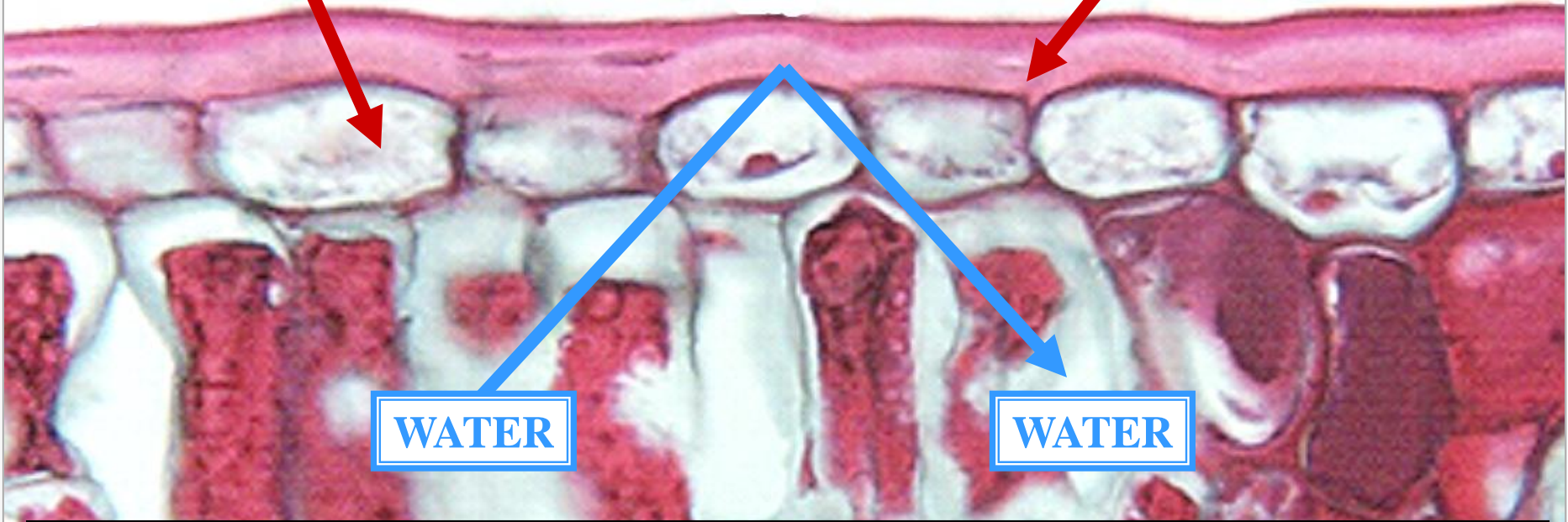




ATMOSPHERE

EPIDERMIS

CUTICLE



WATER

WATER

EPIDERMIS INHIBITS DESICCATION

LEAF

C.S.



