



**COMMONWEALTH OF KENTUCKY  
JUSTICE CABINET  
DIVISION OF KENTUCKY STATE MEDICAL  
EXAMINER'S OFFICE**

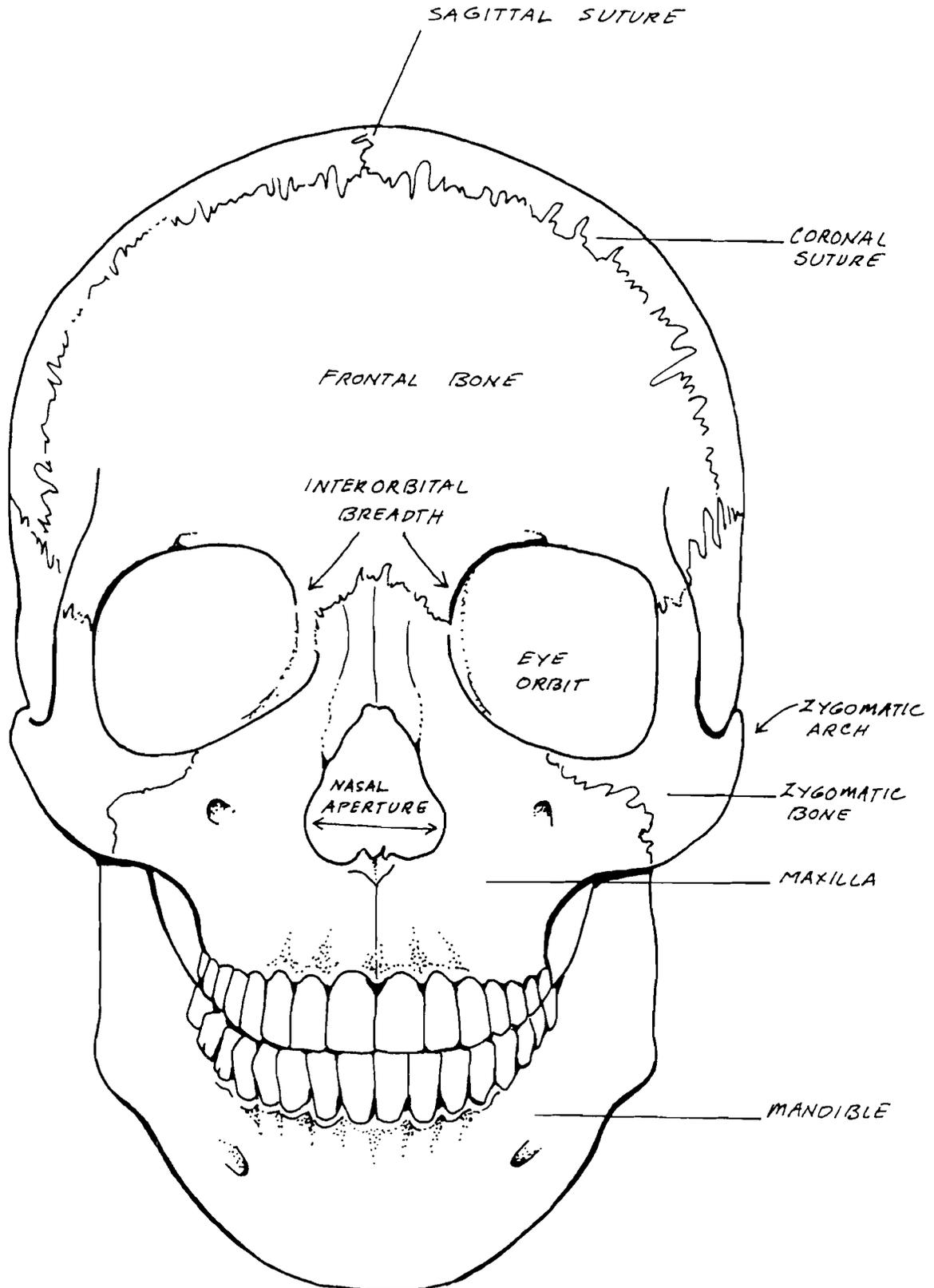
# **OSTEOLOGY HANDBOOK**

**PREPARED BY  
EMILY A. CRAIG, Ph.d.  
FORENSIC ANTHROPOLOGIST**

**1997**

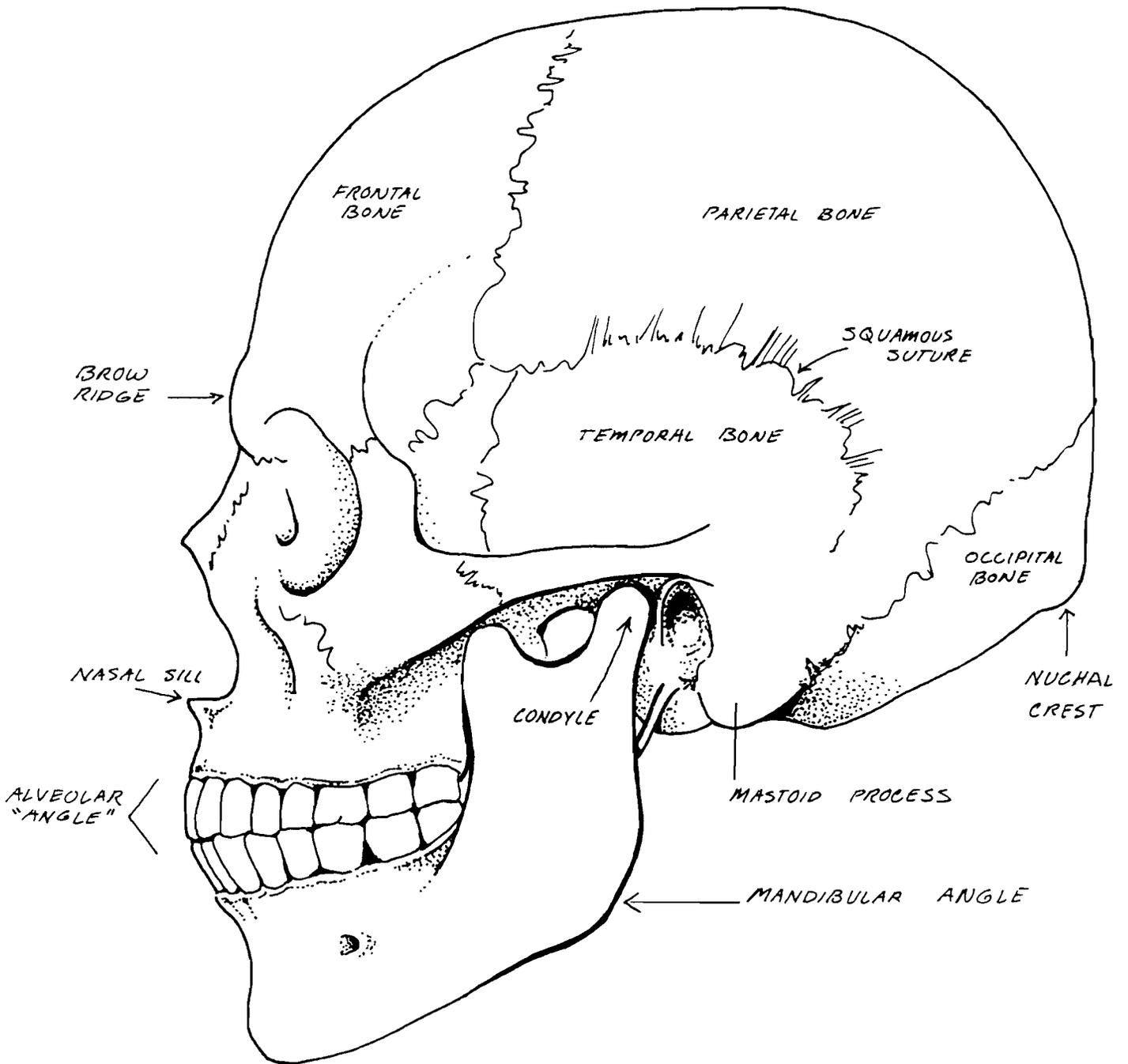
# SKULL

FIGURE 1: ANTERIOR VIEW OF THE SKULL.



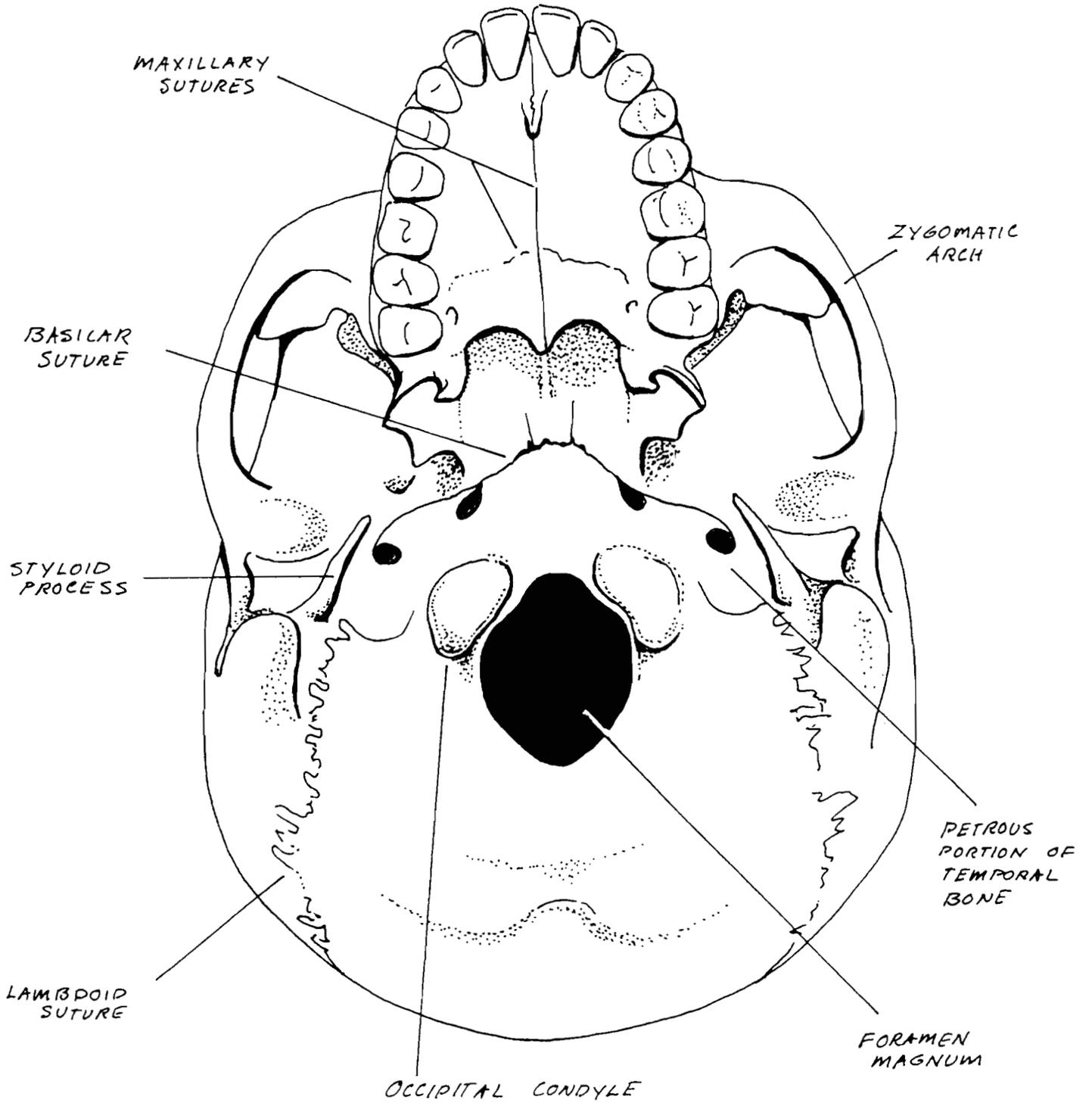
# SKULL

FIGURE 2 : LEFT SIDE OF THE SKULL.



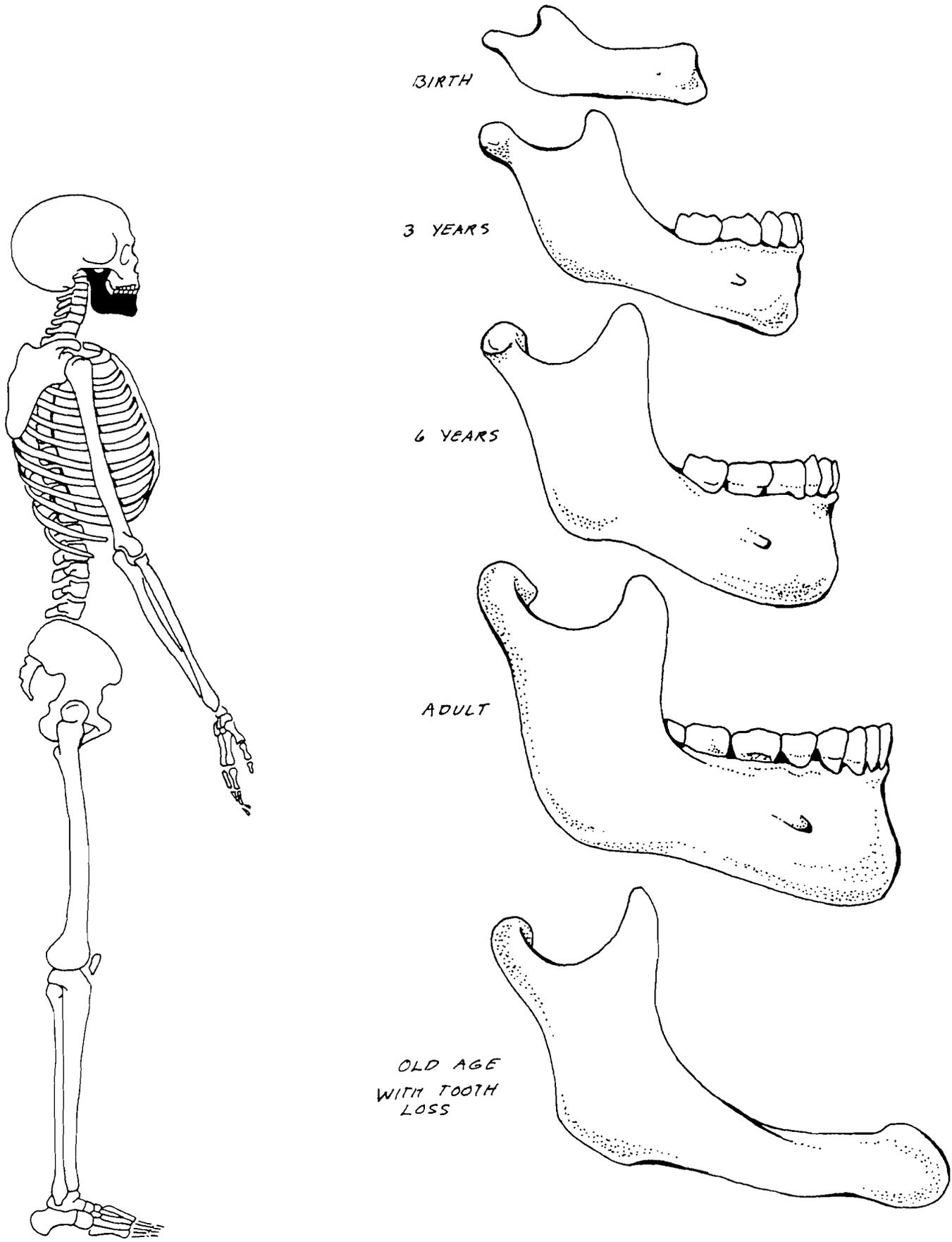
# SKULL

FIGURE 3: BASE OF THE SKULL.



