

BIO 211:
ANATOMY & PHYSIOLOGY I



Module 1 of 5

BONE LABS:

- STRUCTURE -
- CLASSIFICATION -
- SKELETON ORGANIZATION -

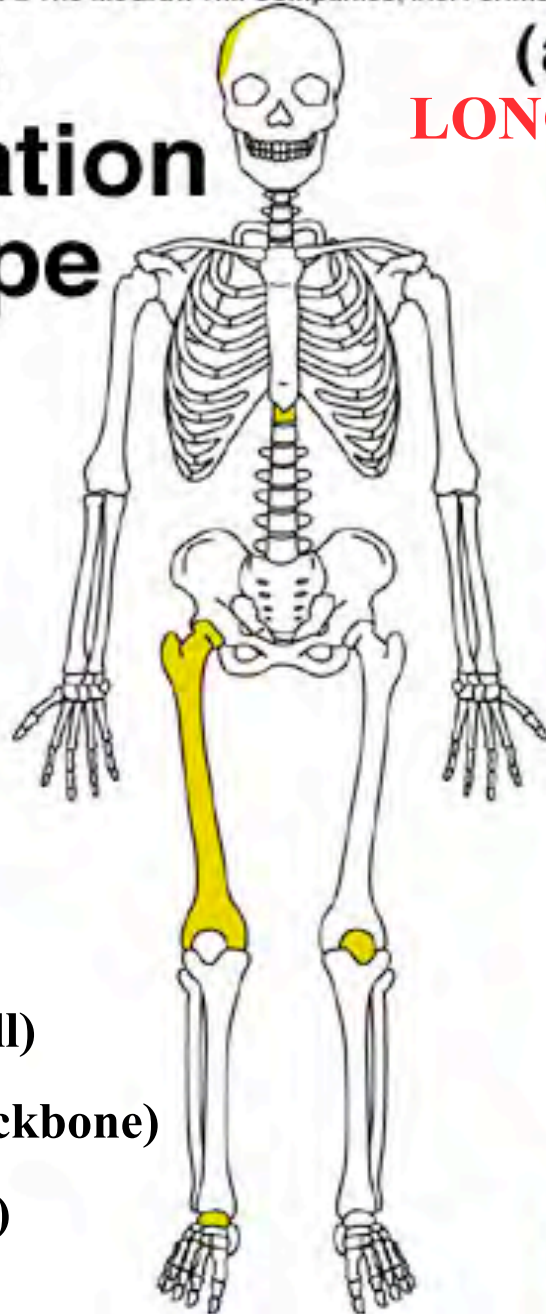
Dr. Lawrence G. Altman

www.lawrencegaltman.com

Some illustrations are courtesy of McGraw-Hill.

Bone Classification by Shape

STRUCTURE & CLASSIFICATION



- a. FEMUR (thigh)
- b. TARSAL (foot)
- c. PARIETAL (skull)
- d. VERTEBRA (backbone)
- e. PATELLA (knee)

