

คู่มือภาพ
กายวิภาคศาสตร์ และ สรีรวิทยาของมนุษย์



ผู้ช่วยศาสตราจารย์ פרםเฟรา ผลเจริญสุข

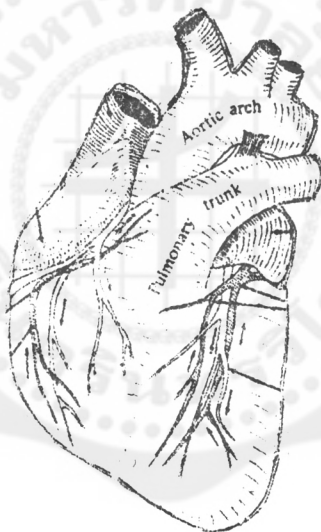
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มหาวิทยาลัยศรีนครินทรวิโรฒ พลศึกษา

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Dr. สมชาย มนต์ สวัสดิ์
สมชาย มนต์ สวัสดิ์

คำนำ

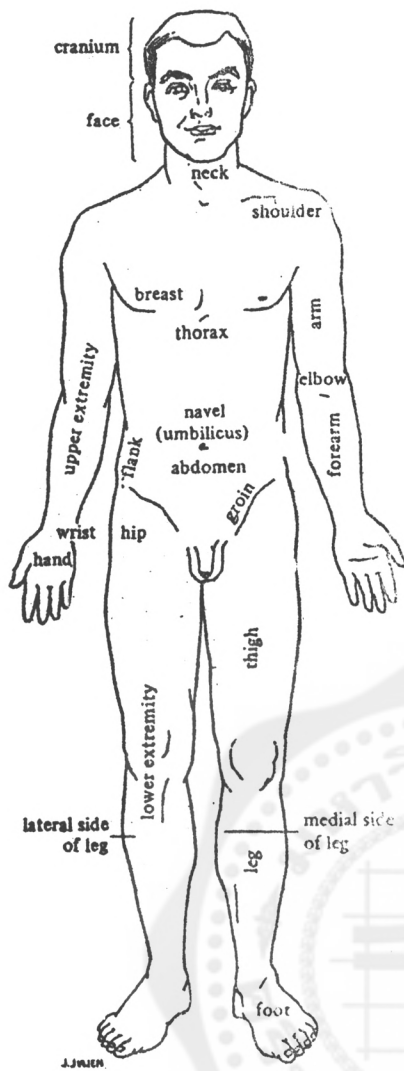
"คู่มือภาควิทยาศาสตร์และสรีรวิทยาของมนุษย์" เล่มนี้ ข้าพเจ้าได้เรียบเรียงขึ้นไว้เป็นตำราภาพประกอบการเรียน วิชา สุข 213, สุข 214 "กายวิภาคศาสตร์และสรีรวิทยาของมนุษย์ 1 และ 2" แก่นิสิตวิชาเอกพลศึกษา และสุขศึกษา มหาวิทยาลัยศรีนครินทรวิโรฒ วิทยาเขตพลศึกษา เพื่อให้ได้ใช้ประกอบการเรียนภาคทฤษฎีในวิชานี้ให้มีความเข้าใจยิ่งขึ้น จึงได้จัดทำฉบับนี้ขึ้น เพราะเล่มเก่าได้หมดไป