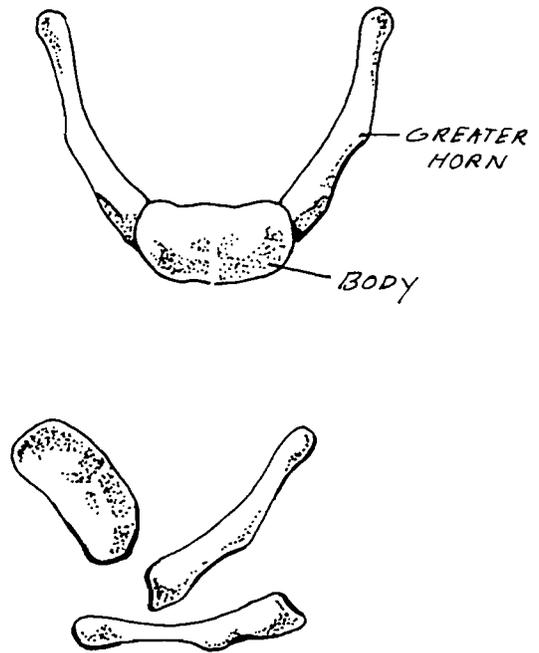
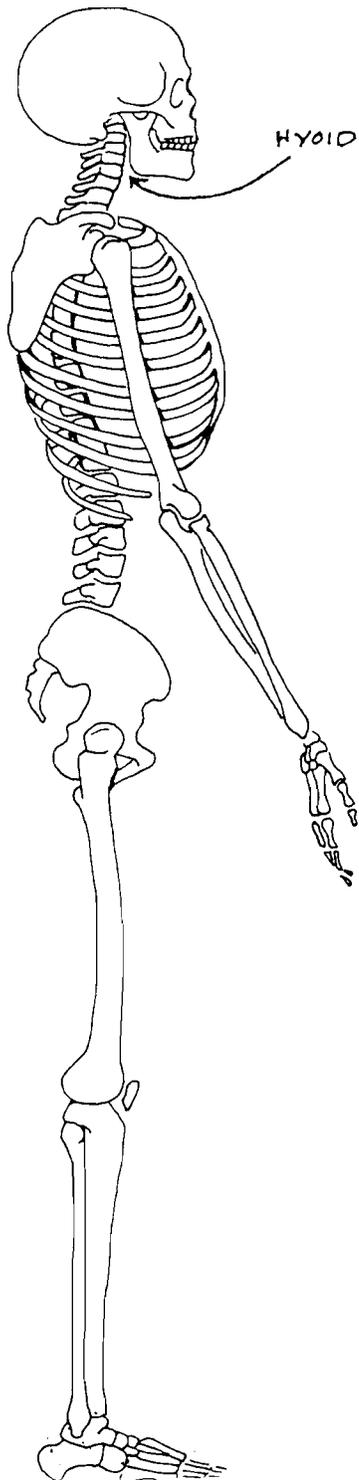
# MANDIBLE (JAW BONE)

FIGURE 4: MANDIBLE AT DIFFERENT STAGES OF GROWTH AND MATURATION.



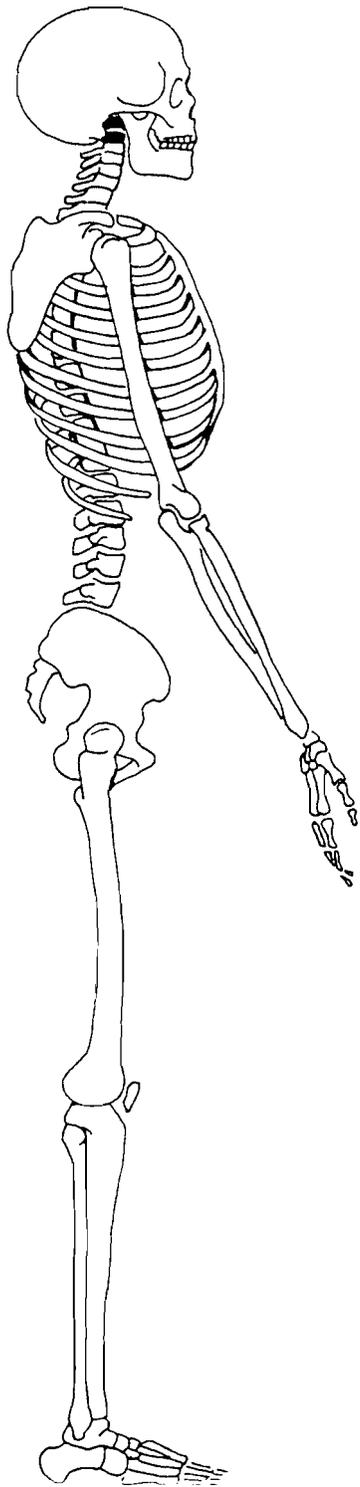
# HYOID

FIGURE 5: HYOID BONE SHOWN INTACT AND AS INDIVIDUAL UNFUSED SECTIONS.

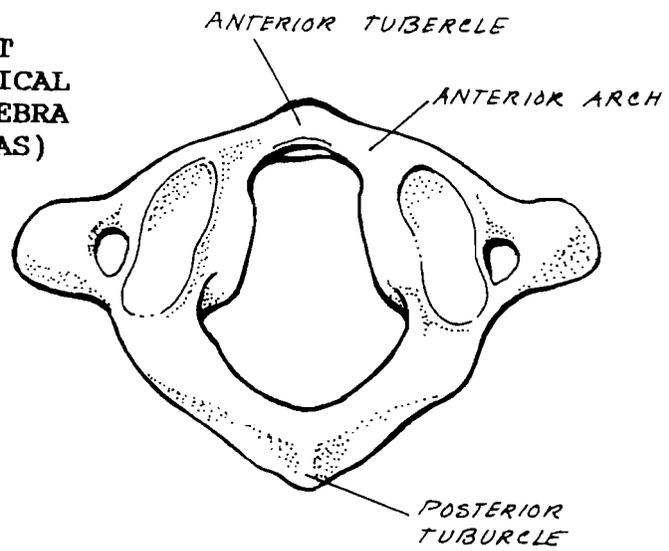


# CERVICAL VERTEBRAE

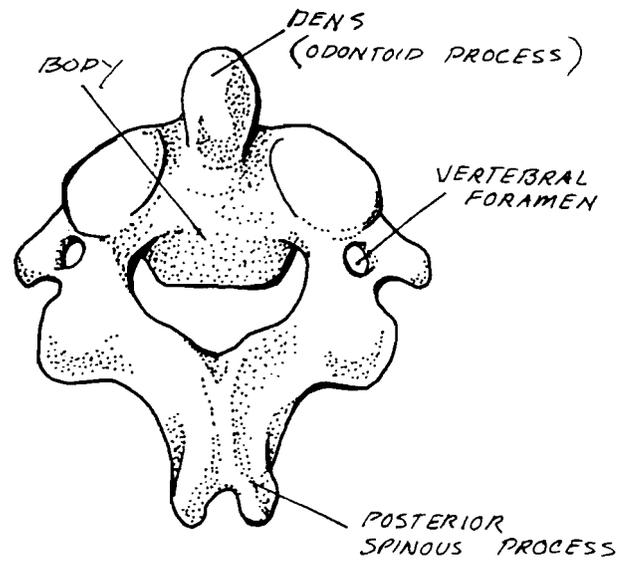
FIGURE 6: SUPERIOR VIEW OF FIRST 2 CERVICAL VERTEBRAE.



**FIRST  
CERVICAL  
VERTEBRA  
(ATLAS)**

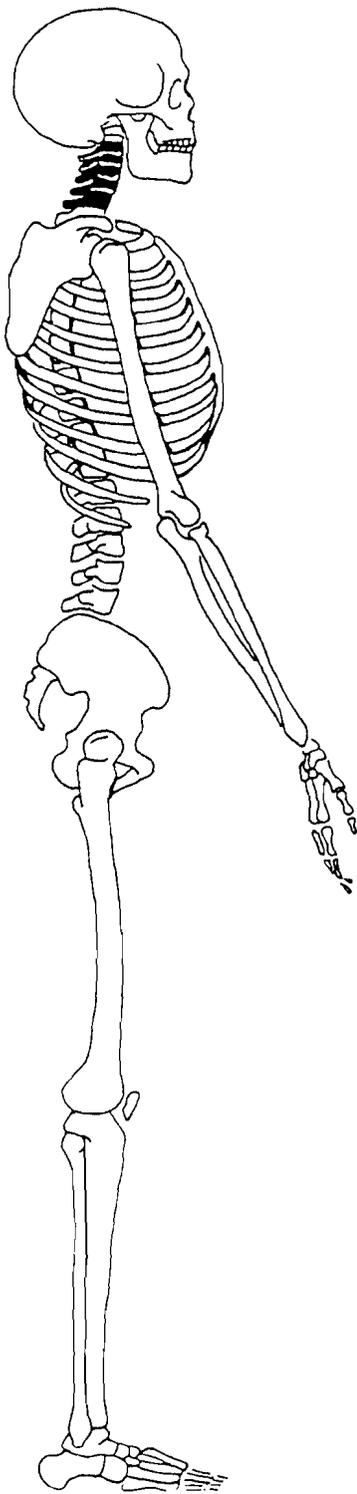


**SECOND  
CERVICAL  
VERTEBRA  
(AXIS)**

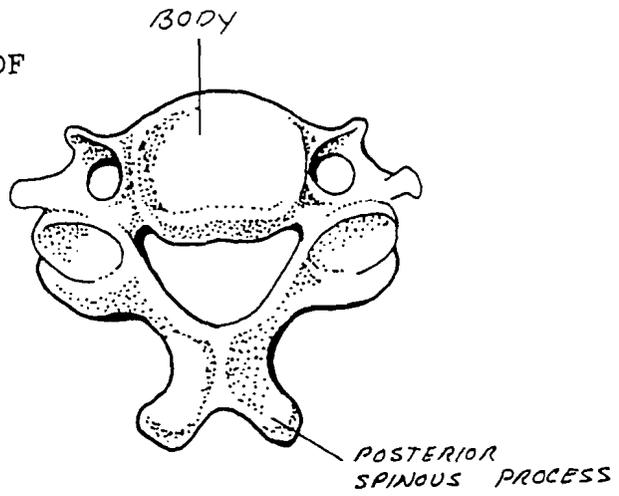


# CERVICAL VERTEBRAE

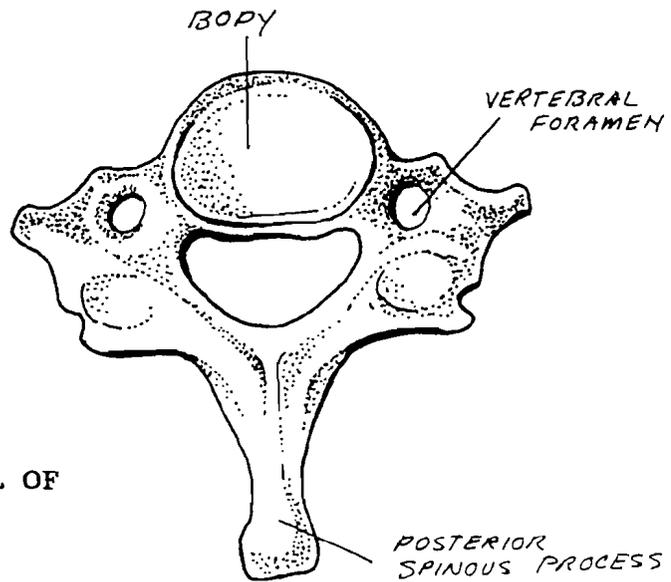
FIGURE 7: TYPICAL SHAPES OF CERVICAL VERTEBRAE.



