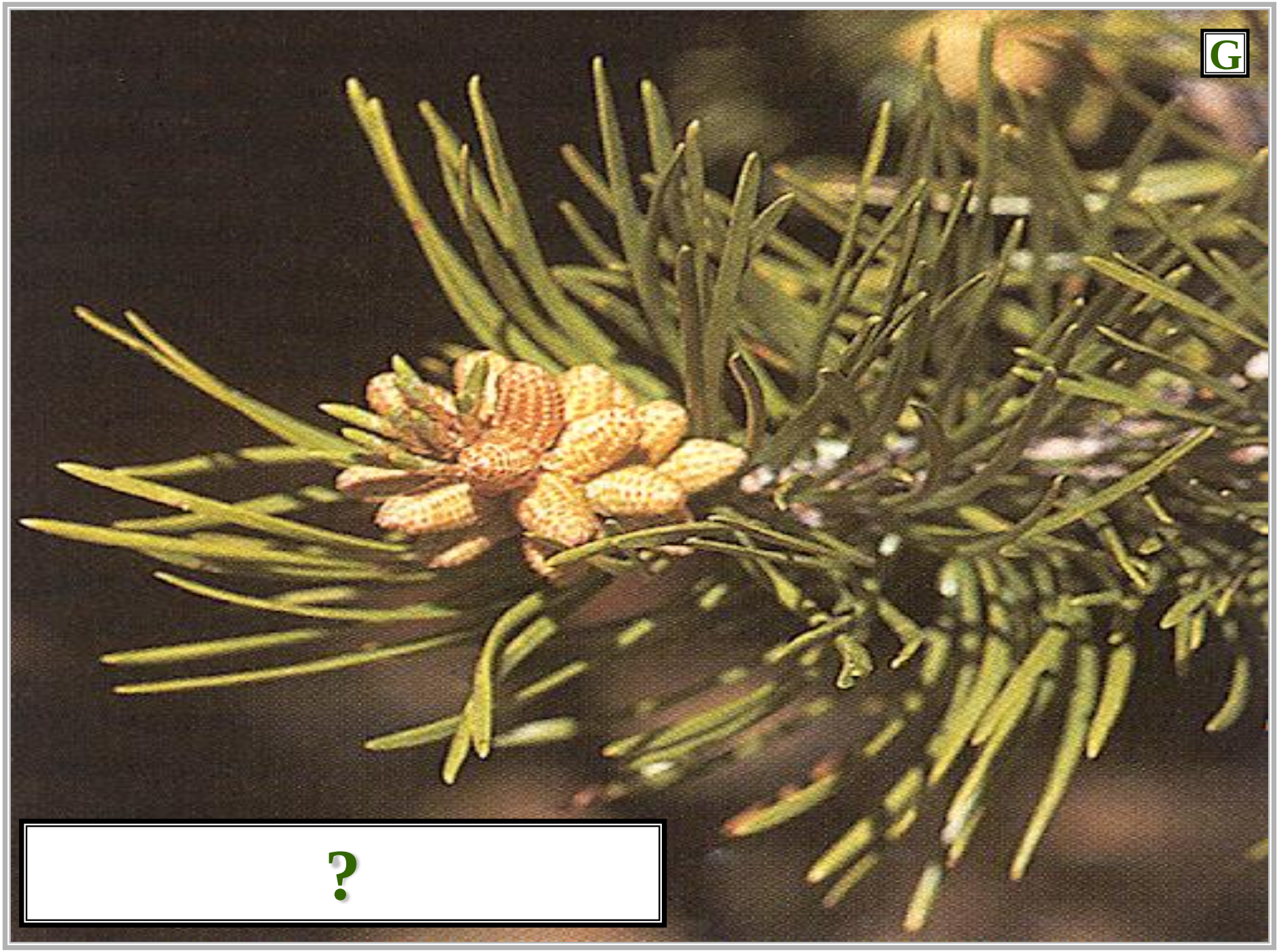
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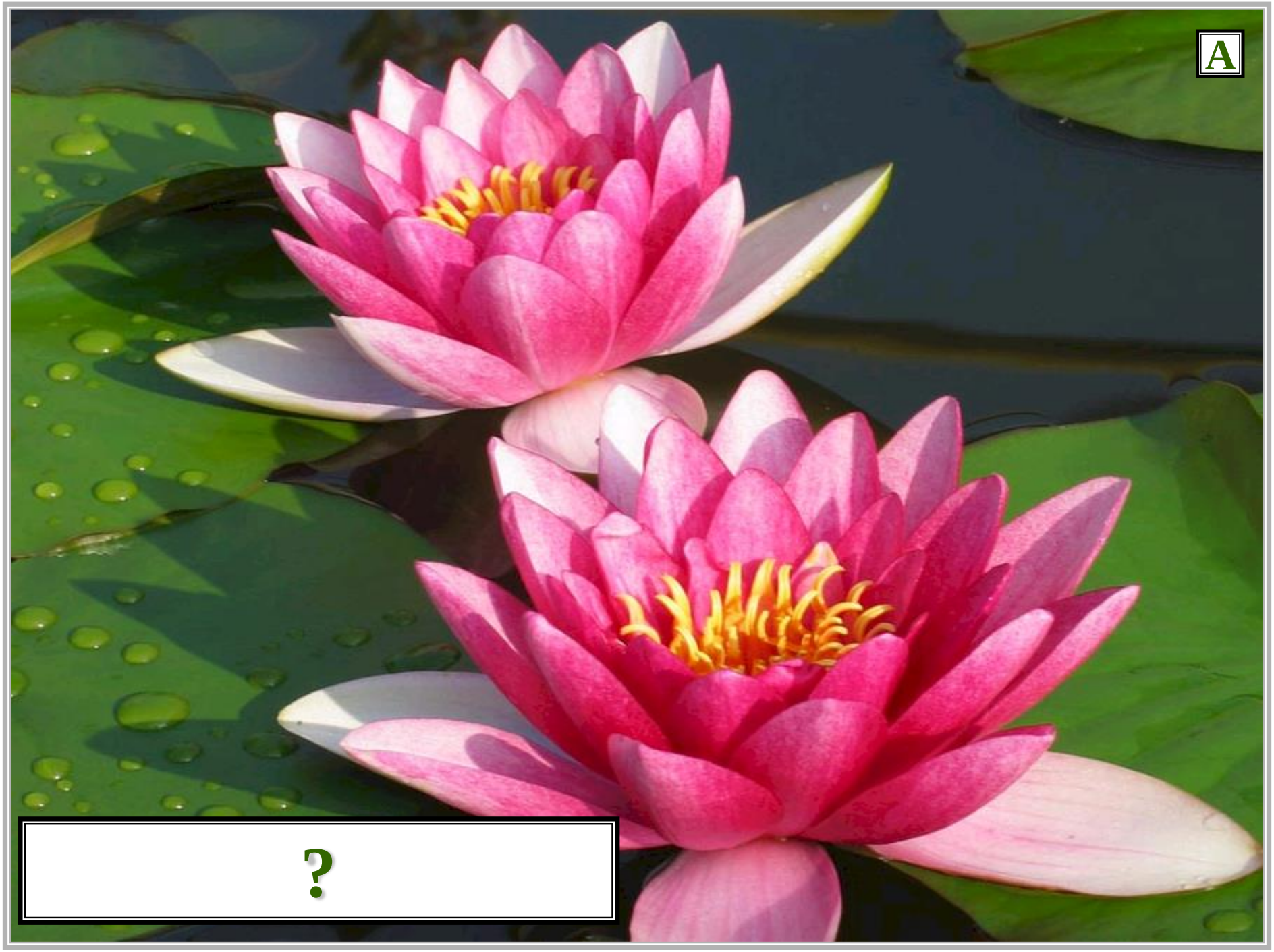
GYMNOSPERMS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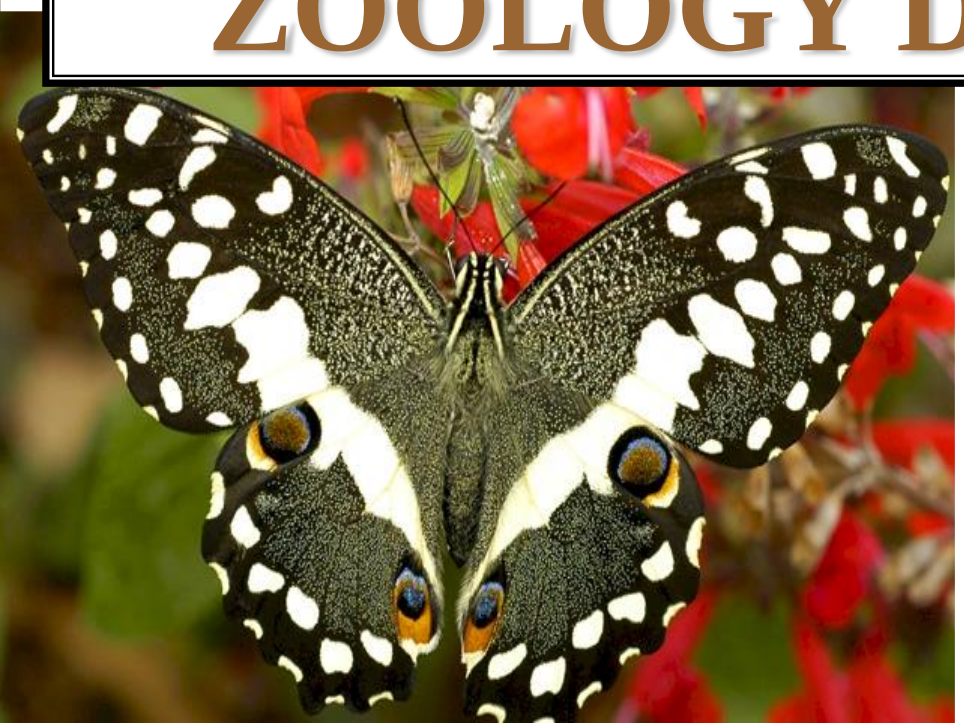
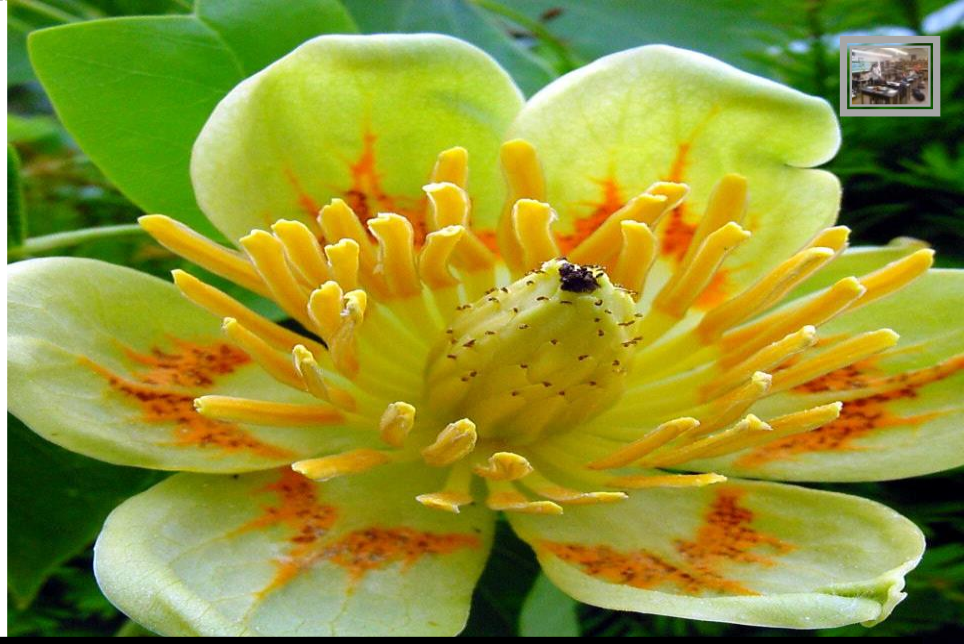
ANGIOSPERMS

ZOOLOGY DISCIPLINES





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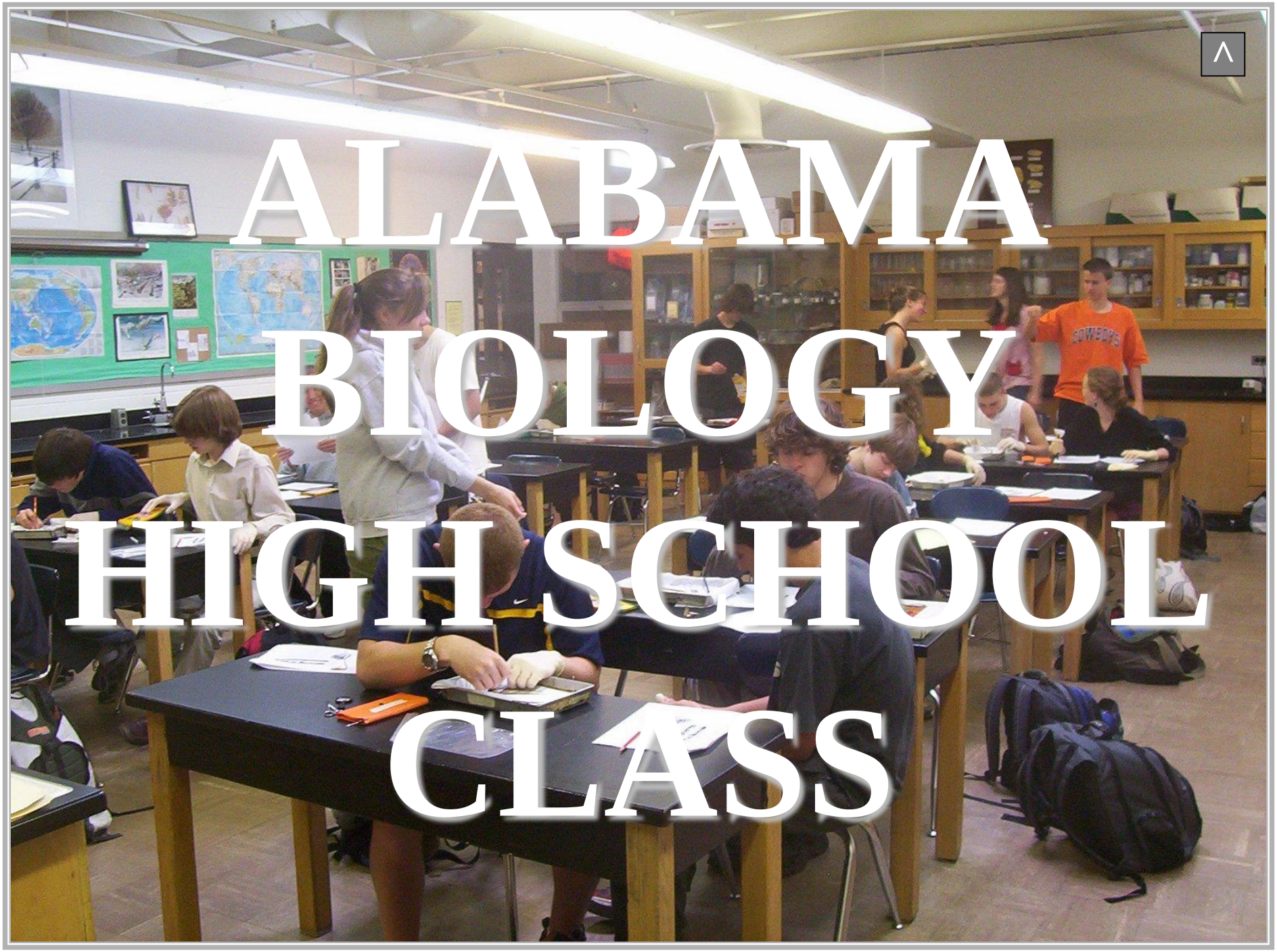