EPIDERMIS TYPES

EPIDERMIS TYPES

UNISERIATE EPIDERMIS

EPIDERMIS TYPES

EPIDERMIS TYPES

UNISERIATE EPIDERMIS
MULTIPLE EPIDERMIS

EPIDERMIS
TYPES

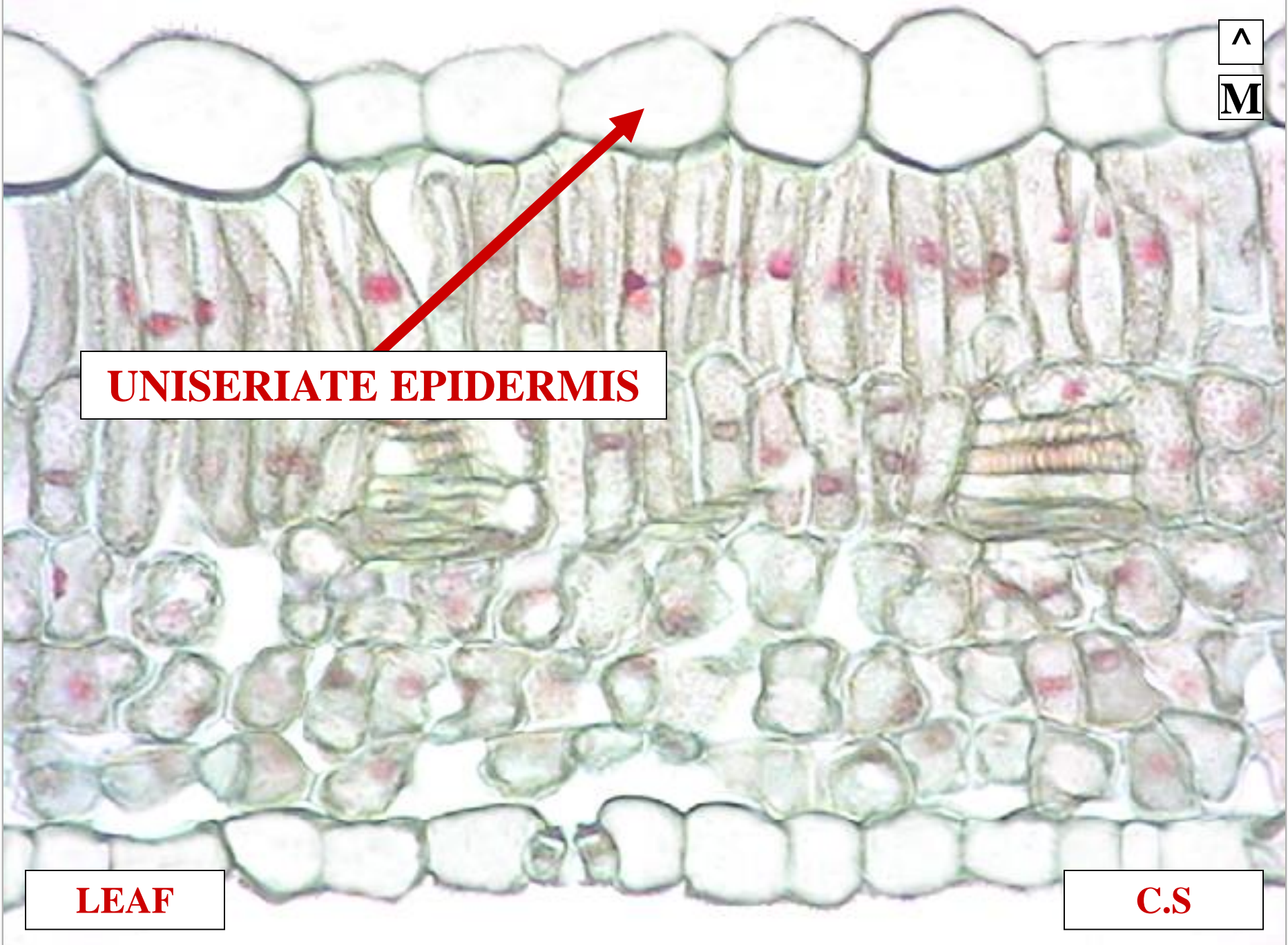
UNISERIATE EPIDERMIS



UNISERIATE EPIDERMIS

CONSISTS ONE CELL LAYER

UNISERIATE EPIDERMIS



UNISERiate EPIDERMIS

LEAF

C.S

MULTIPLE EPIDERMIS



MULTIPLE EPIDERMIS

**CONSISTS MORE THAN ONE
CELL LAYER**

MULTIPLE EPIDERMIS



MULTIPLE EPIDERMIS

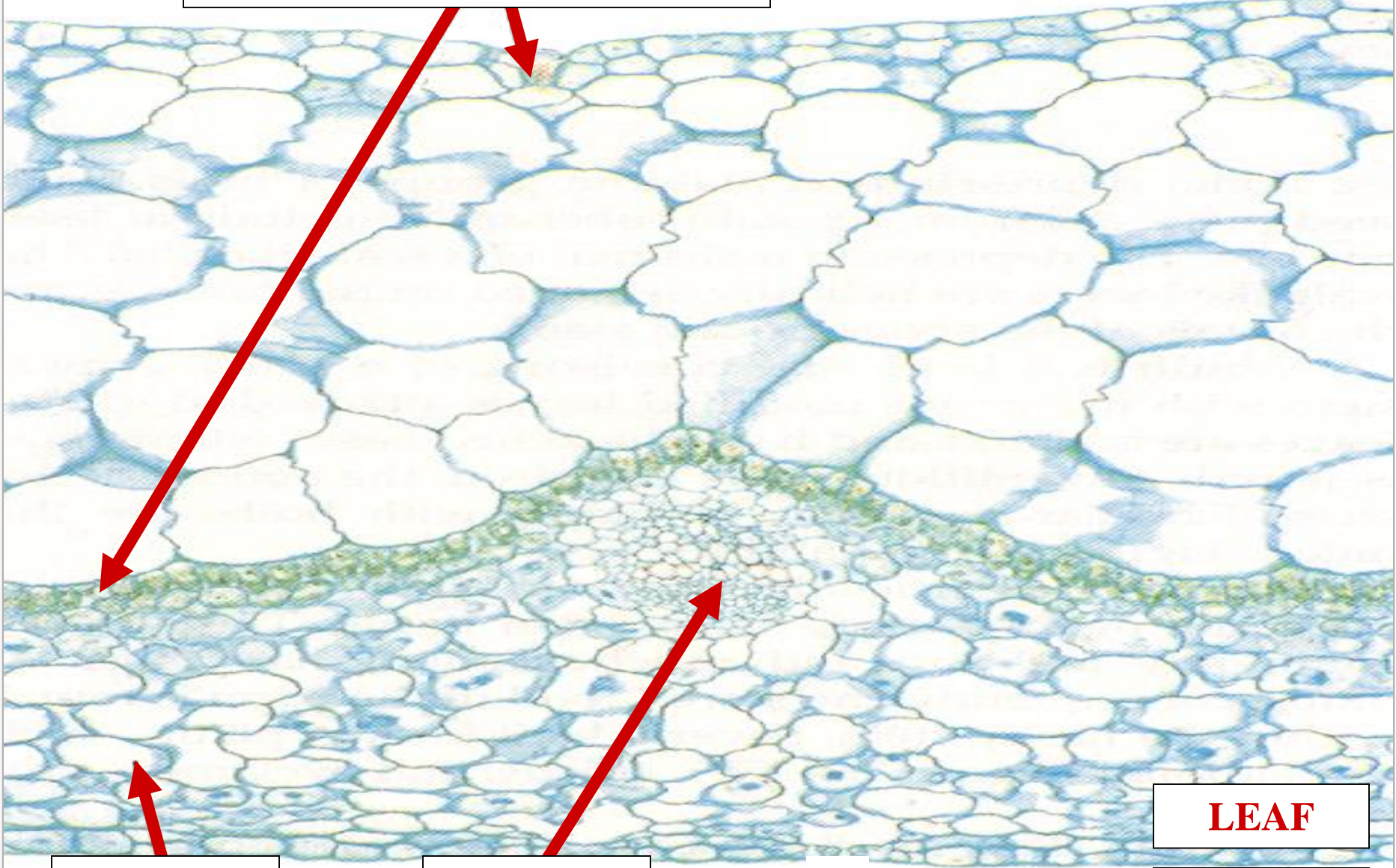
**CONSISTS MORE THAN ONE
CELL LAYER**

ELIMINATES DESICCATION

MULTIPLE EPIDERMIS



MULTIPLE EPIDERMIS