พริ้มเพรา ผลเจริญสุข
กรกฎาคม 2527

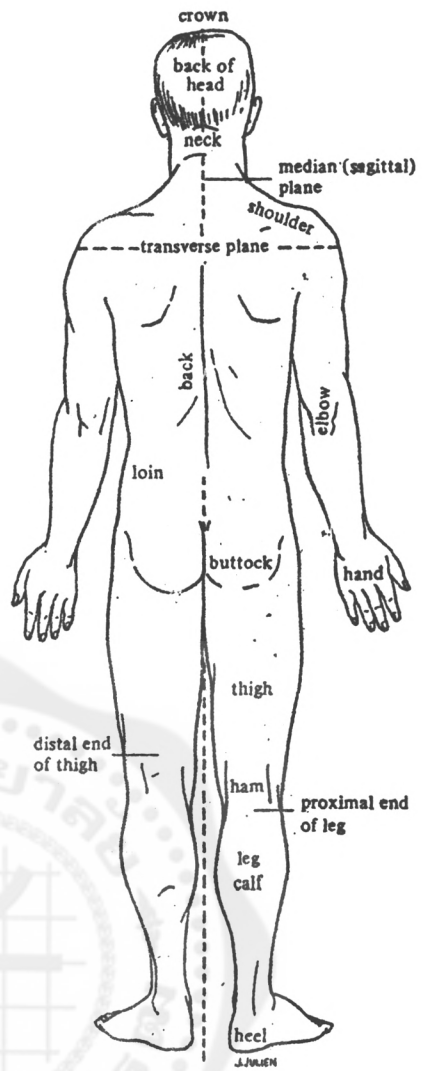
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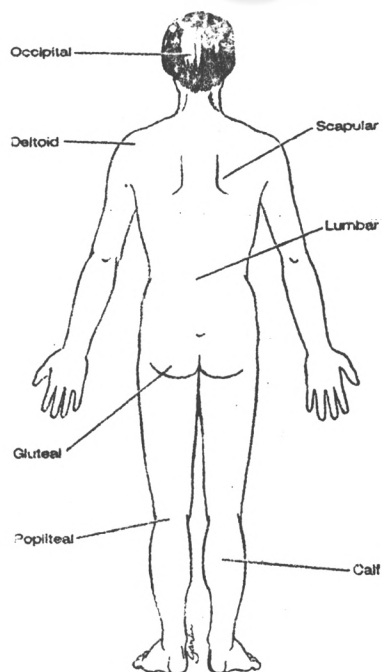
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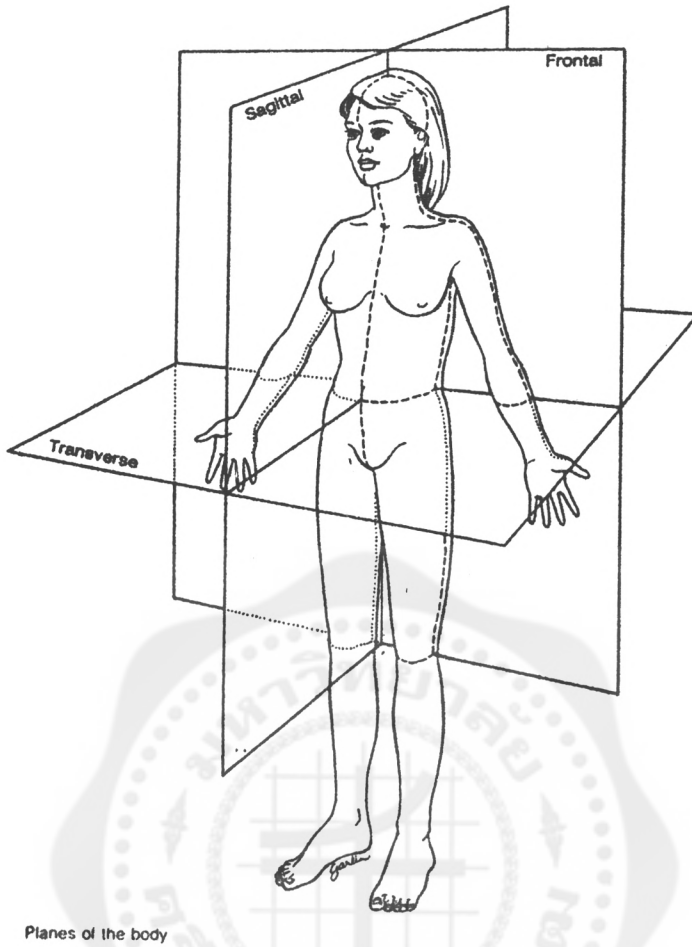
Human Figure in the Anatomical Position