ALABAMA
BIOLOGY
HIGHSCHOOL
CLASS

BIOLOGY SUBDISCIPLINES

BIOLOGY SUBDISCIPLINES

CYTOLOGY

BIOLOGY SUBDISCIPLINES

BIOLOGY SUBDISCIPLINES

CYTOLOGY
PHYSIOLOGY

BIOLOGY SUBDISCIPLINES

BIOLOGY SUBDISCIPLINES

CYTOLOGY
PHYSIOLOGY
GENETICS

BIOLOGY SUBDISCIPLINES

BIOLOGY SUBDISCIPLINES

CYTOLOGY
PHYSIOLOGY
GENETICS
ANATOMY

BIOLOGY SUBDISCIPLINES

BIOLOGY SUBDISCIPLINES

CYTOLOGY
PHYSIOLOGY
GENETICS
ANATOMY
MORPHOLOGY

BIOLOGY SUBDISCIPLINES

BIOLOGY SUBDISCIPLINES

CYTOLOGY
PHYSIOLOGY
GENETICS
ANATOMY
MORPHOLOGY
TAXONOMY

BIOLOGY SUBDISCIPLINES

C

BIOLOGY SUBDISCIPLINES

CYTOLOGY
PHYSIOLOGY
GENETICS
ANATOMY
MORPHOLOGY
TAXONOMY
ECOLOGY

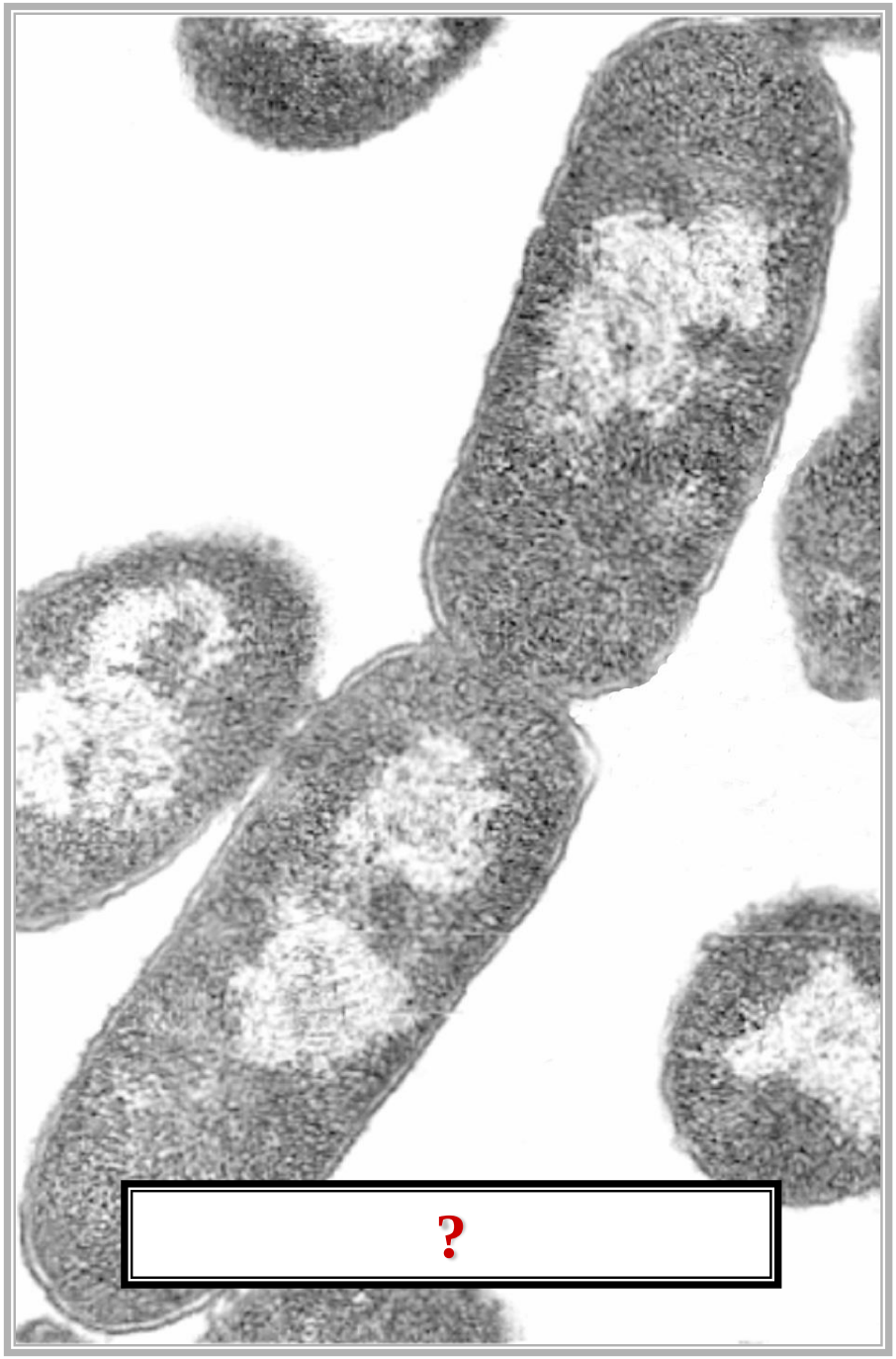
BIOLOGY SUBDISCIPLINES

CYTOLOGY

BIOLOGY SUBDISCIPLINES
CYTOLOGY

STUDY OF CELLS

BIOLOGY SUBDISCIPLINES
CYTOLOGY



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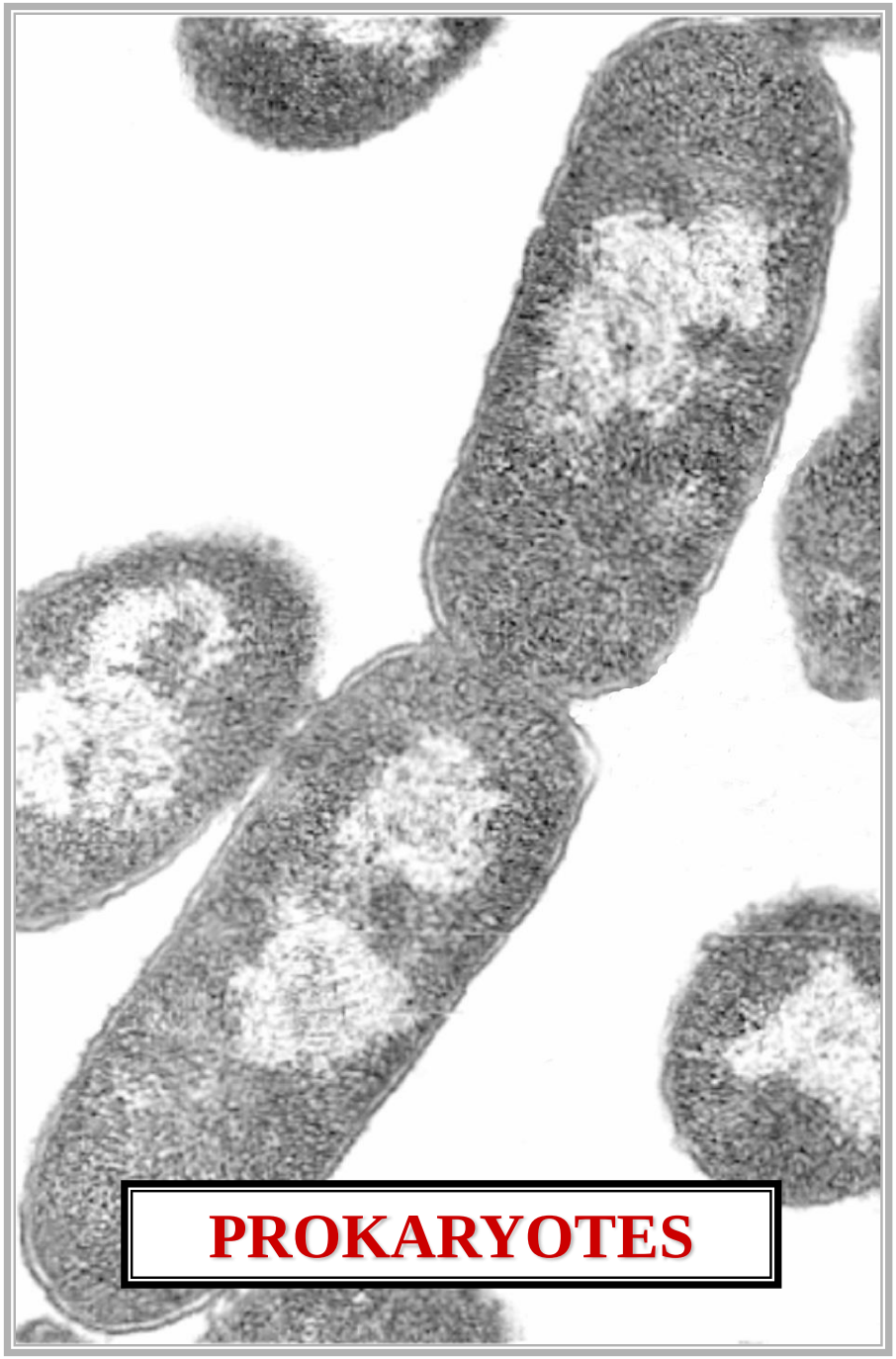

PROKARYOTES

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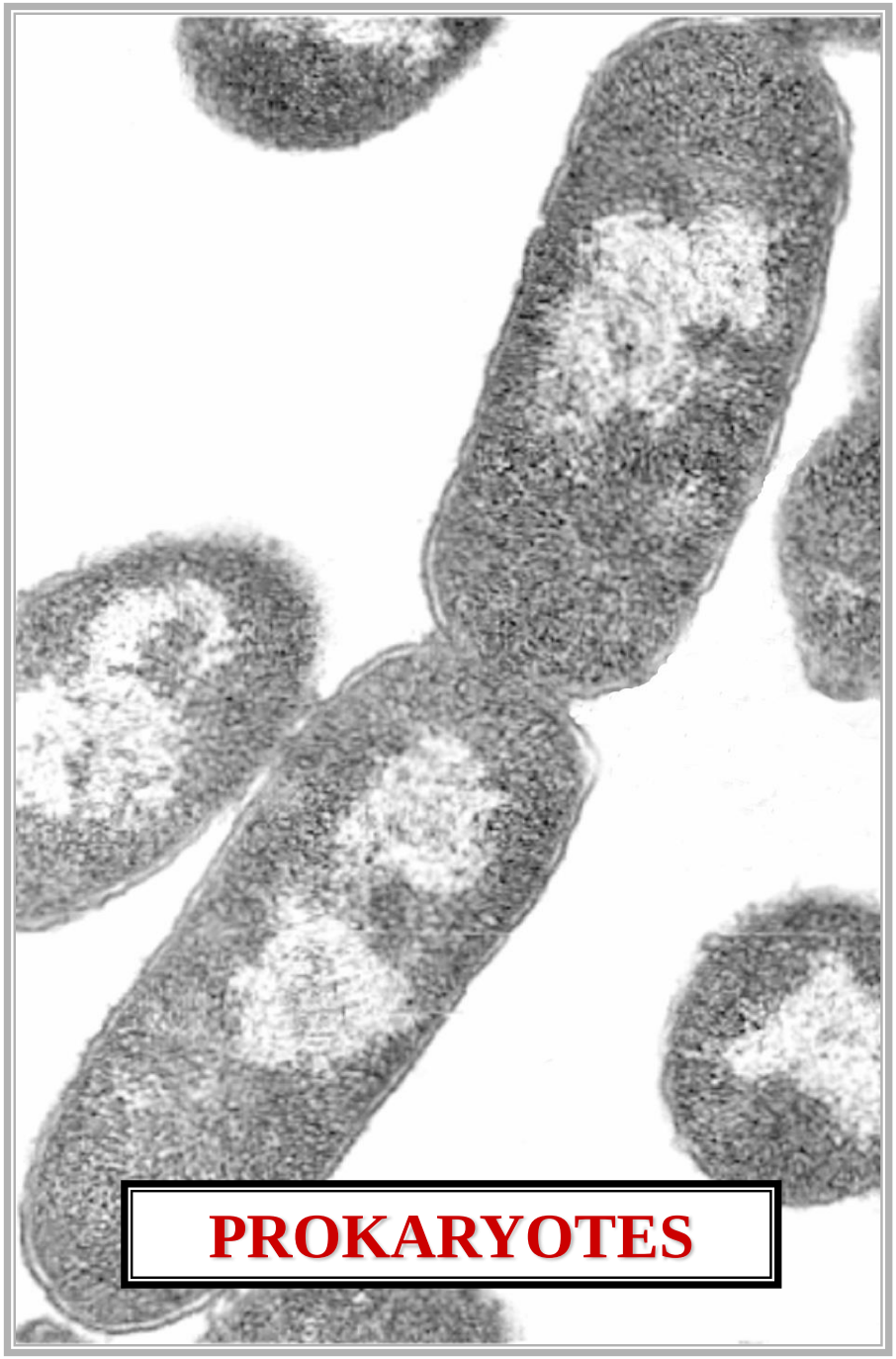