(a) LONG



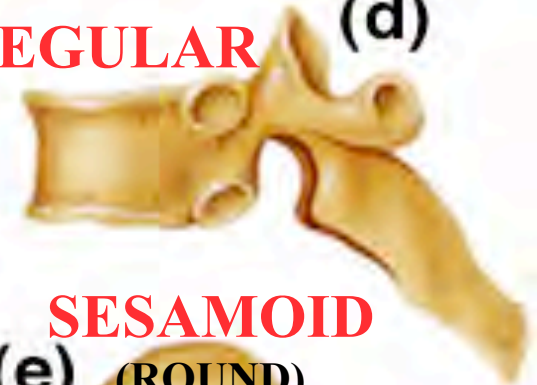
(b) SHORT



(c) FLAT



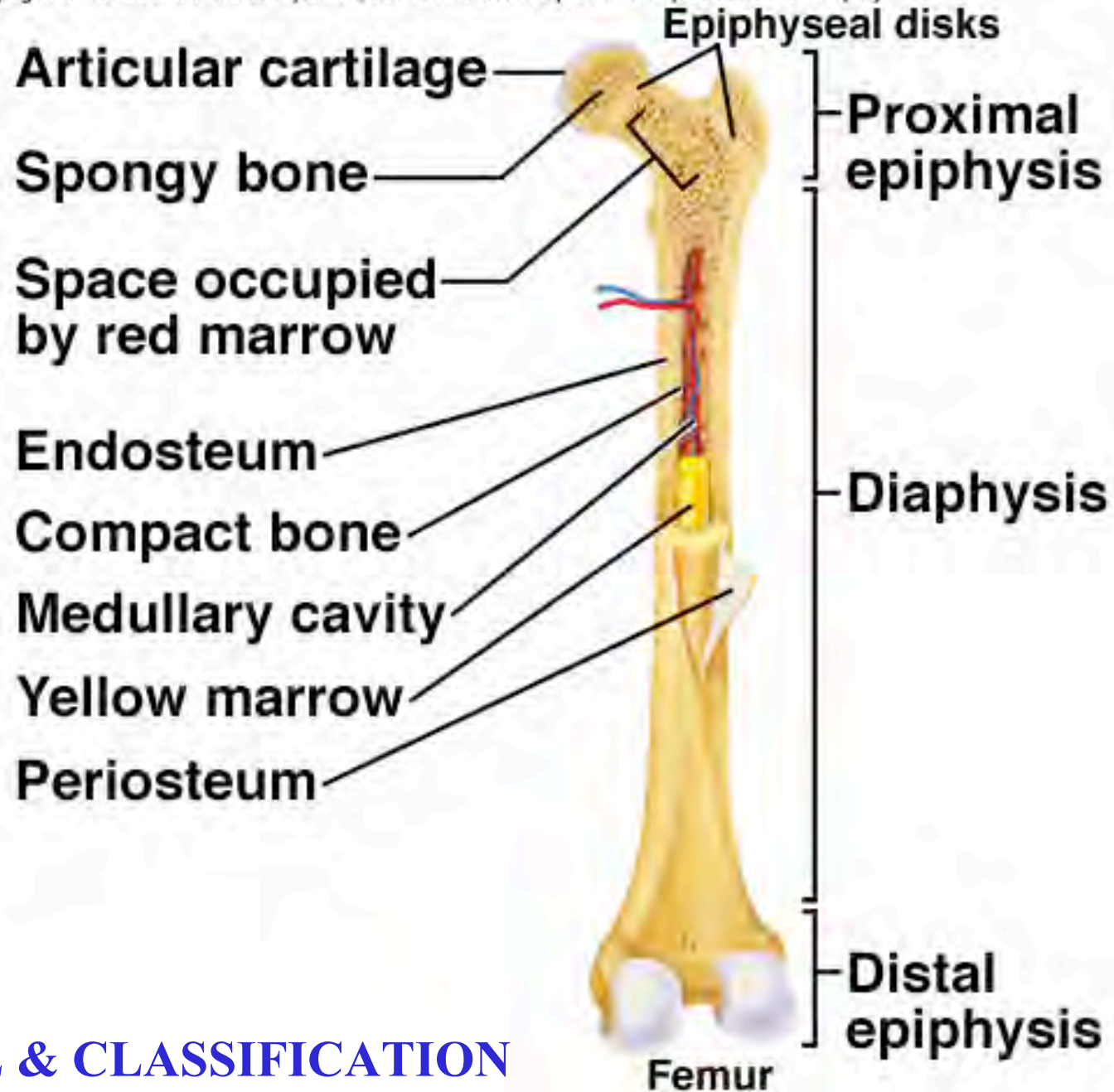
(d) IRREGULAR



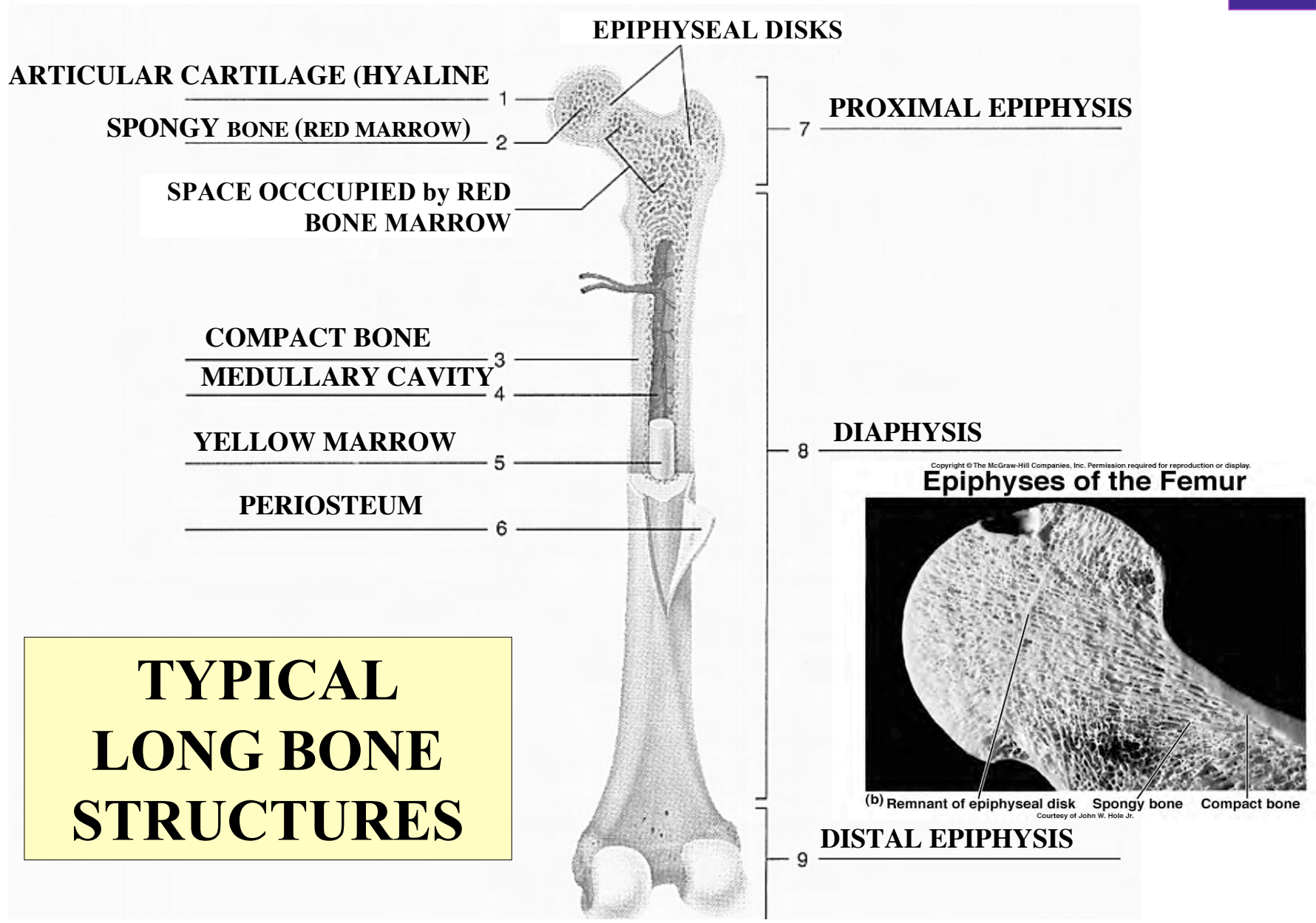
(e) SESAMOID (ROUND)