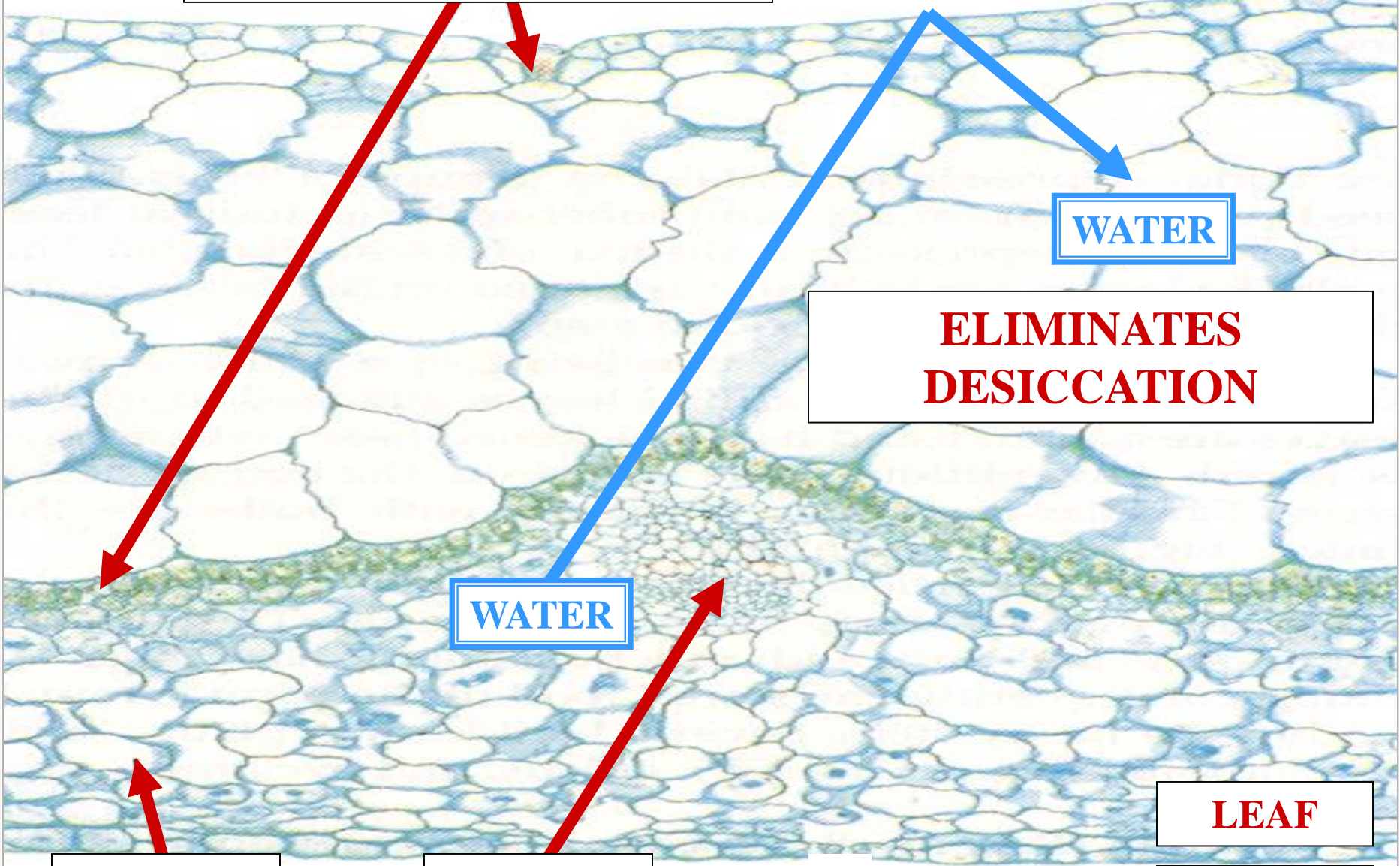
LEAF

C.S

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MULTIPLE EPIDERMIS



WATER

**ELIMINATES
DESICCATION**

WATER

LEAF

C.S

HYPODERMIS

HYPODERMIS

HYPODERMIS

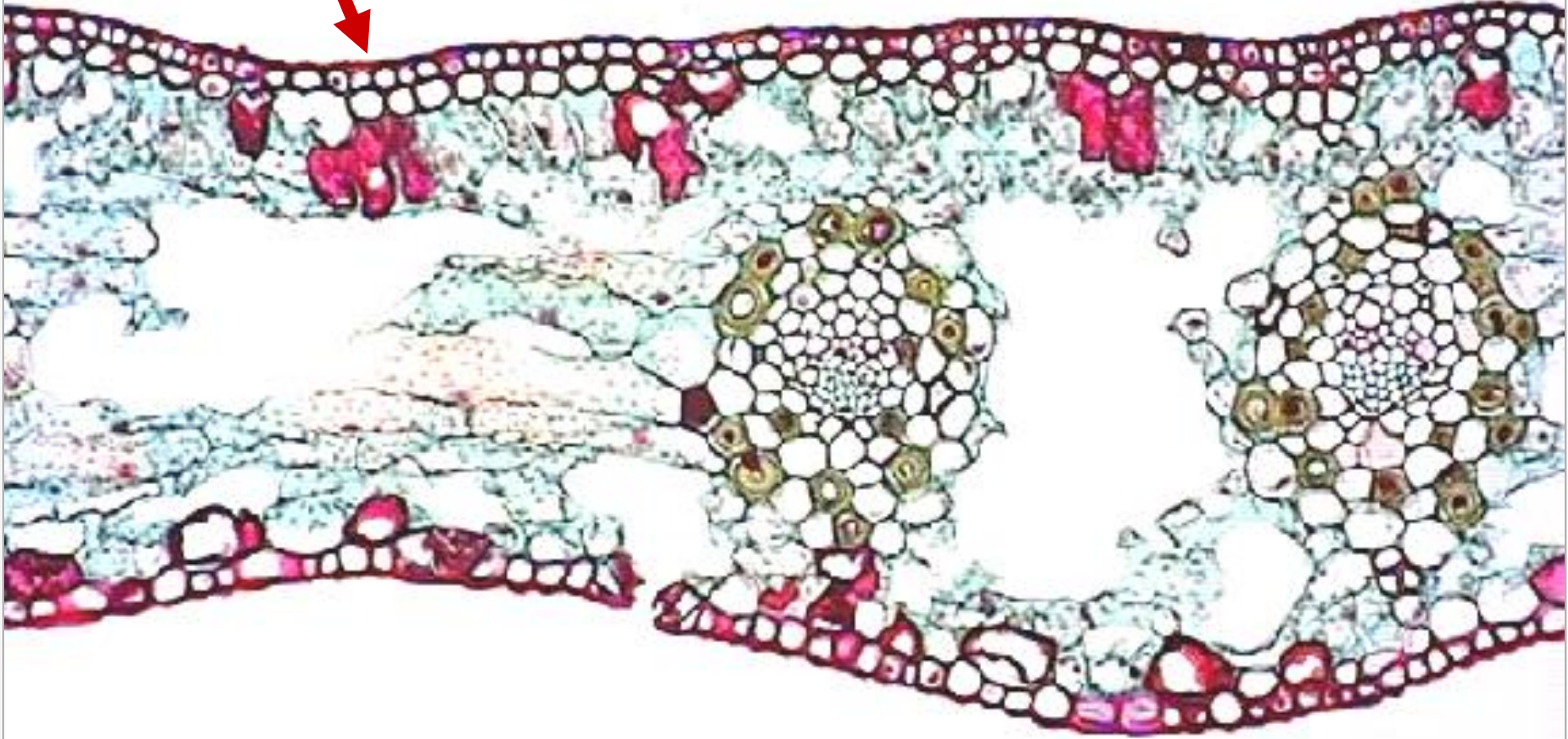


E

**CELL LAYER(S)
BENEATH EPIDERMIS**

HYPODERMIS

EPIDERMIS



LEAF

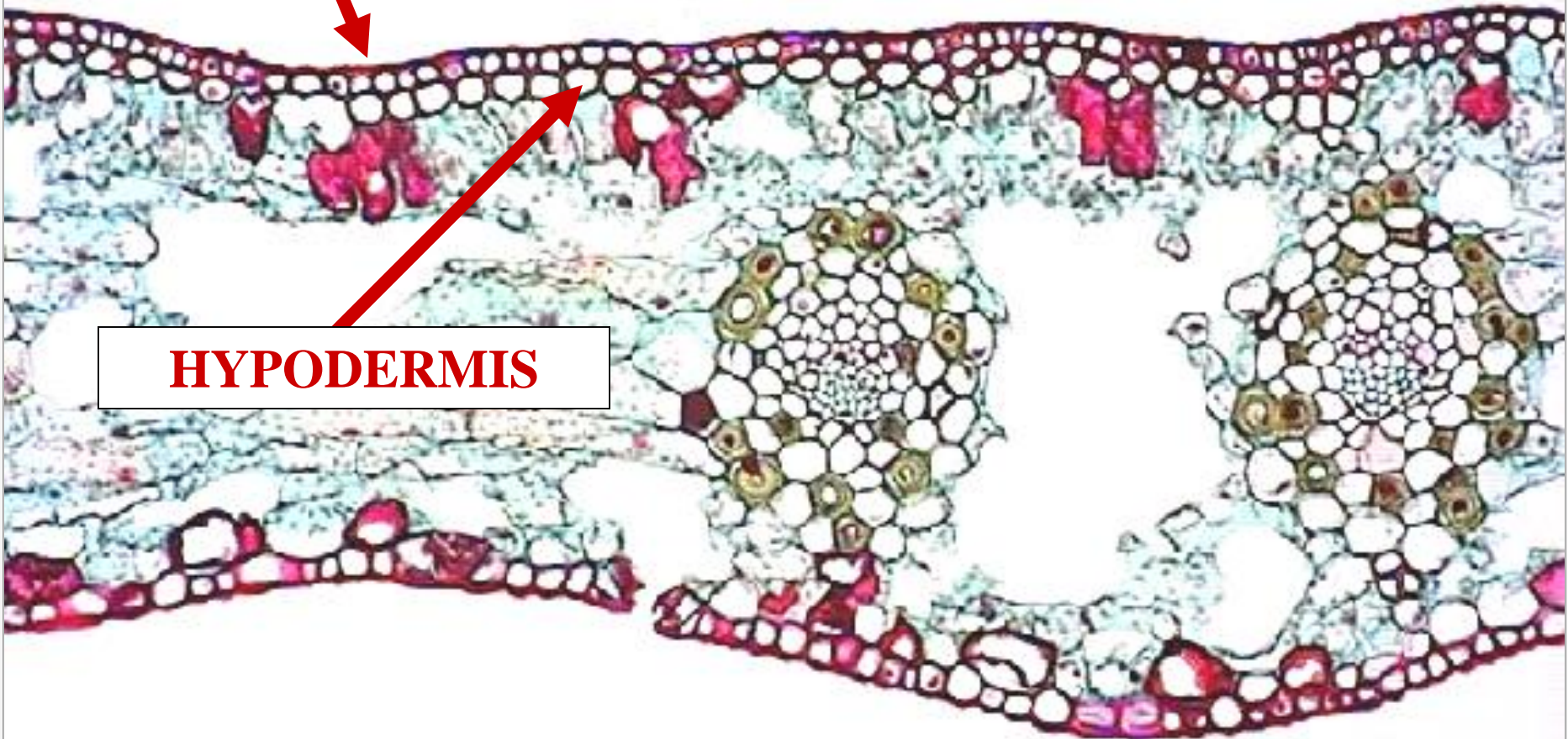
C.S

CF

EPIDERMIS



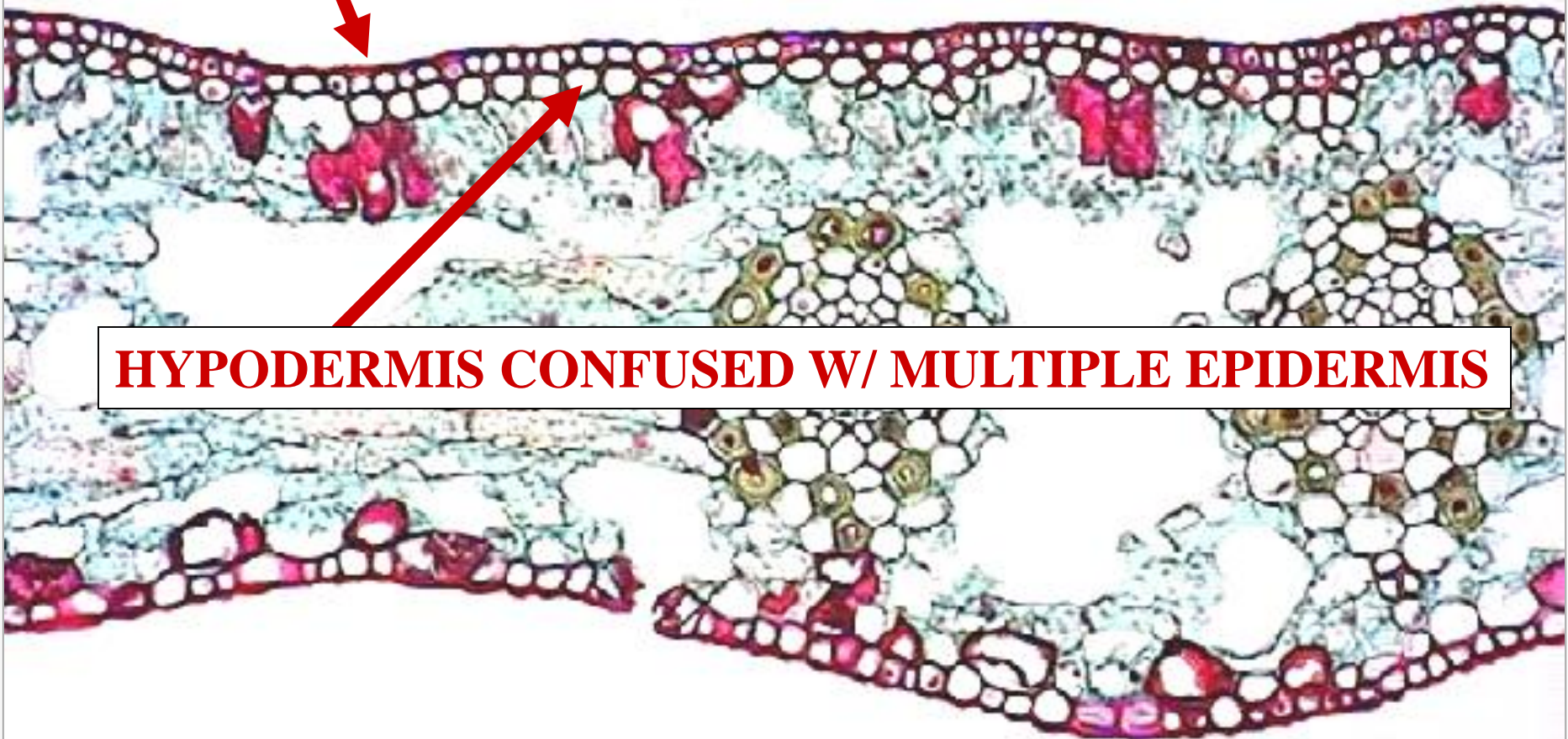
HYPODERMIS



LEAF

C.S

EPIDERMIS



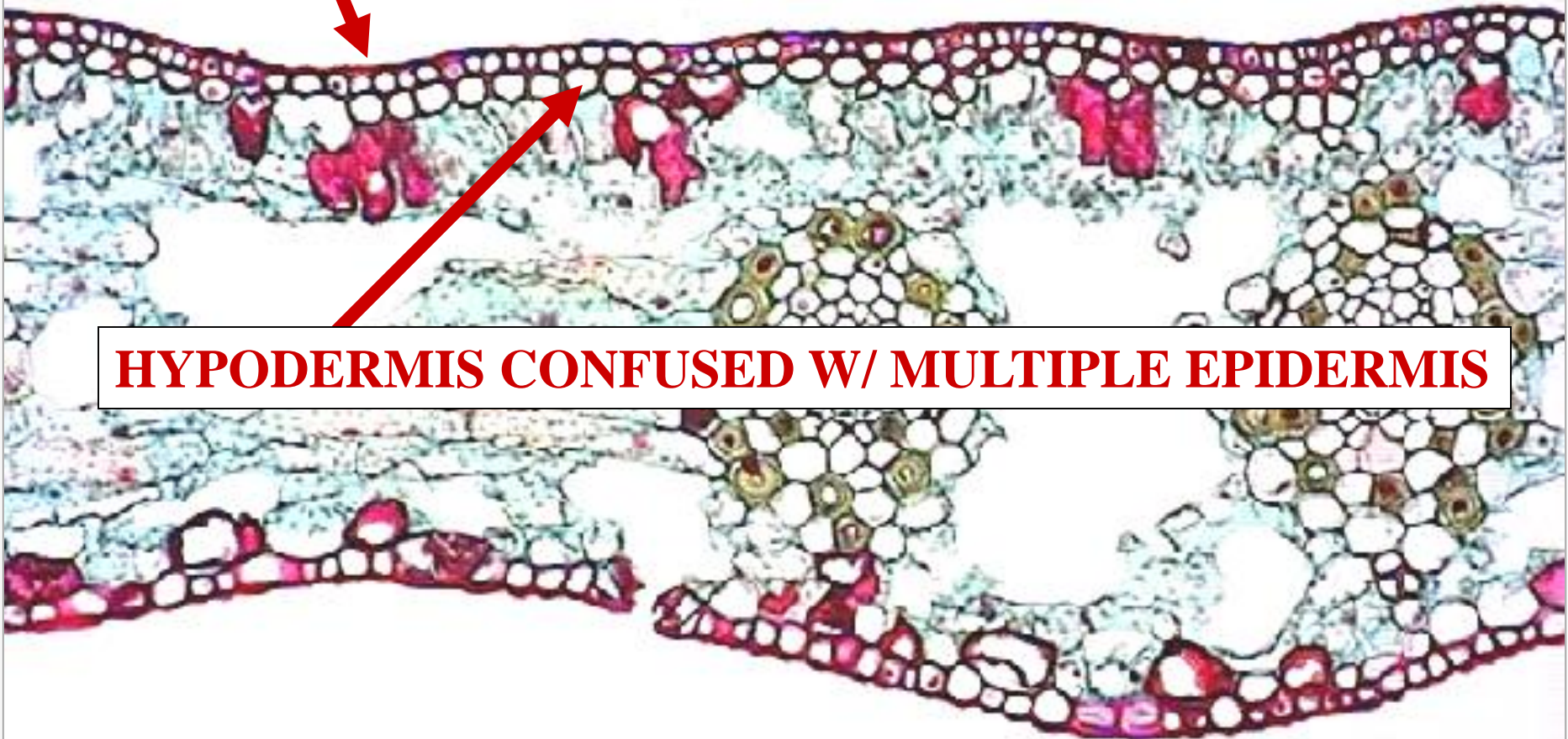
HYPODERMIS CONFUSED W/ MULTIPLE EPIDERMIS

LEAF

C.S

EPIDERMIS DERIVED PROTODERM ~1 MERISTEM

~