PROKARYOTES

EUKARYOTES

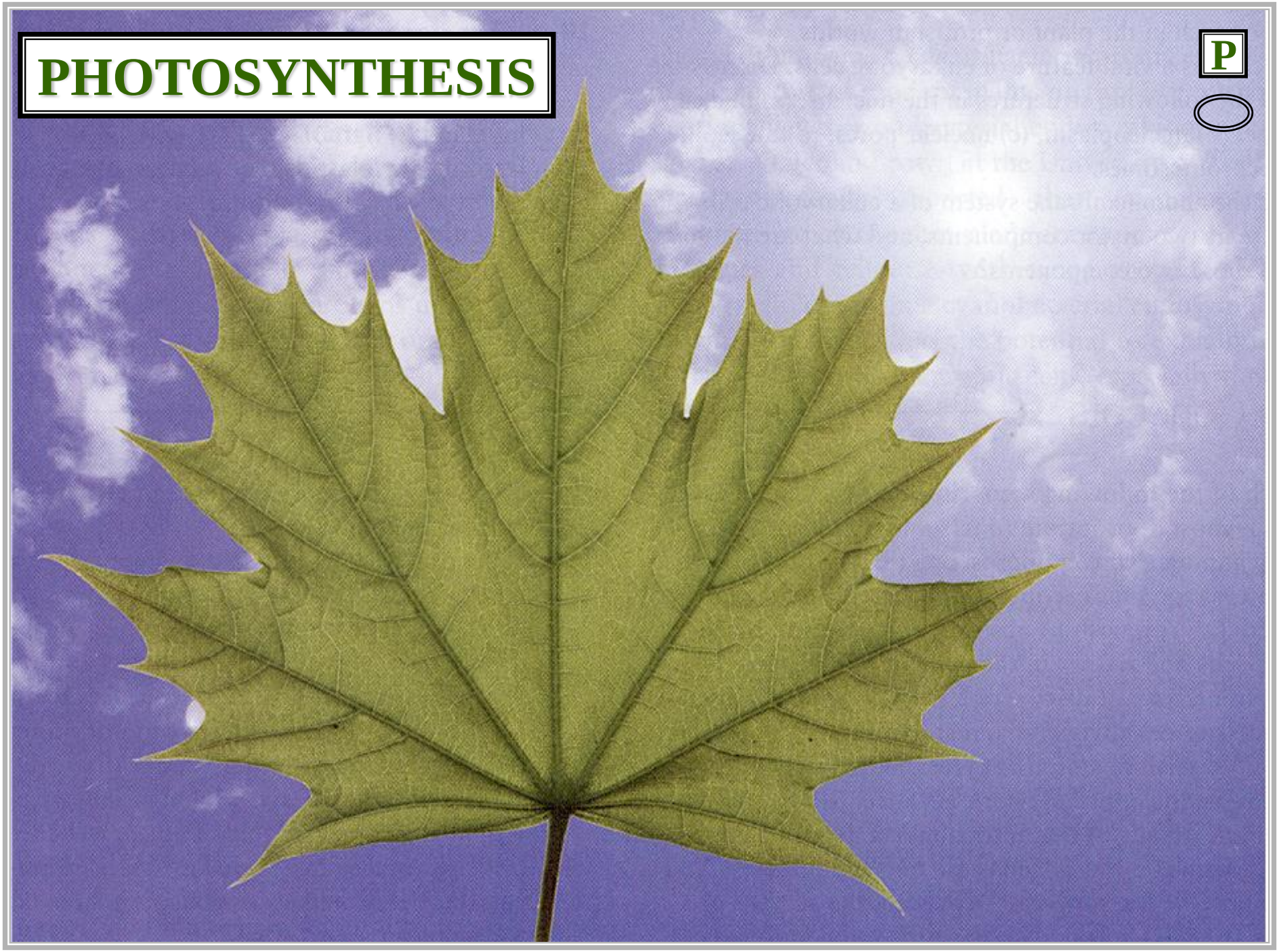
PHYSIOLOGY

BIOLOGY SUBDISCIPLINES
PHYSIOLOGY

STUDY OF BIOCHEMISTRY

BIOLOGY SUBDISCIPLINES
PHYSIOLOGY

PHOTOSYNTHESIS



PHOTOSYNTHESIS

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G

WATER

CO2

LIGHT EGY

PHOTO

ATMOSPHERE

E-

PHOTOLYSIS

LT RXT

THYLAKOID

CHEMICAL ENERGY

DK RXT

STROMA

SYNTHESIS

CHEM EGY INPUT

CHLOROPLAST

ATMOSPHERE

OXYGEN

GLUCOSE

GENETICS

BIOLOGY SUBDISCIPLINES

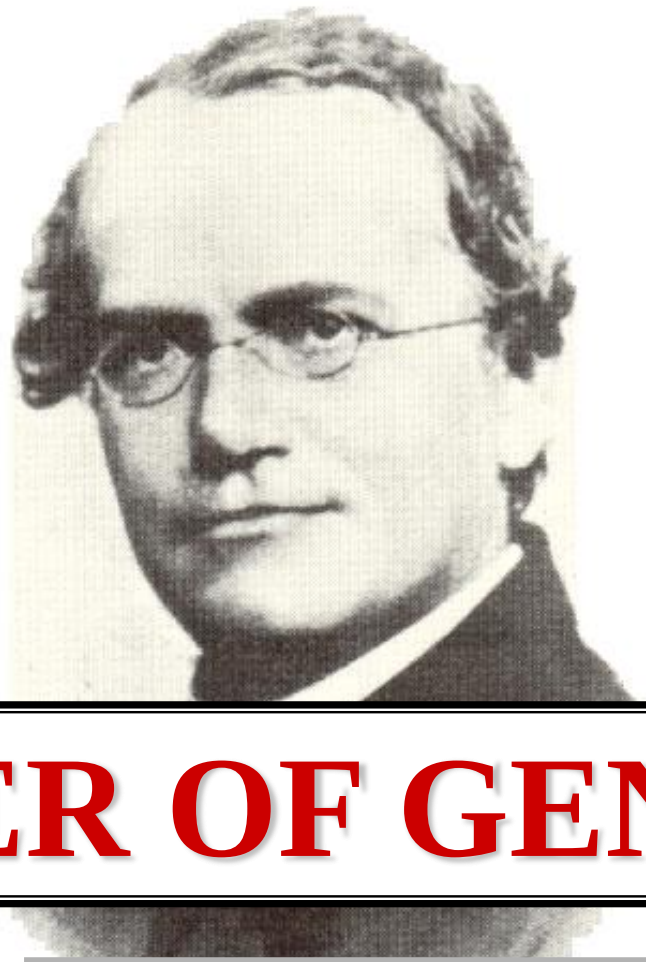
GENETICS

STUDY OF INHERITANCE

BIOLOGY SUBDISCIPLINES

GENETIC

GENETICS



FATHER OF GENETICS

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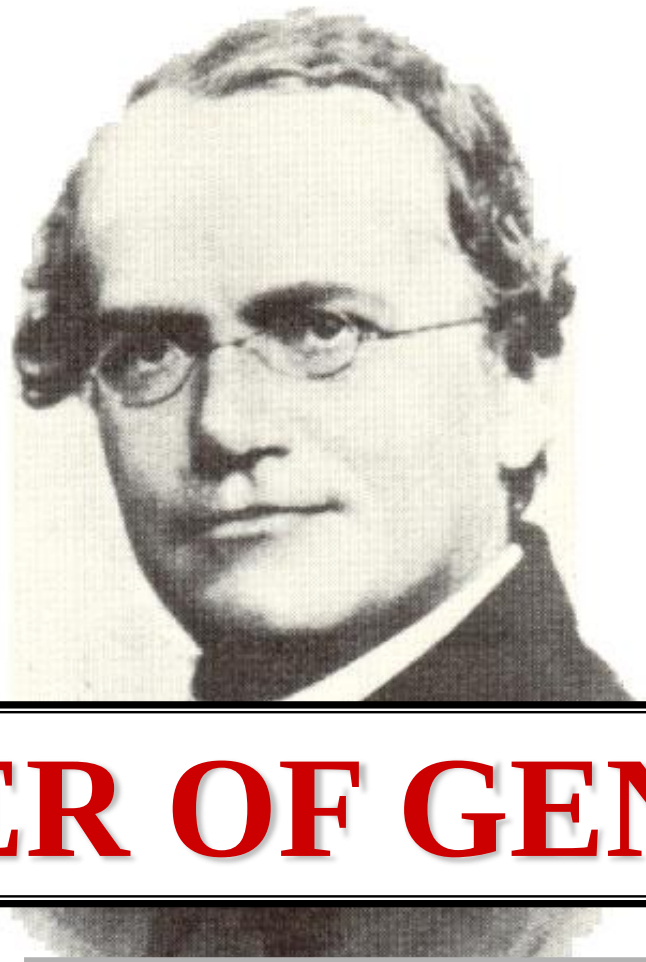
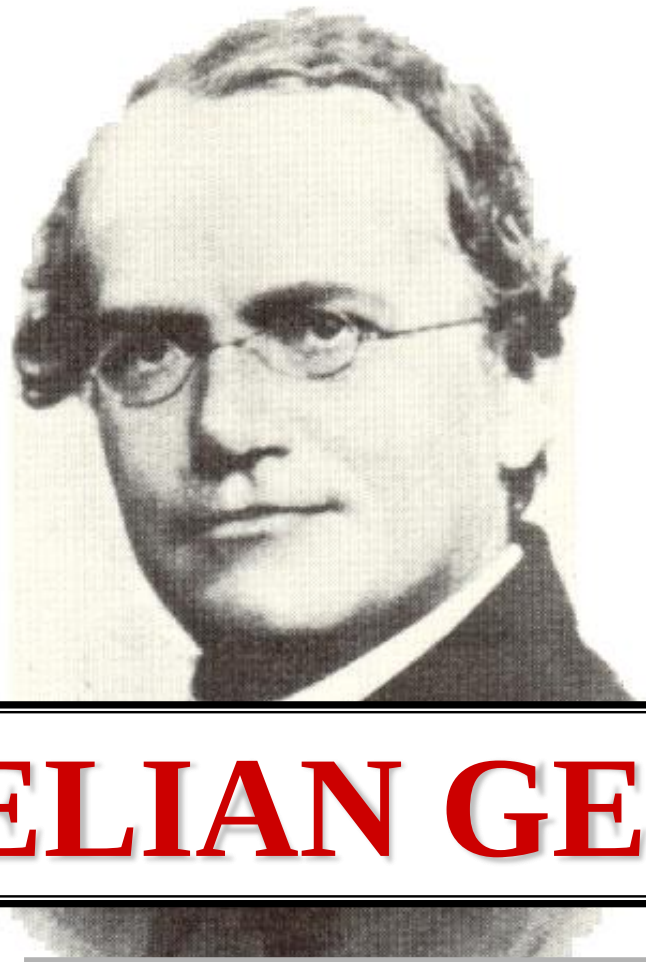
GENETICS



FATHER OF GENETICS

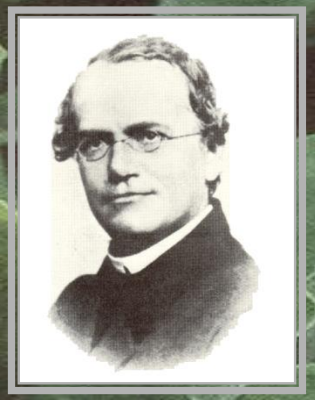
GREGOR MENDEL

GENETICS



MENDELIAN GENETICS

GREGOR MENDEL



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A

GARDEN PEA

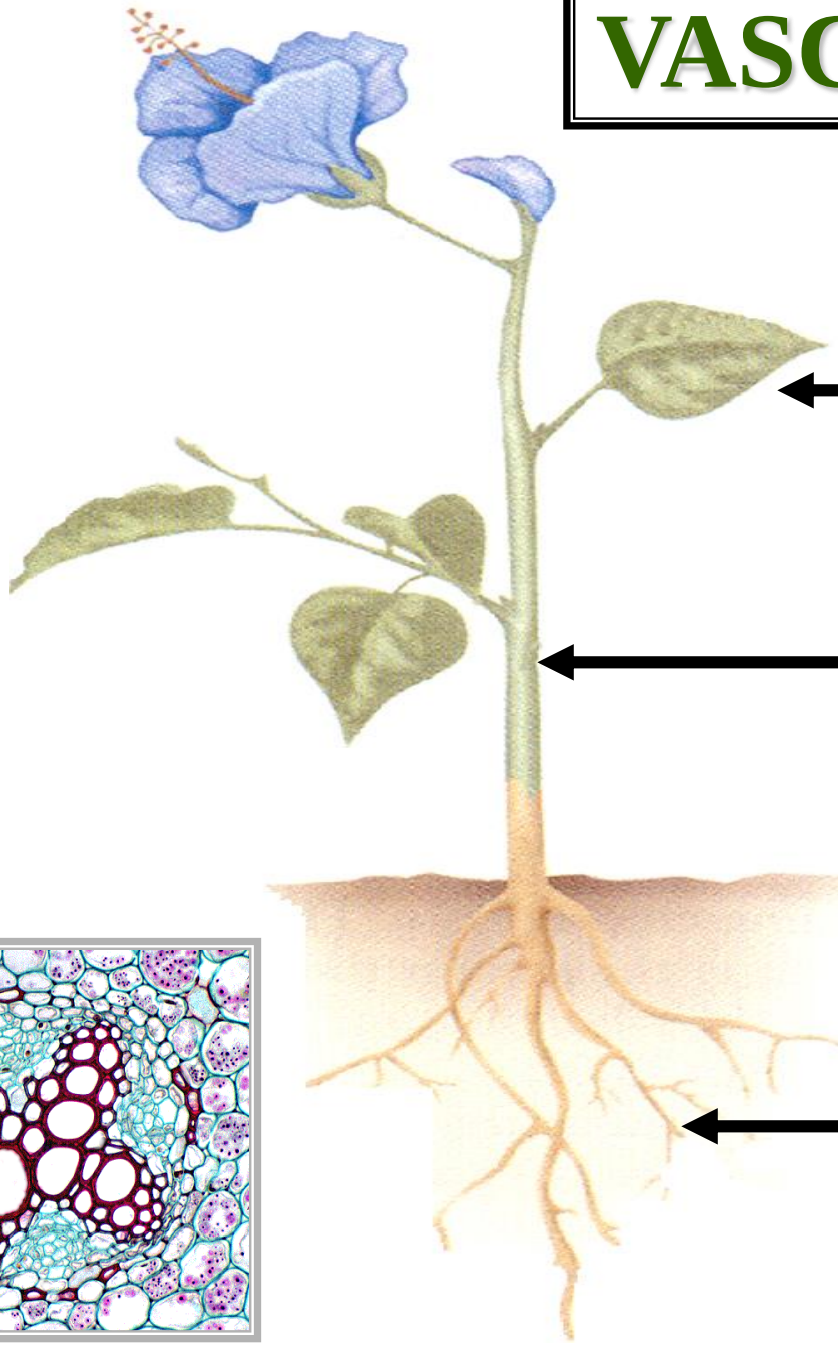
ANATOMY

BIOLOGY SUBDISCIPLINES
ANATOMY

STUDY OF INTERNAL STRUCTURE

BIOLOGY SUBDISCIPLINES
ANATOMY

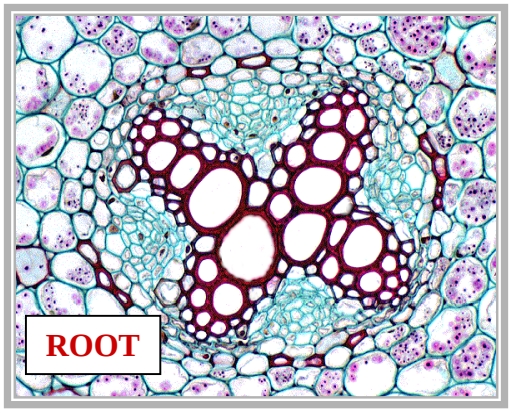
VASCULAR PLANT



LEAF

STEM

ROOT



VASCULAR TISSUE

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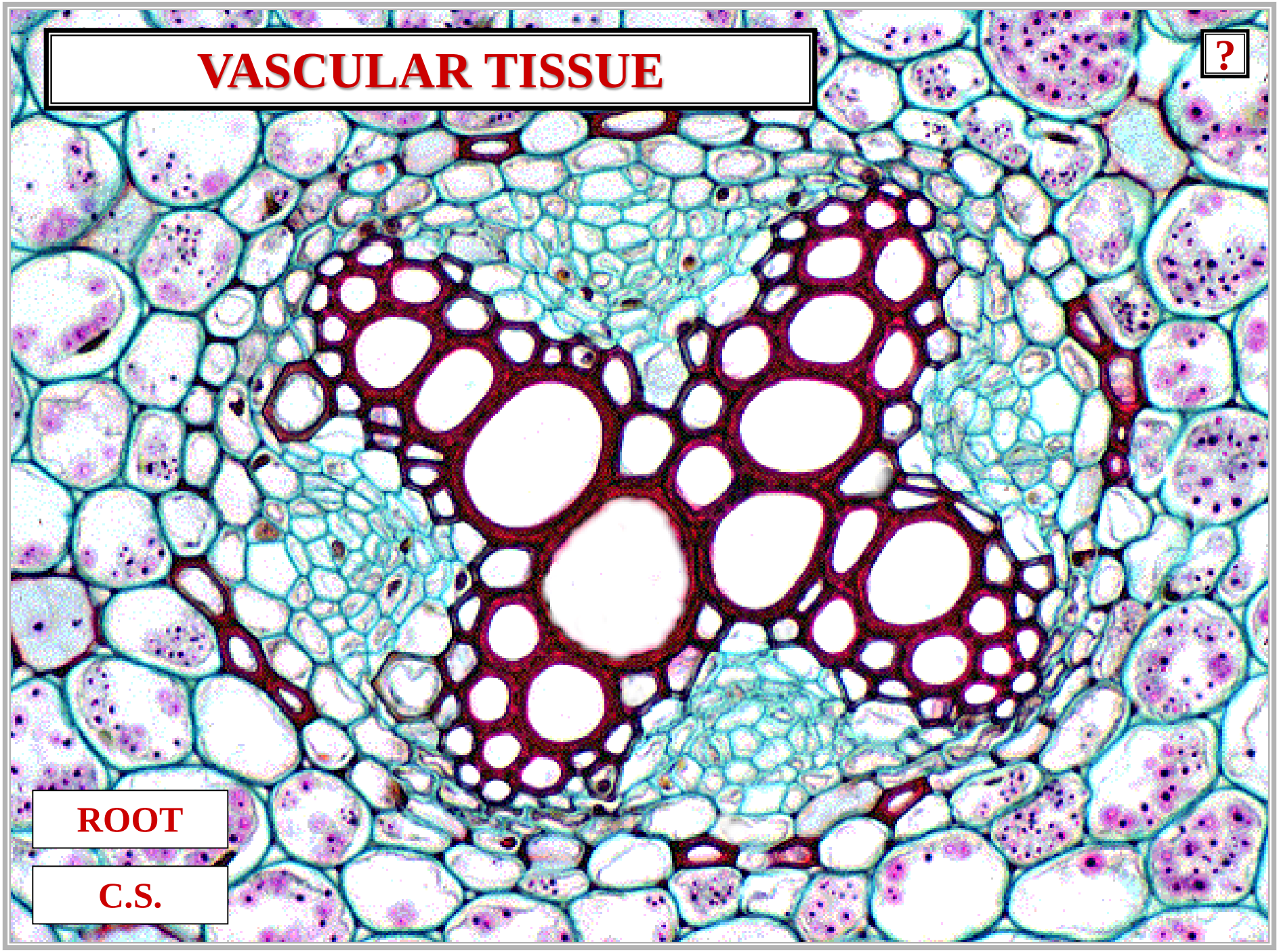


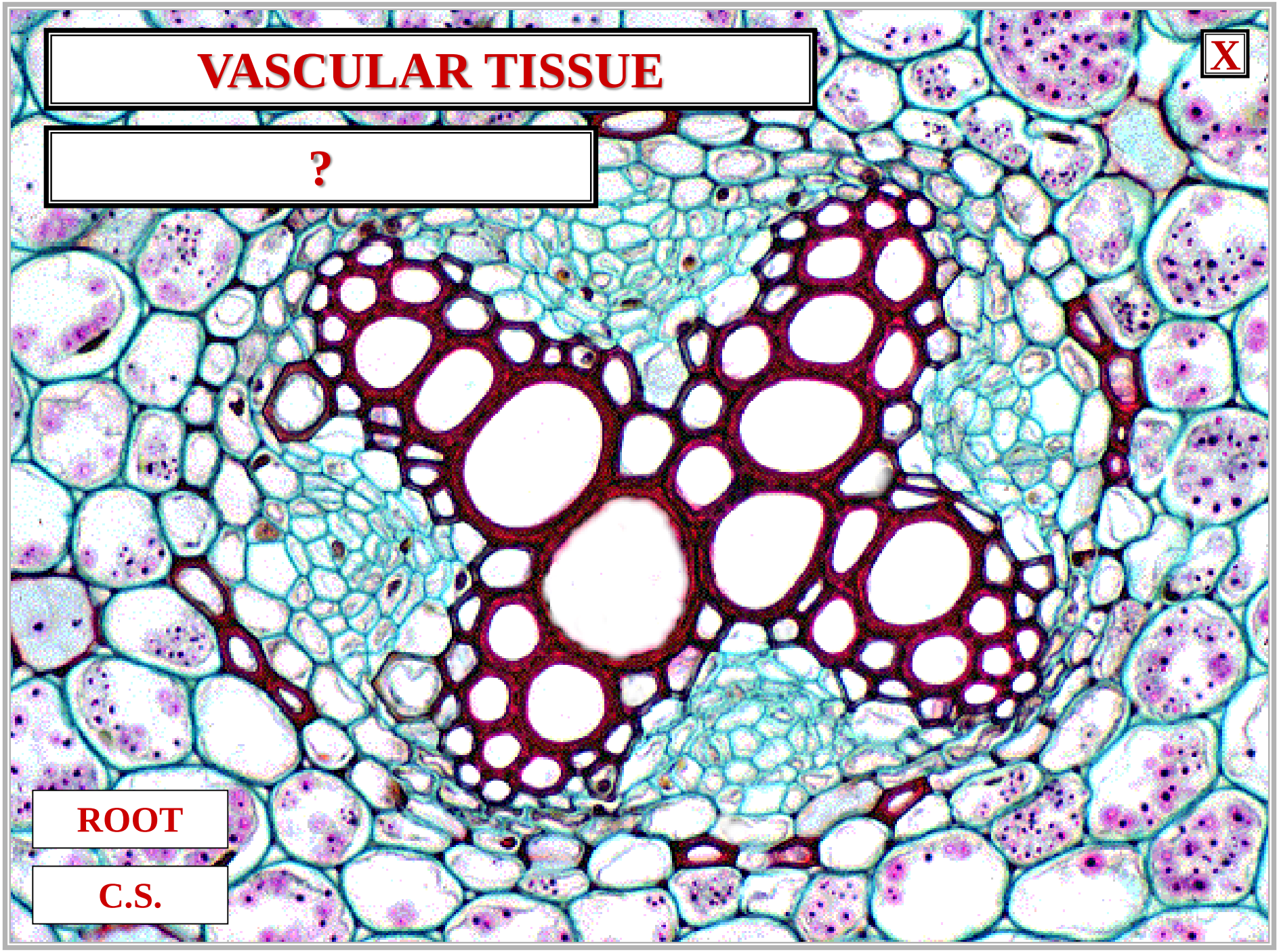
ROOT

C.S.

VASCULAR TISSUE

X

?



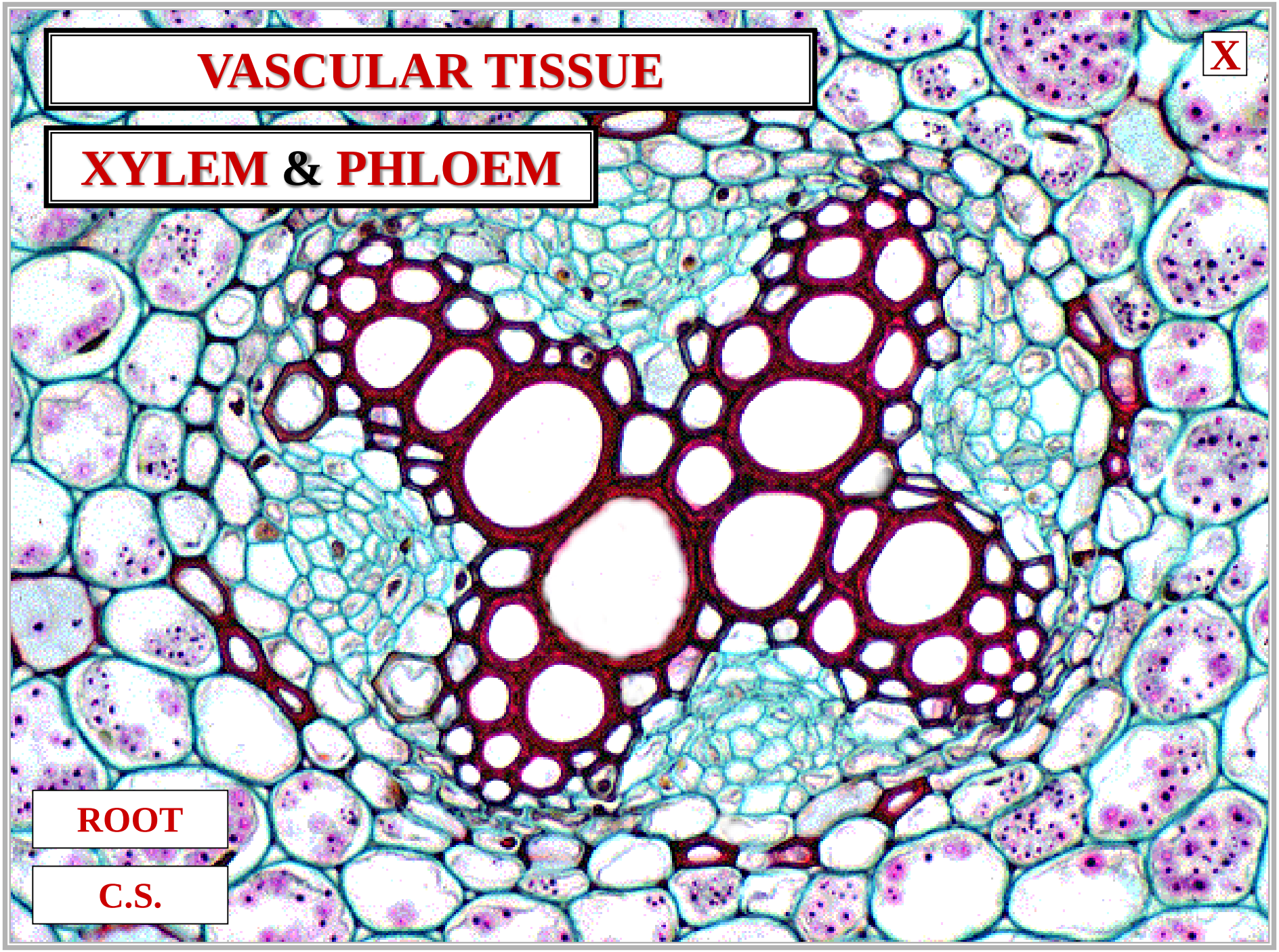
ROOT

C.S.