TYPICAL OF  
C3-C5

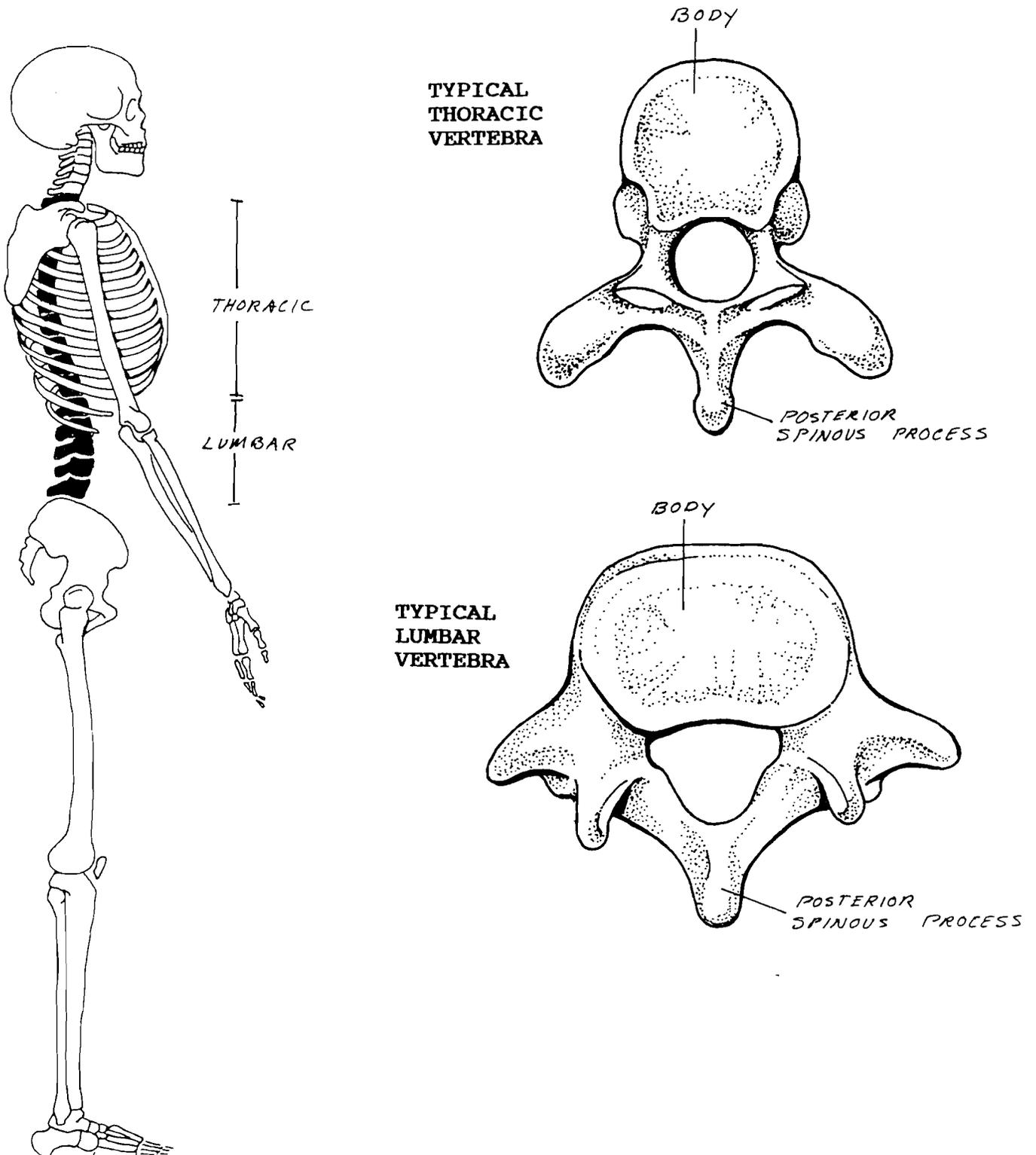


TYPICAL OF  
C7



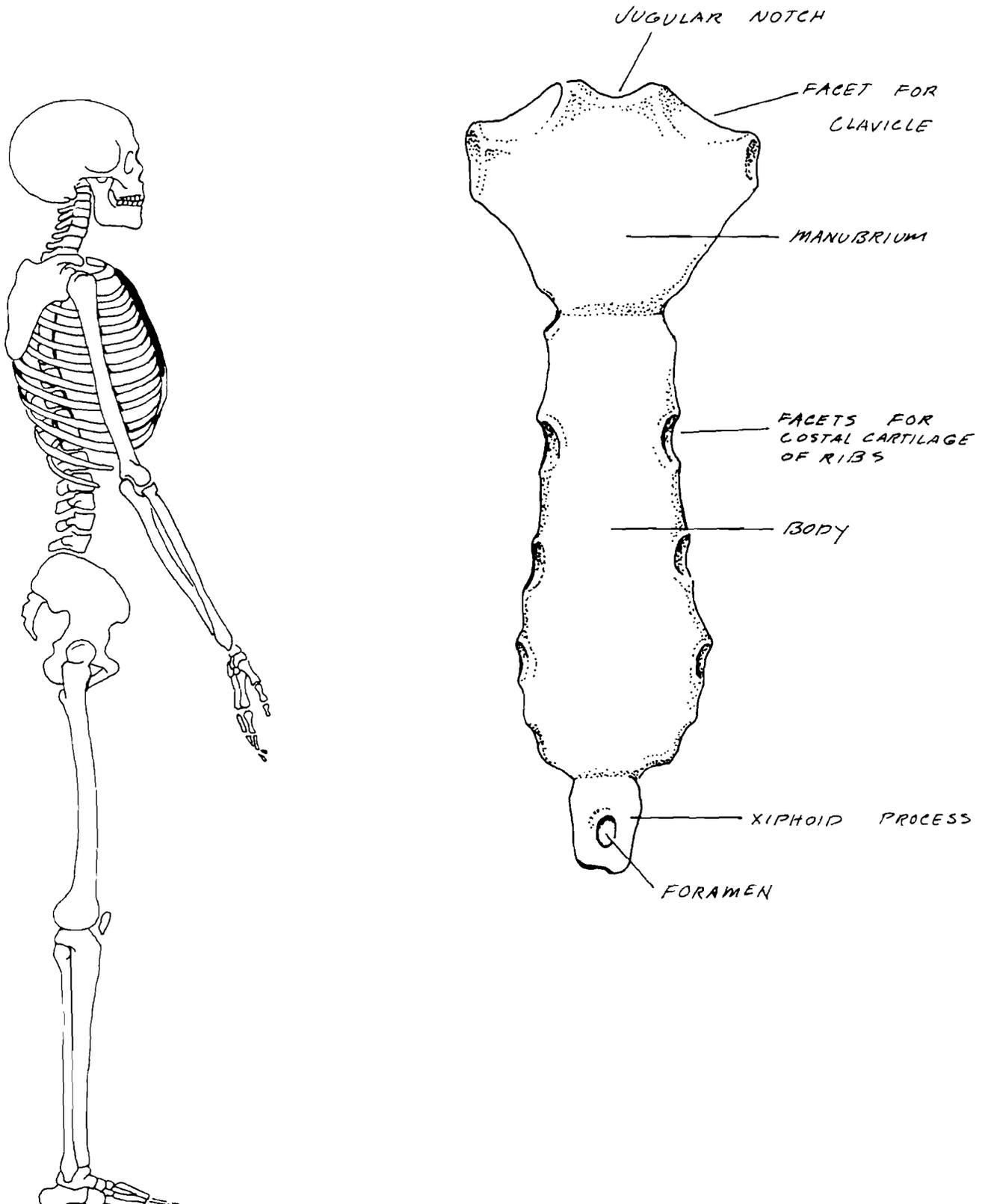
# THORACIC AND LUMBAR VERTEBRAE

FIGURE 8: SUPERIOR VIEW OF TYPICAL THORACIC AND LUMBAR VERTEBRAE.



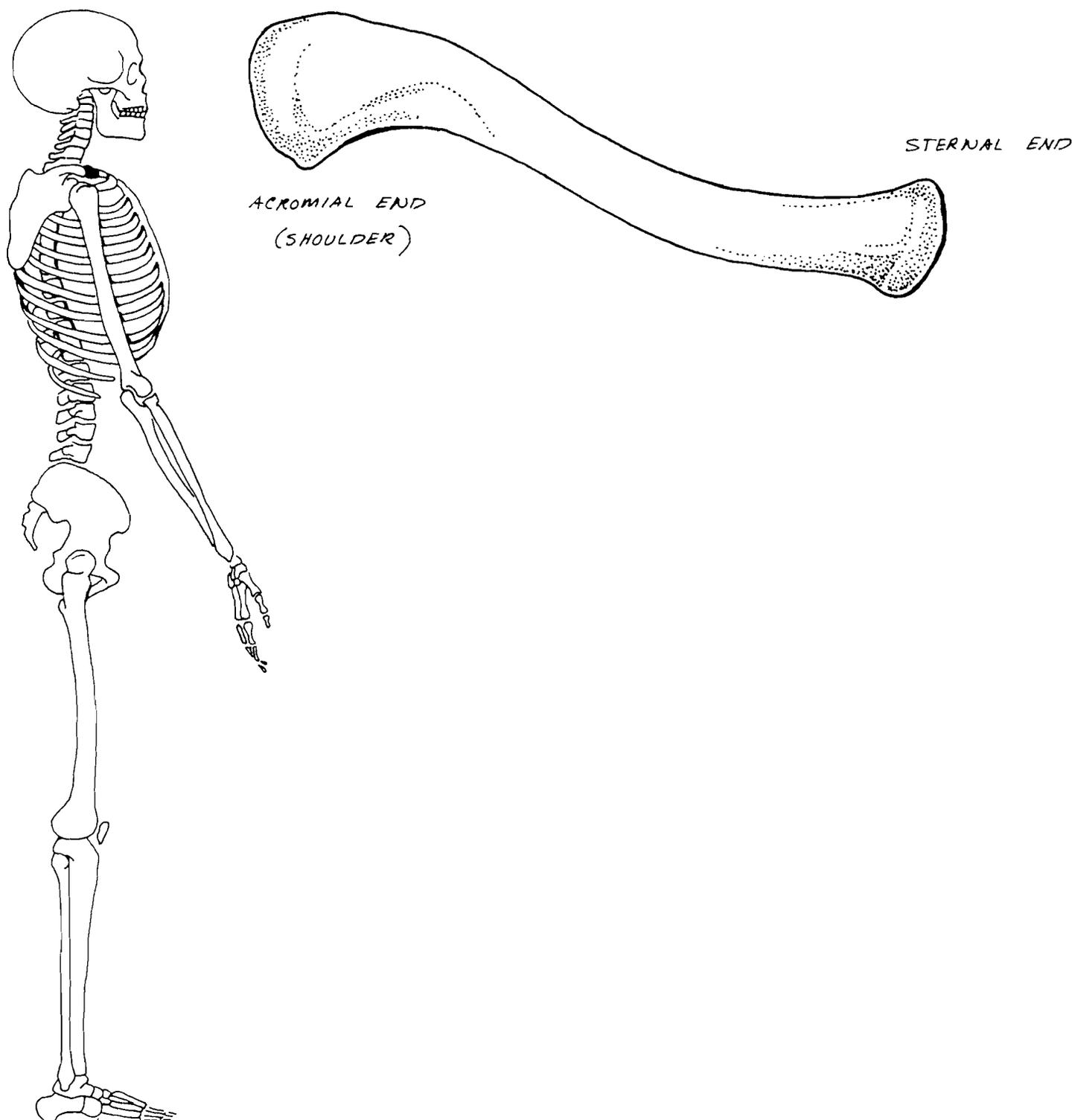
# STERNUM

FIGURE 9: ANTERIOR VIEW OF STERNUM (BREAST BONE).



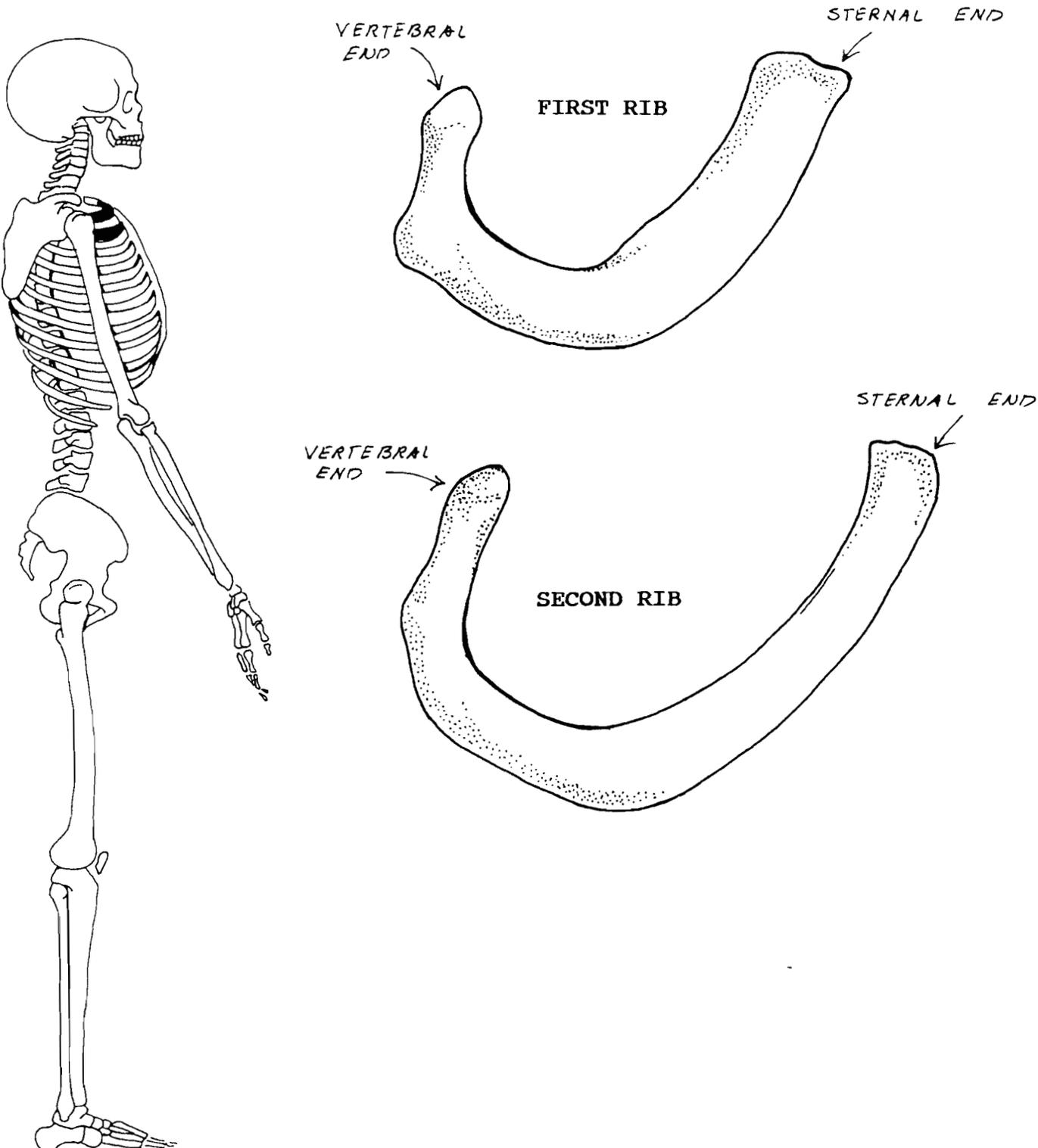
# CLAVICLE

FIGURE 10: SUPERIOR VIEW OF RIGHT CLAVICLE (COLLAR BONE).