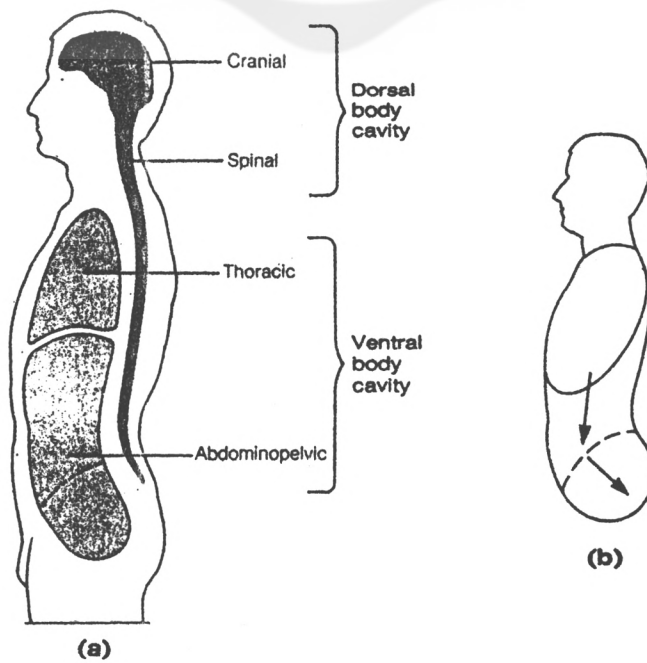
Human Figure—Posterior View



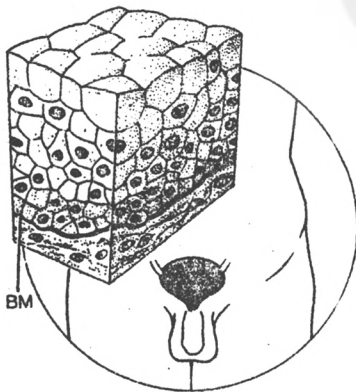
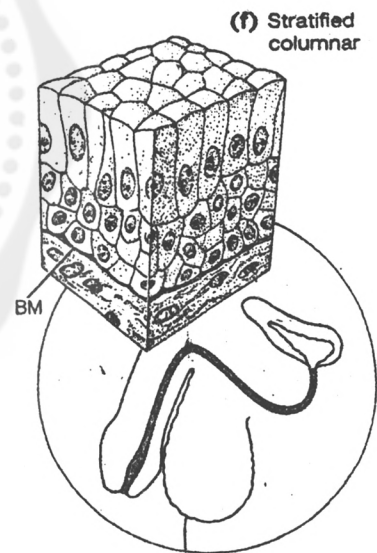
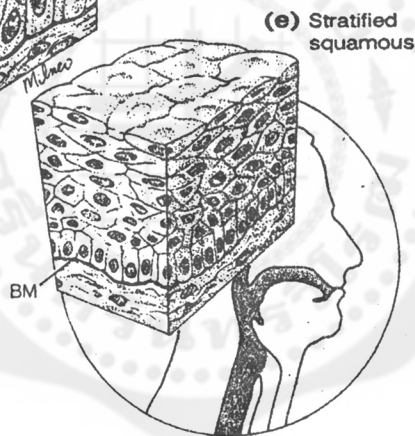
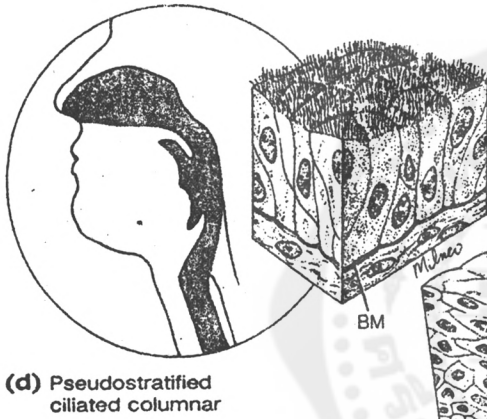
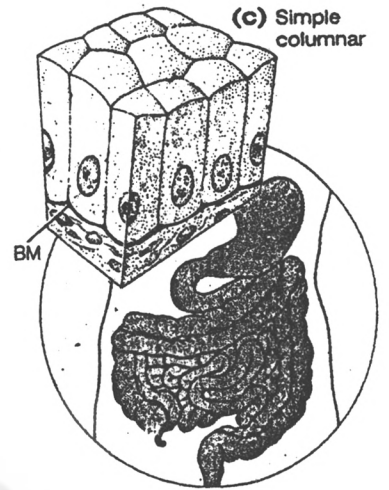
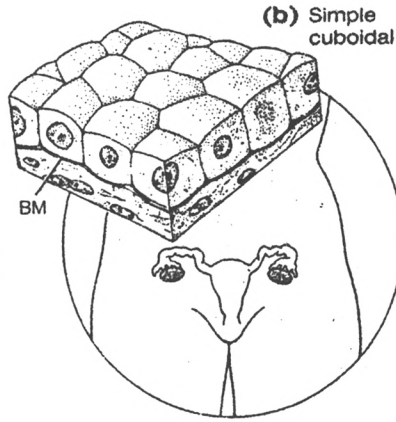
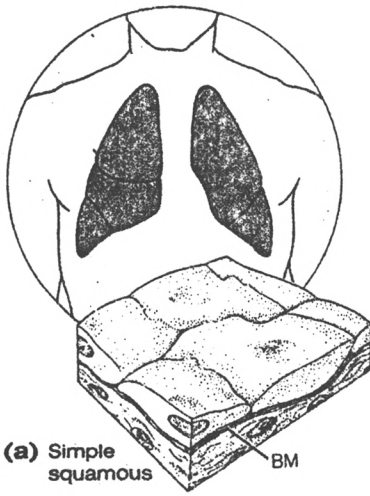
Posterior body landmarks