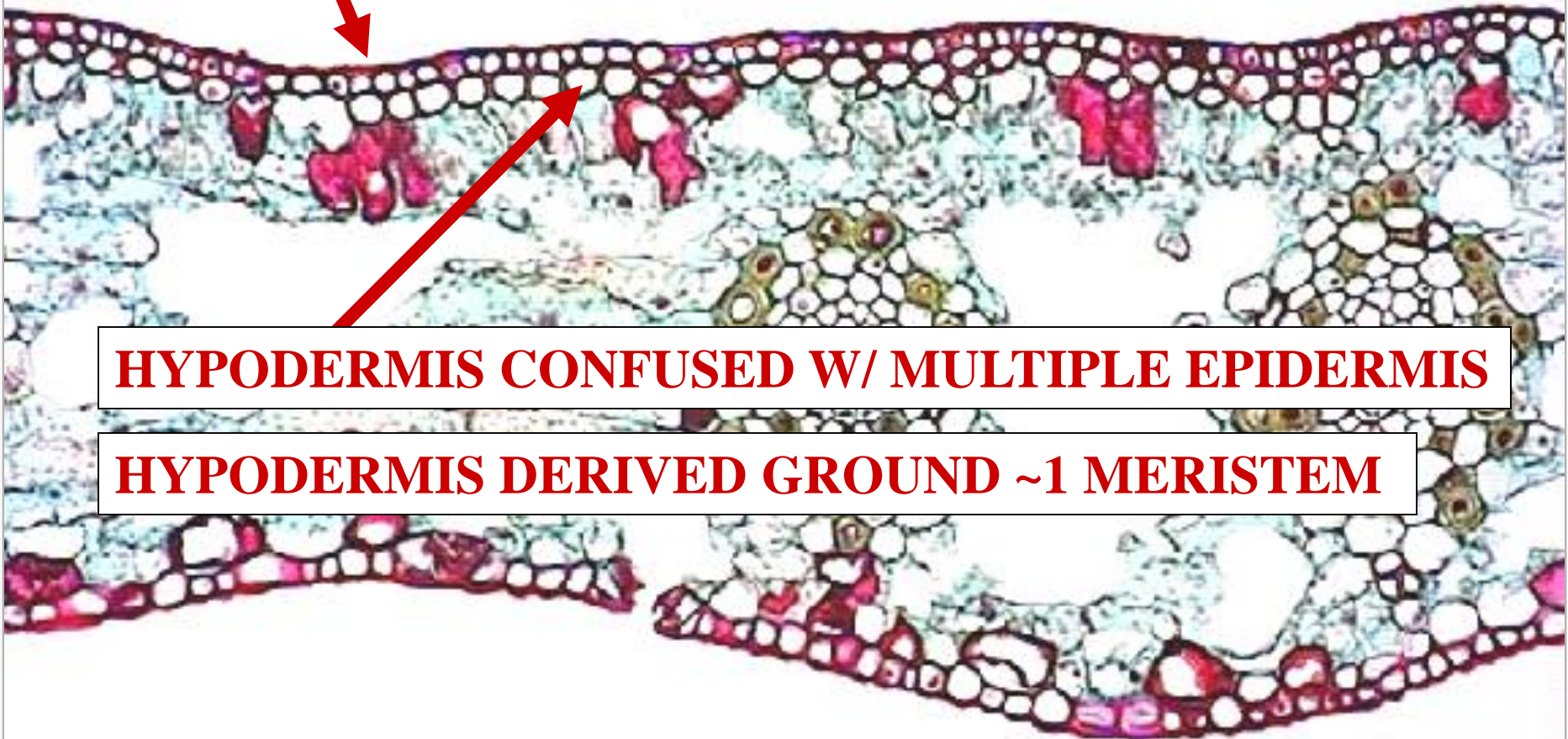
HYPODERMIS CONFUSED W/ MULTIPLE EPIDERMIS

LEAF

C.S



EPIDERMIS DERIVED PROTODERM ~1 MERISTEM



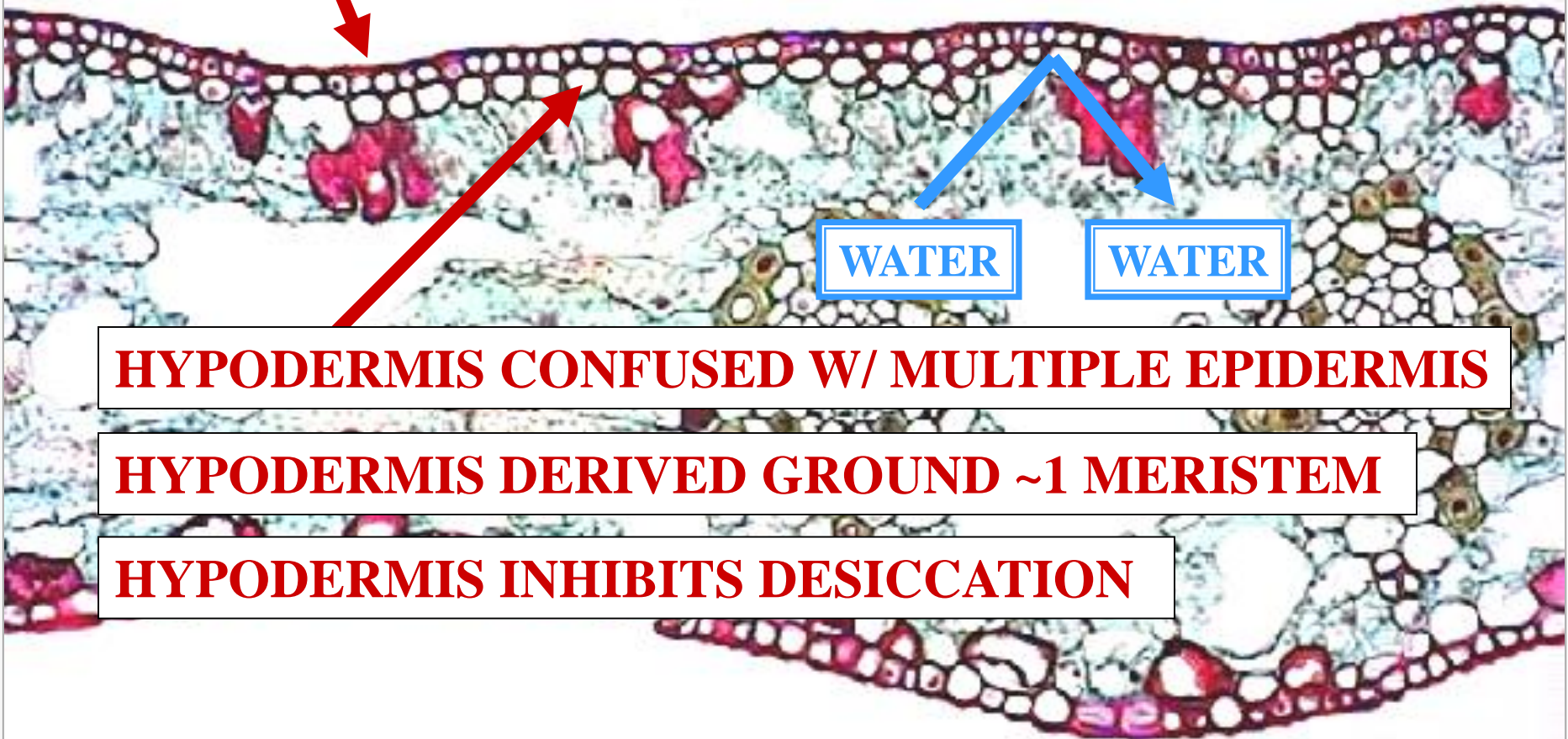
HYPODERMIS CONFUSED W/ MULTIPLE EPIDERMIS

HYPODERMIS DERIVED GROUND ~1 MERISTEM

LEAF

C.S

EPIDERMIS DERIVED PROTODERM ~1 MERISTEM



HYPODERMIS CONFUSED W/ MULTIPLE EPIDERMIS

HYPODERMIS DERIVED GROUND ~1 MERISTEM

HYPODERMIS INHIBITS DESICCATION

LEAF

C.S

EPIDERMIS CELL TYPES

EPIDERMIS

VEGETATIVE CELL

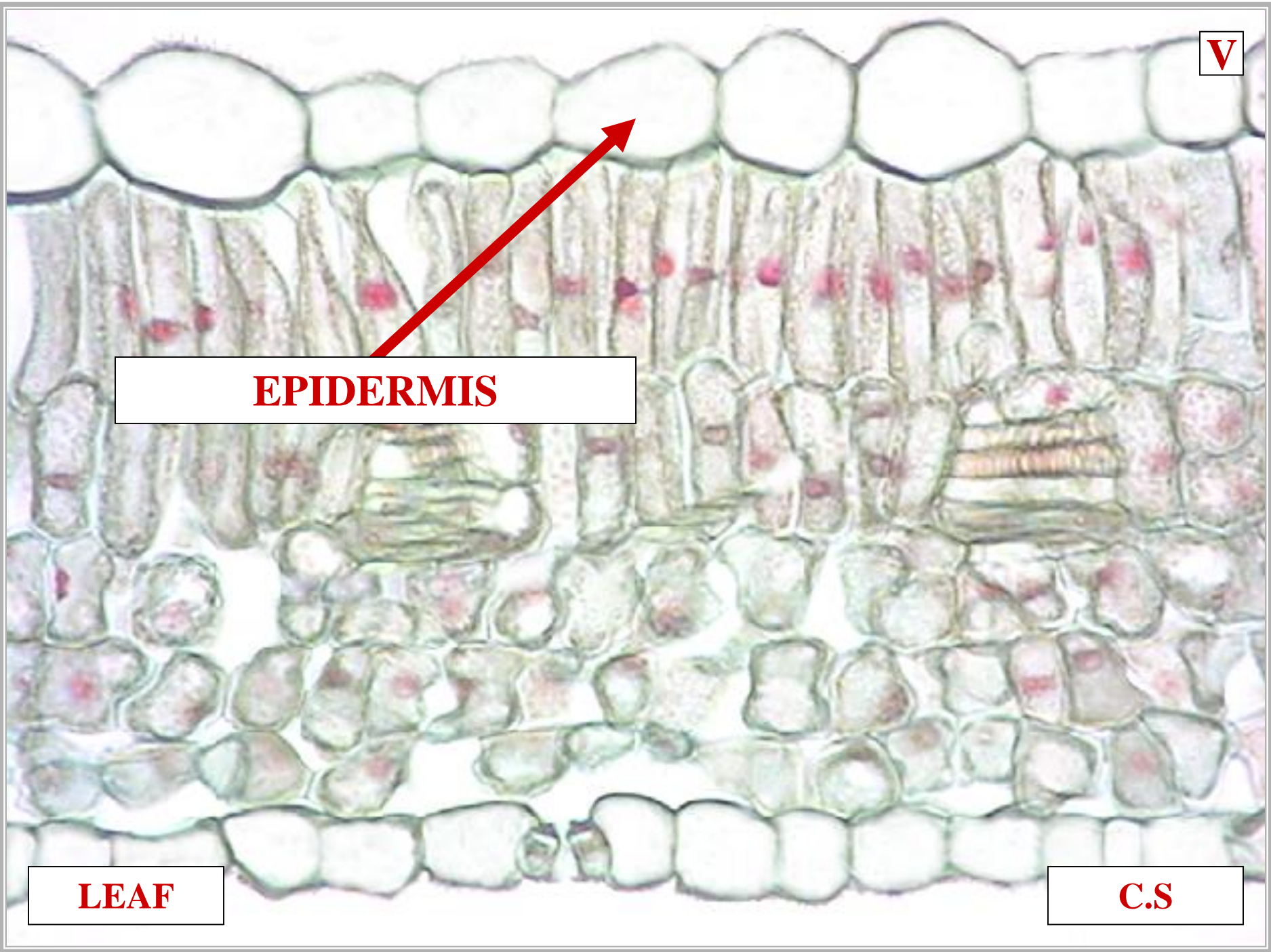
**EPIDERMIS
VEGETATIVE CELL**



E

**UNSPECIALIZED
EPIDERMIS CELL**