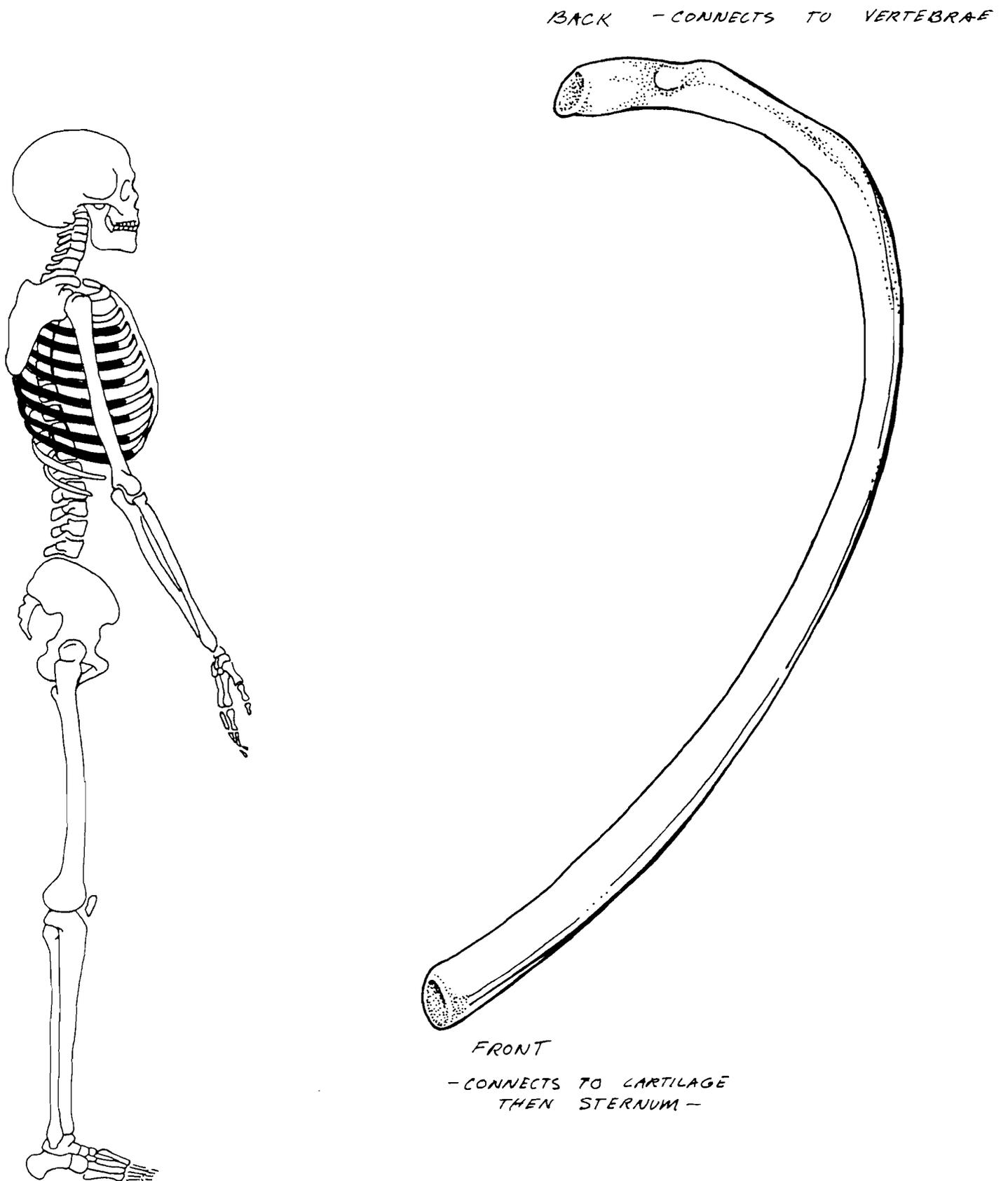
**RIBS**

**FIGURE 11: SUPERIOR VIEW OF FIRST TWO RIGHT RIBS.**



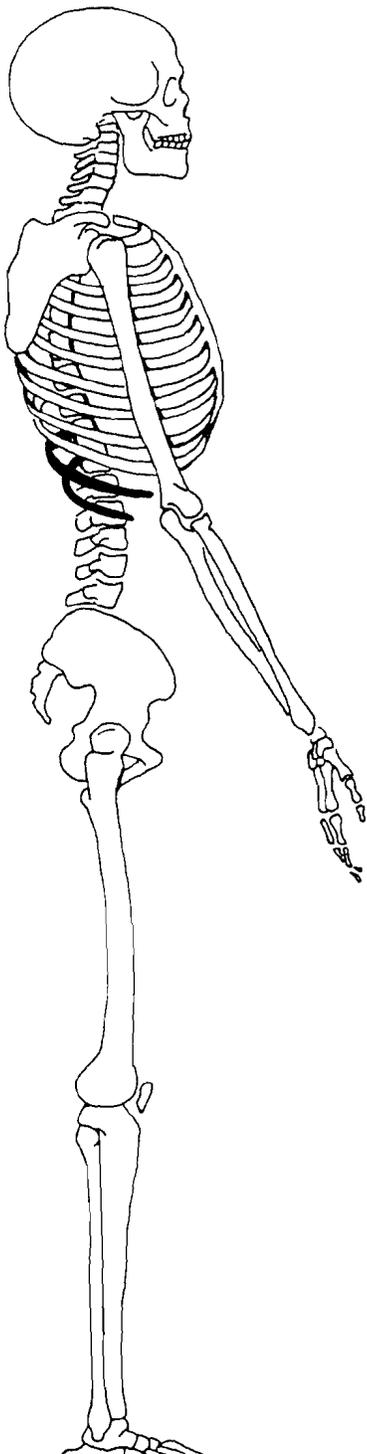
# RIB

FIGURE 12: TYPICAL OF RIBS 3-10. INFERIOR ASPECT OF RIGHT RIB #8.

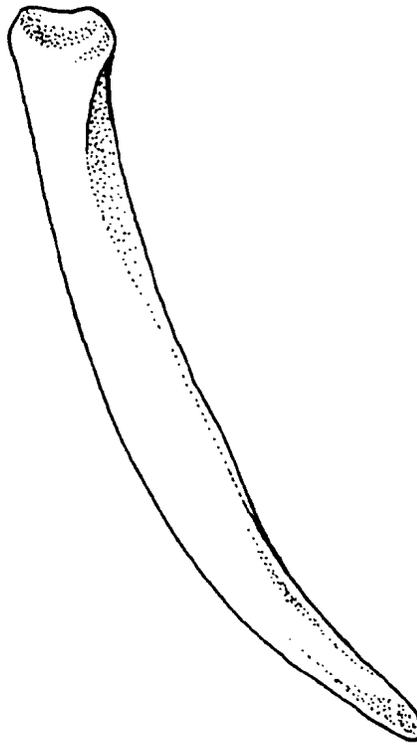


# RIB

FIGURE 13: TYPICAL OF RIBS 11-12. ANTERIOR ASPECT OF RIGHT RIB #12.



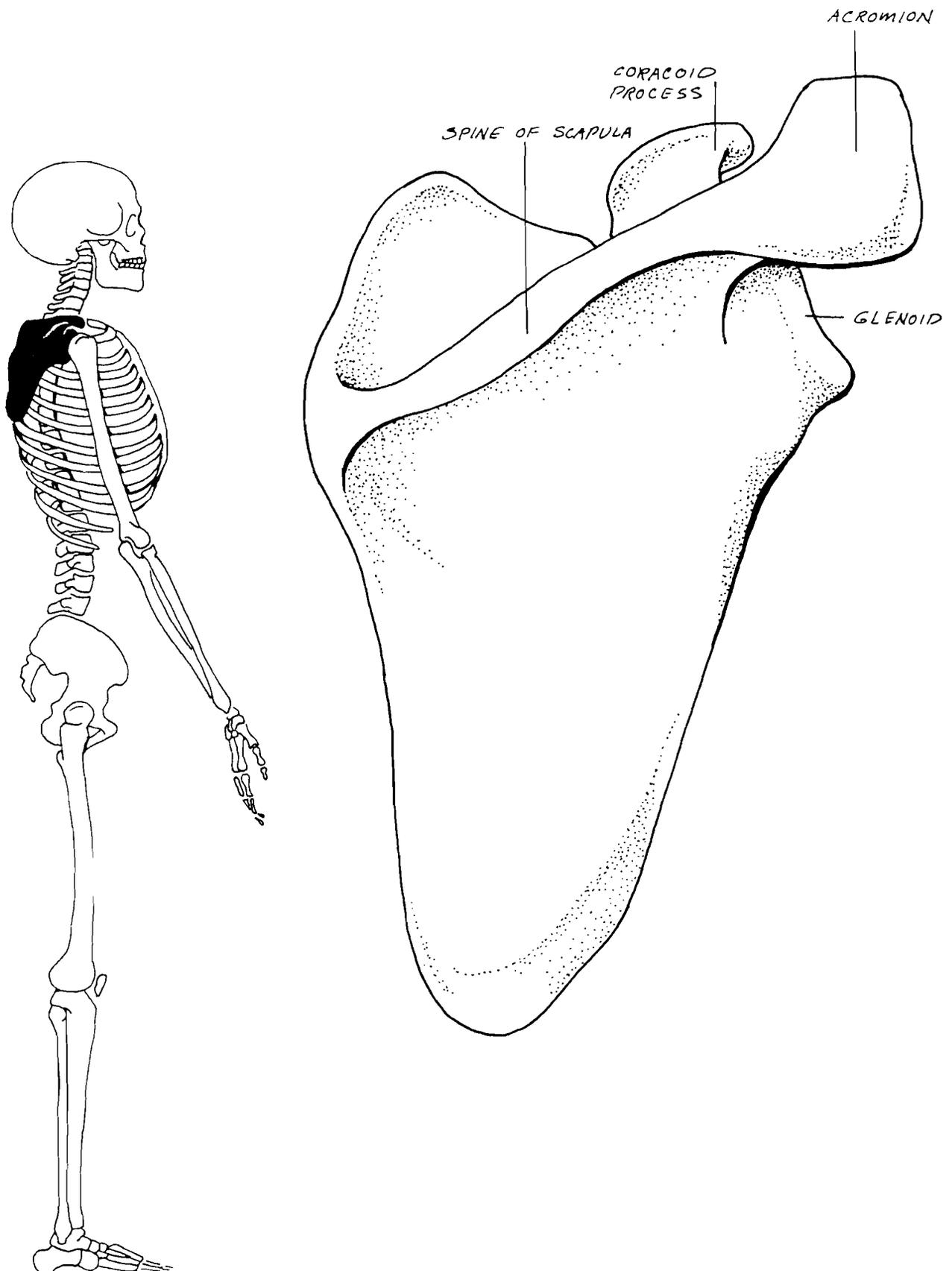
BACK - CONNECTS TO VERTEBRA



FRONT END "FREE"  
SO-CALLED FLOATING RIB

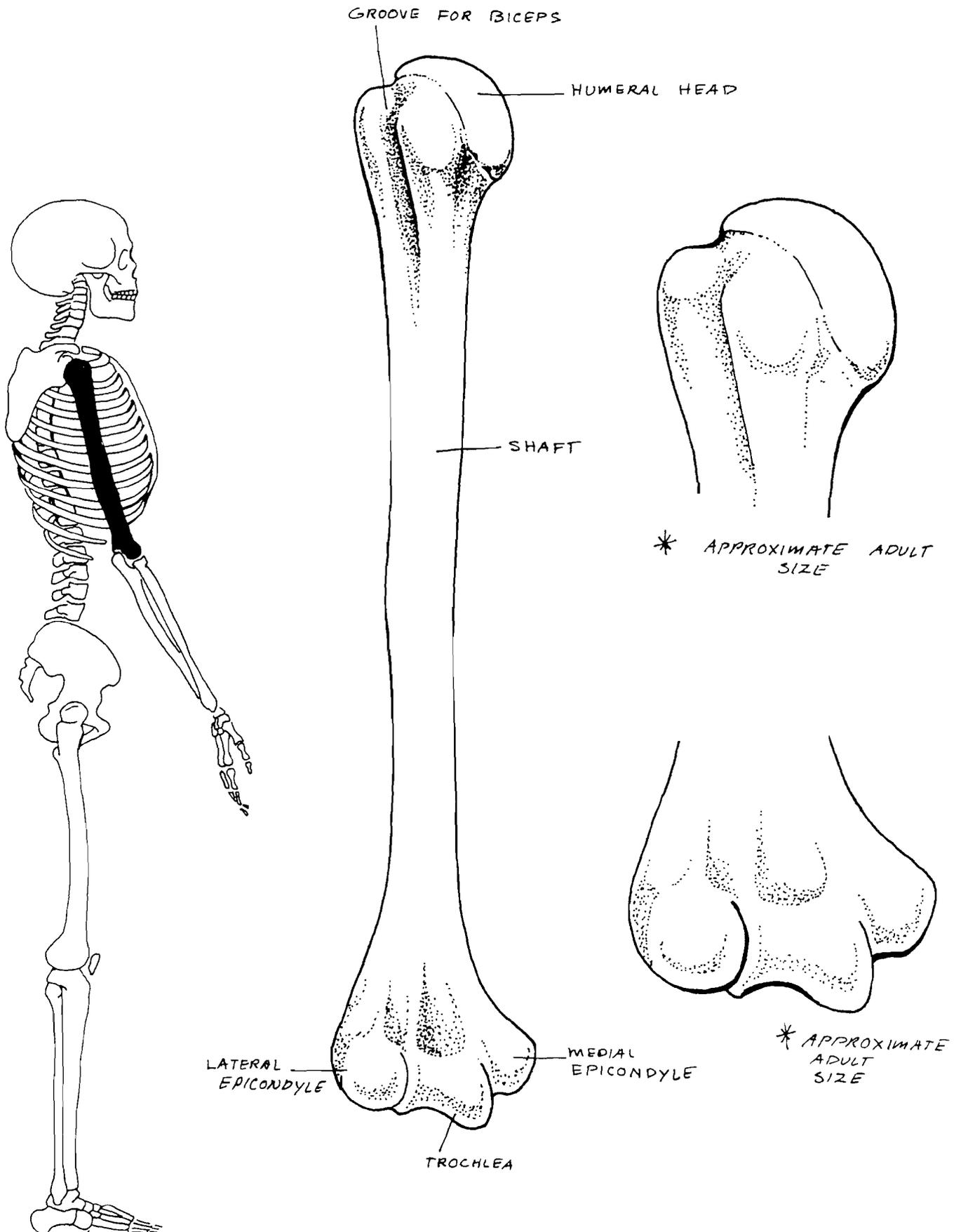
# SCAPULA

FIGURE 14: POSTERIOR ASPECT OF RIGHT SCAPULA (SHOULDER BLADE).