Long Bone

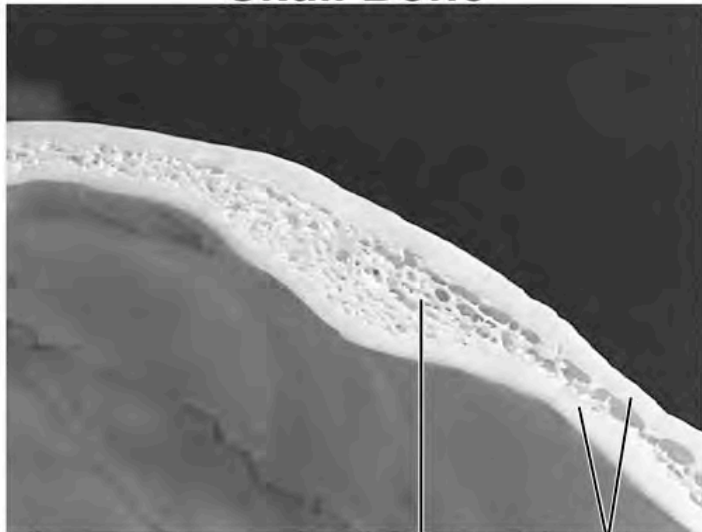


STRUCTURE & CLASSIFICATION



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Skull Bone



(c) Spongy bone Compact bone
Courtesy of John W. Hole Jr.

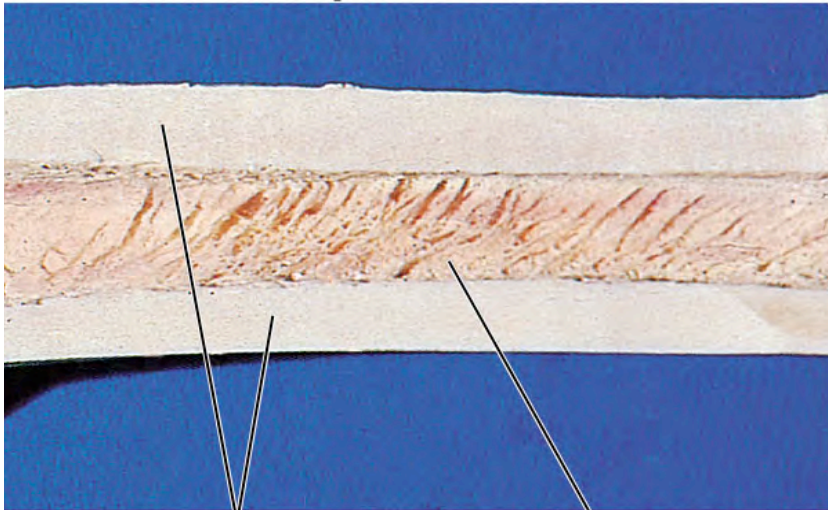
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COMPACT BONE