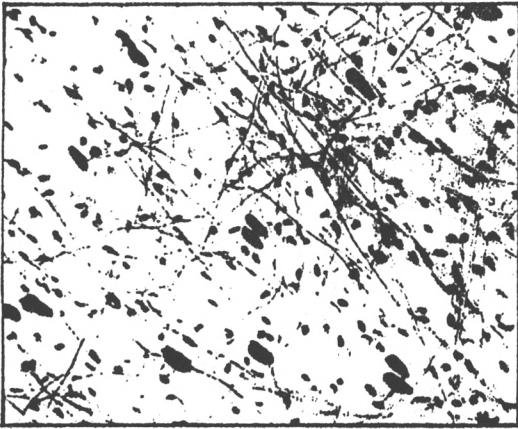
Planes of the body



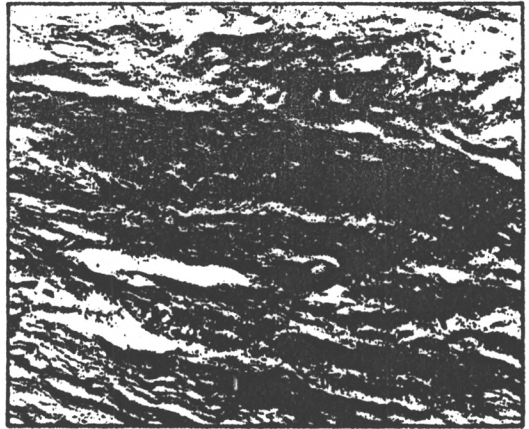
Body cavities: (a) dorsal and ventral cavities (lateral view); (b) angle of the relationship between the abdominal and pelvic cavities.



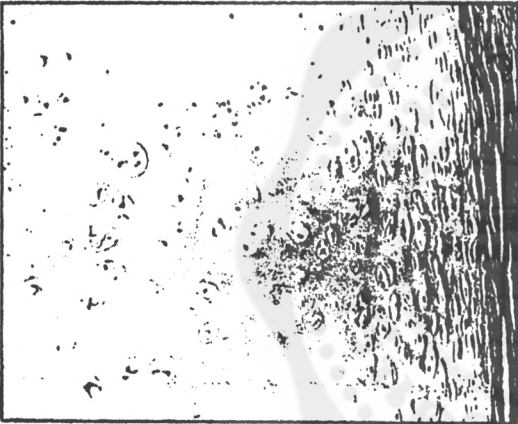
Types of epithelia (BM = basement membrane). Types a-d are simple epithelia; types e-g are stratified epithelia.



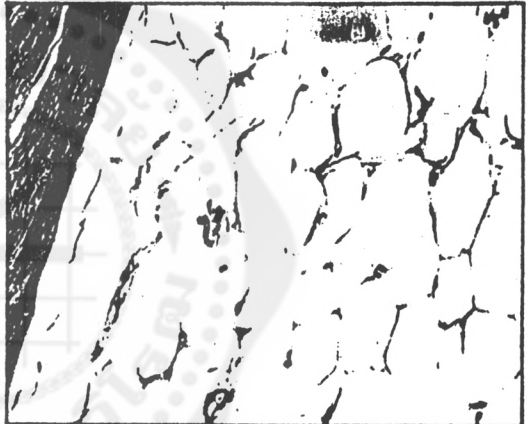
(a)



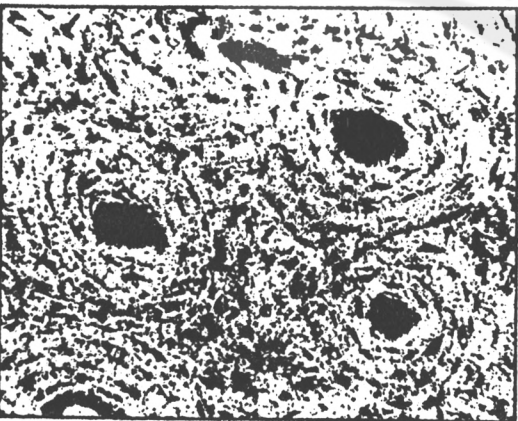
(b)



(c)

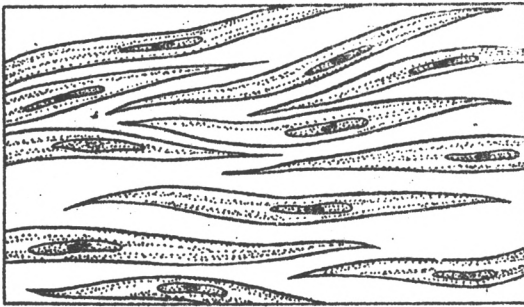


(d)

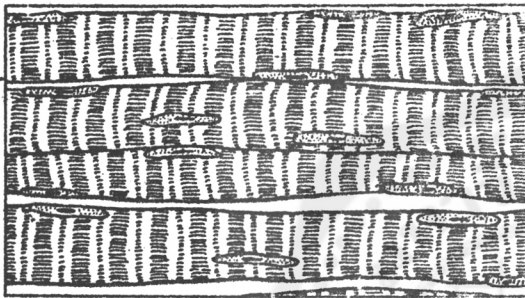
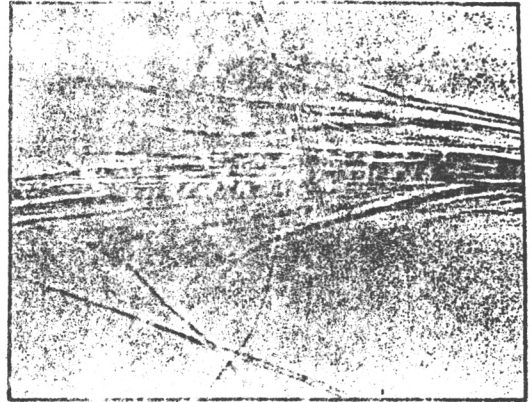