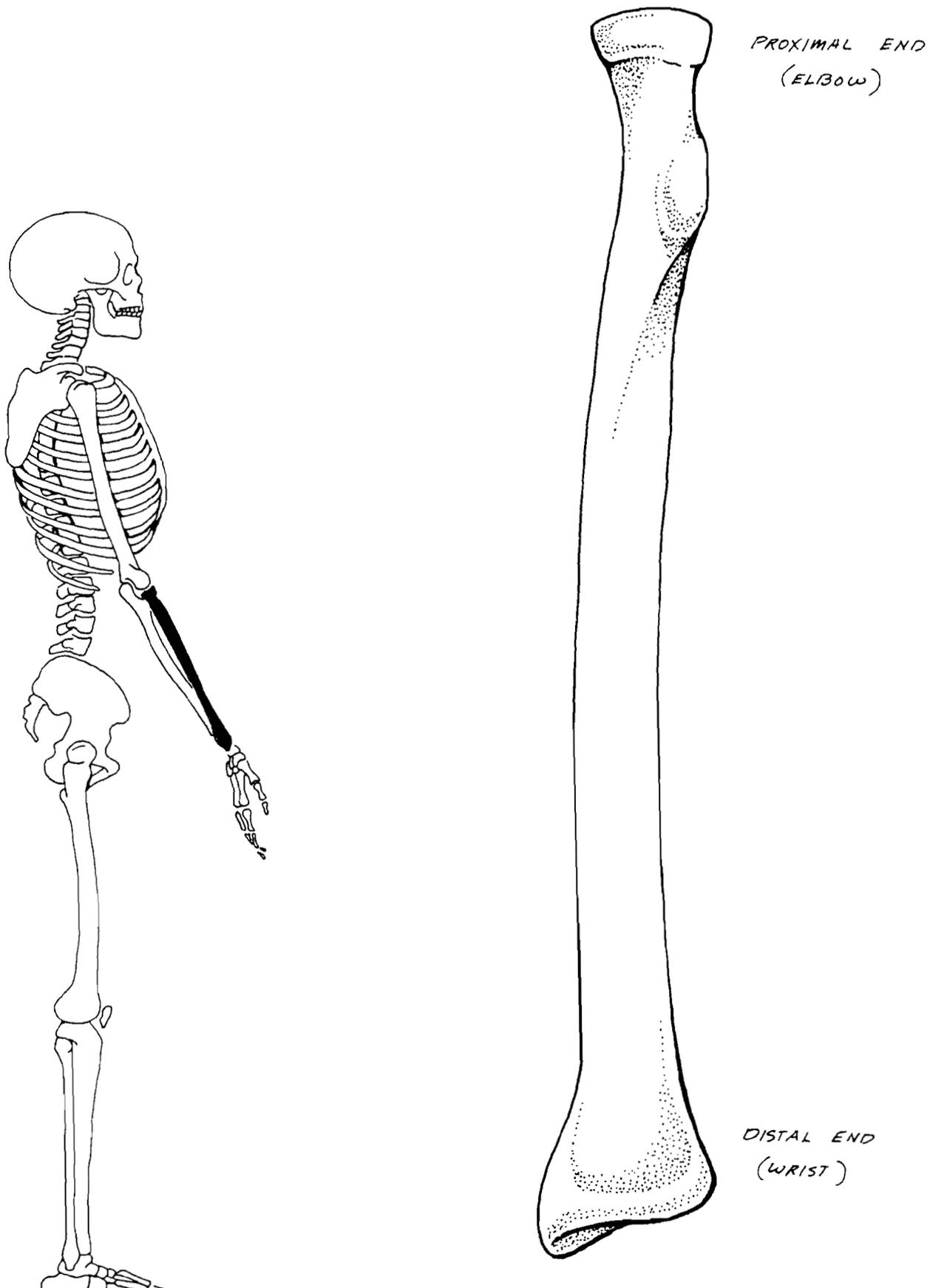
# HUMERUS

FIGURE 15: ANTERIOR VIEW OF RIGHT HUMERUS. ADULT JOINT SIZE SHOWN.



# RADIUS

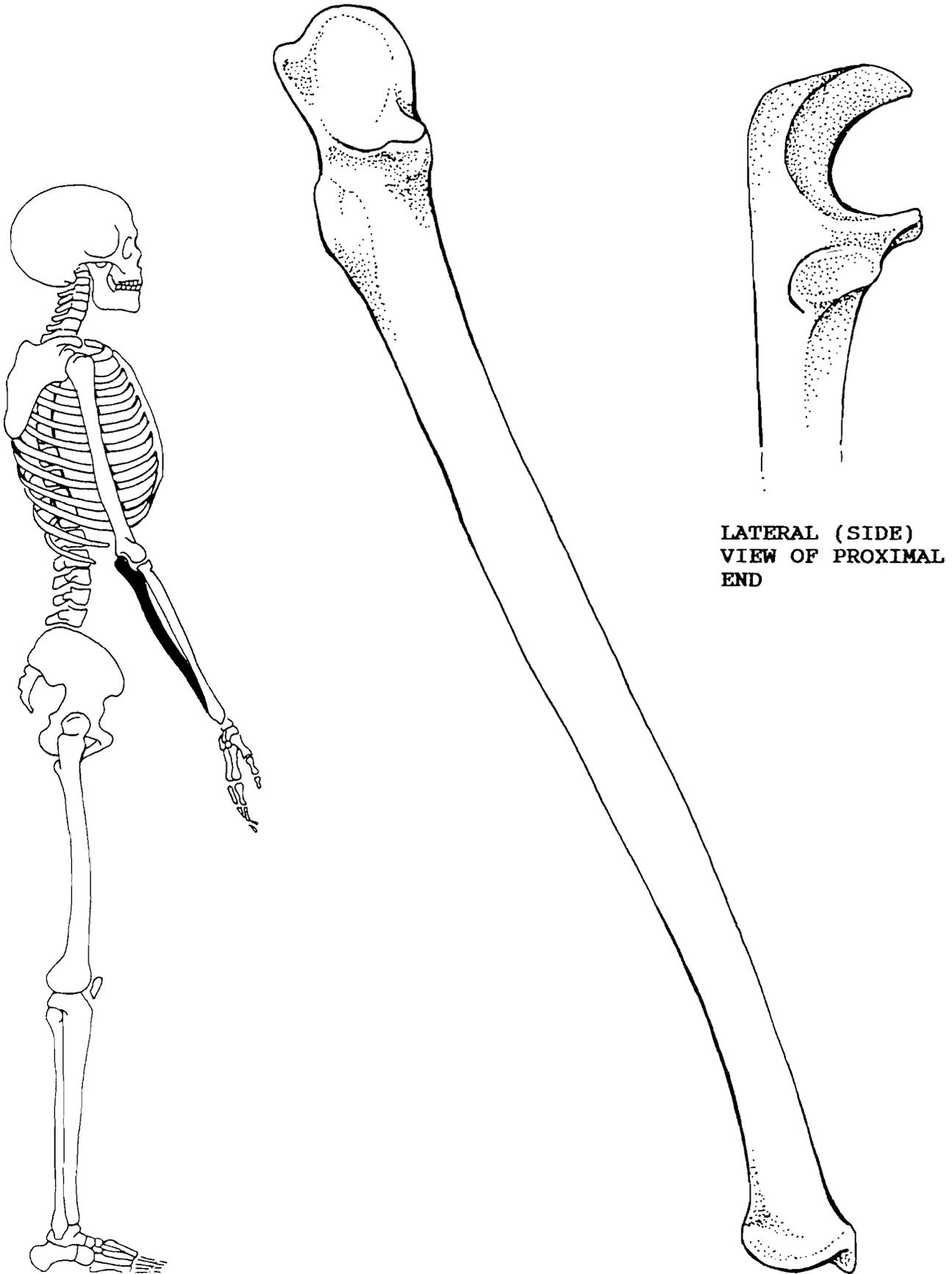
FIGURE 16: ANTERIOR ASPECT, RIGHT RADIUS. APPROXIMATE ADULT SIZE.



## ULNA

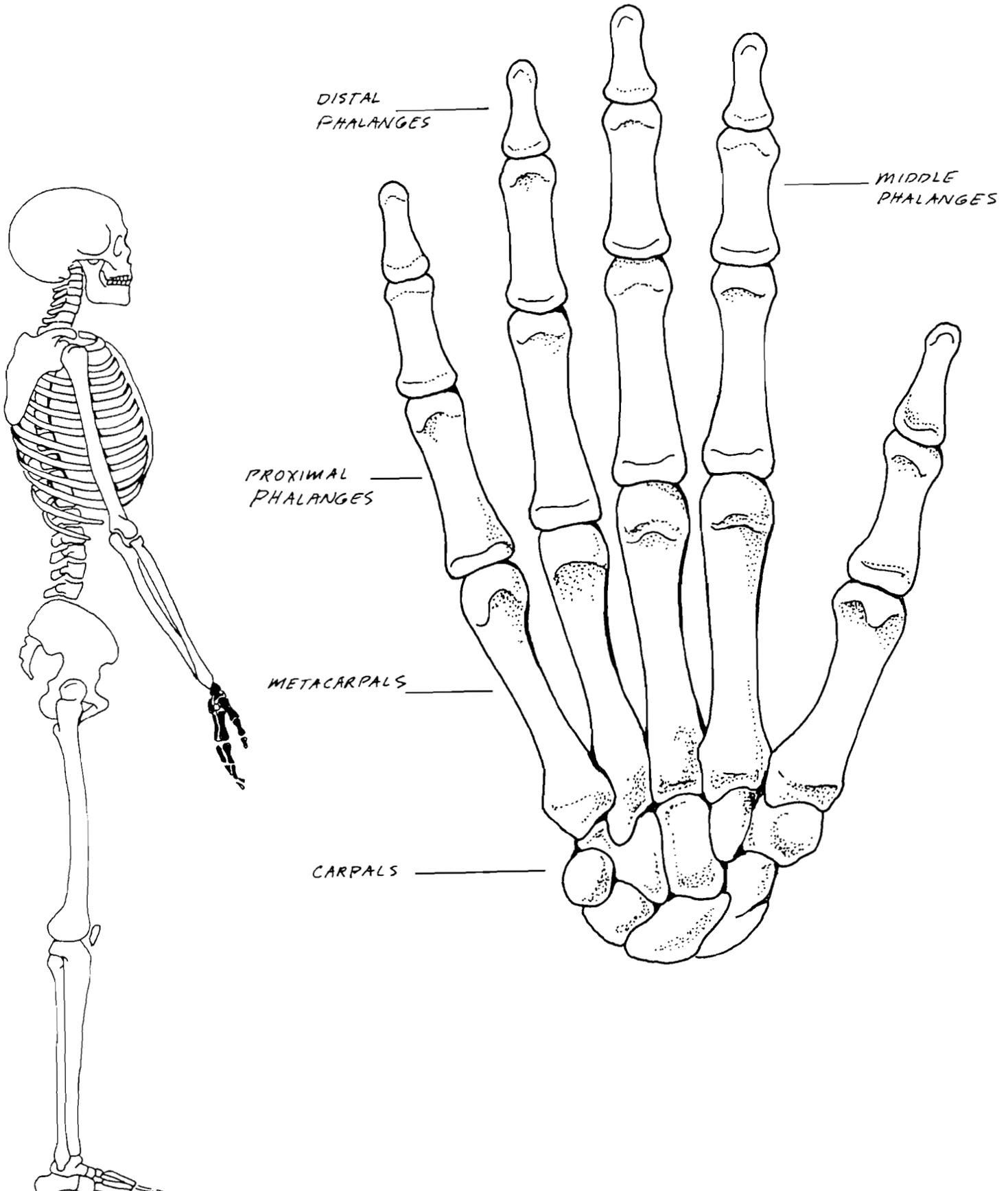
FIGURE 17: ANTERIOR AND LATERAL ASPECT OF RIGHT ULNA. LATERAL ASPECT SHOWS DISTINCTIVE SHAPE AT ELBOW.

APPROXIMATE LIFE SIZE.



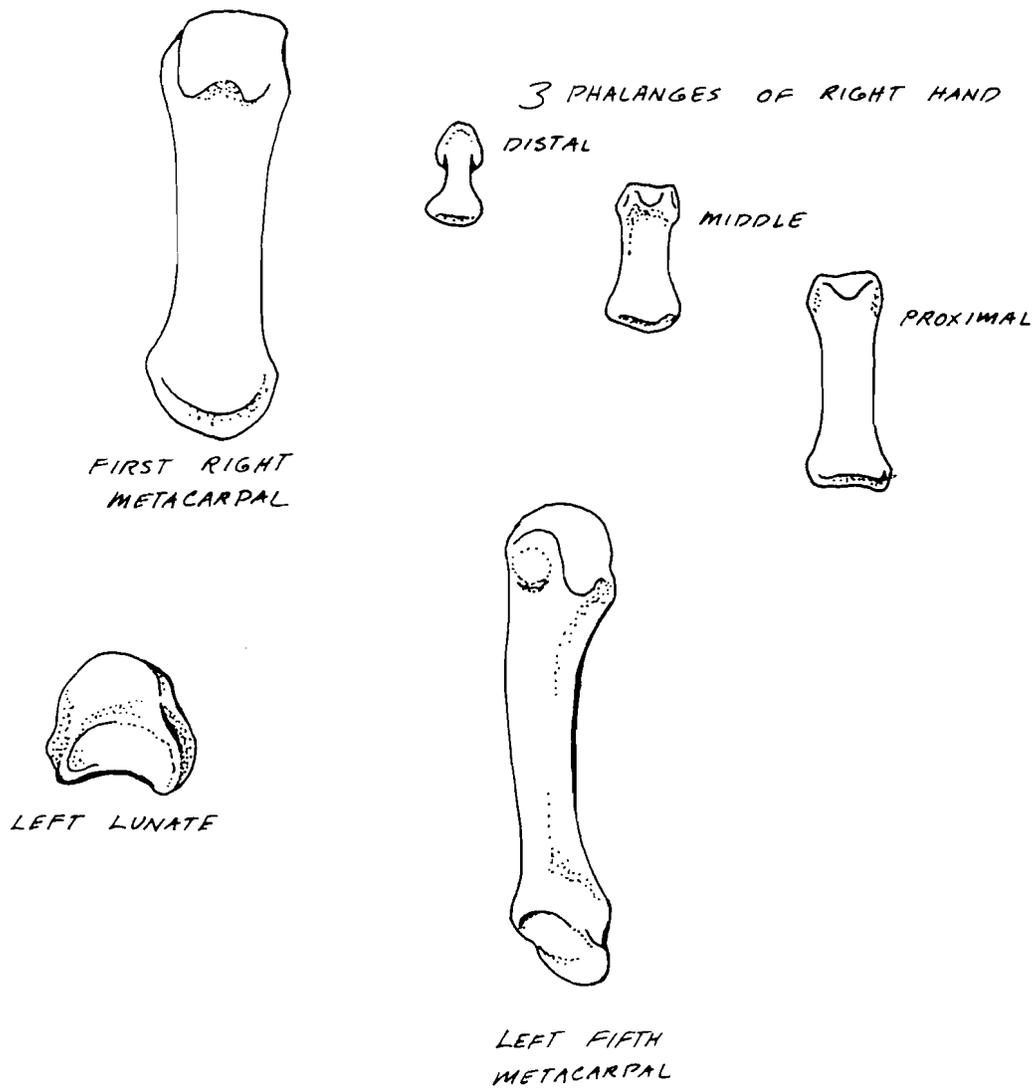
# HAND AND WRIST

FIGURE 18: PALM SURFACE OF THE RIGHT HAND AND WRIST (ARTICULATED).