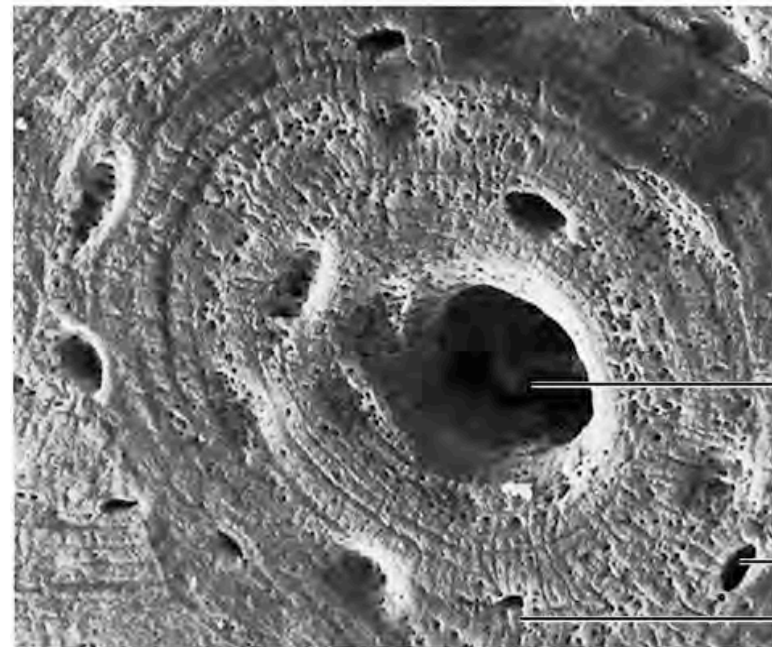
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Compact Bone



Compact bone Yellow marrow in medullary cavity
Copyright Lester Bergman & Associates



Osteon in Compact Bone

Osteonic canal

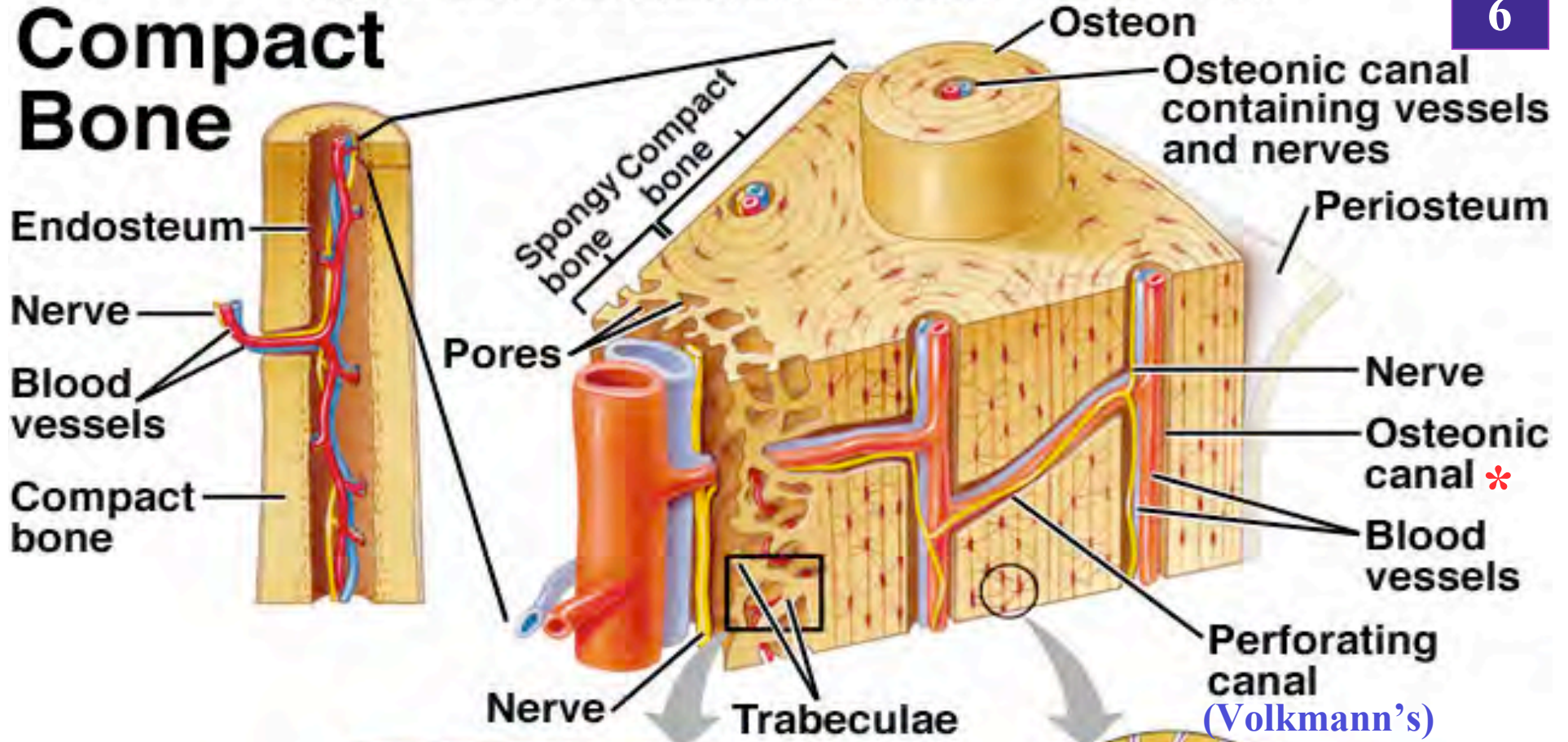
(HAVERSIAN)