VASCULAR TISSUE

XYLEM & PHLOEM

X

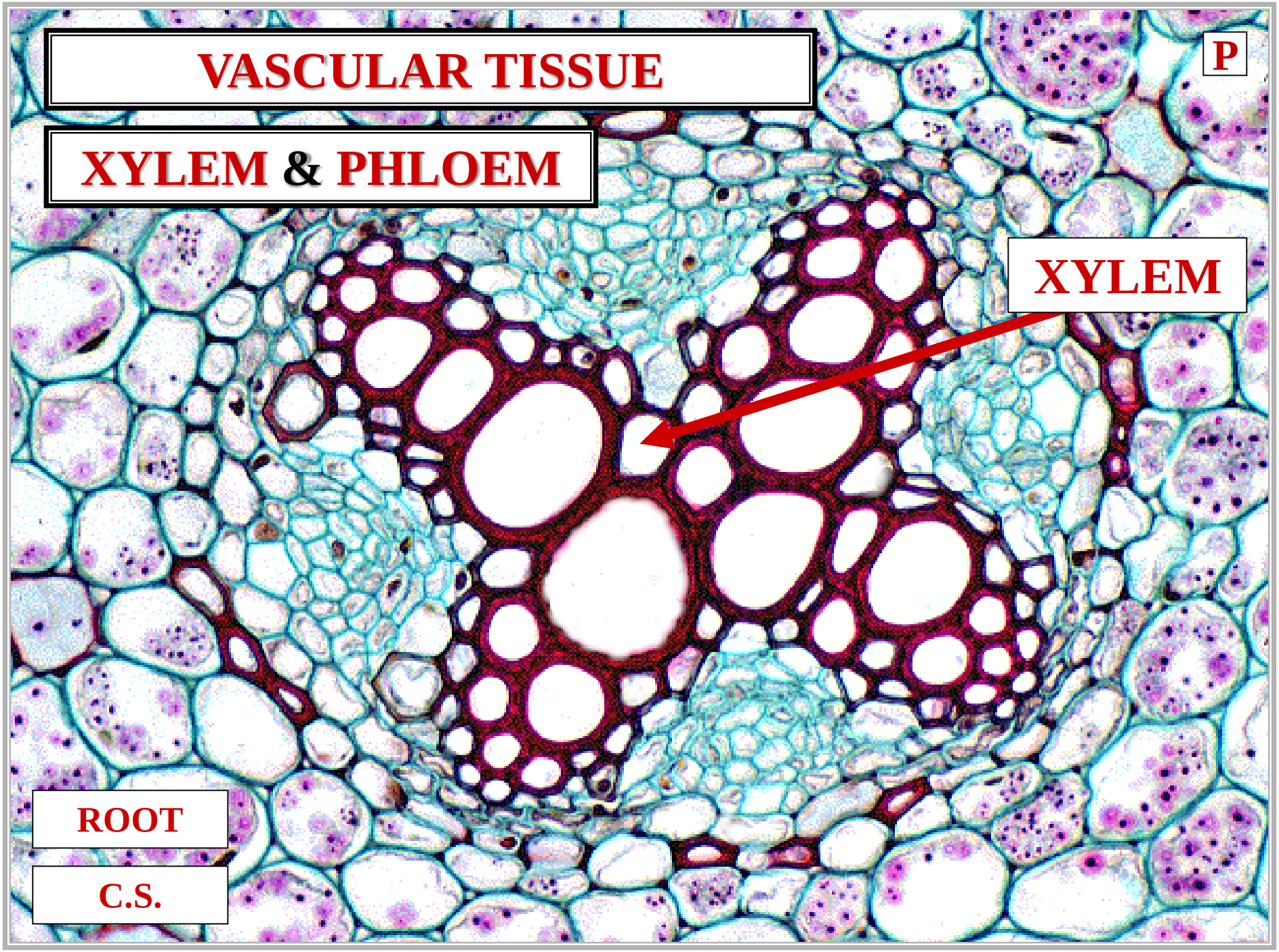


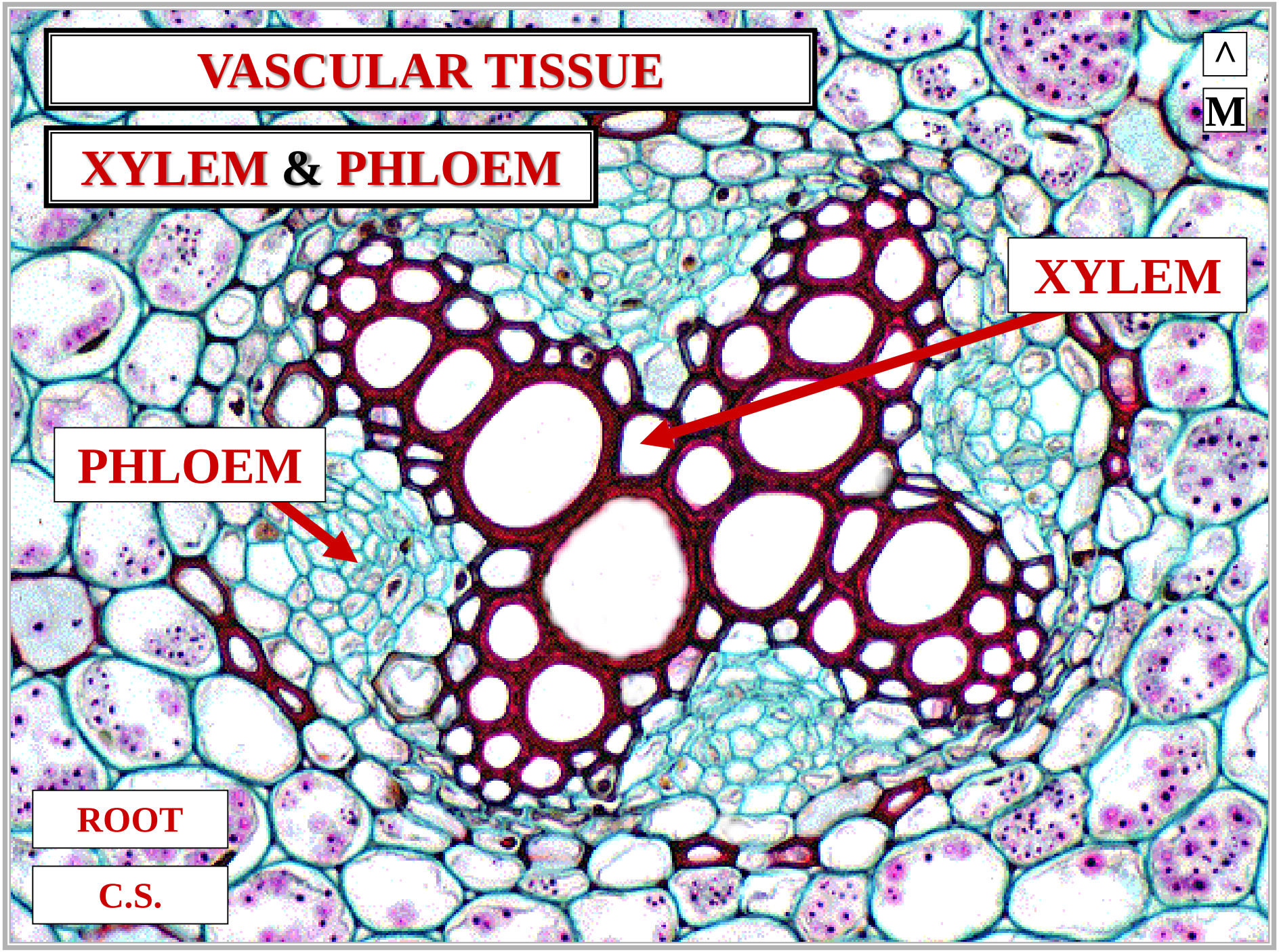
ROOT

C.S.

VASCULAR TISSUE

XYLEM & PHLOEM




VASCULAR TISSUE
XYLEM & PHLOEM
XYLEM
PHLOEM
ROOT
C.S.
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M

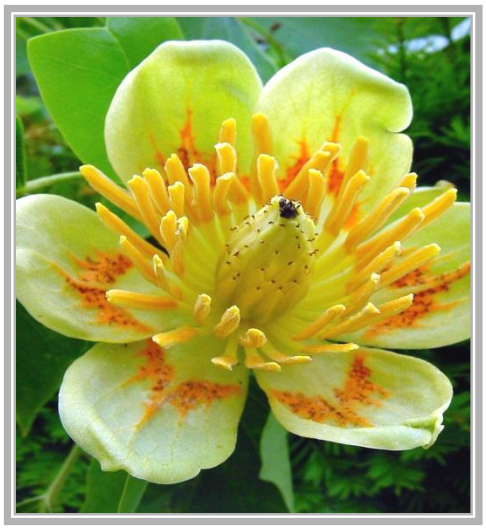
MORPHOLOGY

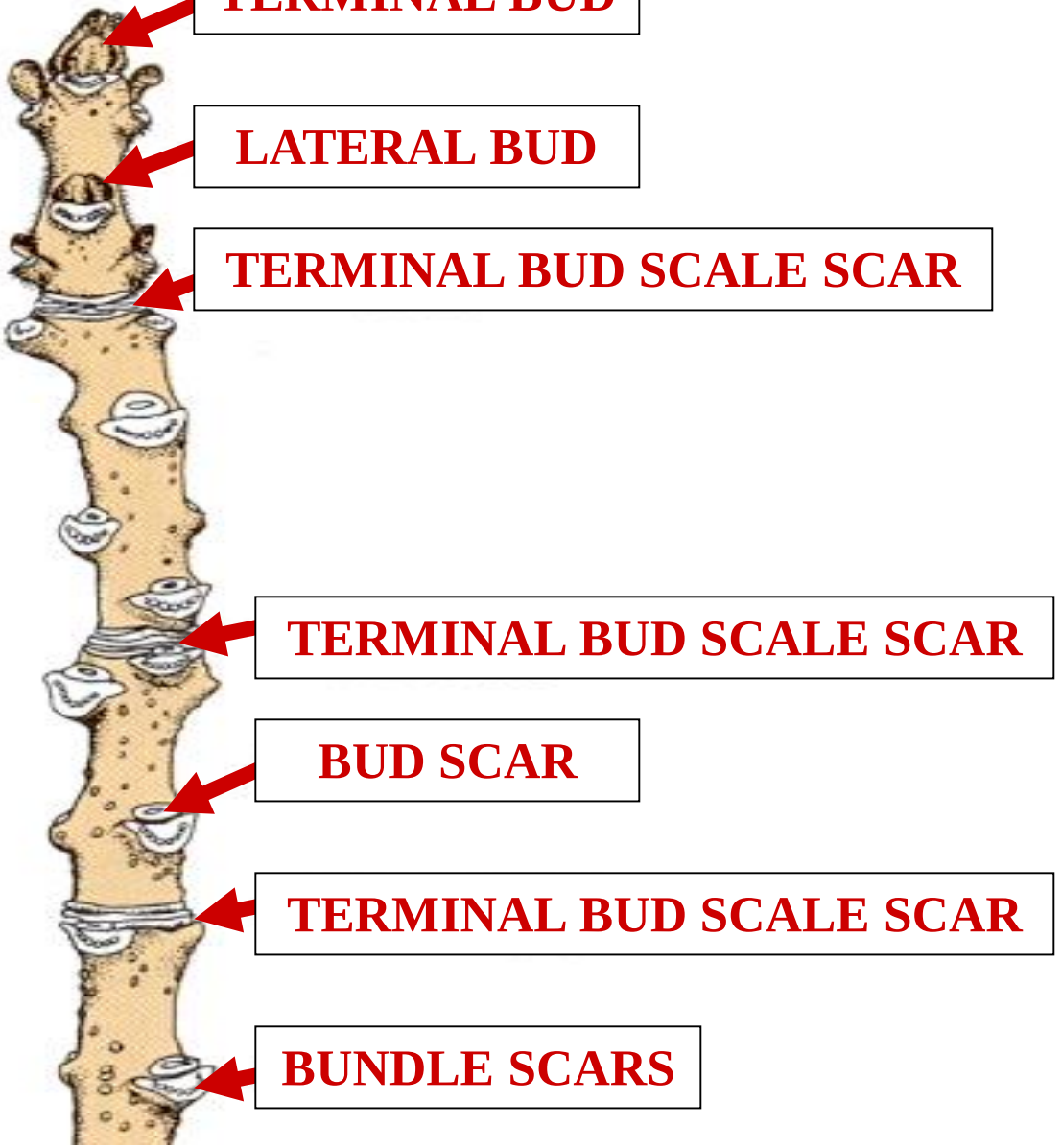
BIOLOGY SUBDISCIPLINES
MORPHOLOGY

STUDY OF EXTERNAL STRUCTURE

BIOLOGY SUBDISCIPLINES
MORPHOLOGY

ANGIOSPERM TWIG MORPHOLOGY





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T

TAXONOMY

BIOLOGY SUBDISCIPLINES TAXONOMY

STUDY OF CLASSIFICTION

BIOLOGY SUBDISCIPLINES TAXONOMY

SPECIES GENUS FAMILY ORDER CLASS PHYLUM KINGDOM DOMAIN

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E

URSUS

URSIDAE

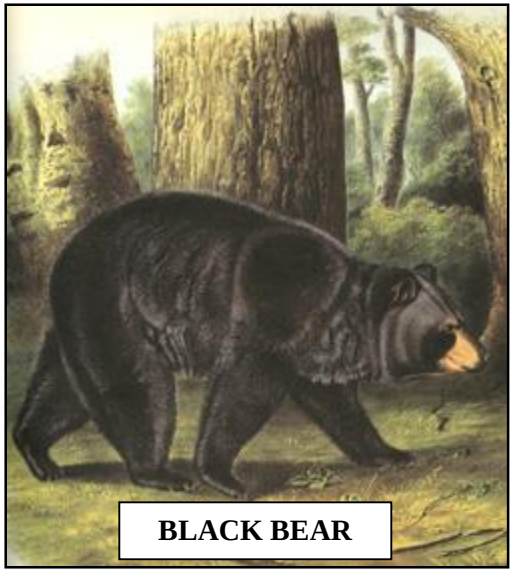
CARNIVORA

MAMMALIA

CHORDATA

ANIMALIA

EUKARYA



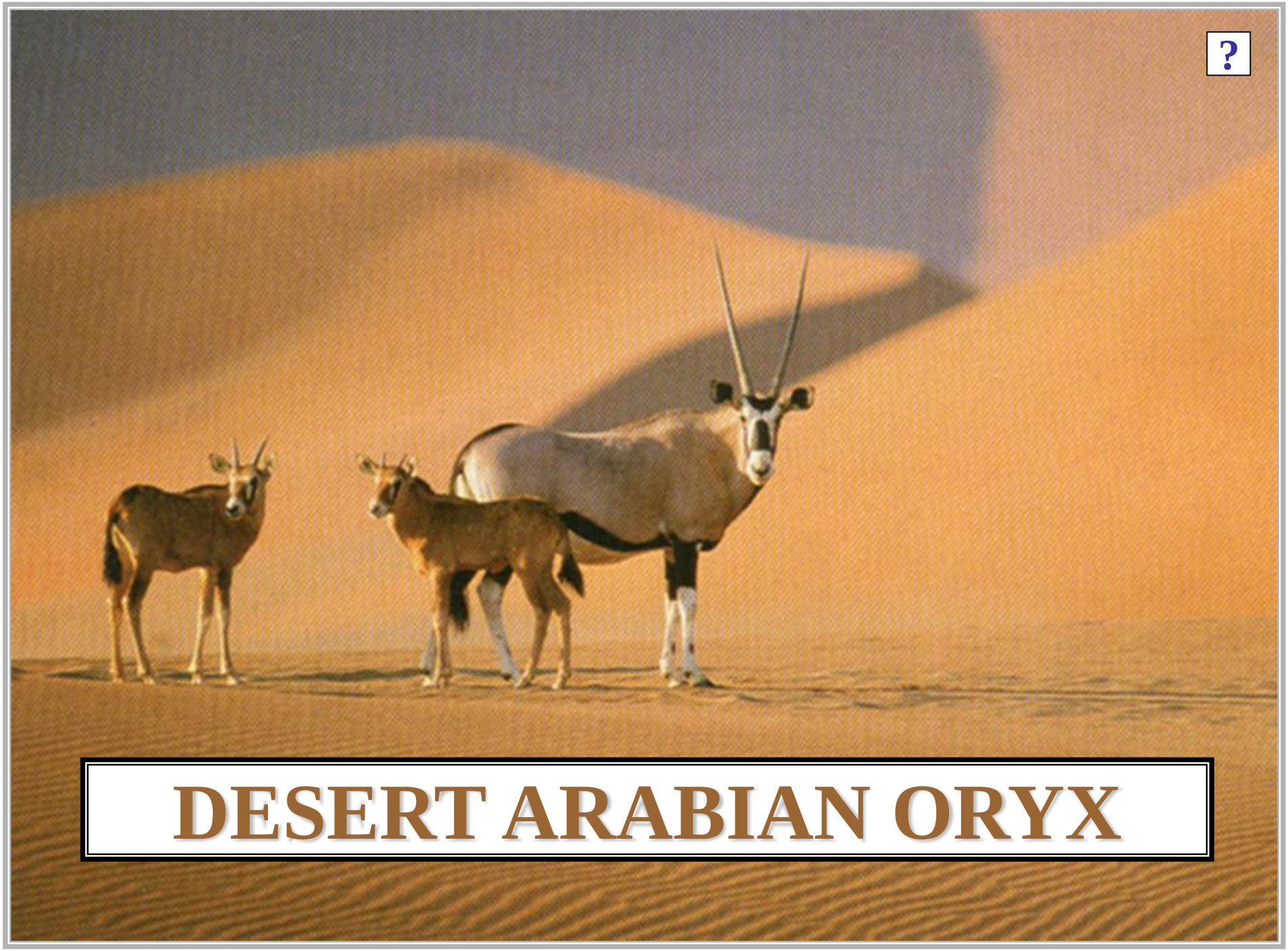
BLACK BEAR

ECOLOGY

BIOLOGY SUBDISCIPLINES
ECOLOGY

STUDY OF ORGANISM INTERACTION WITH THE ENIVIRONMENT

BIOLOGY SUBDISCIPLINES
ECOLOGY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DESERT ARABIAN ORYX

A

QUESTION

WHAT PROCEDURAL OUTLINE DO SCIENTISTS USE TO SOLVE A PROBLEM?