(e)

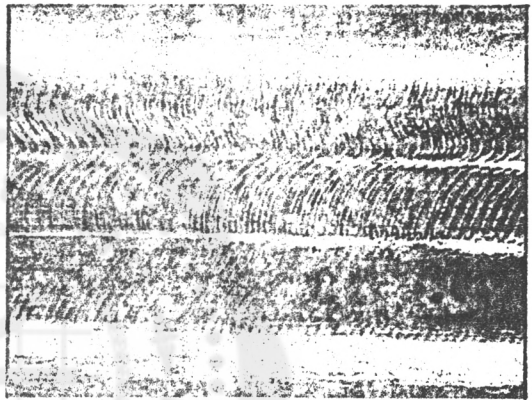
Types of connective tissue: (a) areolar connective tissue, 55 X; (b) dense fibrous connective tissue, 80 X; (c) hyaline cartilage, 35 X; (d) adipose connective tissue, 60 X; (e) bone, or osseous connective tissue, 35 X. (Photomicrographs courtesy of Ripon Microslides, Ripon, Wisconsin.)



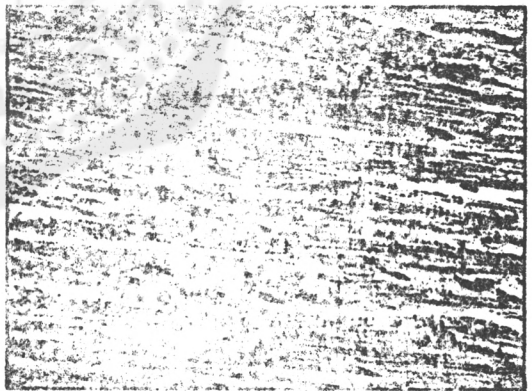
(a)



(b)

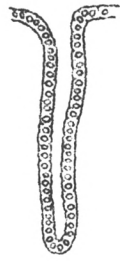


(c)



Muscle tissues: (a) isolated, teased smooth muscle cells with photomicrograph, 75 X; (b) skeletal muscle with photomicrograph, 200 X; (c) cardiac muscle (note branching) with photomicrograph, 130 X. (Photomicrographs courtesy of Ripon Microslides, Ripon, Wisconsin.)