**EPIDERMIS
VEGETATIVE CELL**



EPIDERMIS

LEAF

C.S

U



EPIDERMIS

VEGETATIVE CELL

LEAF

C.S

^

B



EPIDERMIS

VEGETATIVE CELL

UNSPECIALIZED CELL

LEAF

C.S

EPIDERMIS

BULLIFORM CELL



EPIDERMIS
BULLIFORM CELL

LARGE MONOCOT LEAF CELL

EPIDERMIS
BULLIFORM CELL



EPIDERMIS

BULLIFORM CELL

LARGE MONOCOT LEAF CELL
SENSE WATER LOSS →

EPIDERMIS

BULLIFORM CELL



EPIDERMIS

BULLIFORM CELL

LARGE MONOCOT LEAF CELL

SENSE WATER LOSS →

CONTRACT WITH WATER LOSS →

EPIDERMIS

BULLIFORM CELL



EPIDERMIS

BULLIFORM CELL

LARGE MONOCOT LEAF CELL

SENSE WATER LOSS →

CONTRACT WITH WATER LOSS →

REDUCED LEAF SURFACE AREA →

EPIDERMIS

BULLIFORM CELL

EPIDERMIS

BULLIFORM CELL



LARGE MONOCOT LEAF CELL
SENSE WATER LOSS →
CONTRACT WITH WATER LOSS →
REDUCED LEAF SURFACE AREA →
REDUCED DESICCATION

EPIDERMIS

BULLIFORM CELL

L

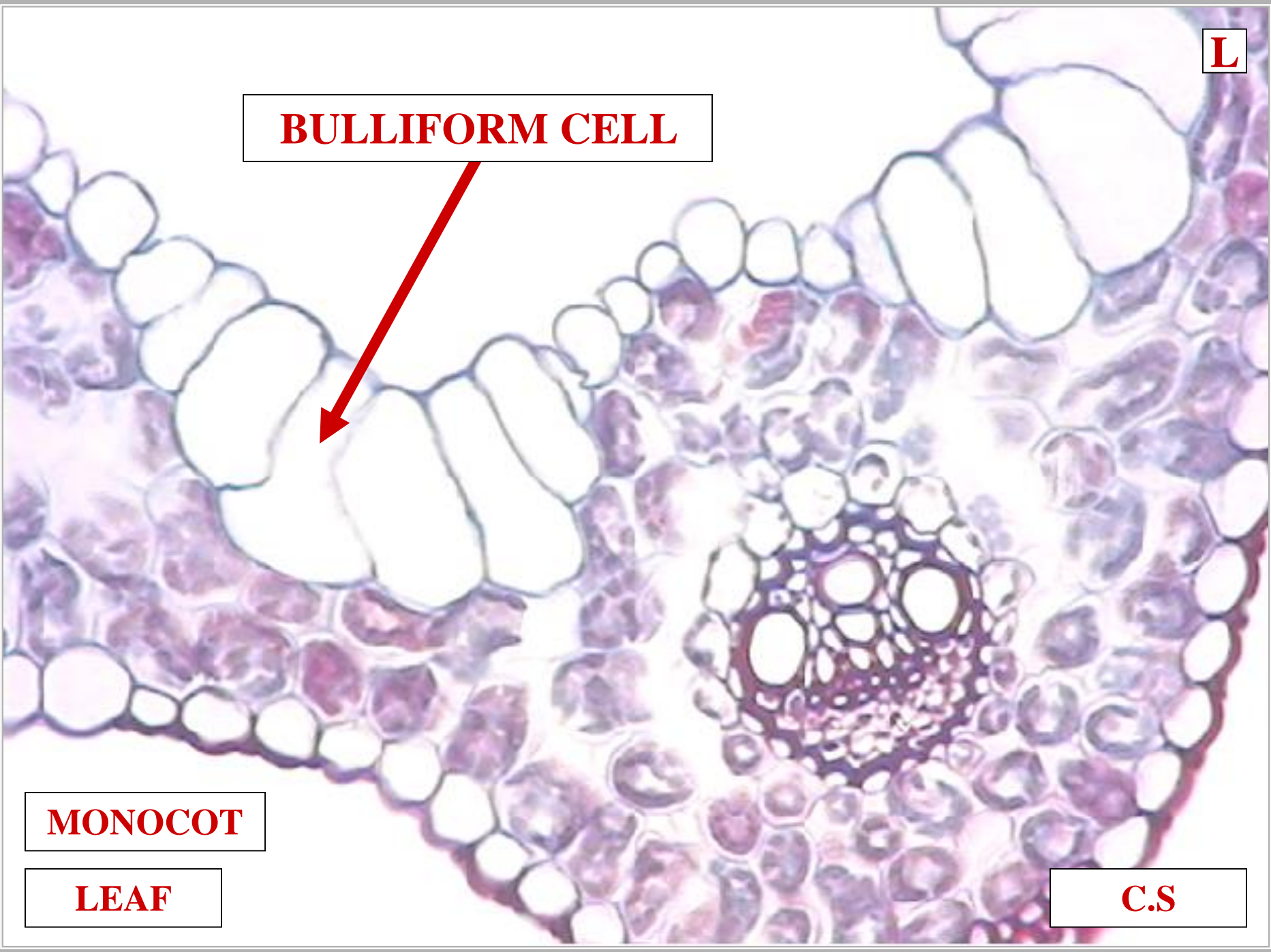
BULLIFORM CELL



MONOCOT

LEAF

C.S



S

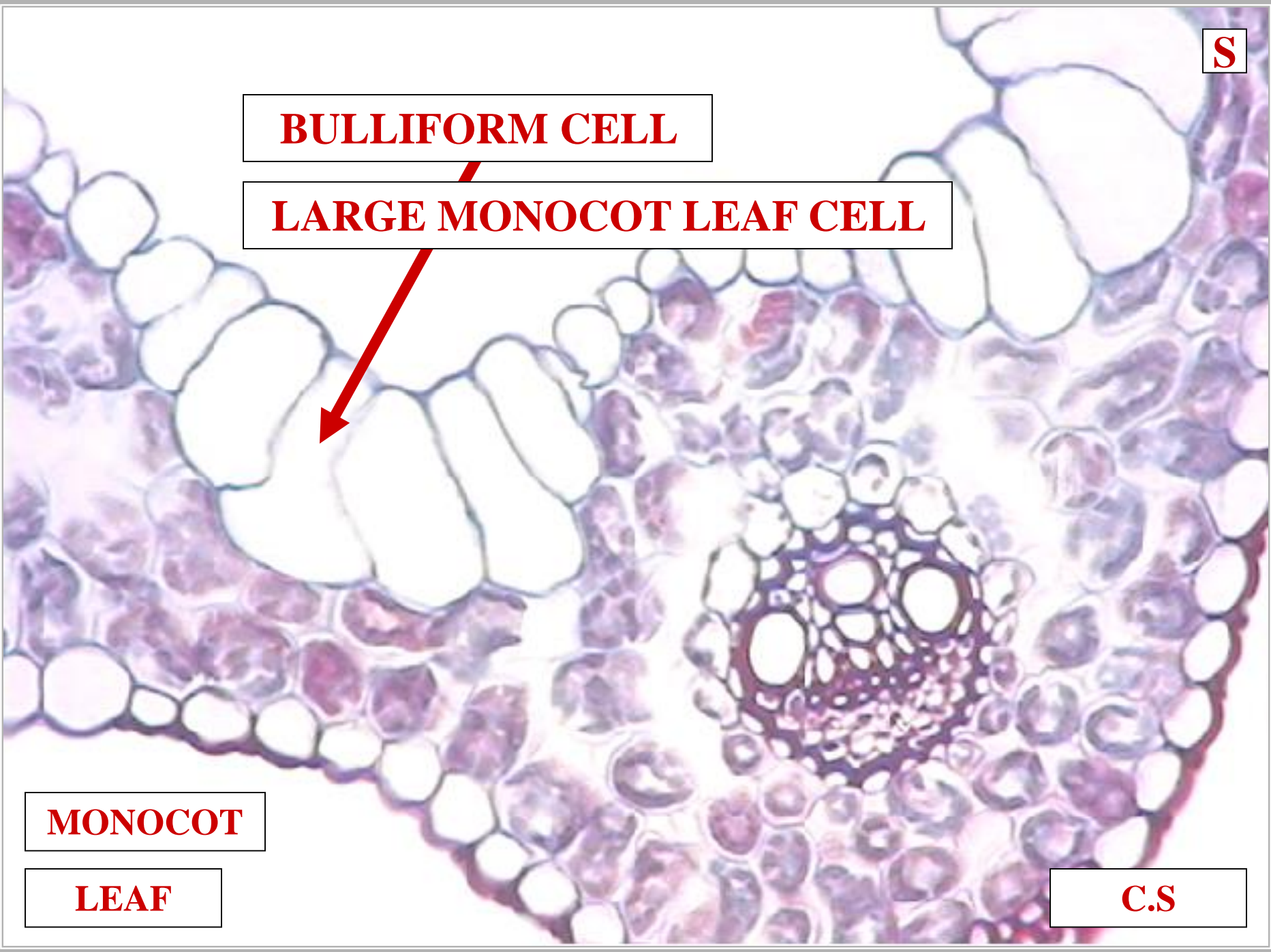
BULLIFORM CELL

LARGE MONOCOT LEAF CELL

MONOCOT

LEAF

C.S





C

BULLIFORM CELL

LARGE MONOCOT LEAF CELL

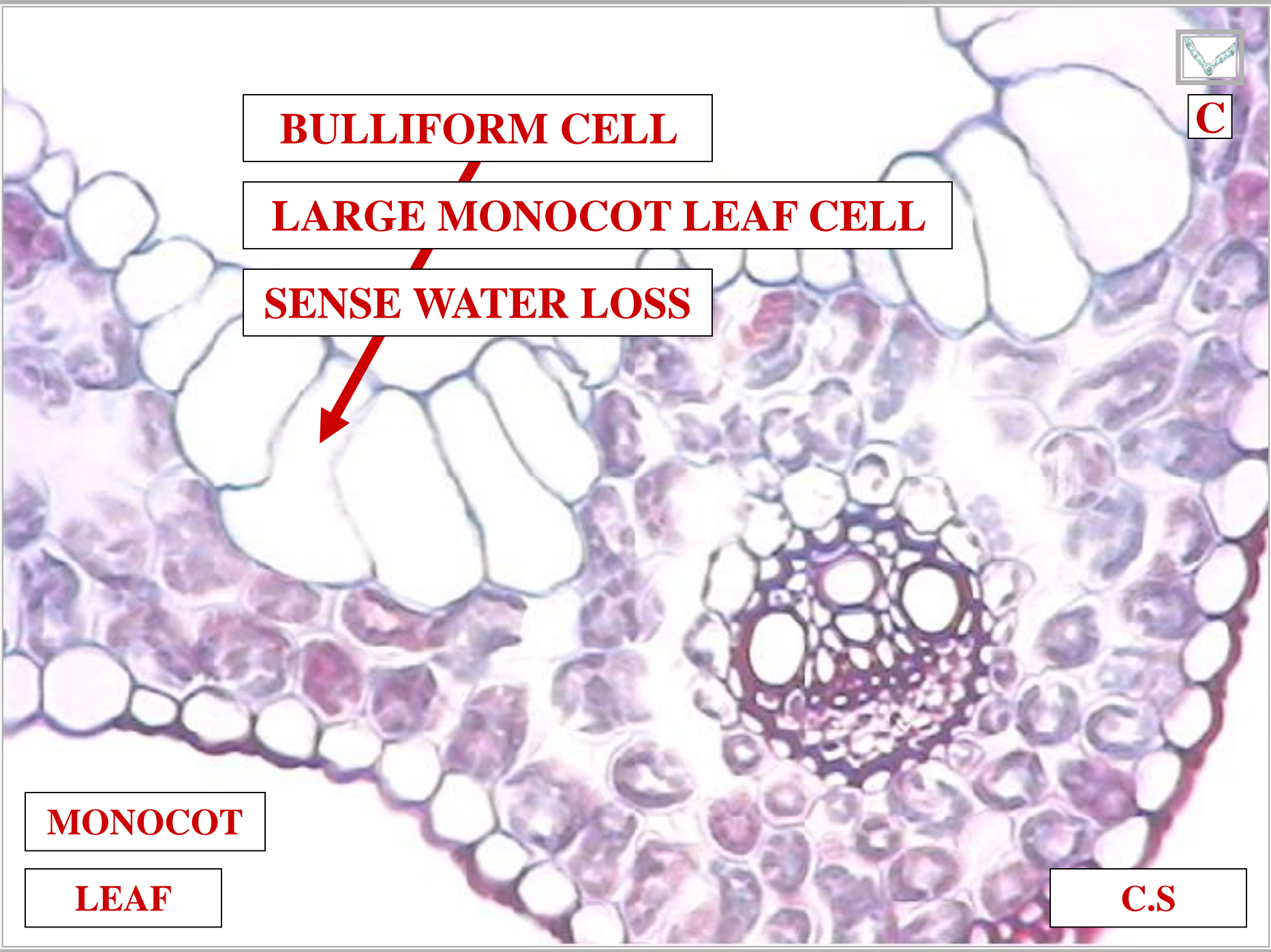
SENSE WATER LOSS



MONOCOT

LEAF

C.S



TYPICAL MONOCOT LEAF

R

BULLIFORM CELL