QUESTION

ANSWER

SCIENTIFIC METHOD

ANSWER

S

SCIENTIFIC METHOD

SCIENTIFIC METHOD

SCIENTIFIC METHOD

PROCEDURE SOLVE SCIENTIFIC PROBLEM

SCIENTIFIC METHOD

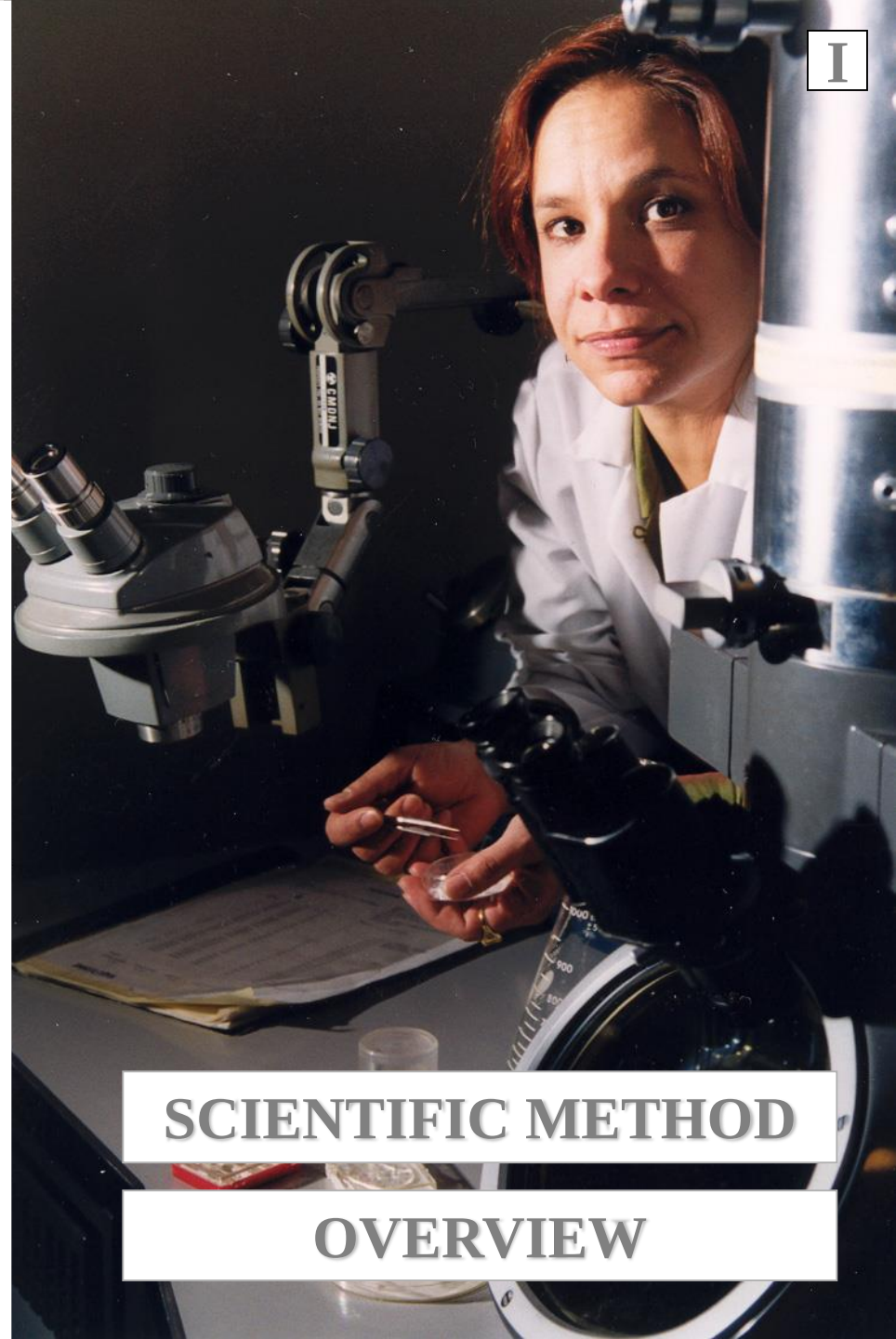
LABORATORY

SCIENTIFIC METHOD

LABORATORY

SCIENTIFIC METHOD

OVERVIEW

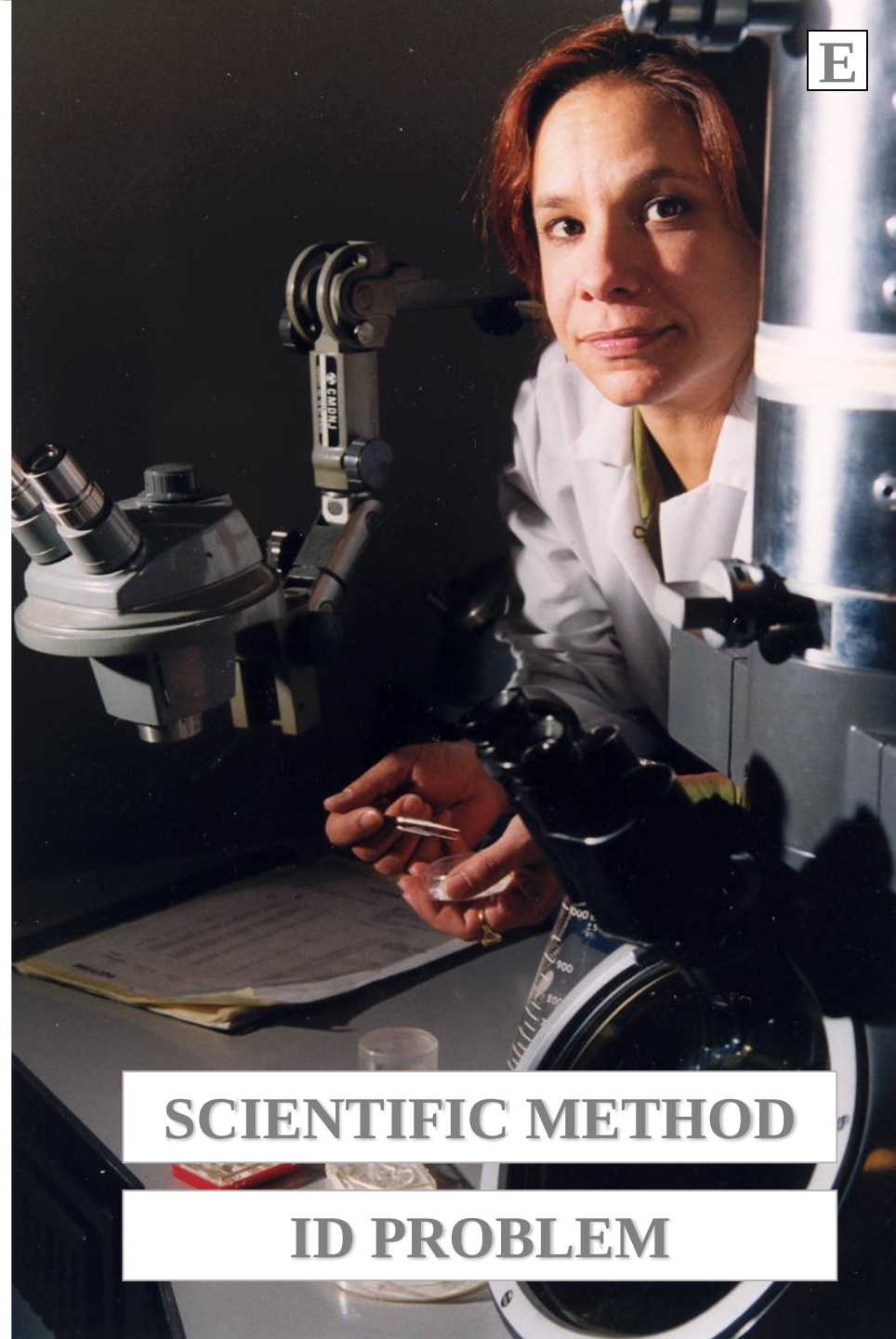


SCIENTIFIC METHOD

OVERVIEW

SCIENTIFIC METHOD

ID PROBLEM

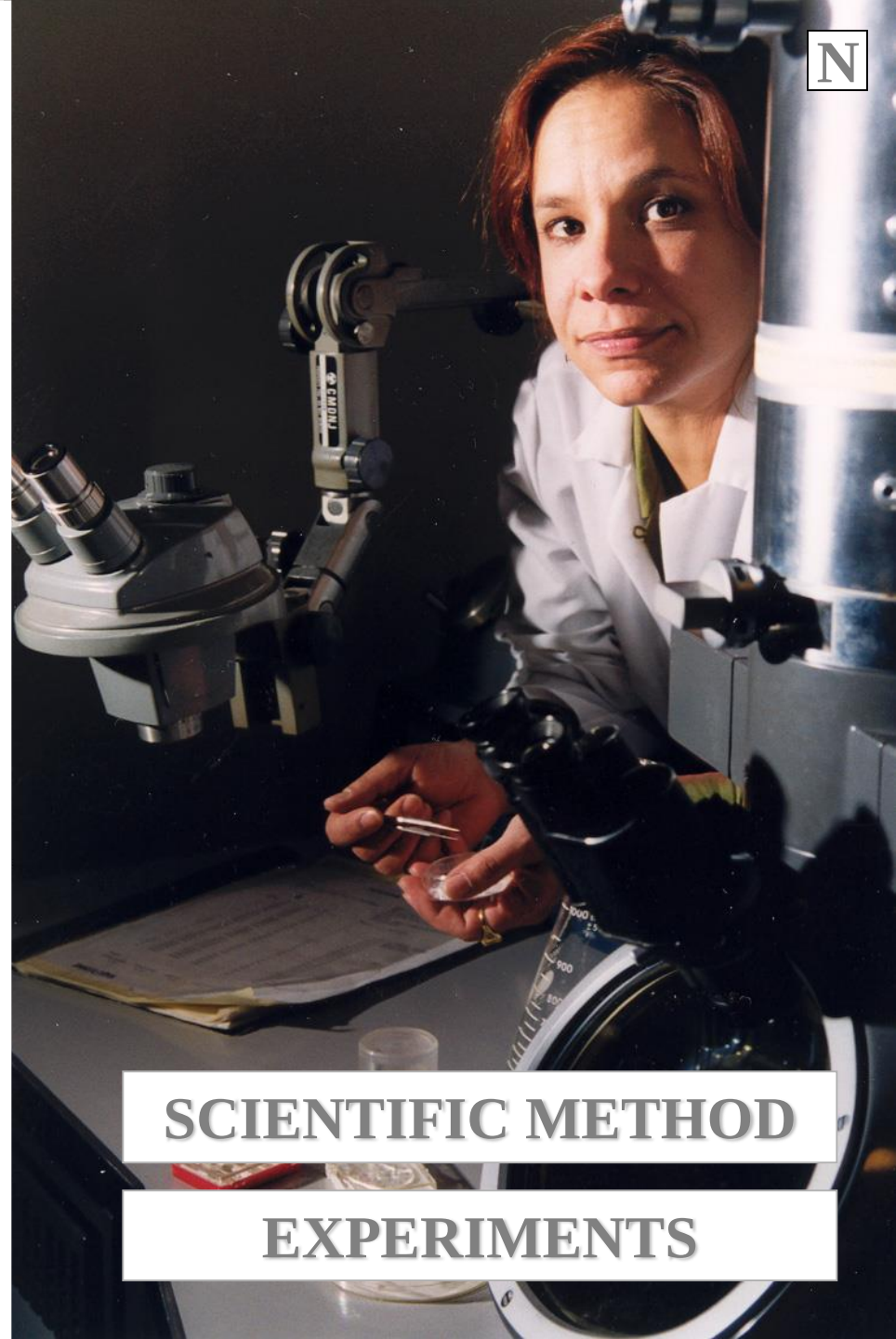


SCIENTIFIC METHOD

ID PROBLEM

SCIENTIFIC METHOD

EXPERIMENTS

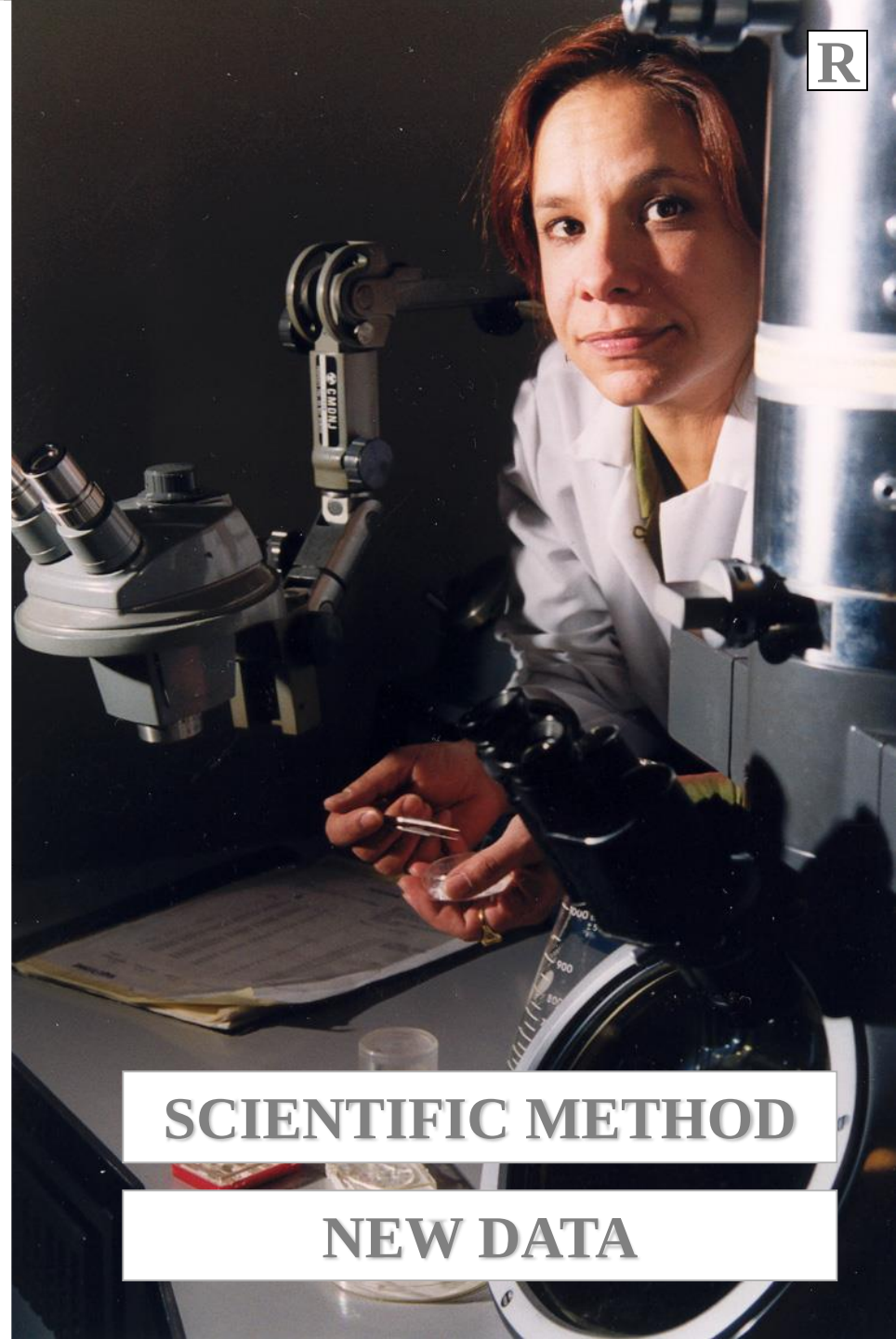


SCIENTIFIC METHOD

EXPERIMENTS

SCIENTIFIC METHOD

NEW DATA

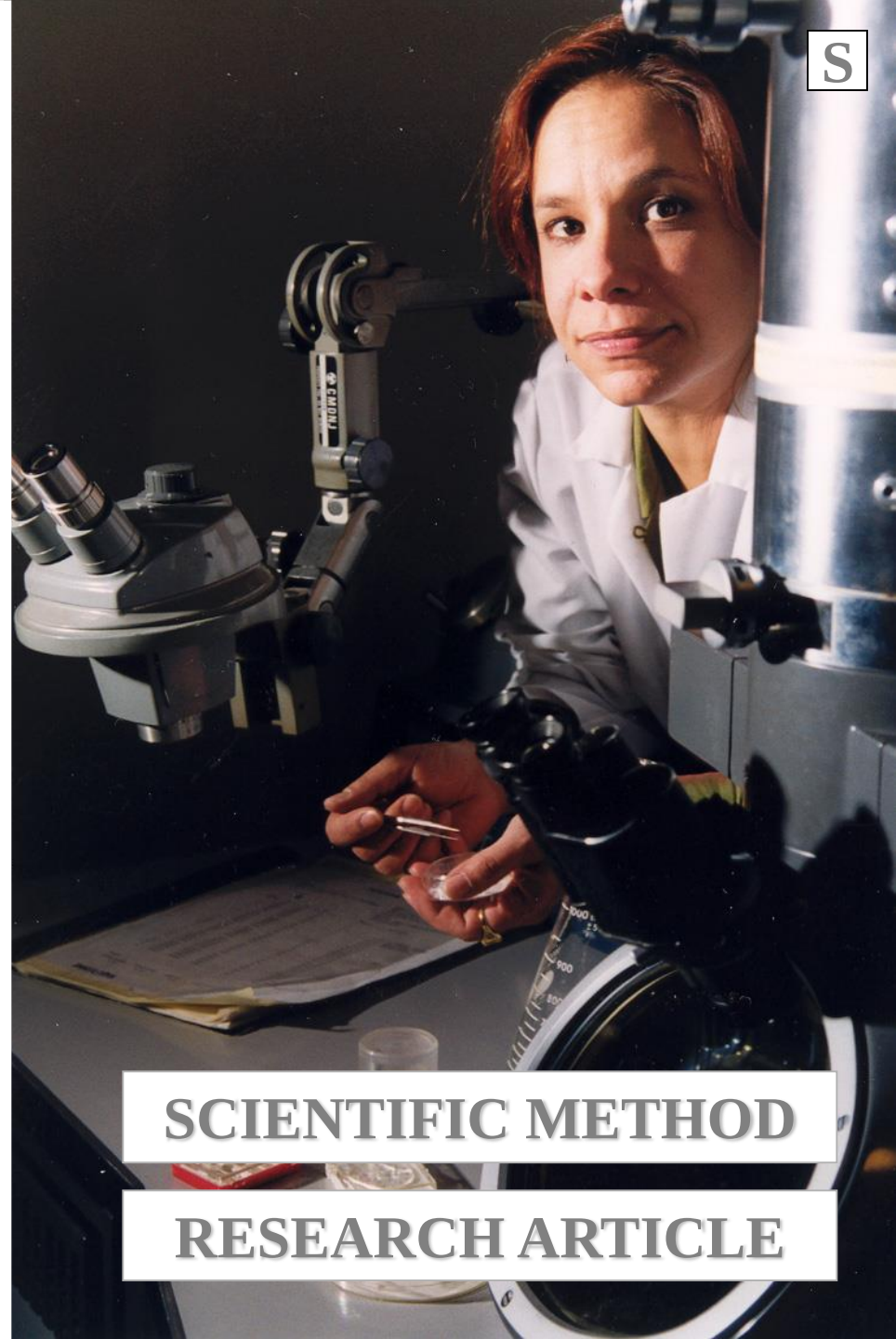


SCIENTIFIC METHOD

NEW DATA

SCIENTIFIC METHOD