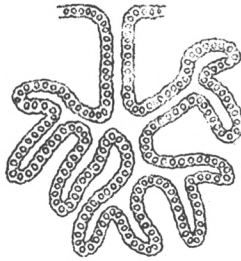
Simple tubular



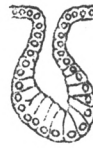
Simple coiled tubular



Compound tubular



Simple alveolar



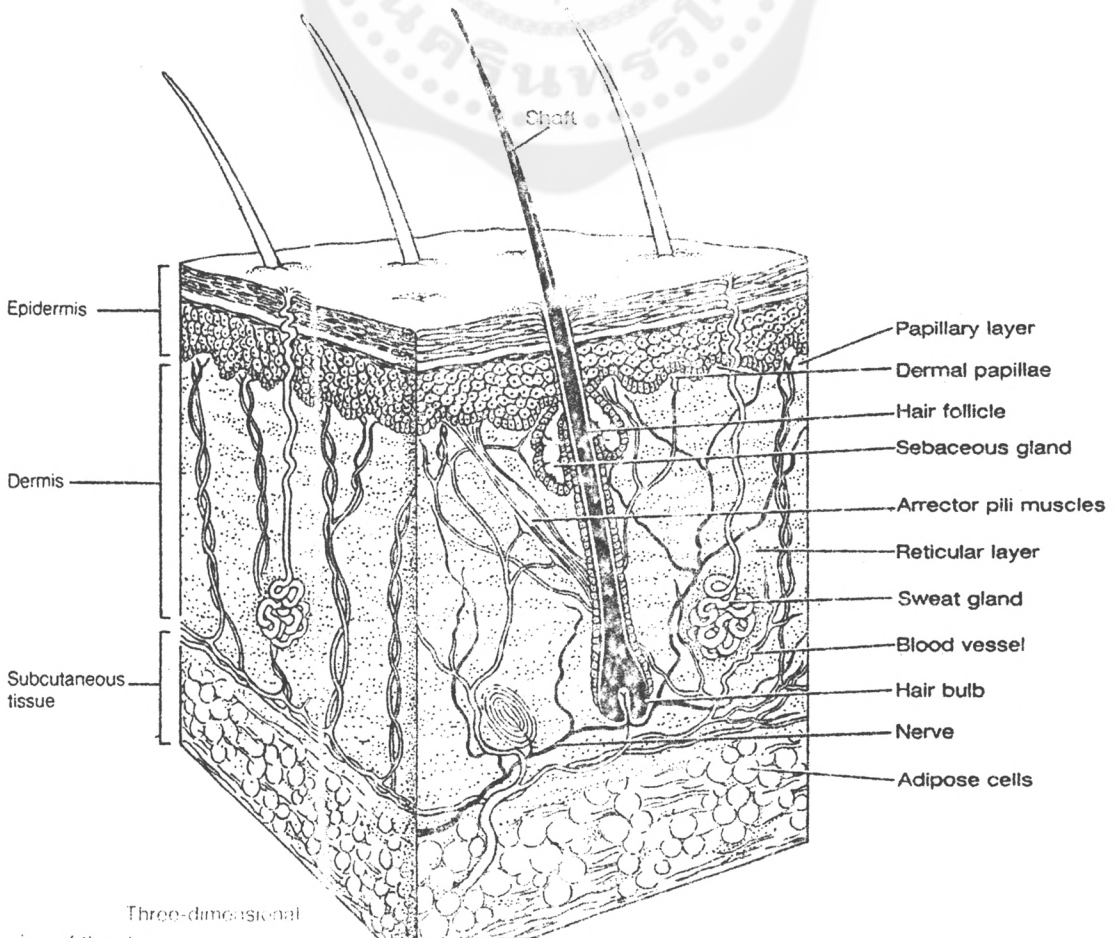
Branched alveolar



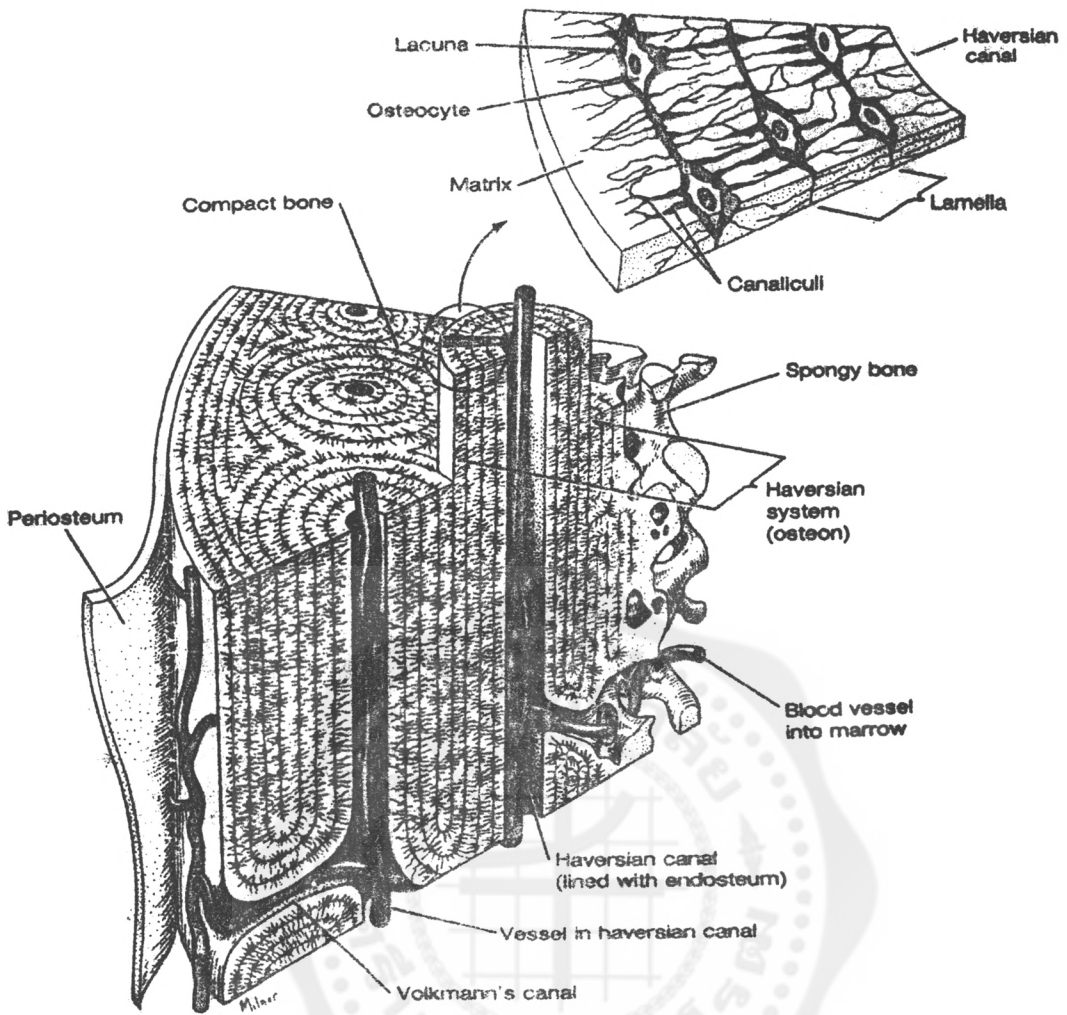
Compound alveolar



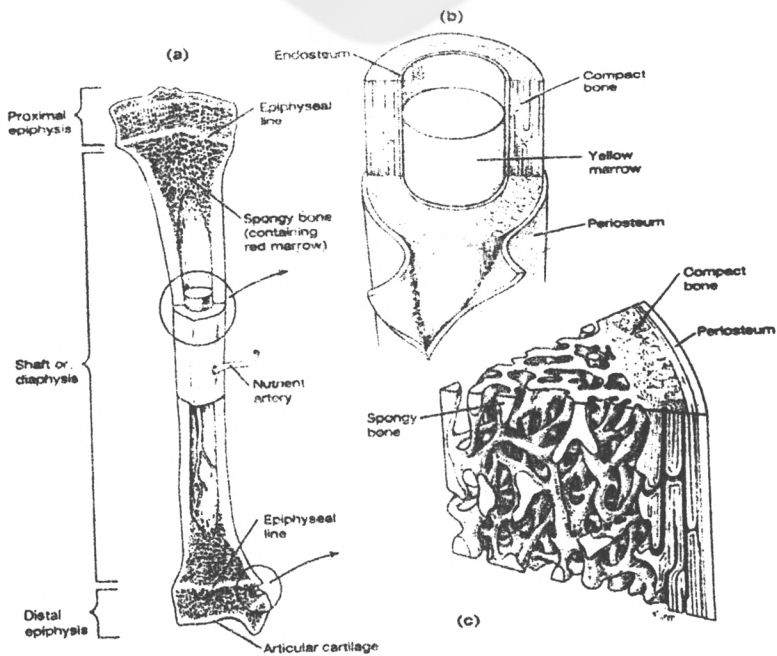
Structural classification of exocrine glands.



Three-dimensional view of the skin



Histological structure of a long bone (three-dimensional)



Tibia: (a) anterior view with longitudinal section cut away at both ends; (b) cross section of shaft (diaphysis); (c) peripheral three-dimensional view of spongy bone