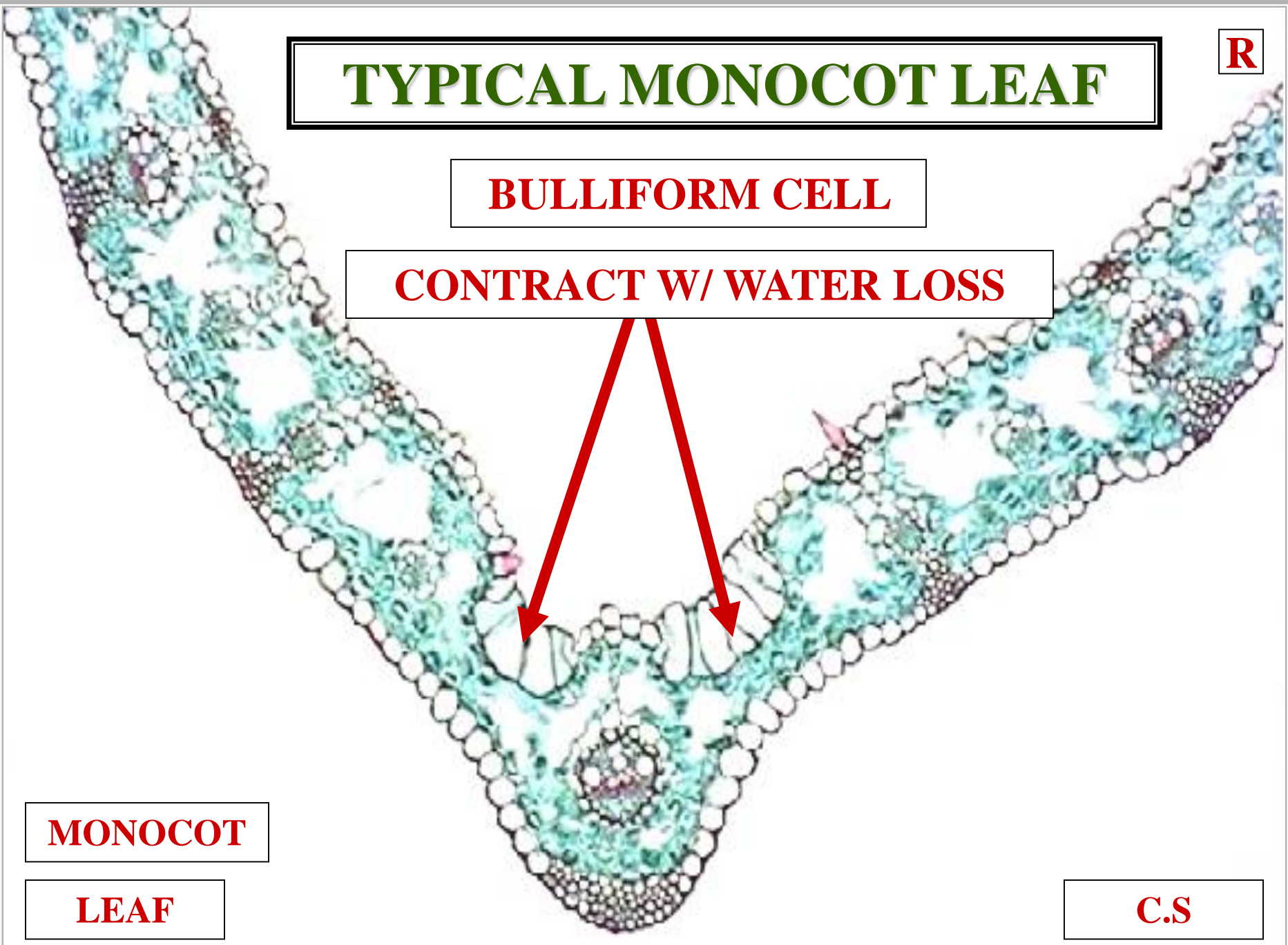
CONTRACT W/ WATER LOSS



MONOCOT

LEAF

C.S



TYPICAL MONOCOT LEAF

BULLIFORM CELL

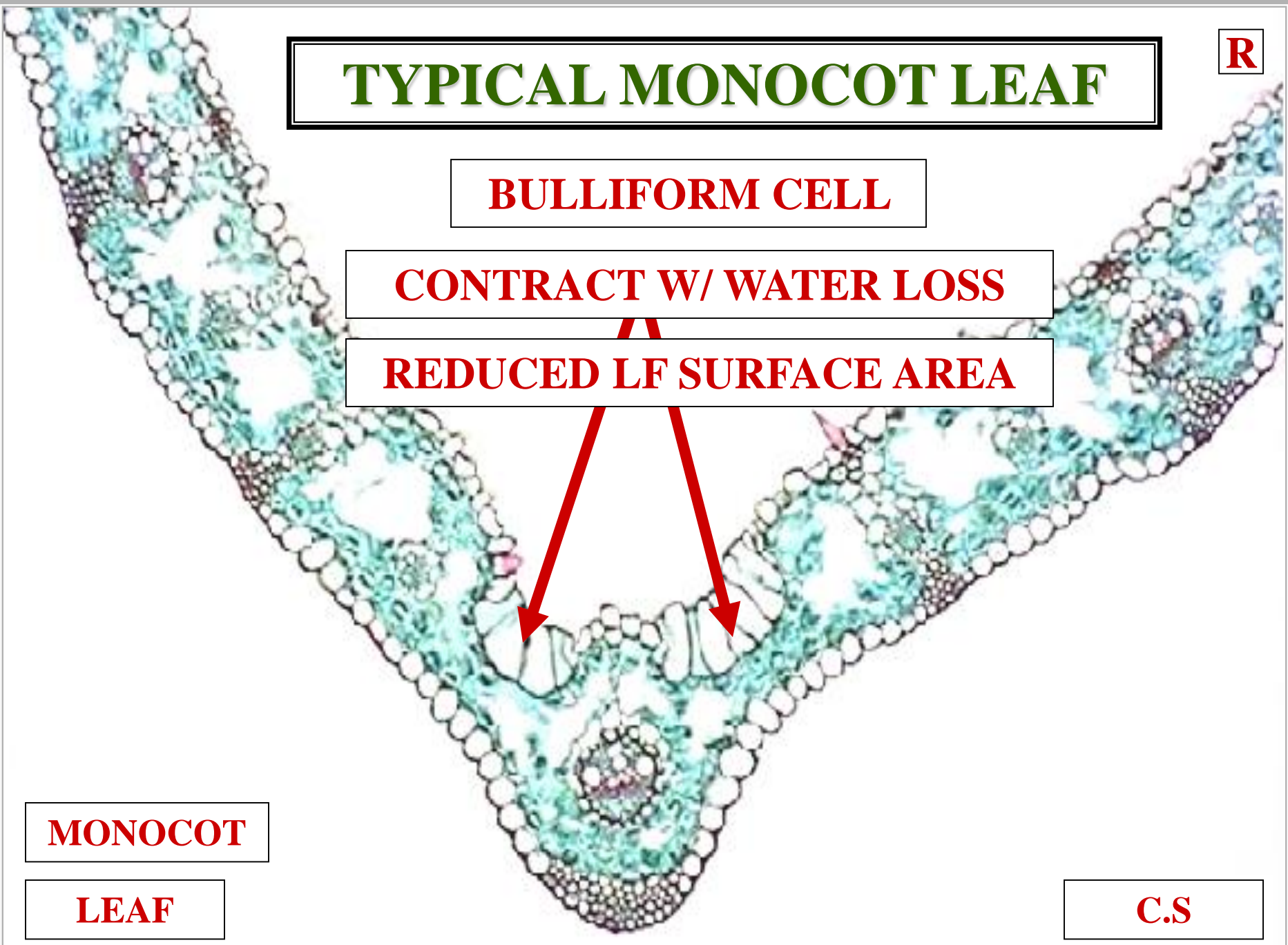
CONTRACT W/ WATER LOSS

REDUCED LF SURFACE AREA

MONOCOT

LEAF

C.S



TYPICAL MONOCOT LEAF

^
L

BULLIFORM CELL

CONTRACT W/ WATER LOSS

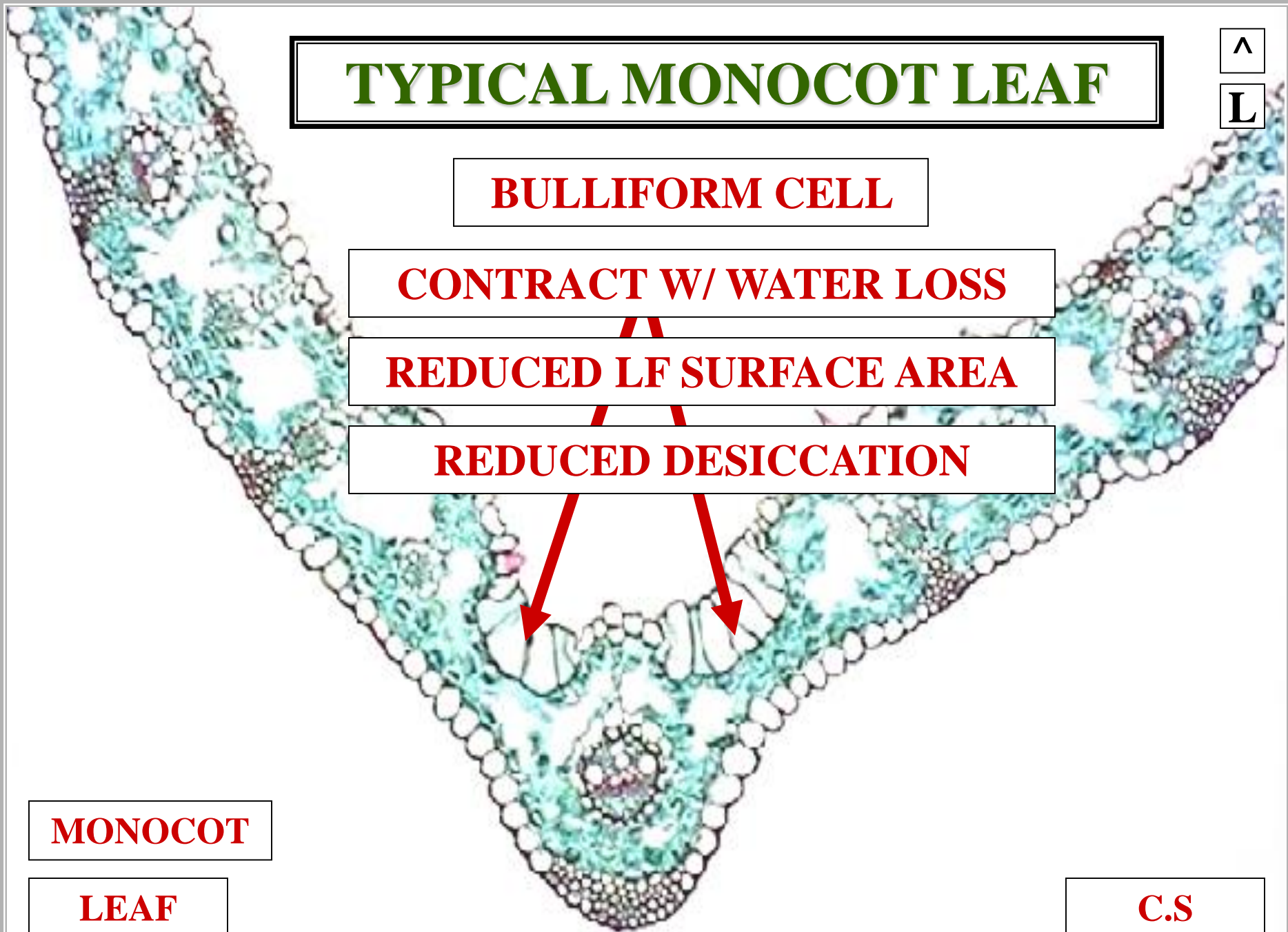
REDUCED LF SURFACE AREA

REDUCED DESICCATION

MONOCOT

LEAF

C.S



EPIDERMIS

LITHOCYST CELL



**EPIDERMIS
LITHOCYST CELL**

CONTAINS CRYSTAL

**EPIDERMIS
LITHOCYST CELL**



**EPIDERMIS
LITHOCYST CELL**

CONTAINS CRYSTAL

CYTOLITH CRYSTAL

**EPIDERMIS
LITHOCYST CELL**