RESEARCH ARTICLE

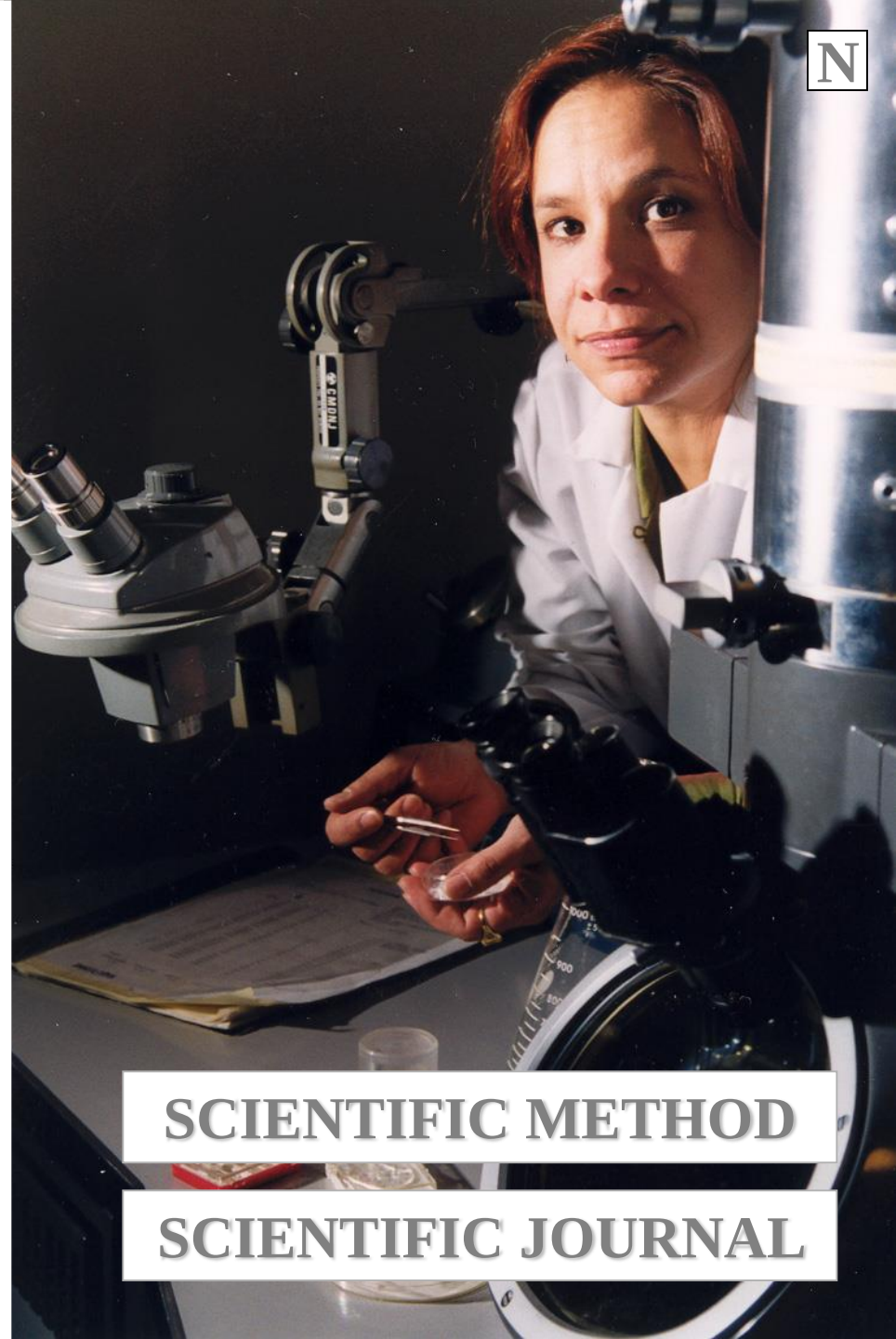


SCIENTIFIC METHOD

RESEARCH ARTICLE

SCIENTIFIC METHOD

SCIENTIFIC JOURNAL

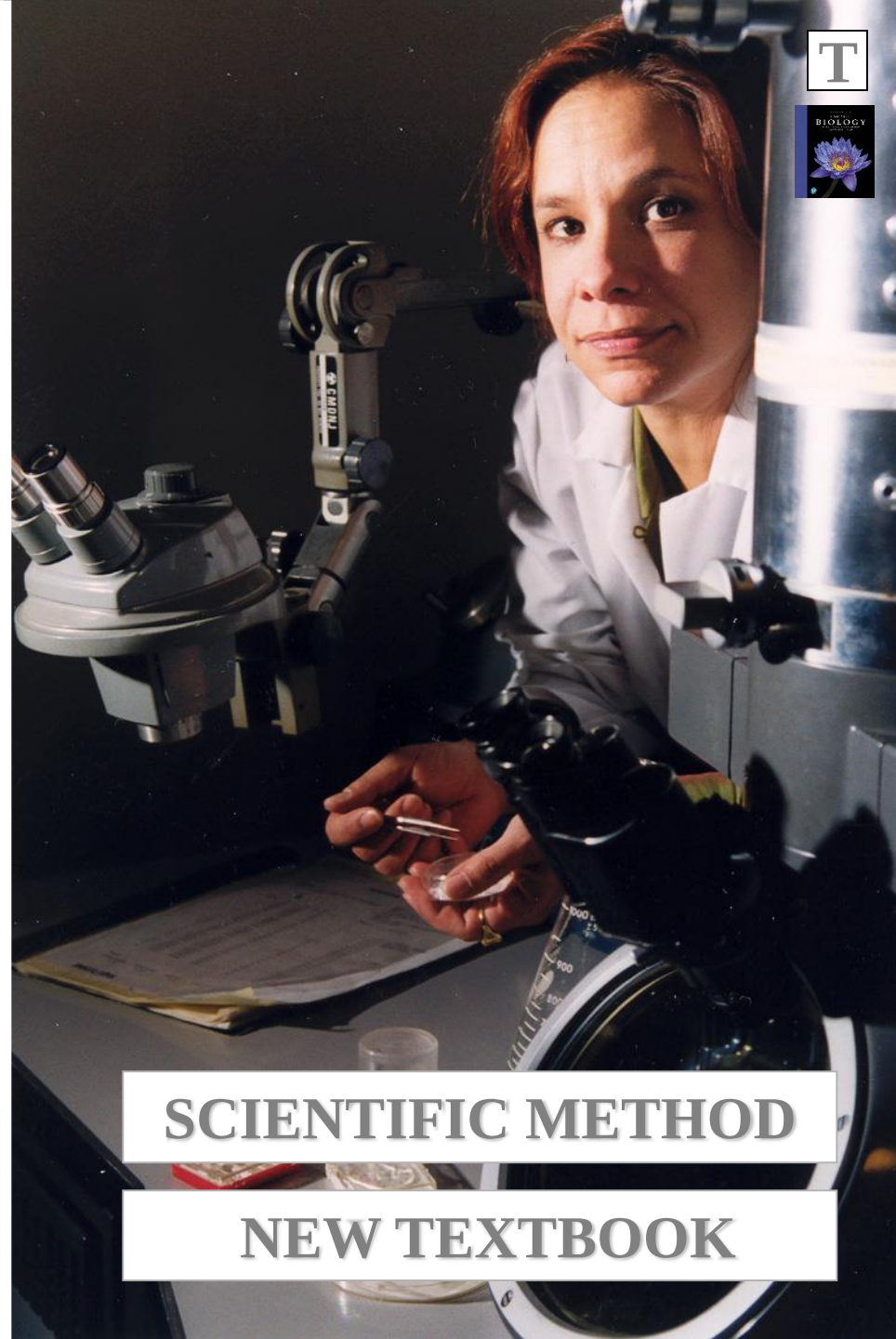


SCIENTIFIC METHOD

SCIENTIFIC JOURNAL

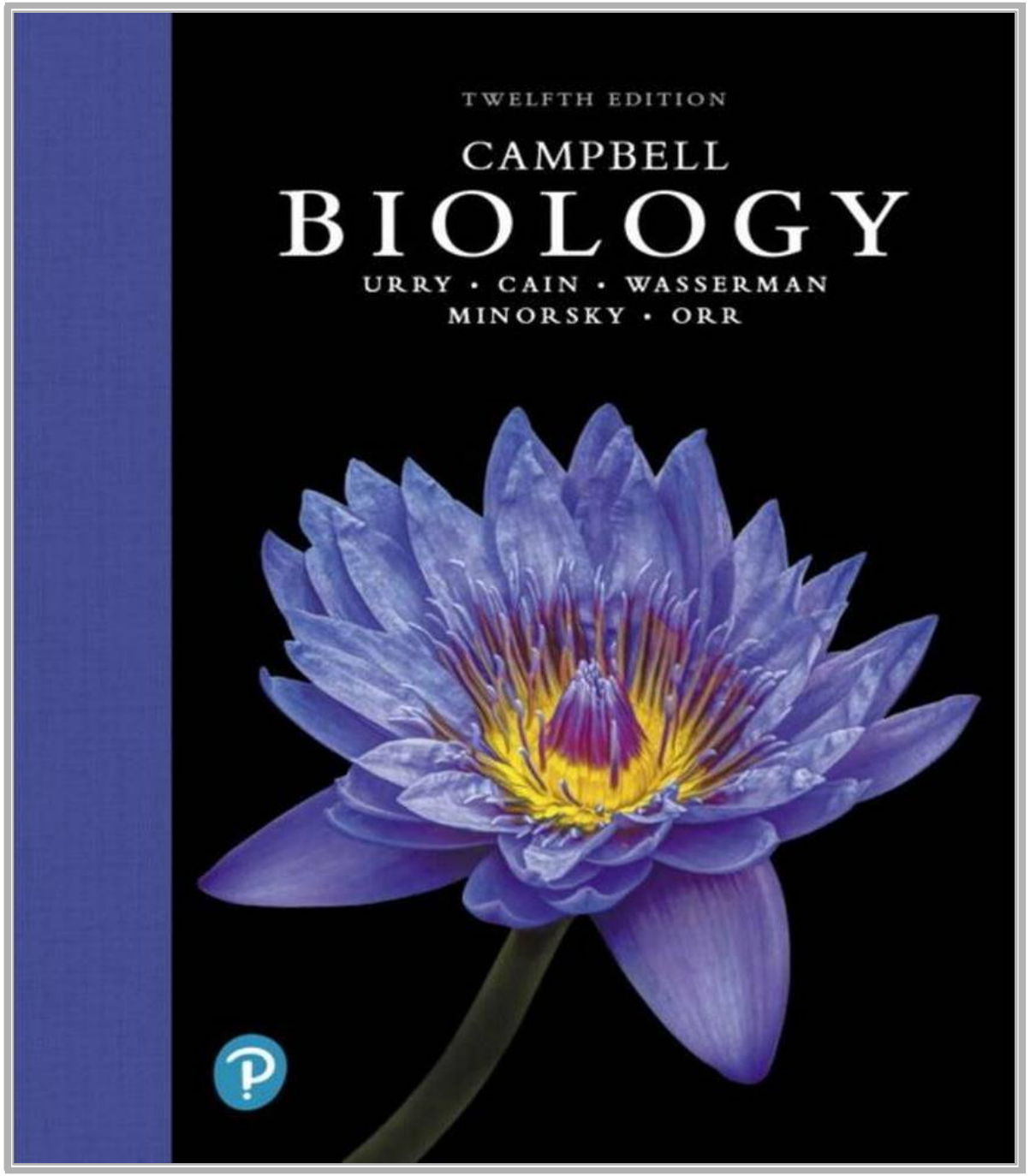
SCIENTIFIC METHOD

NEW TEXTBOOK



SCIENTIFIC METHOD

NEW TEXTBOOK


TWELFTH EDITION
CAMPBELL
BIOLOGY
URRY • CAIN • WASSERMAN
MINORSKY • ORR


L
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SCIENCE
CONTINUOUS
PURSUIT OF
KNOWLEDGE

LABORATORY

SCIENTIFIC METHOD

LABORATORY

THEORY
VS
HYPOTHESIS

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THEORY

QUESTION

WHAT IS A THEORY?

QUESTION

"MAD SCIENTIST"