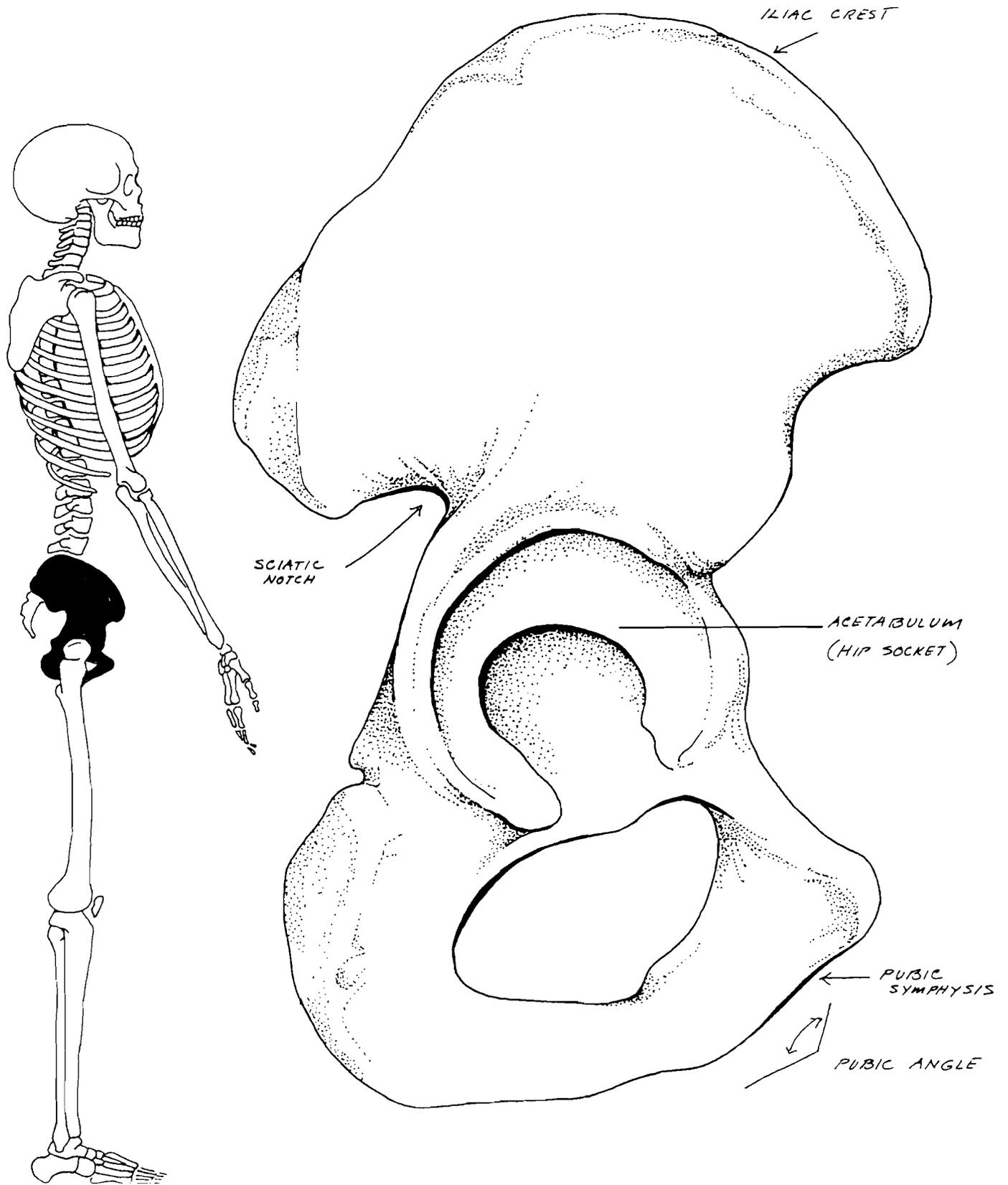
# HAND AND WRIST

FIGURE 19: SOME DISARTICULATED BONES OF THE HAND AND WRIST.



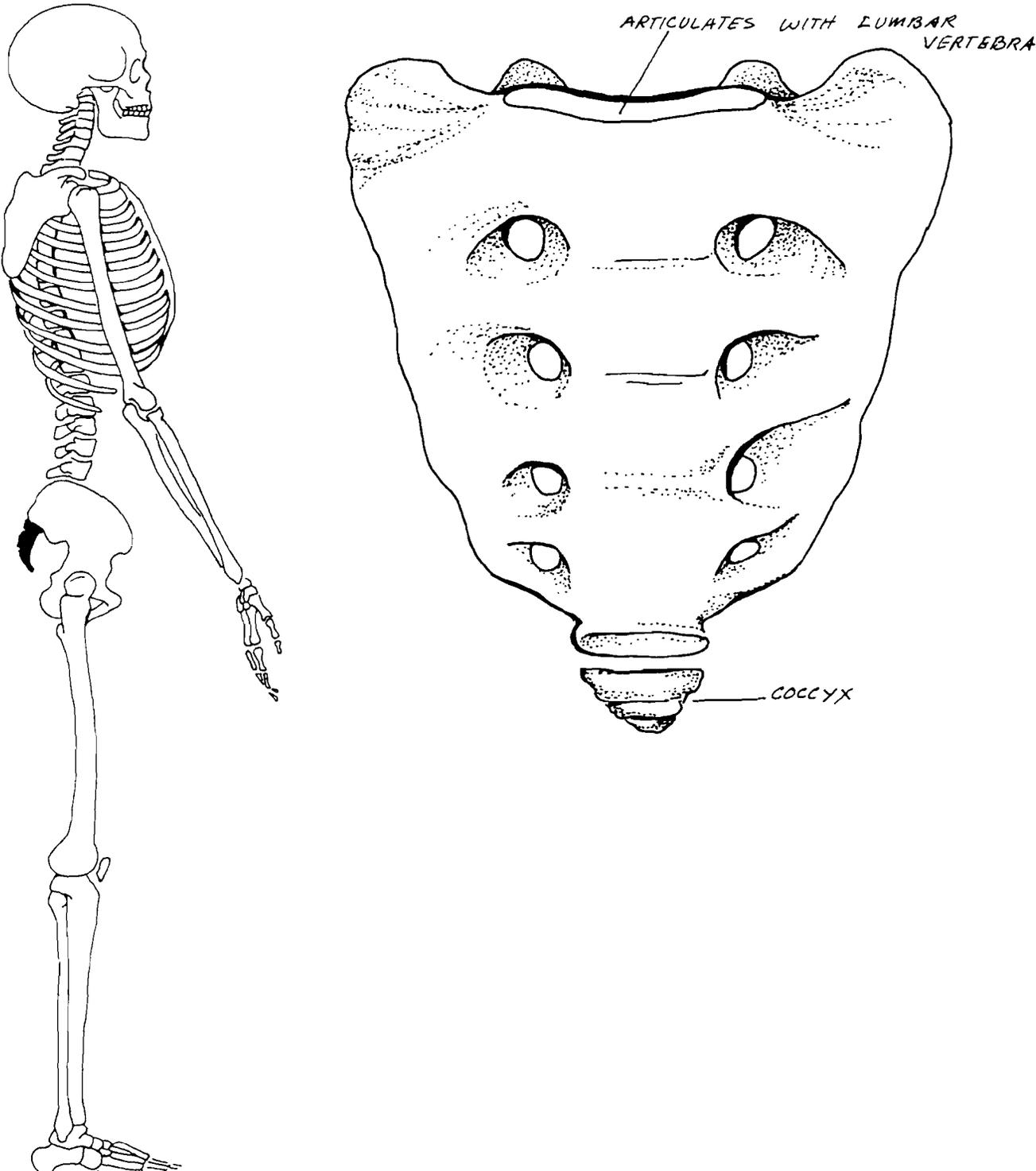
# INNOMINATE (PELVIS)

FIGURE 20: RIGHT INNOMINATE IS ONE OF THREE ADULT PELVIC BONES.



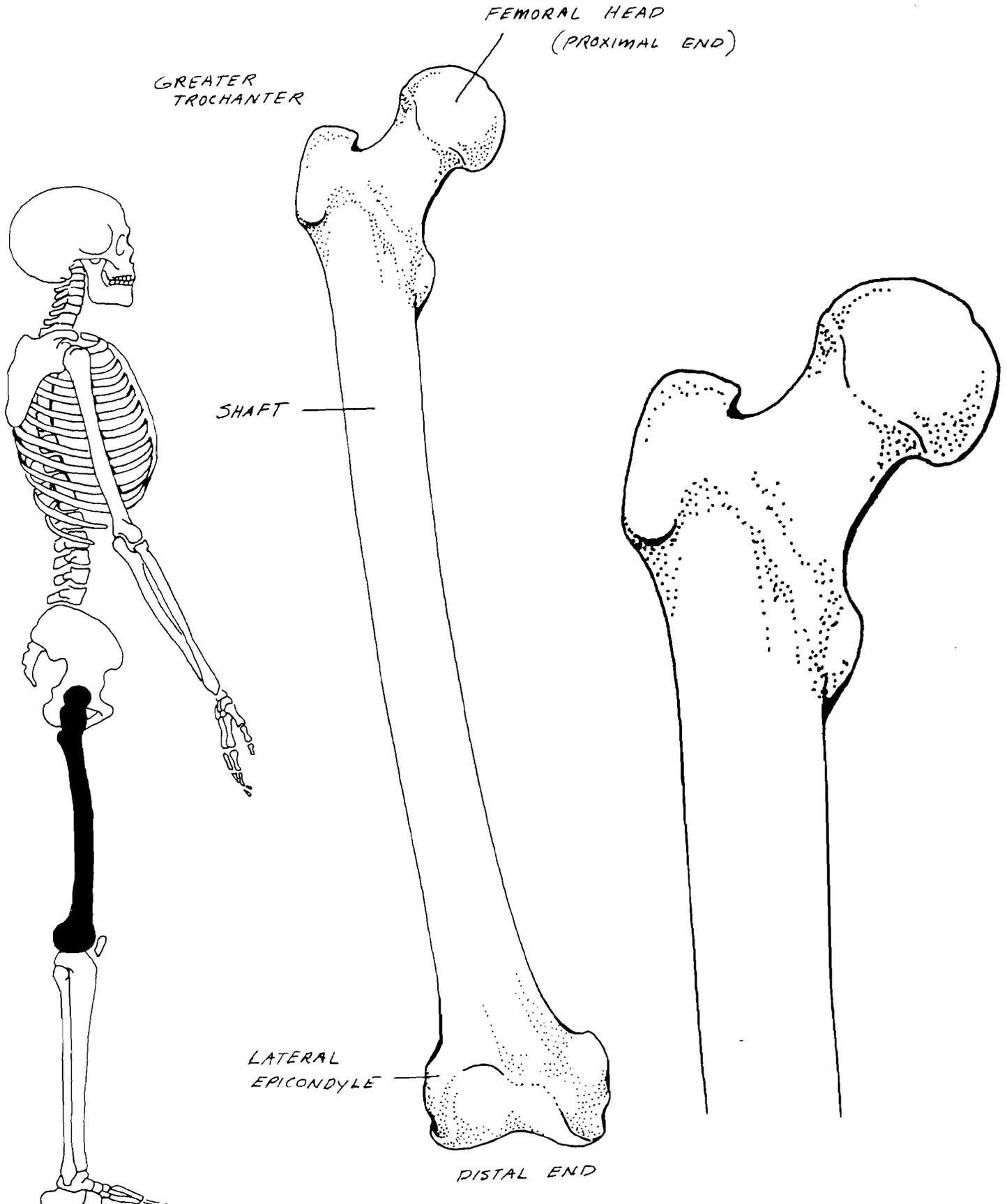
**SACRUM AND COCCYX**

**FIGURE 21:** THE SACRUM AND COCCYX (TAIL BONE) ARE OFTEN FUSED INTO ONE BONE THAT FORMS THE POSTERIOR PELVIS.



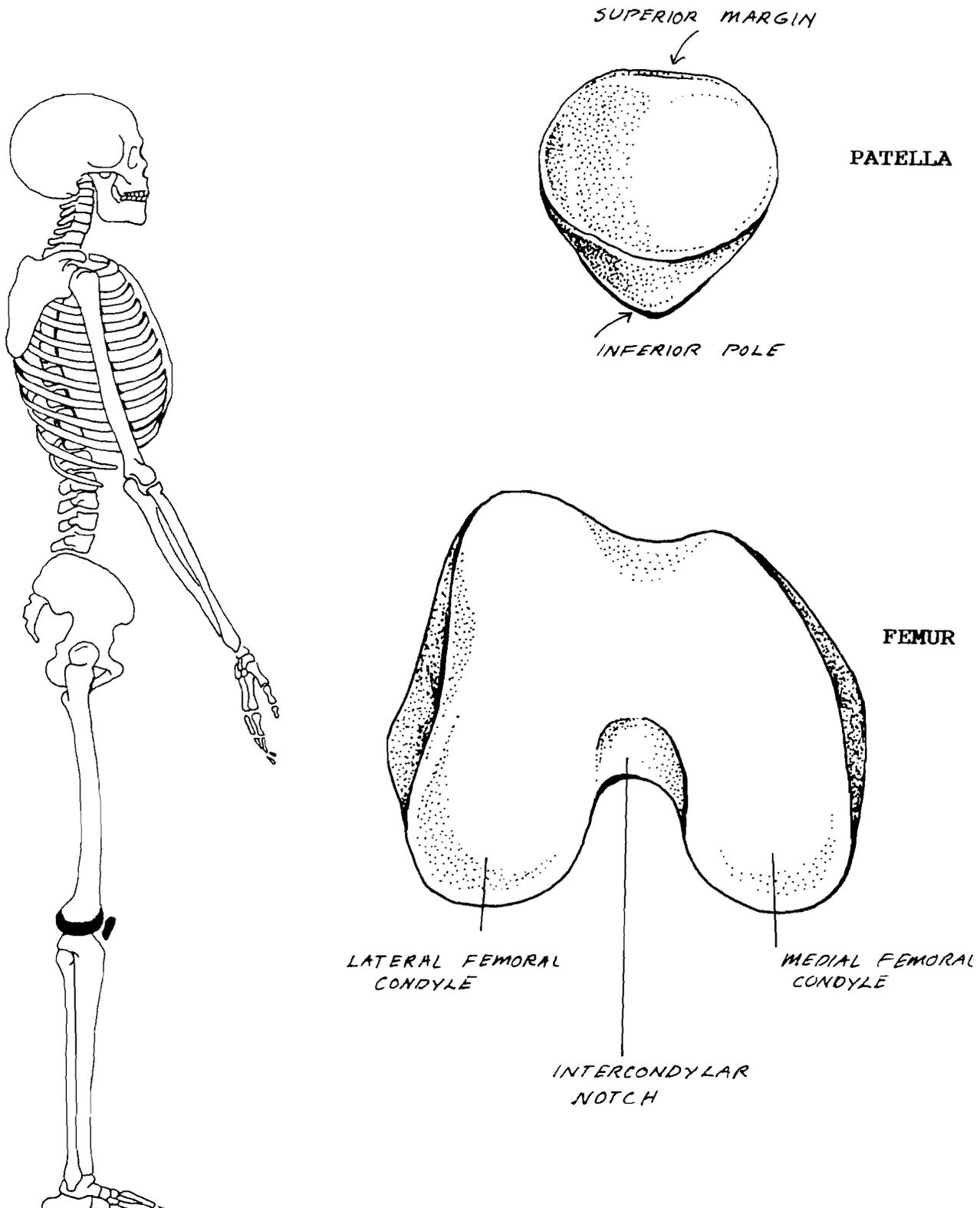
# FEMUR

FIGURE 22: ANTERIOR VIEW OF THE FEMUR (THIGH BONE). CLOSE UP OF THE FEMORAL HEAD IS APPROXIMATELY THE SIZE OF AN ADULT FEMALE.