Lacuna

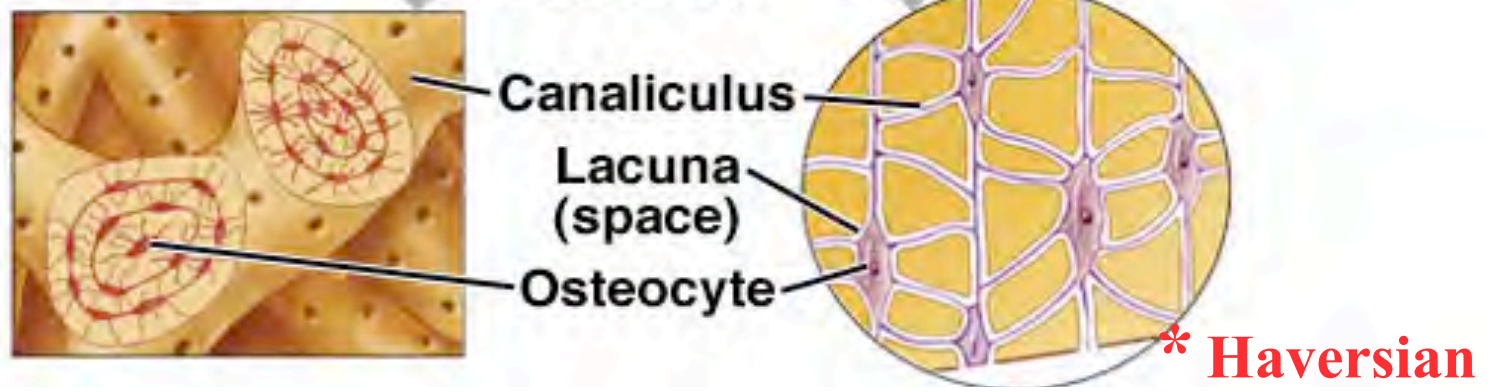
Canaliculus

Copyright R.G. Kessel & R.H. Kardon, Tissues and Organs: A Text-Atlas of Scanning Electron Microscopy, 1979 (W.H. Freeman & Co.)

Compact Bone



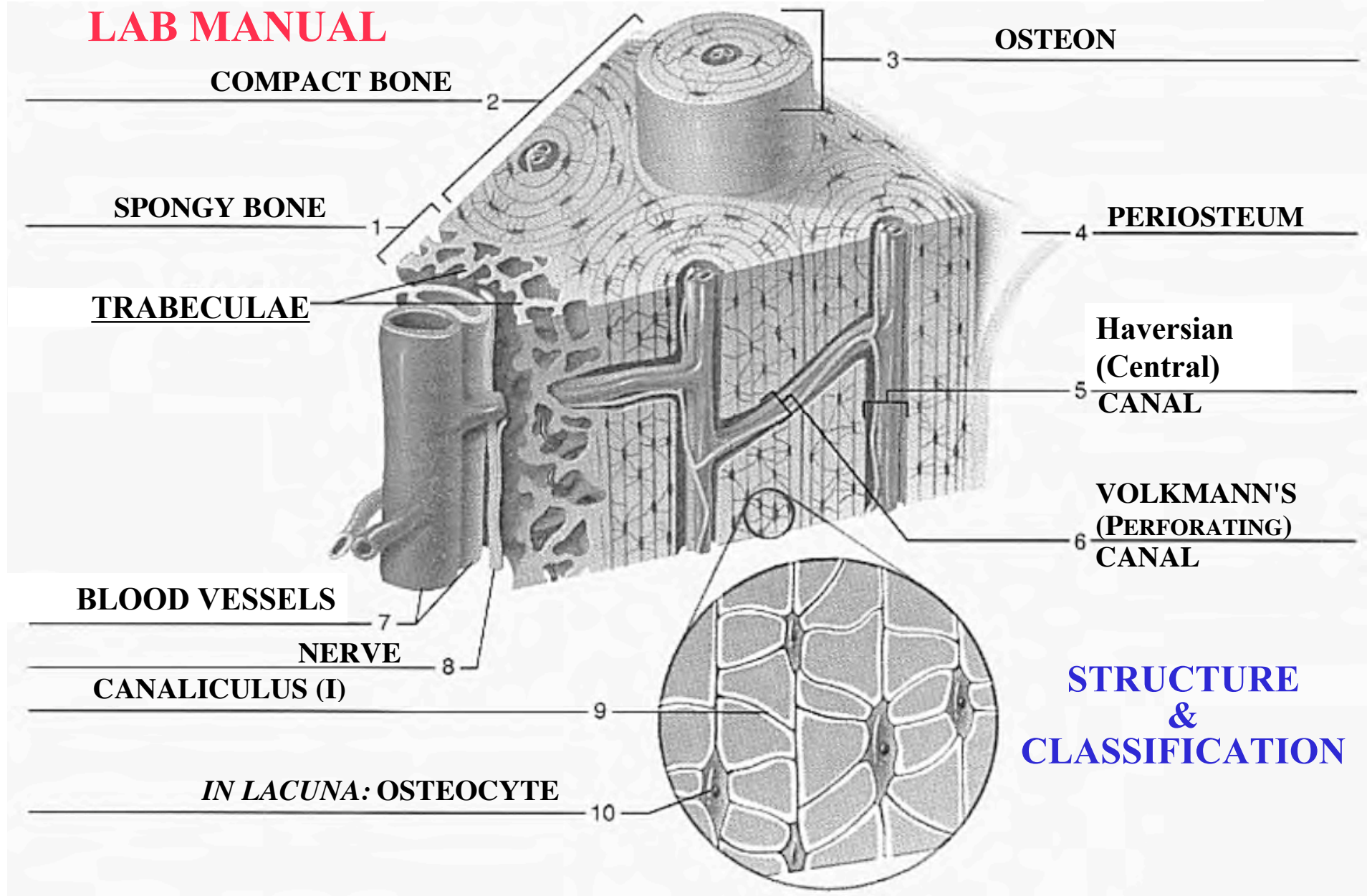
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* Haversian