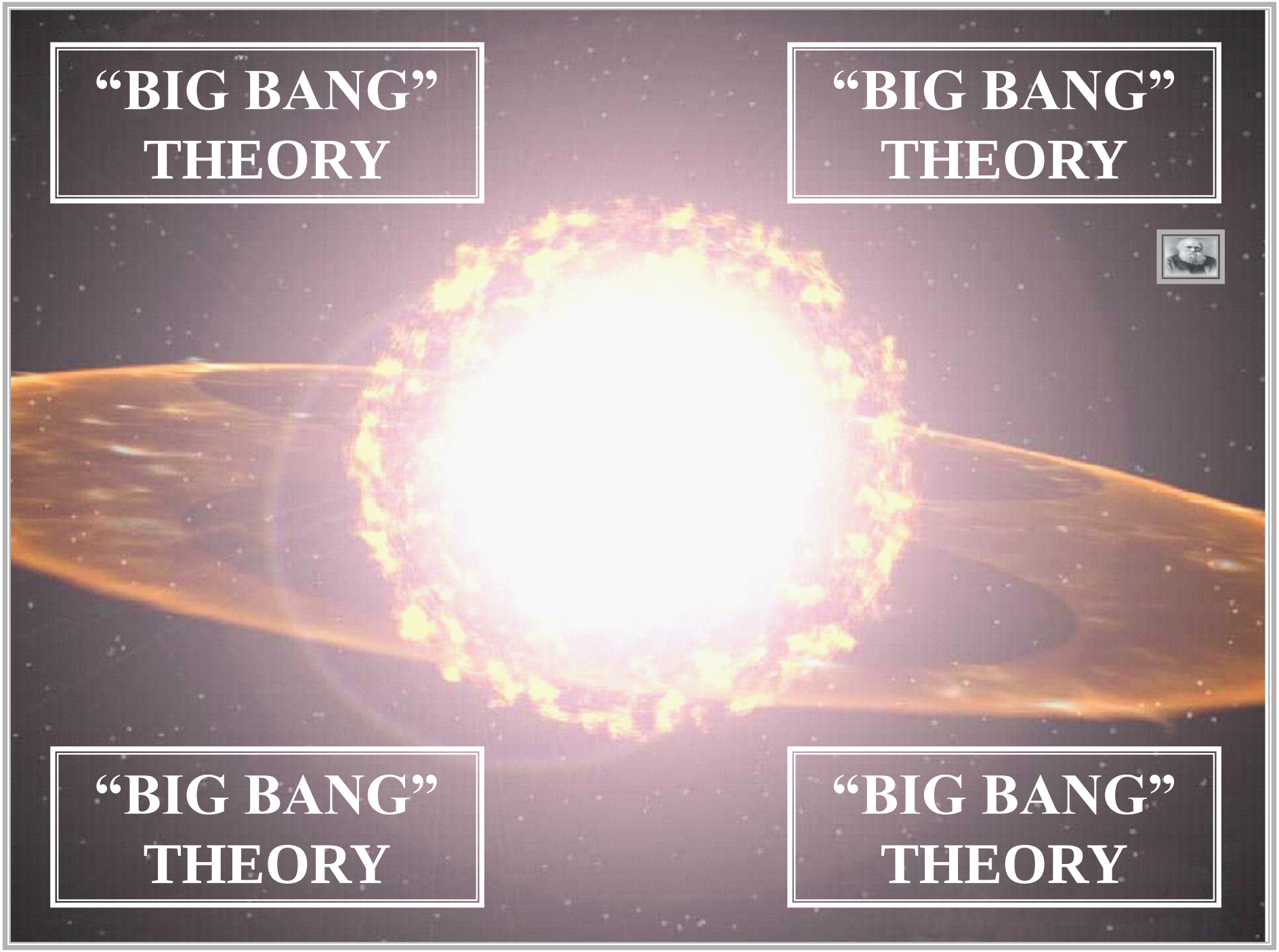
THEORY

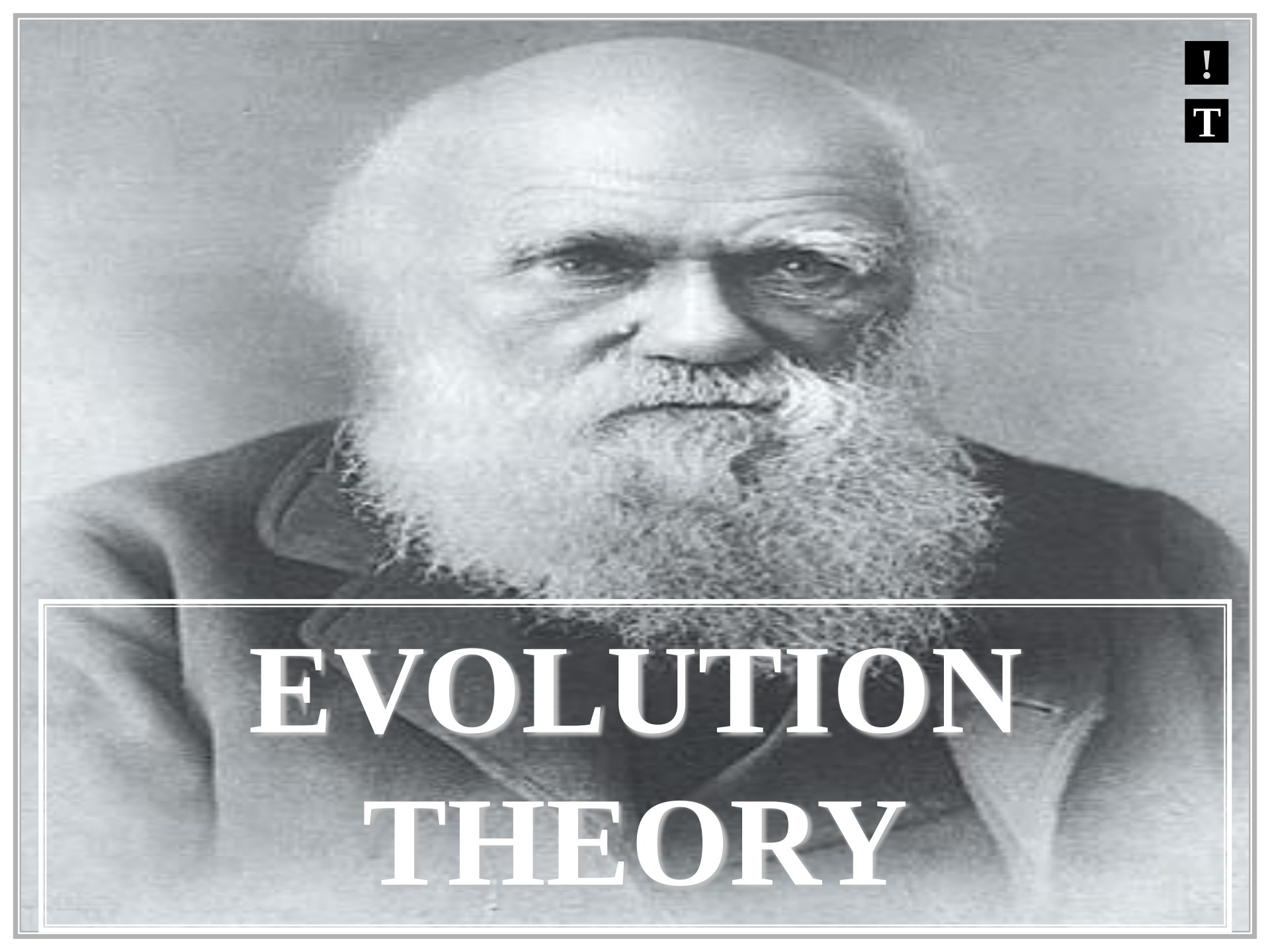
EG

THEORY

SCIENTIFIC SUPPORTED IDEA

THEORY


“BIG BANG” THEORY
“BIG BANG” THEORY
“BIG BANG” THEORY
“BIG BANG” THEORY



EVOLUTION THEORY

THEORY

CANNOT ALWAYS BE SUPPORTED BY DIRECT OBSERVATION

THEORY

THEORY

CAN ONLY BE SUPPORTED BY INDIRECT OBSERVATION

THEORY

THEORY

EG

CAN BE
SUPPORTED TO A
“RELATIVE CERTAINTY”
ONLY

THEORY


EXAMPLE
6
DINOSAUR
EXTINCTION


EXAMPLE
?
CRETACEOUS
65 MYA

QUESTION

WHAT IS THE MOST ACCEPTED THEORY FOR DINOSAUR EXTINCTION?

QUESTION


C
ASTEROID IMPACT
THEORY

SE

ASTEROID IMPACT THEORY CAUSED DINOSAUR EXTINCTION

ASTEROID IMPACT THEORY SUPPORTING EVIDENCE

I

ASTEROID

ASTEROID

ELEMENT IRIDIUM
ABUNDANT ON ASTEROIDS

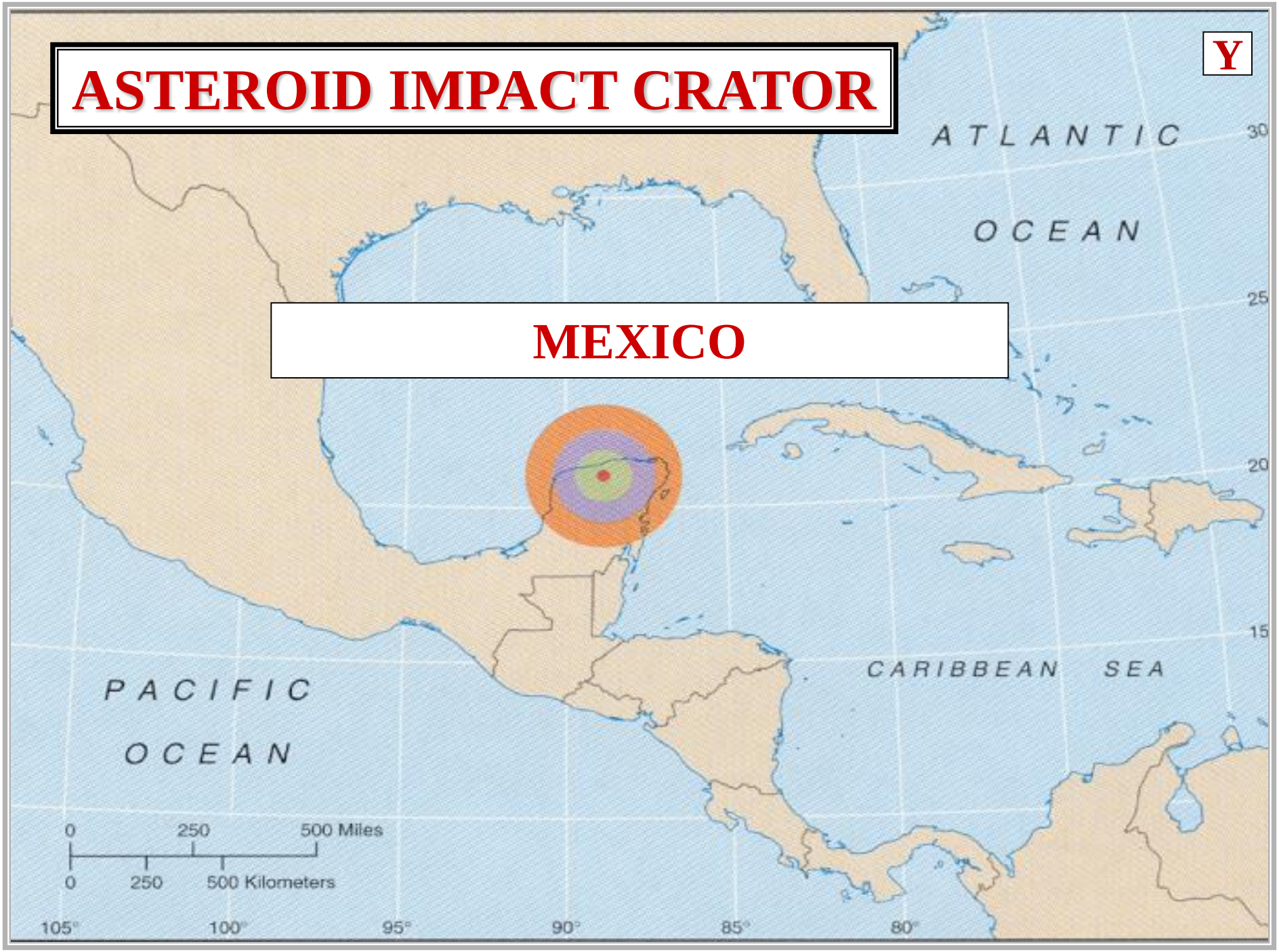
ELEMENT IRIDIUM
RARE ON EARTH

EARTH

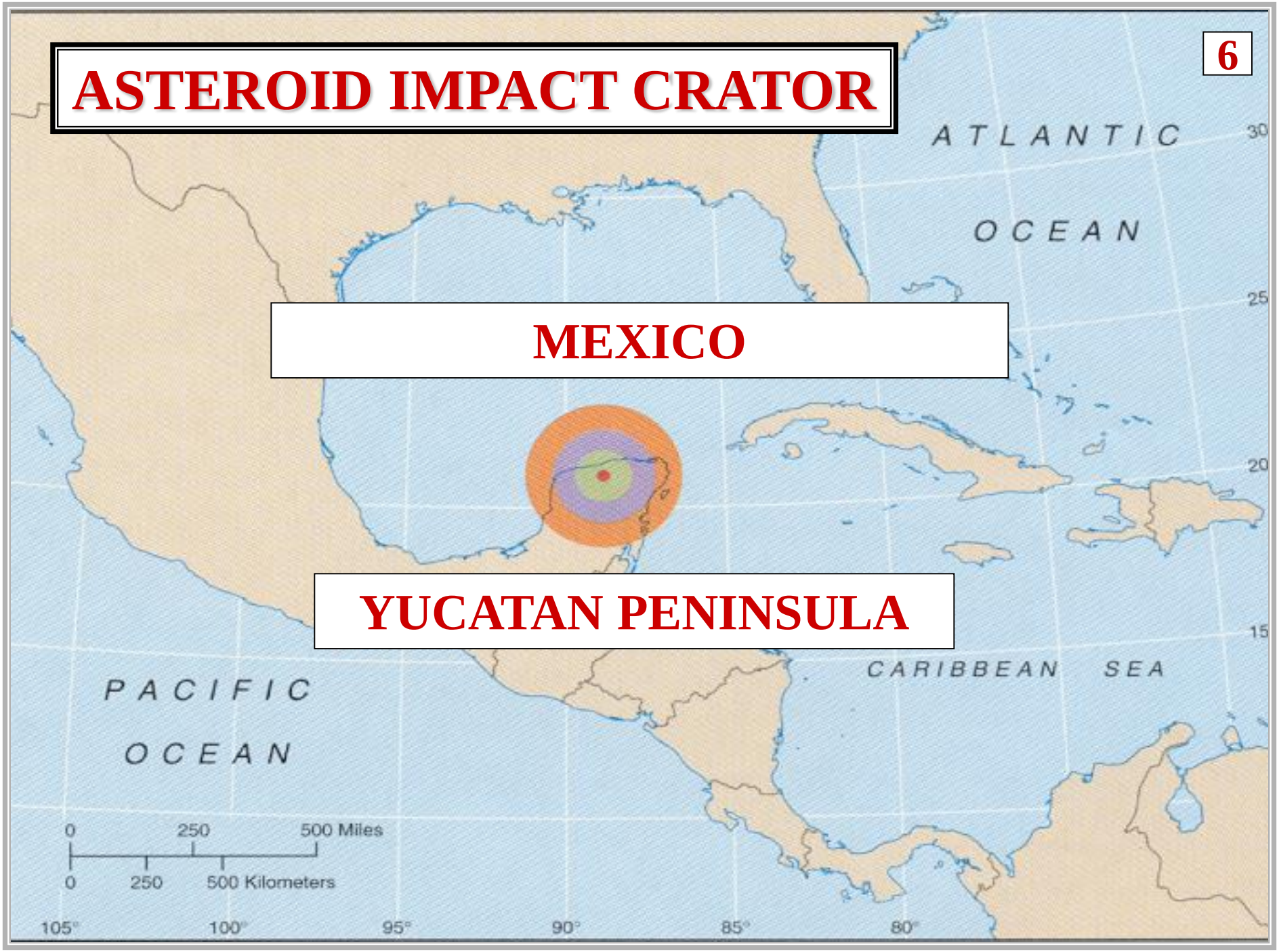

ASTEROID IMPACT

ASTEROID IMPACT CRATOR

Y



ASTEROID IMPACT CRATOR



ASTEROID IMPACT CRATOR

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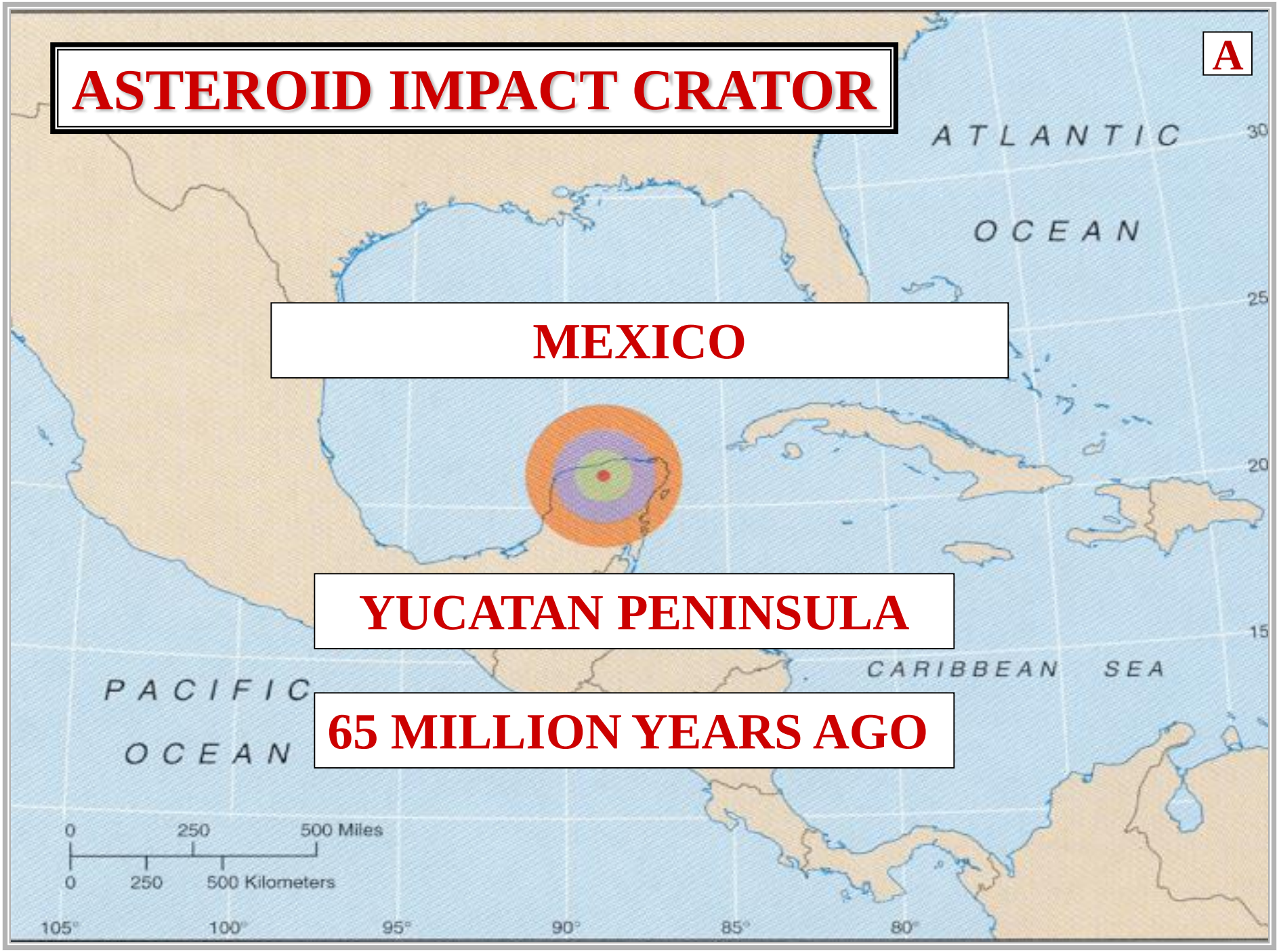