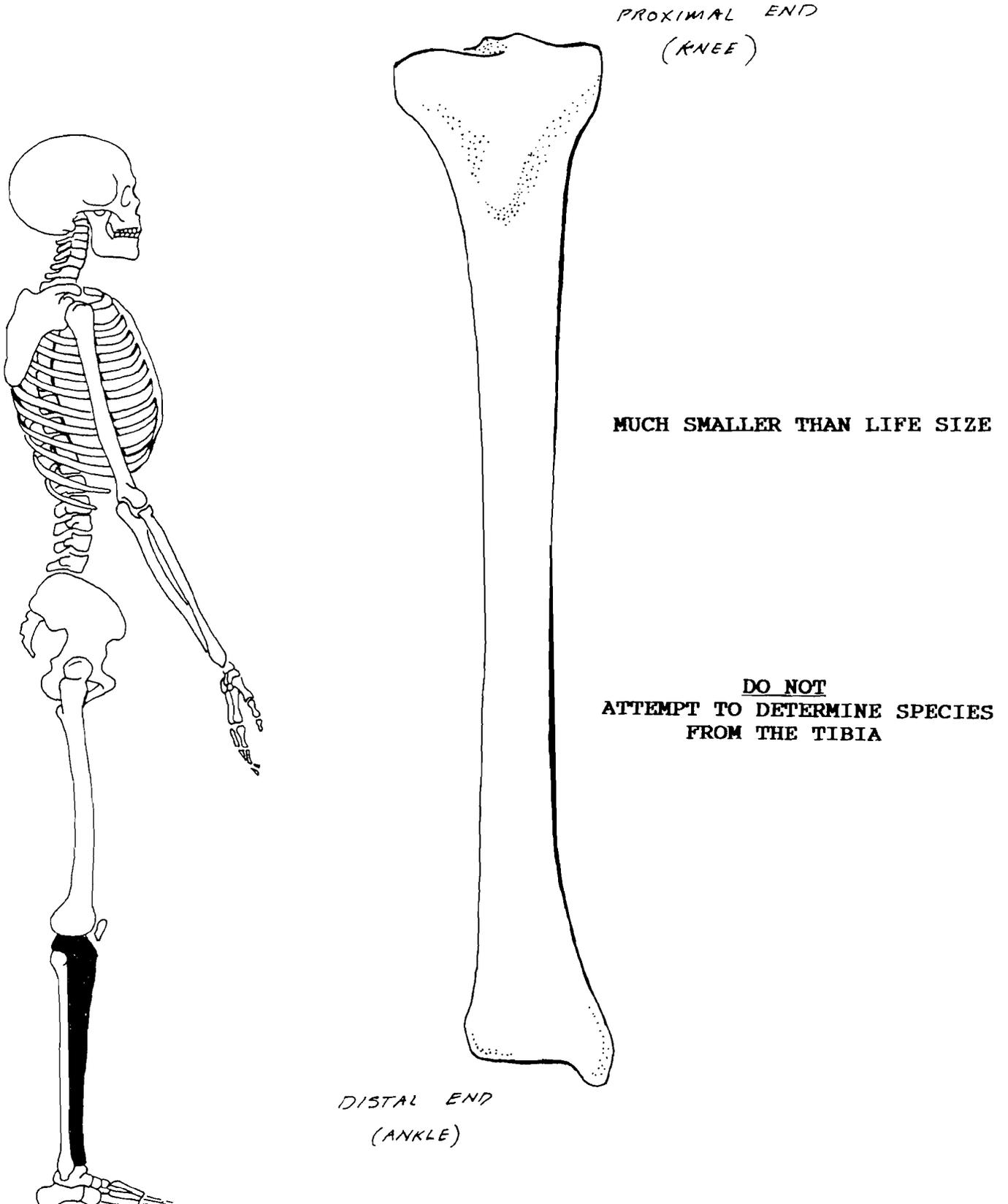
# FEMUR AND PATELLA

FIGURE 23: ARTICULAR SURFACES OF THE PATELLA (KNEE CAP) AND FEMUR ARE SHOWN APPROXIMATELY LIFE SIZE.



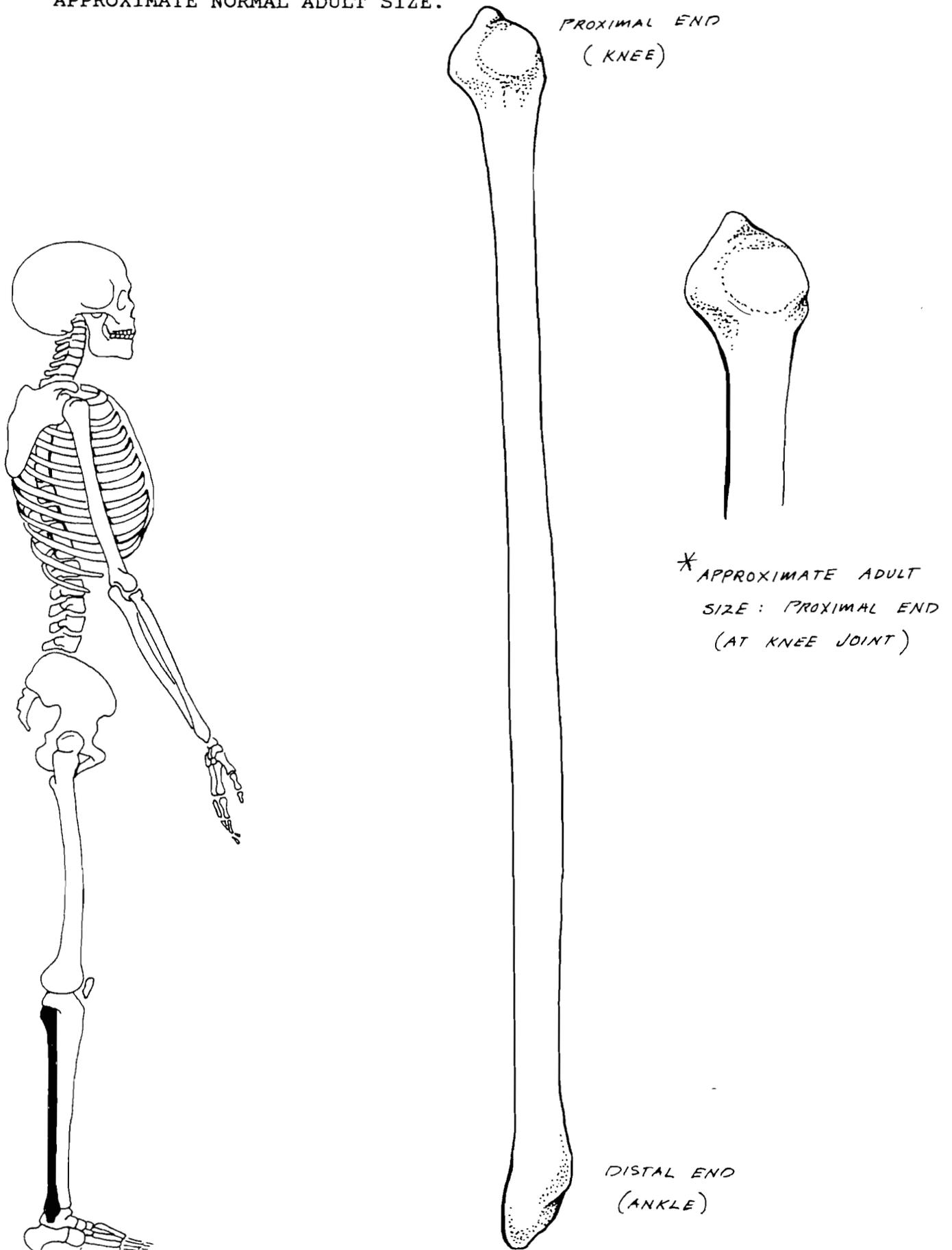
# TIBIA

FIGURE 24: ANTERIOR VIEW OF RIGHT TIBIA (SHIN BONE).



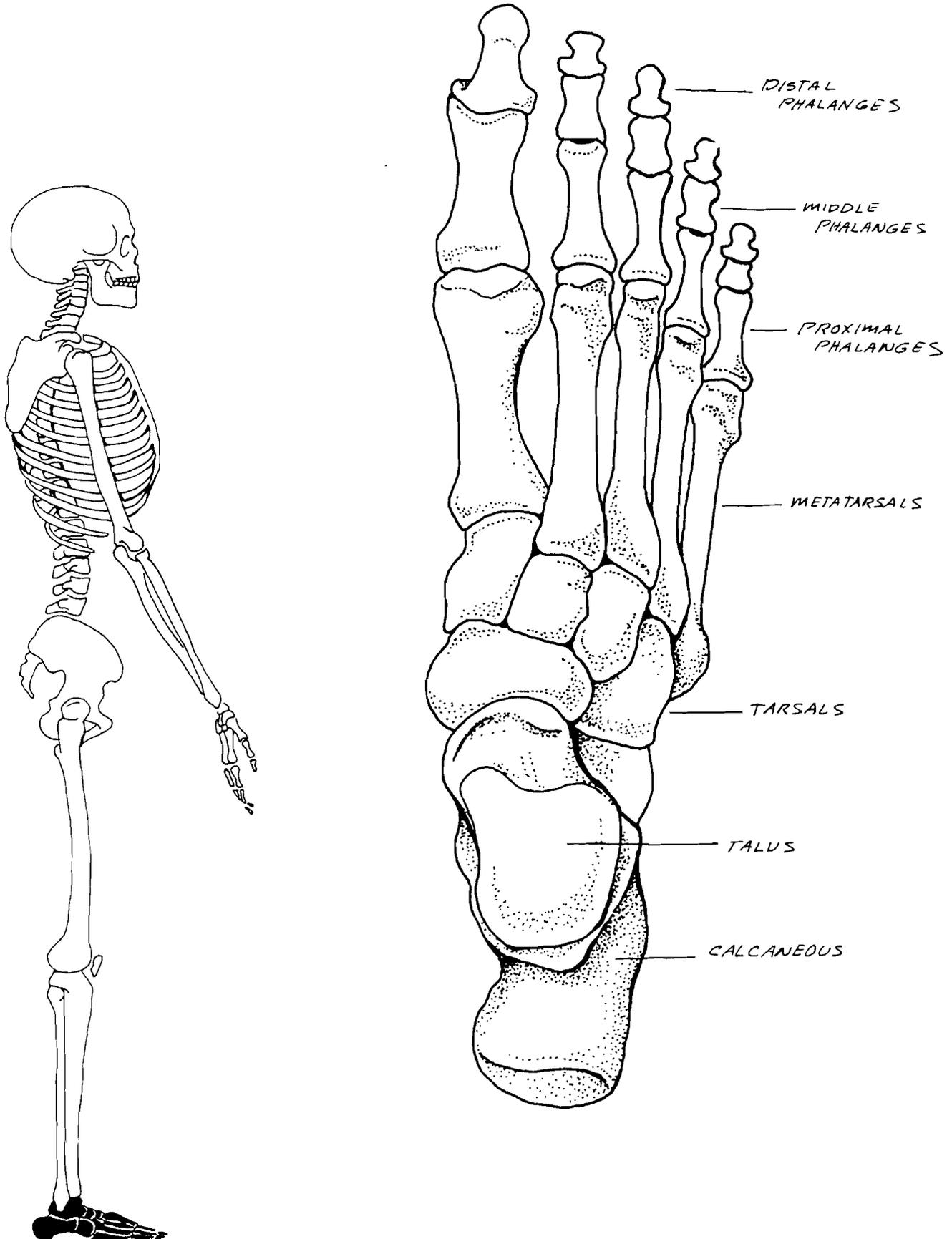
# FIBULA

FIGURE 25: ANTERIOR VIEW OF RIGHT FIBULA. PROXIMAL END ENLARGED TO APPROXIMATE NORMAL ADULT SIZE.



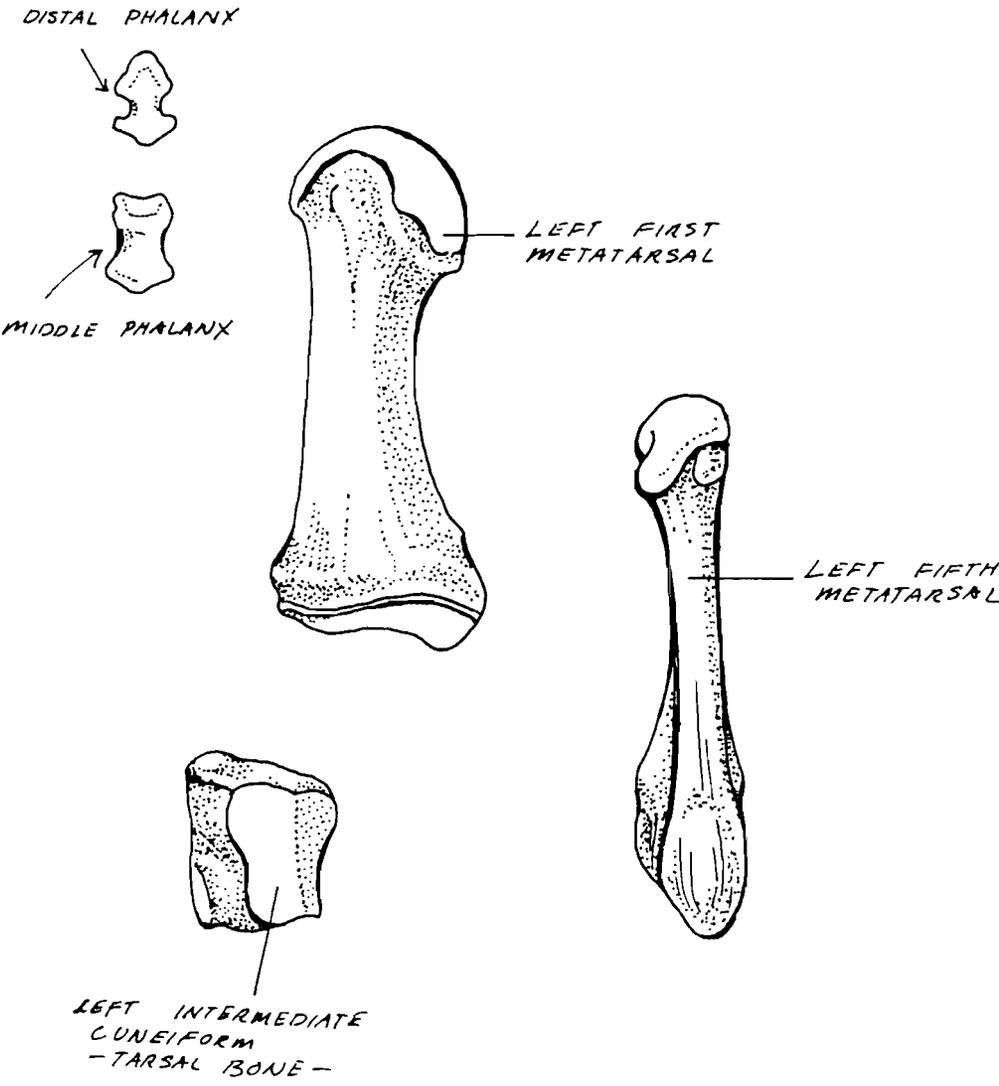
# FOOT

FIGURE 26: SUPERIOR VIEW OF AN ARTICULATED RIGHT FOOT.