EPIDERMIS

LITHOCYST CELL

CONTAINS CRYSTAL

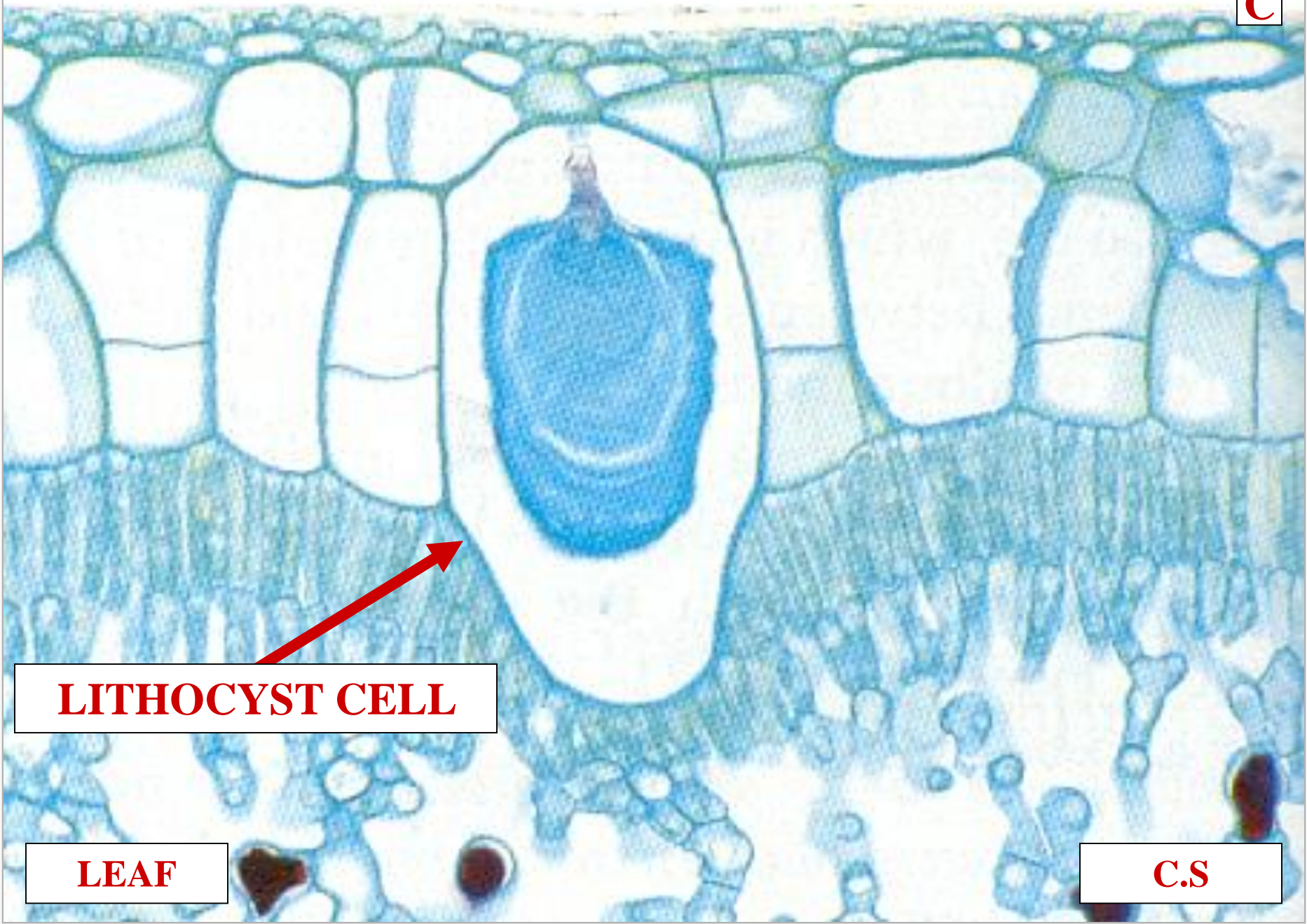
CYTOLITH CRYSTAL

INHIBIT HERBIVORES

EPIDERMIS

LITHOCYST CELL

C

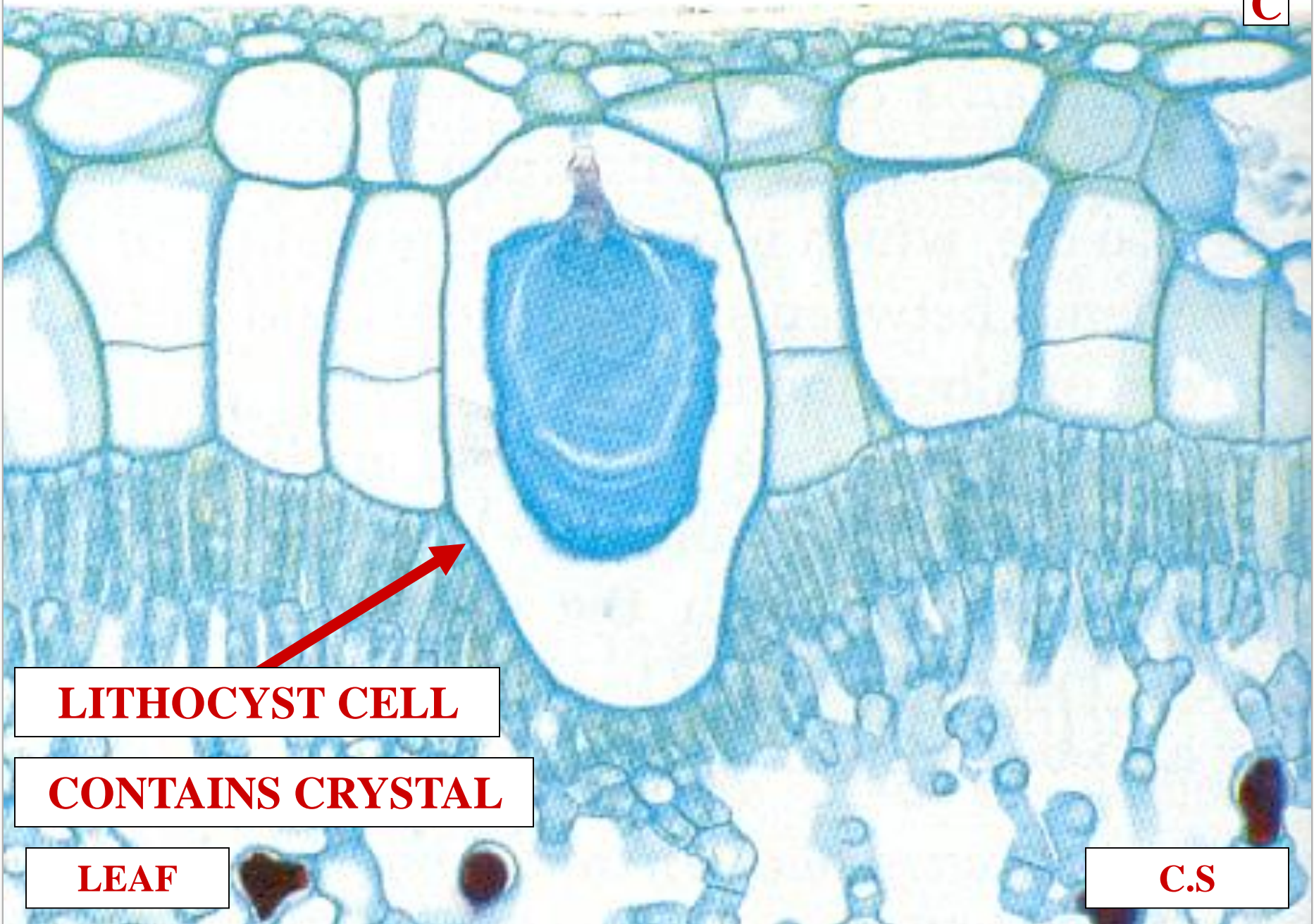


LITHOCYST CELL

LEAF

C.S

C



LITHOCYST CELL

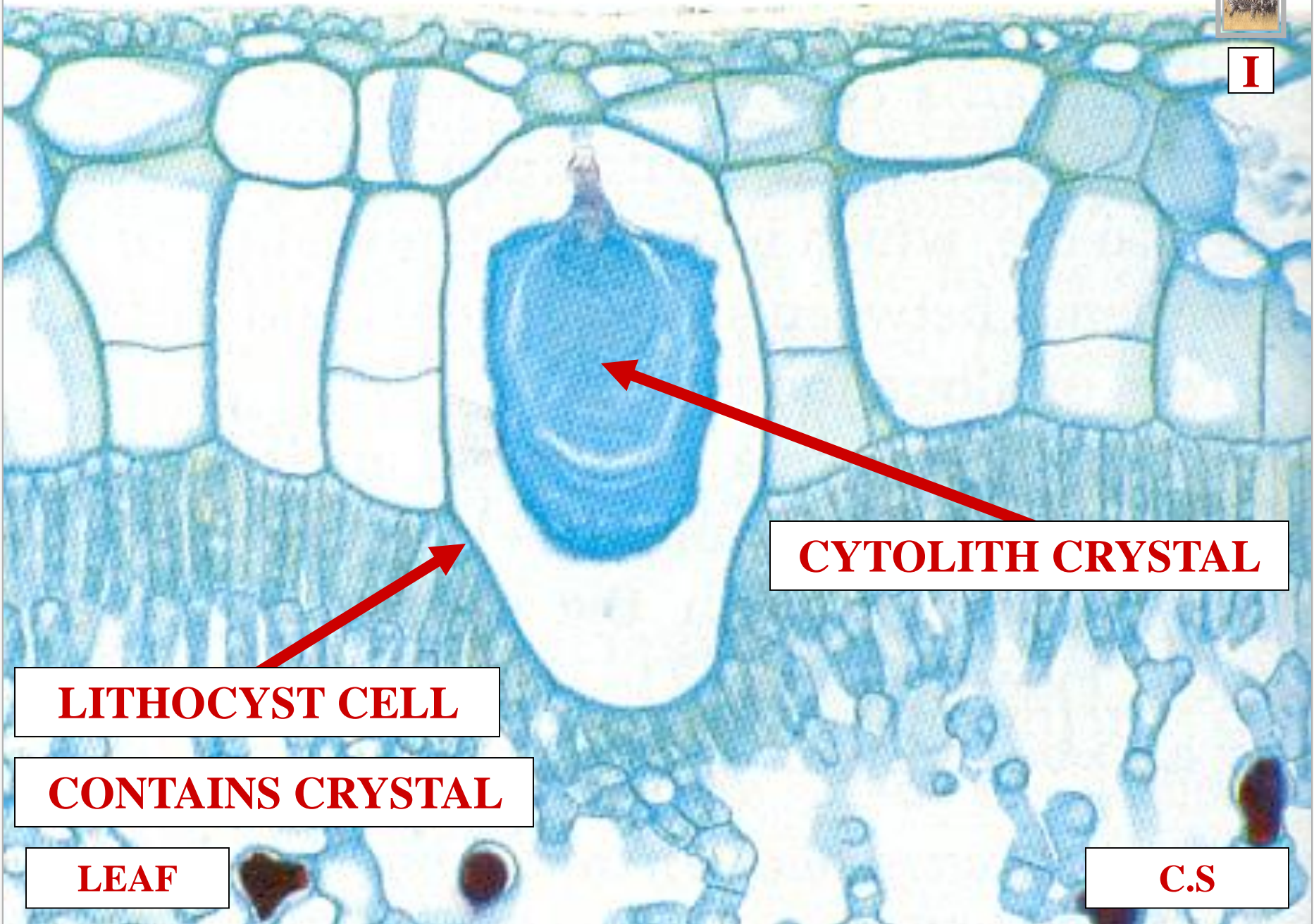
CONTAINS CRYSTAL

LEAF

C.S



I



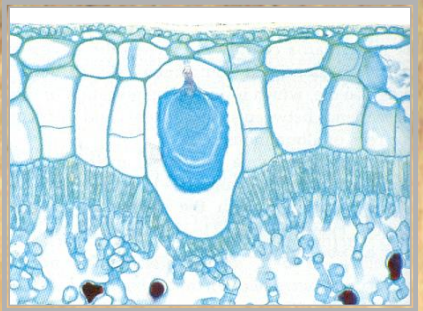
LITHOCYST CELL

CONTAINS CRYSTAL

CYTOLITH CRYSTAL

LEAF

C.S



INHIBIT HERBIVORES

EPIDERMIS

STOMATE COMPLEX

STOMATE COMPLEX

EPIDERMIS
STOMATE COMPLEX



SPECIALIZED
CELL ASSEMBLAGE
FOR GAS EXCHANGE

EPIDERMIS
STOMATE COMPLEX