ASTEROID IMPACT CRATOR

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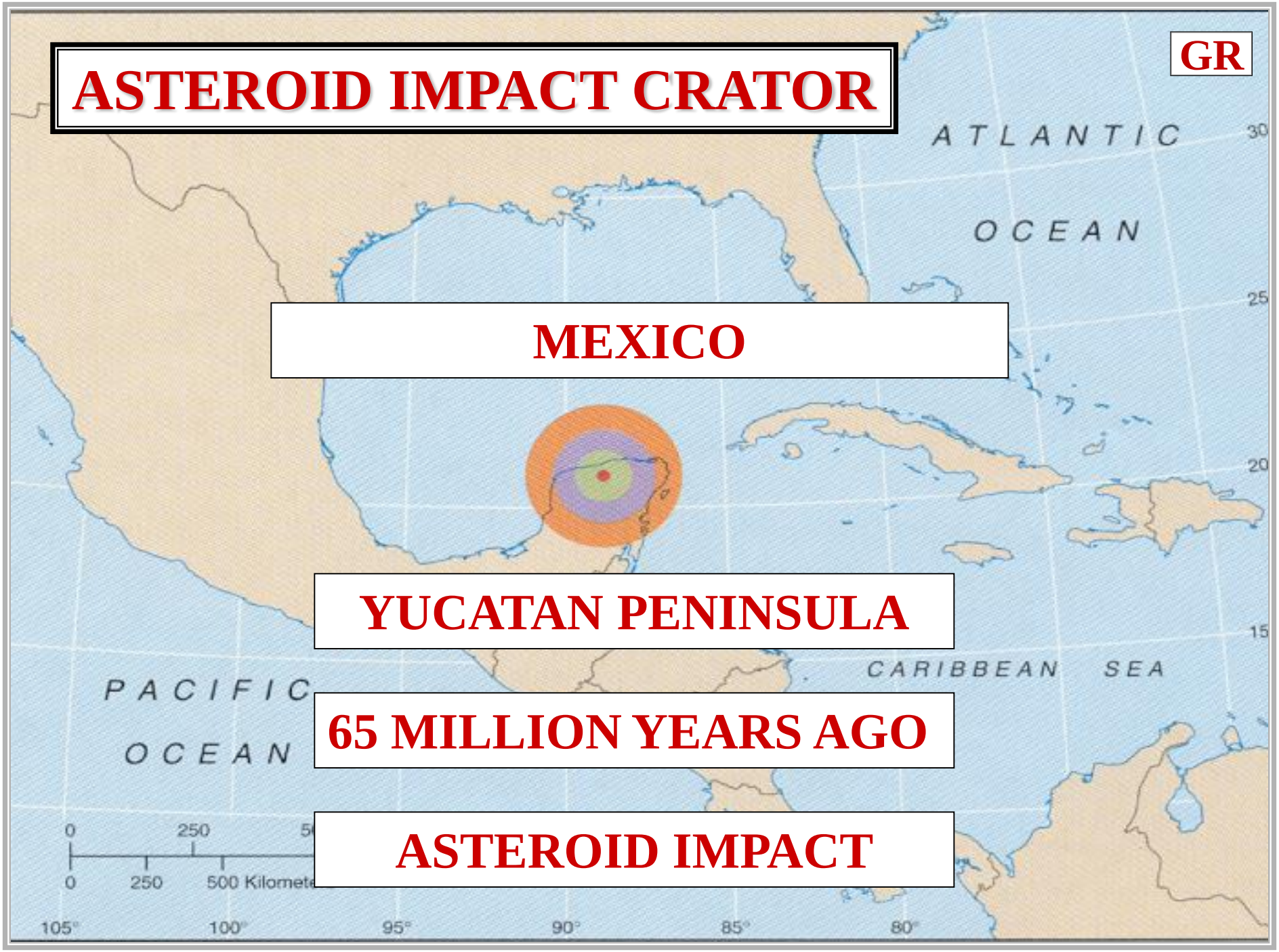


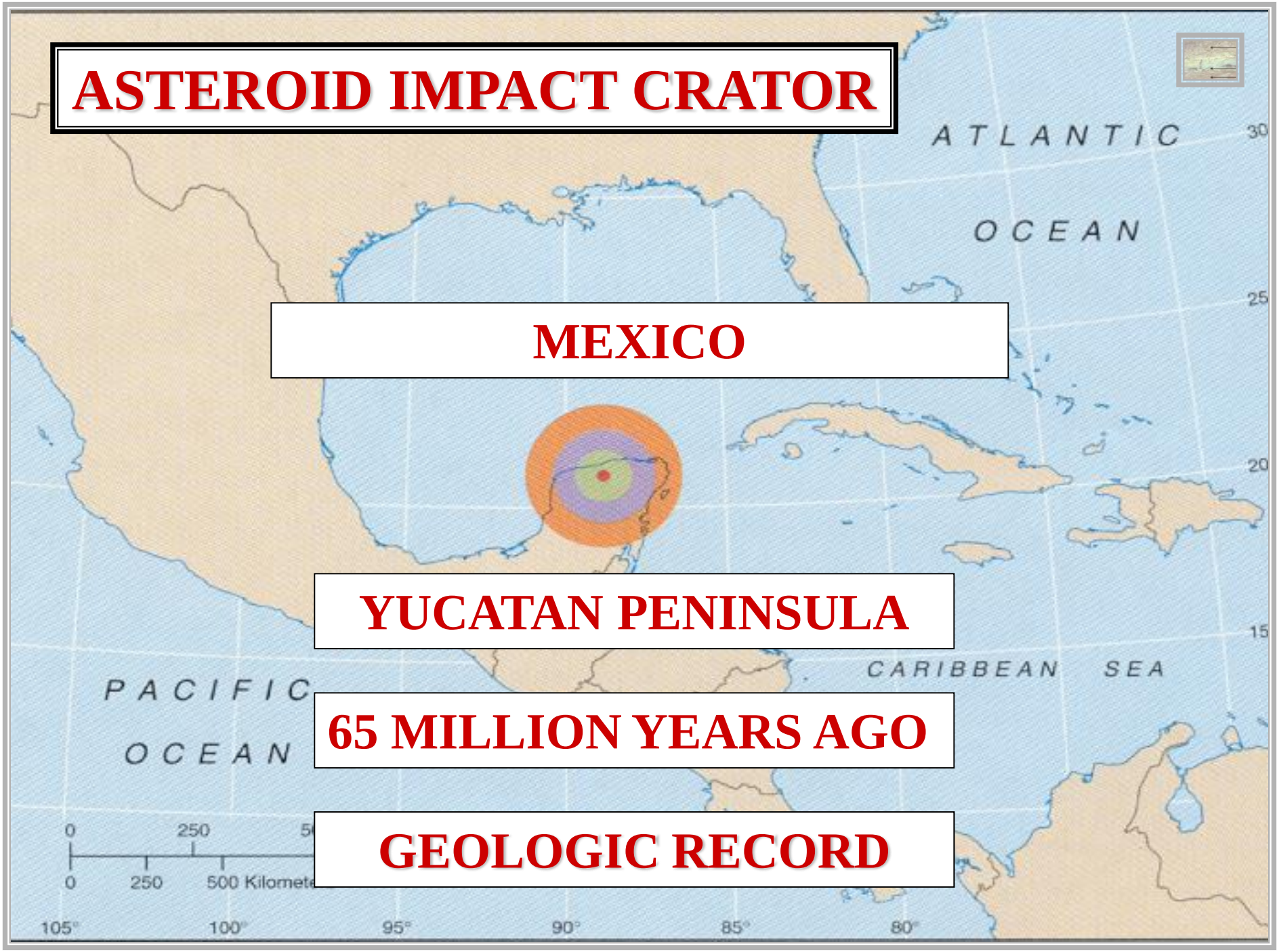
MEXICO

YUCATAN PENINSULA

65 MILLION YEARS AGO

ASTEROID IMPACT

ASTEROID IMPACT CRATOR



MEXICO

YUCATAN PENINSULA

65 MILLION YEARS AGO

GEOLOGIC RECORD

GEOLOGIC RECORD

AFTER 65 MYA

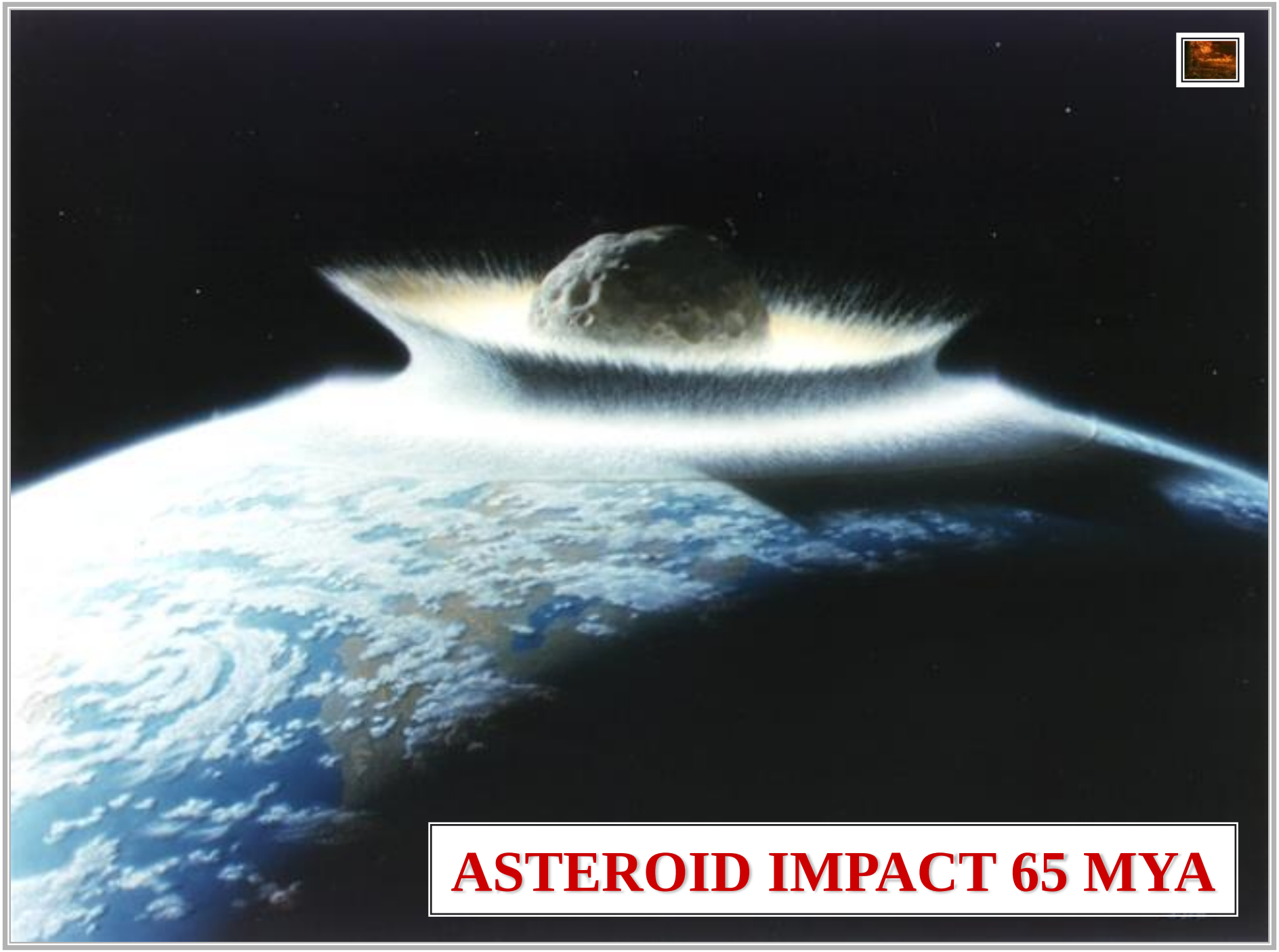
DINOSAUR FOSSILS ABSENT

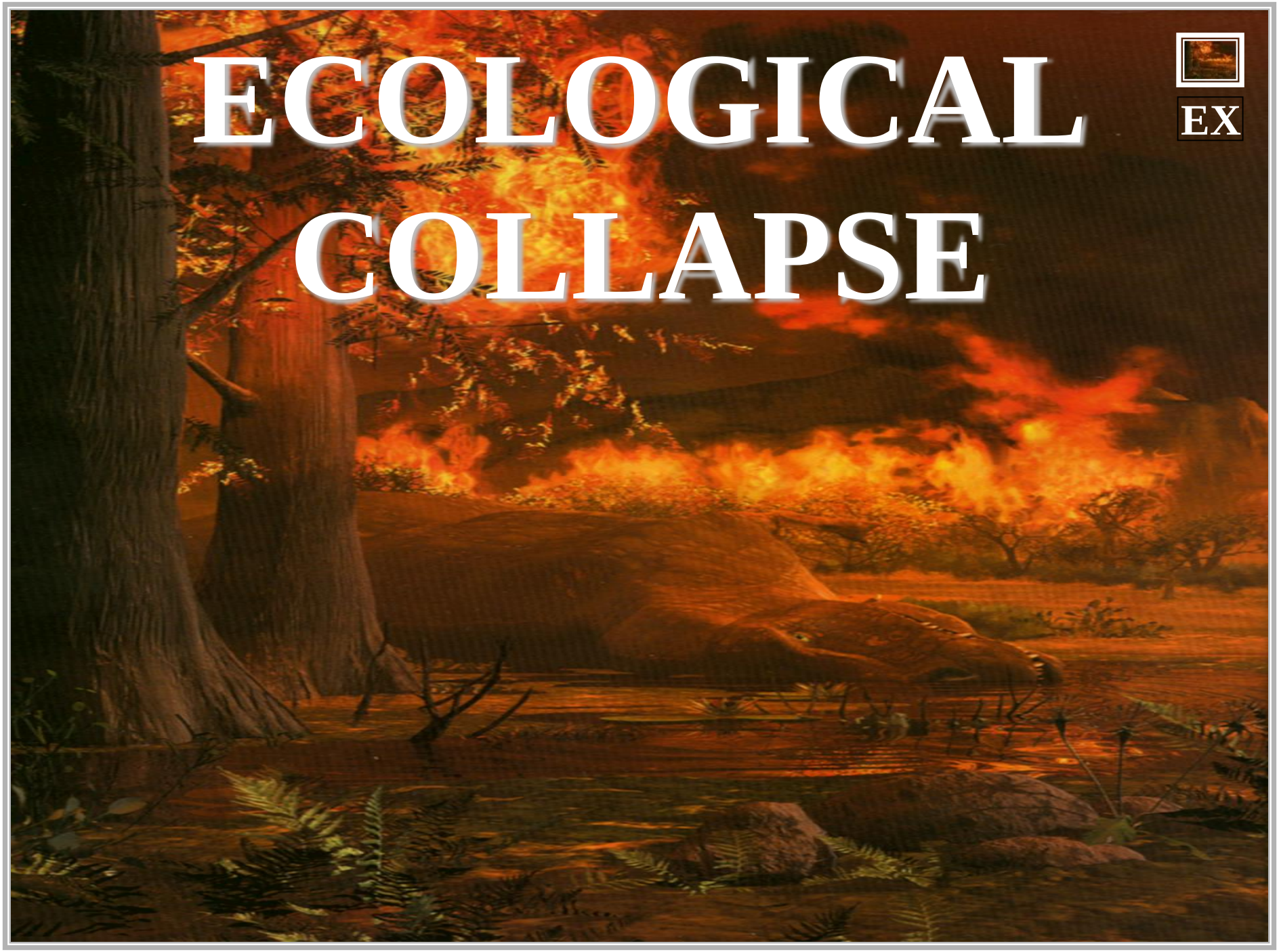
65 MYA

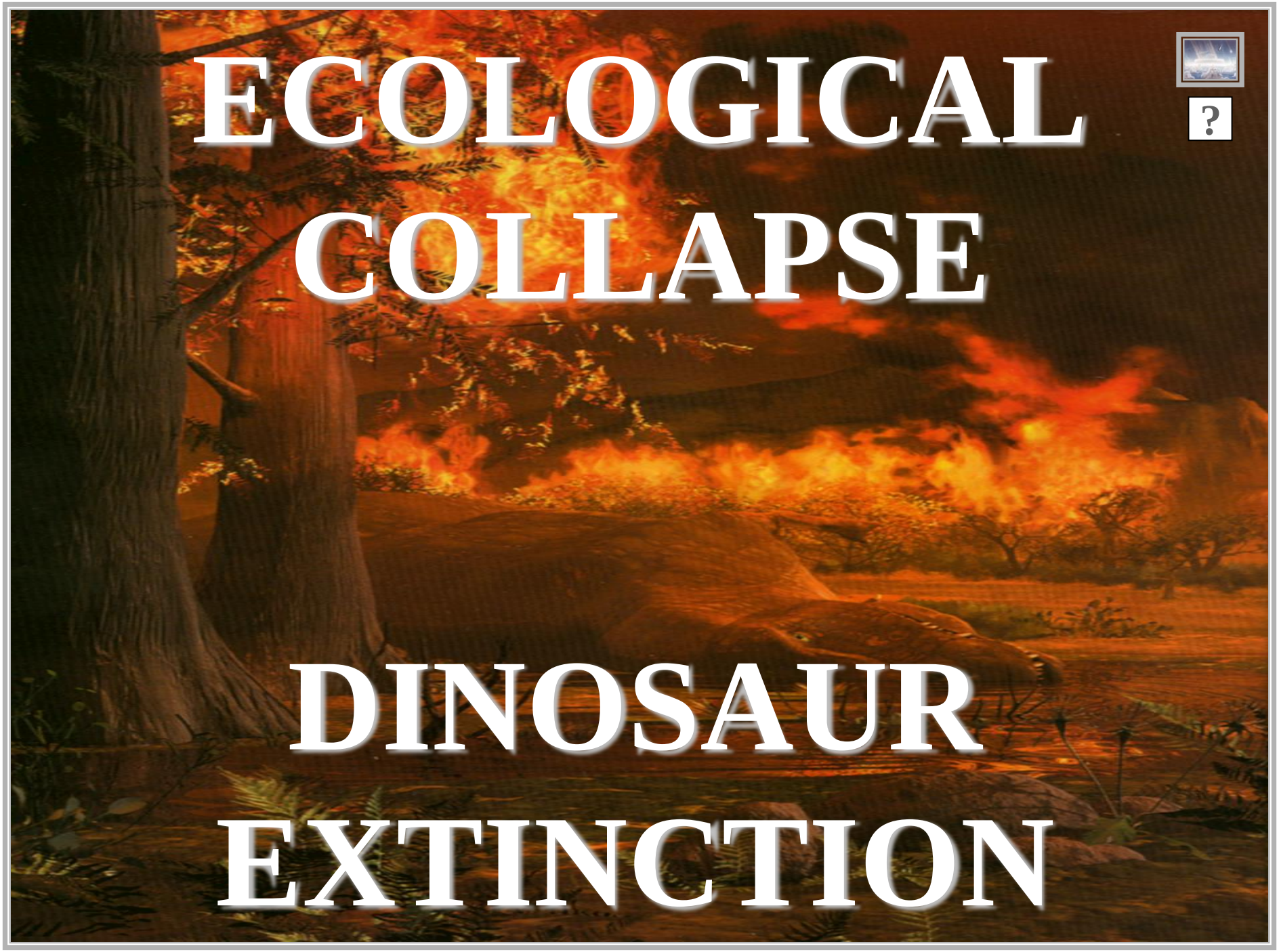
IRIDIUM LAYER

BEFORE 65 MYA

DINOSAUR FOSSILS PRESENT


ASTEROID IMPACT 65 MYA


ECOLOGICAL
COLLAPSE
EX


ECOLOGICAL
COLLAPSE
DINOSAUR
EXTINCTION
?

ASTEROID IMPACT

I

THEORY

SUPPORTING EVIDENCE

?

OBSERVATION

ASTEROID IMPACT THEORY SUPPORTING EVIDENCE

“

INDIRECT OBSERVATION

ASTEROID IMPACT THEORY SUPPORTING EVIDENCE

"RELATIVE CERTAINTY" ONLY

?

HYPOTHESIS

QUESTION

WHAT IS A HYPOTHESIS?

QUESTION

H

"MAD SCIENTIST"

HYPOTHESIS