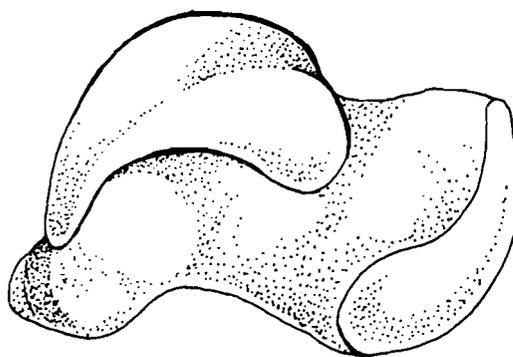
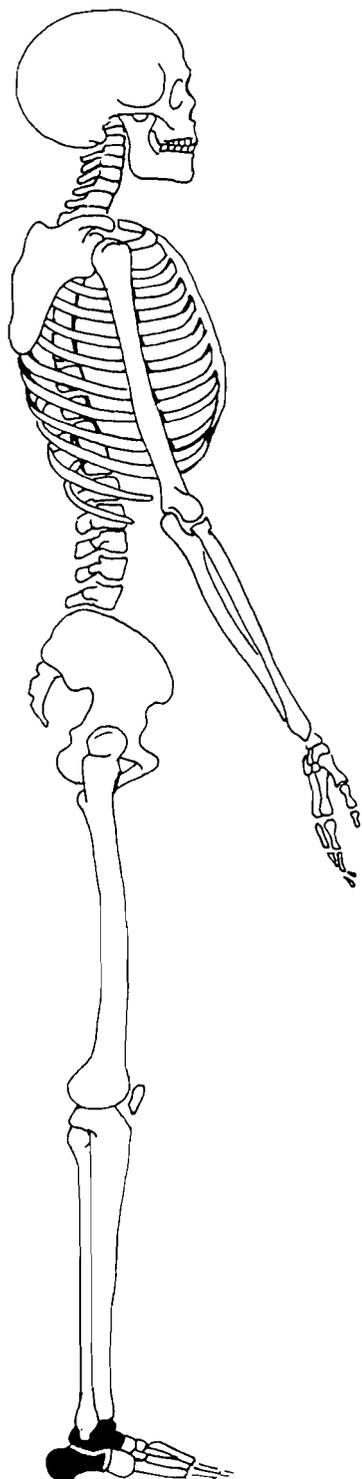
**FOOT**

FIGURE 27: SOME DISARTICULATED BONES OF THE LEFT FOOT.

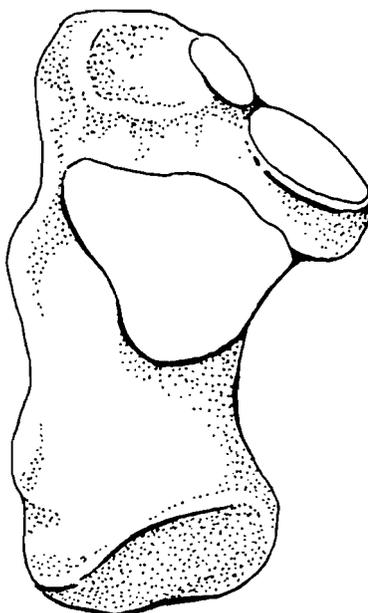


## FOOT

FIGURE 28: TWO DISARTICULATED BONES OF THE LEFT FOOT, THE TALUS AND CALCANEUS, HAVE DISTINCTIVE SHAPES.

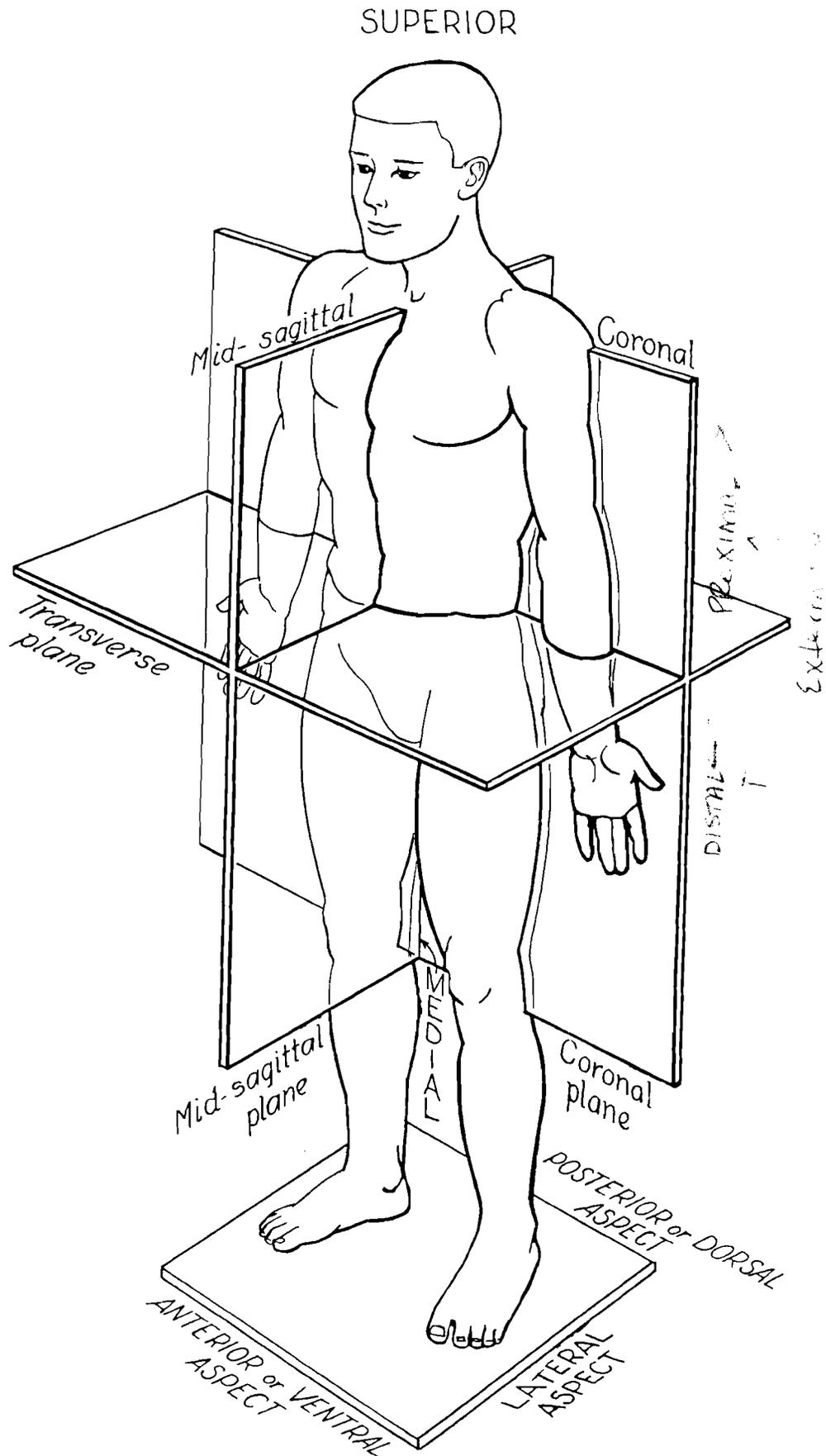


*LEFT TALUS  
(ONE OF THREE "ANKLE BONES")*



*LEFT CALCANEUS  
(HEEL BONE)*

# BASIC REFERENCE SYSTEMS



## GLOSSARY OF SKELETAL TERMS

| <u>SCIENTIFIC TERM</u> | <u>TRANSLATION</u>                                |
|------------------------|---|
| ACETABULUM             | HIP SOCKET  |
| ACROMION               | "POINT" OF SHOULDER                               |
| ALANTOAXIAL JOINT      | JOINT BETWEEN 1st AND 2nd VERTEBRAE               |
| ALVEOLAR               | PERTAINS TO THE TOOTH SOCKETS                     |
| APERTURE               | OPENING   |
| ARTICULAR SURFACE      | WHERE TWO BONES COME TOGETHER AT A JOINT          |
| ATLAS                  | FIRST "UPPERMOST" NECK BONE                       |
| AUDITORY MEATUS        | EAR OPENING ON SKULL                              |
| AXIS                   | SECOND NECK BONE                                  |
| BASILAR                | PART OF THE BASE OF THE SKULL                     |
| BOSSING                | ROUNDED CURVE ON FOREHEAD OF FEMALE SKULL         |
| CALCANEUS              | HEEL BONE   |
| CAPITAL (CAPITATE)     | PERTAINING TO THE HEAD                            |
| CARPAL                 | PERTAINING TO THE WRIST BONES                     |
| CERVICAL               | PERTAINING TO THE NECK (1st 7 vertebrae)          |
| CONDYLE                | ROUNDED OR KNUCKLE-LIKE END OF A BONE             |
| CORONAL                | ONE OF THE SKULL SUTURES (ALSO A REFERENCE PLANE) |
| CHONDRAL               | PERTAINING TO CARTILAGE                           |
| CLAVICLE               | COLLAR BONE                                       |
| COCCYX                 | TAIL BONE   |
| CRANIUM                | SKULL (EXCEPT THE MANDIBLE)                       |
| CRANIAL                | PERTAINING TO THE HEAD                            |
| DENS                   | PROJECTION ON FRONT OF 2nd CERVICAL VERTEBRA      |
| DIAPHYSIS              | THE SHAFT OF A LONG BONE                          |
| DIGIT                  | FINGER (OR THUMB)                                 |
| EPIPHYSIS              | GROWING ENDS OF LONG BONES                        |
| FEMUR                  | THIGH BONE  |
| FIBULA                 | BONE ON OUTSIDE OF CALF (KNEE TO ANKLE)           |
| FORAMEN                | NORMAL HOLE THROUGH BONE FOR ARTERIES & NERVES    |
| FORAMEN MAGNUM         | LARGE HOLE AT BASE OF SKULL, EXIT OF SPINAL CORD  |
| FOSSA                  | ROUNDED DEPRESSION OR GROOVE IN BONE              |
| FRONTAL                | ONE OF THE SKULL BONES (FOREHEAD)                 |
| HUMERUS                | UPPER ARM BONE                                    |

|                  |  |
|------------------|--|
| HYOID            | CURVED BONE IN FRONT OF THROAT                   |
| ILIUM            | PART OF PELVIS (INNOMINATE)                      |
| INNOMINATE       | PART OF PELVIS (ILIUM)                           |
| INTEROSSEOUS     | BETWEEN BONES                                    |
| INTERVERTEBRAL   | BETWEEN VERTEBRAE                                |
| ISCHIUM          | PART OF PELVIS                                   |
| LACRIMAL         | BONE OF THE SKULL (INNER CORNER OF EYE)          |
| LAMBDOID         | ONE OF THE CRANIAL SUTURES                       |
| LUMBAR           | PERTAINING TO LOWER BACK (lowest 5 vertebrae)    |
| MANDIBLE         | LOWER JAW  |
| MANDIBULAR RAMUS | THE ASCENDING, BACK PART OF THE MANDIBLE         |
| MANUBRIUM        | TOP PART OF STERNUM OR BREAST BONE               |
| MASTOID          | PROMINENCE ON SKULL, BEHIND EACH EAR             |
| MAXILLA          | UPPER JAW BONE                                   |
| METACARPAL       | BONES OF THE PALM OF THE HAND                    |
| METATARSAL       | BONES OF THE MIDDLE PART OF THE FOOT             |
| NUCHAL CREST     | RIDGE OF BONE ON BACK OF SKULL (MALE)            |
| ODONTOID PROCESS | PROJECTION ON FRONT OF 2nd CERVICAL VERTEBRA     |
| OCCIPITAL        | BACK "BASE" OF THE SKULL                         |
| OLECRANON        | "BUMP" OF ELBOW                                  |
| ORBIT            | EYE SOCKET                                       |
| PALATE           | ROOF OF MOUTH                                    |
| PATELLA          | KNEE CAP   |
| PARIETAL         | BONE FOUND ON EACH SIDE OF THE SKULL             |
| PETROUS          | PART OF THE TEMPORAL BONE OF THE SKULL           |
| PHALANGES        | FINGER OR TOE BONES                              |
| PUBIS            | FRONT "CONNECTING" PART OF PELVIC BONES          |
| RADIUS           | LONG BONE OF FOREARM (THUMB SIDE)                |
| SAGGITAL         | ONE SUTURE OF SKULL (ALSO REFERENCE PLANE)       |
| SACRUM           | CONNECTING (BACK) PART OF PELVIS                 |
| SCAPULA          | SHOULDER BLADE                                   |
| SCIATIC NOTCH    | BONY FEATURE OF PELVIS                           |
| SELLA TURCICA    | PART OF THE SPHENOID BONE (PITUITARY FITS HERE)  |
| SPHENOID         | ONE BONE OF THE SKULL                            |
| SQUAMOUS SUTURE  | SUTURE BETWEEN TEMPORAL AND PARIETAL SKULL BONES |
| STERNUM          | BREAST BONE                                      |

|                 |  |
|-----------------|--|
| STYLOID PROCESS | LONG THIN BONE ON BASE OF SKULL                |
| SULCUS          | A FURROW OR GROOVE IN A BONE                   |
| SUTURE          | WAVY LINES WHERE BONES OF THE SKULL JOIN       |
| SYMPHYSIS PUBIS | WHERE PUBIC BONES JOIN                         |
| TARSAL          | PERTAINING TO THE ANKLE BONES                  |
| TEMPORAL        | BONE ON EACH SIDE OF SKULL                     |
| THORAX          | CHEST, OR RIB CAGE                             |
| THORACIC        | PERTAINING TO BACK BONES (middle 12 vertebrae) |
| TIBIA           | SHIN BONE                                      |
| ULNA            | LONG BONE OF FOREARM (LITTLE FINGER SIDE)      |
| VERTEBRA        | BACK BONE                                      |
| ZYGOMATIC ARCH  | CHEEK BONE                                     |
| XYPHOID PROCESS | LOWER TIP OF STERNUM                           |

## ACKNOWLEDGEMENTS

This manual was prepared by Dr. Emily A. Craig and has been designed to assist investigators who must deal with skeletal remains. The labeled drawings should be a valuable guide to help identify specific bones and more importantly, to help interpret and decipher technical reports.

All of the osteological illustrations were re-drawn from originals that appear in the 35th British Edition of *Gray's Anatomy* (1973). The illustration of the Basic Reference Systems was taken from *Structure and Function in Man* by Jacob and Francone (1970).

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