COMPACT BONE

LAB MANUAL



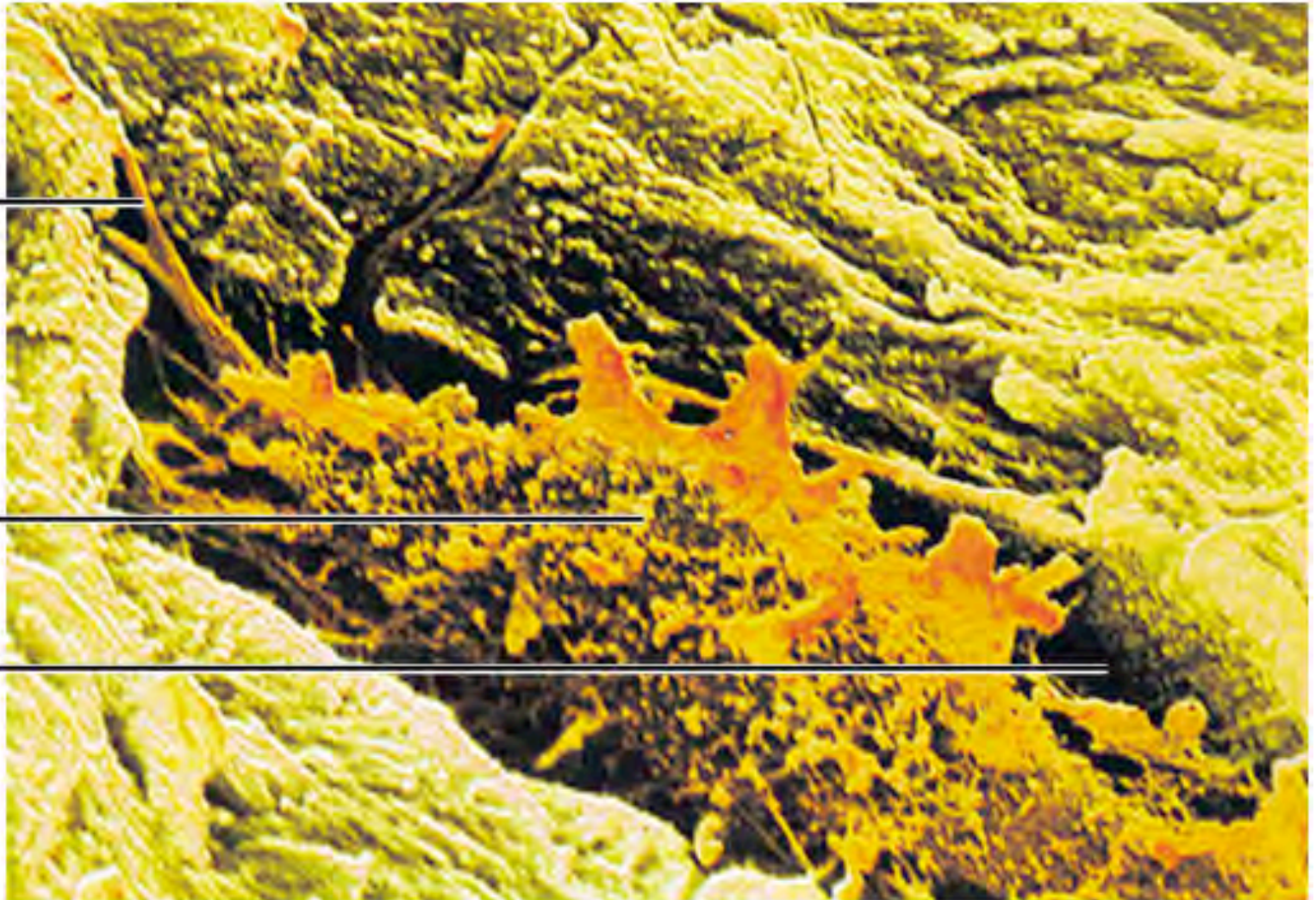
STRUCTURE & CLASSIFICATION

Osteocyte within Lacuna

Cell
process in
canaliculus

Osteocyte

Lacuna



PART A

Complete the following statements:

1. A bone that is platelike is classified as a(an) FLAT bone.
2. The bones of the wrist are examples of SHORT bones.
3. The bone of the thigh is an example of a(an) LONG bone.
4. Vertebrae are examples of IRREGULAR bones. ROUND OR SESAMOID
5. The patella (kneecap) is an example of a very large SESAMOID bone.
6. The bones of the skull that form a protective covering of the brain are examples of FLAT bones.
7. Distinguish between the epiphysis and the diaphysis of a long bone. EPIPHYSIS: EXPANDED ENDS OF A LONG BONE
DIAPHYSIS: SHAFT BETWEEN THE ENDS OF A LONG BONE.
8. Describe where cartilage is found on a long bone. _____
HYALINE CARTILAGE COVERS THE ARTICULAR ENDS OF A LONG BONE.
9. Describe where dense connective tissue is found on a long bone. _____
DENSE CT COMPRISES PERIOSTEUM THAT ENCLOSSES BONE (EXCEPT FOR ARTICULAR ENDS).
10. Distinguish between the periosteum and the endosteum. _____
PERIOSTEUM: OUTER COVERING OF A BONE
ENDOSTEUM: LINES HOLLOW, INTERNAL CHAMBERS

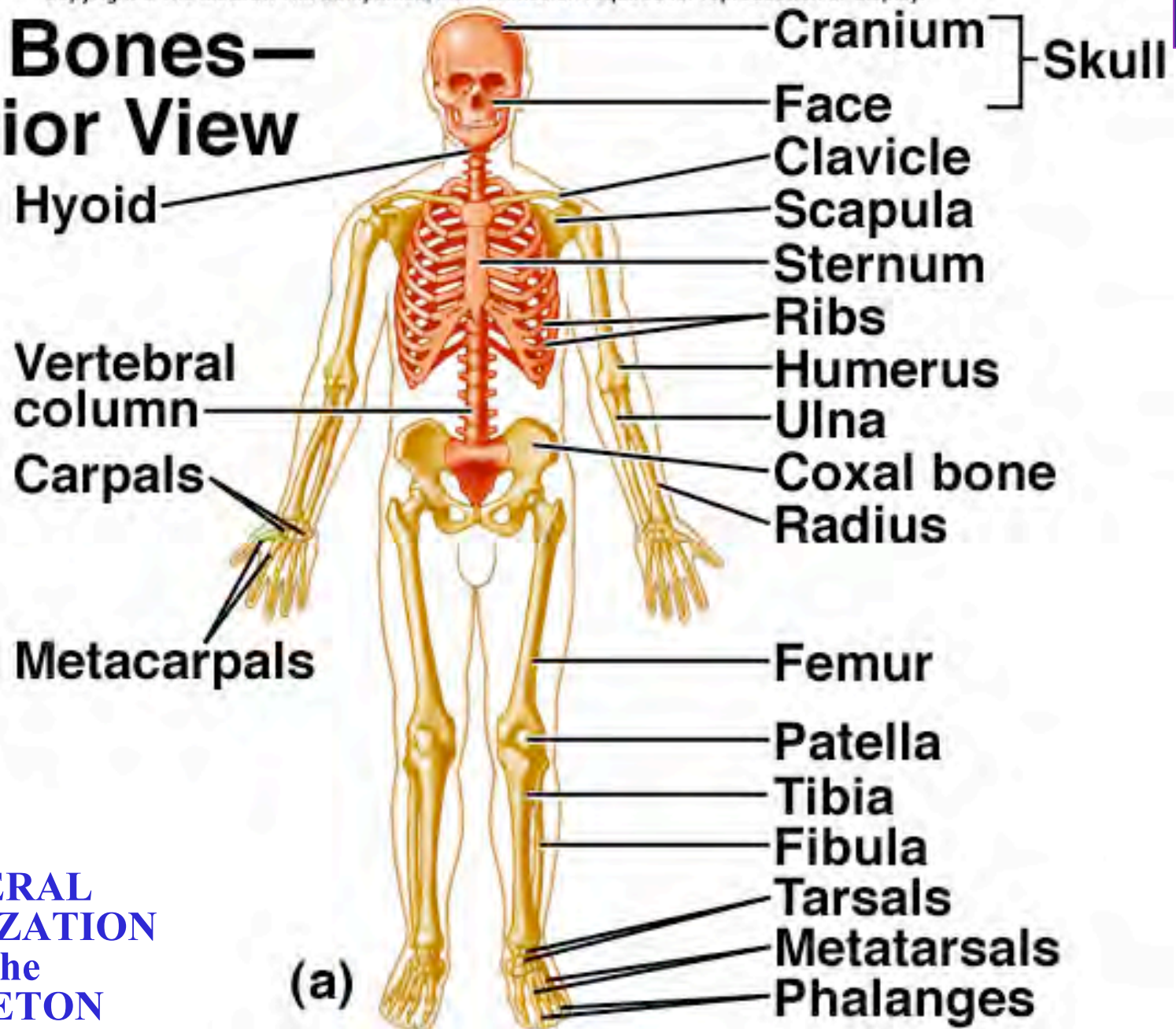
PART B

Complete the following:

1. What differences did you note between the structure of compact bone and spongy bone? _____
COMPACT BONE: OSTEONS PACKED CLOSELY TOGETHER
SPONGY BONE: LARGE SPACES BETWEEN BONY PLATES (TRABECULAE).
2. How are these differences related to the functions of these types of bone? _____
COMPACT BONE: STRENGTH IN SHAFT & BONE BORDER
SPONGY BONE: WEIGHT REDUCTION OF BONE & RED MARROW SPACE.
3. From your observations, how does the marrow in the medullary cavity compare with the marrow in the spaces of the spongy bone? _____
MEDULLARY CAVITY: MARROW IS YELLOW
SPONGY BONE: RED MARROW

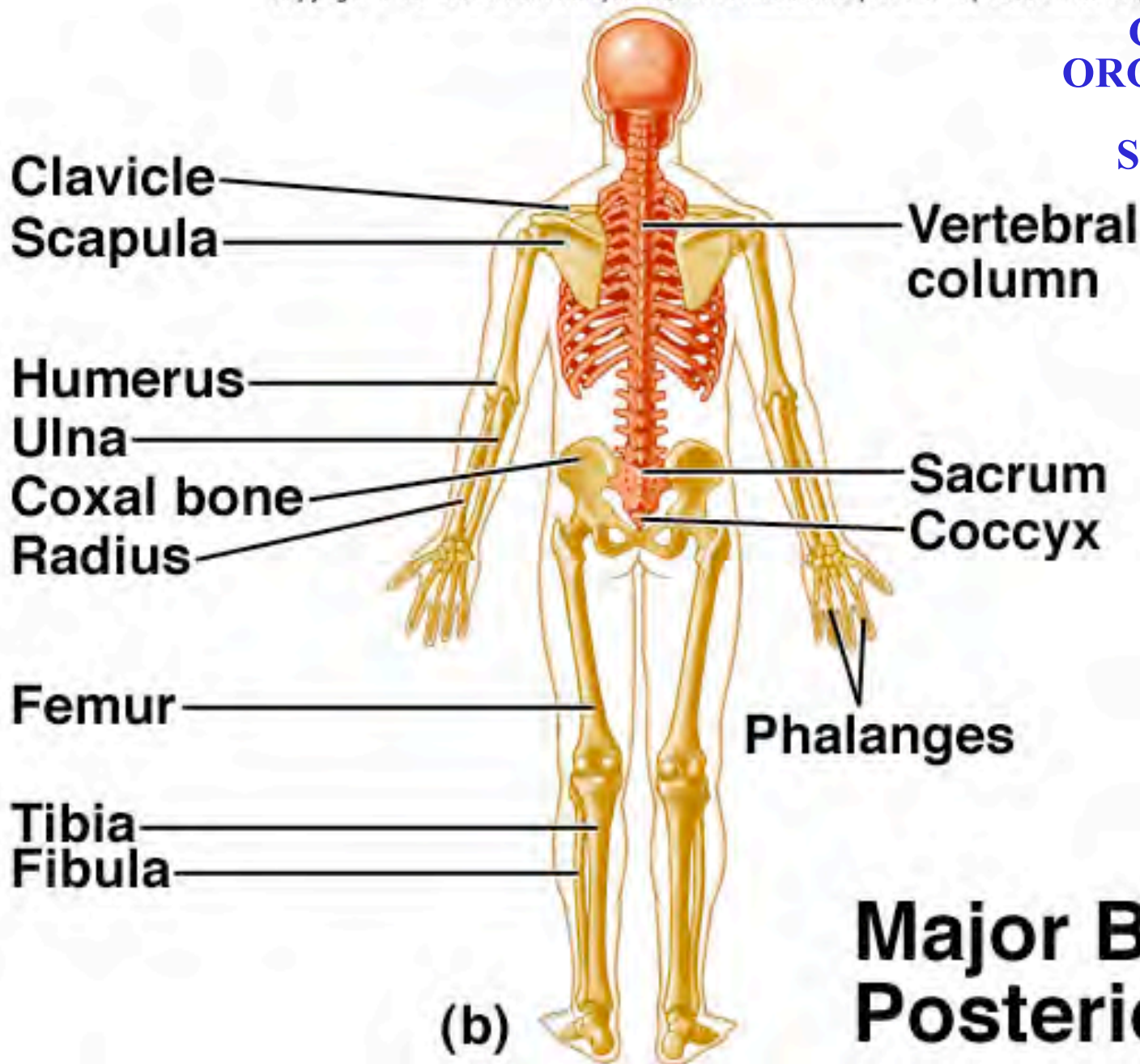
STRUCTURE & CLASSIFICATION LAB MANUAL

Major Bones— Anterior View



**GENERAL
ORGANIZATION
of the
SKELETON**

GENERAL ORGANIZATION of the SKELETON



Major Bones— Posterior View

Self-Test

Skeleton: General

<http://www.bio.psu.edu/faculty/strauss/anatomy/skel/skeletal.htm>

**Students are responsible for all
of the material in
Exercises 11 and 12
(Laboratory Manual)**

Last Plate