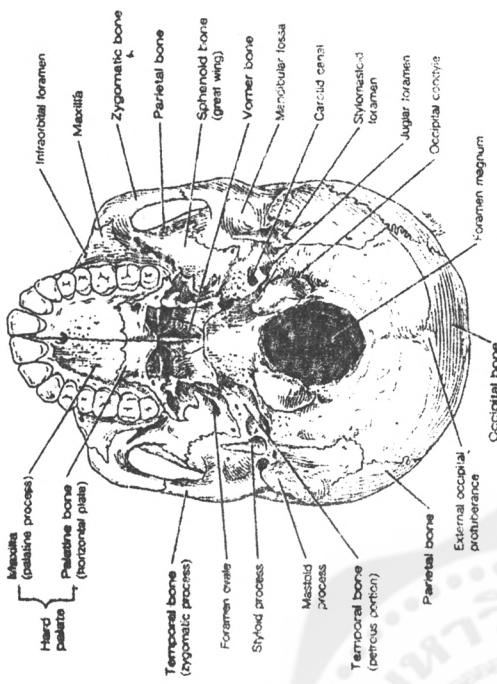


Figure 6-4 Human skull, anterior view

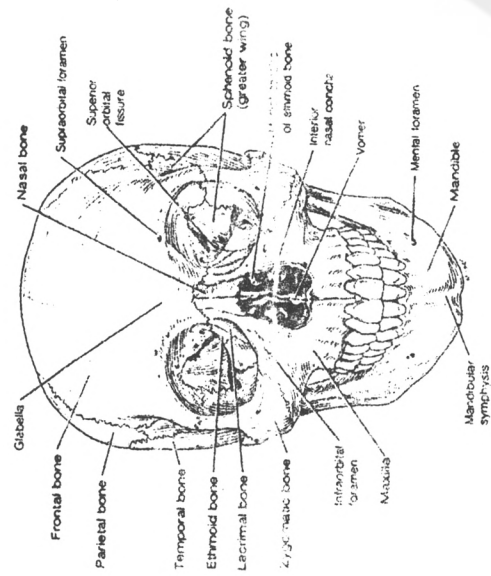
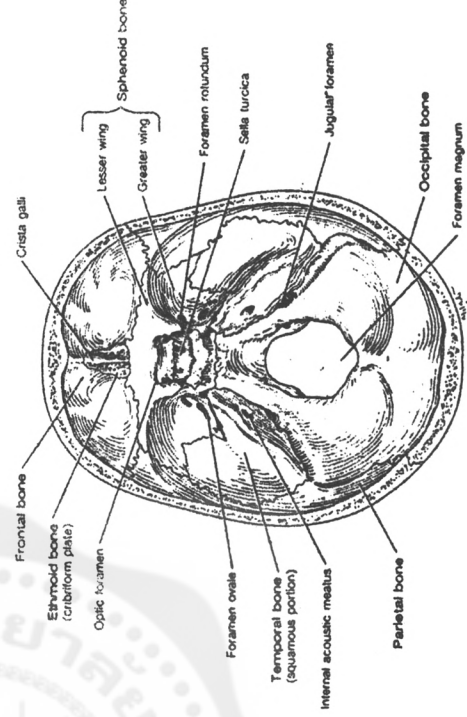
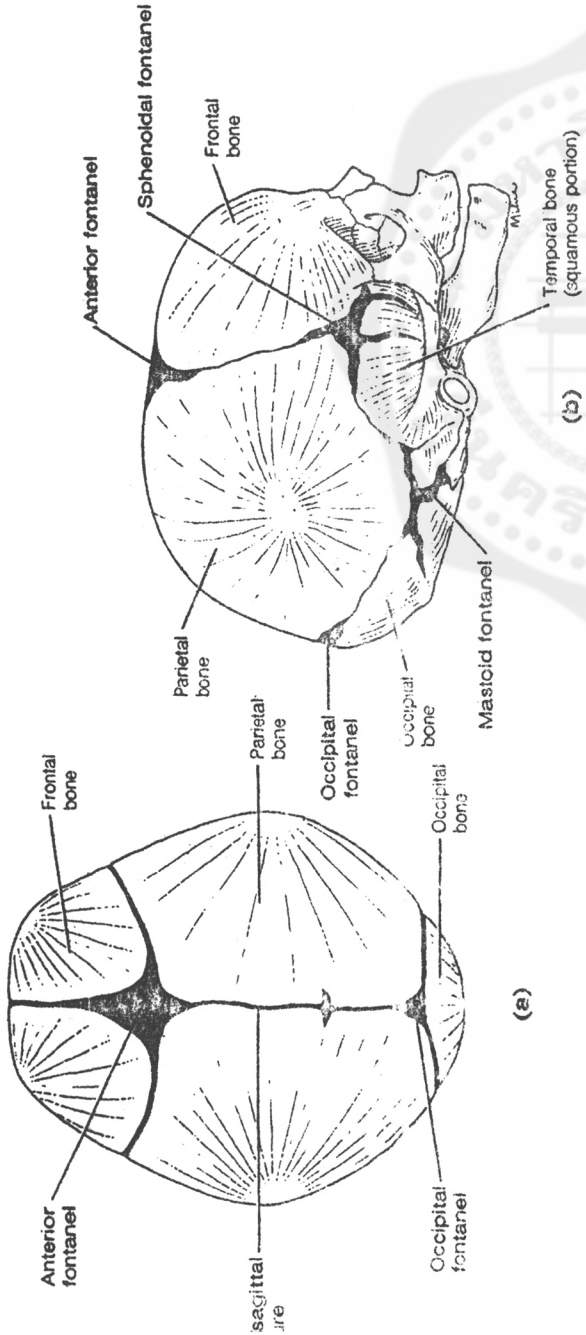


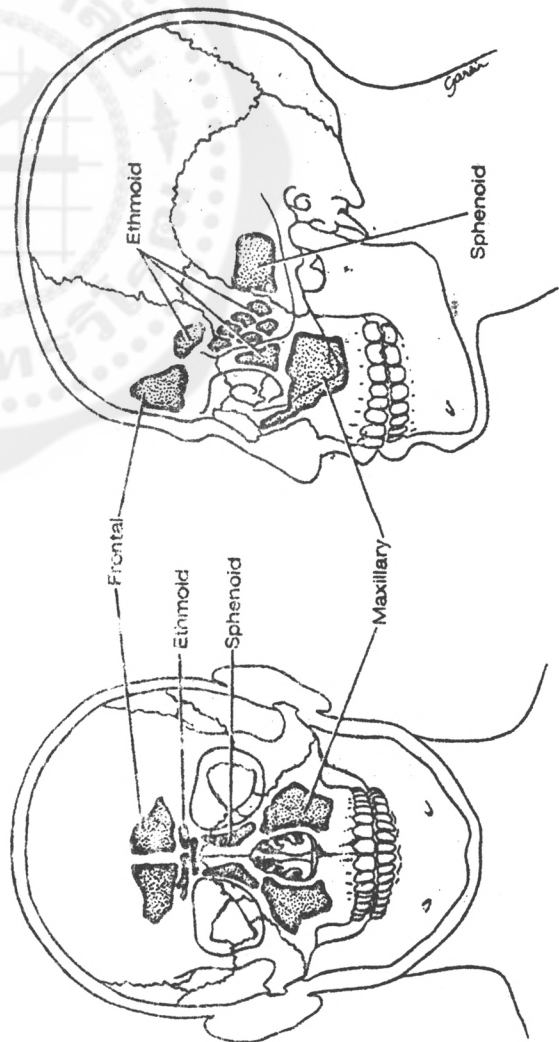
Figure 6-5 Human skull, lateral view



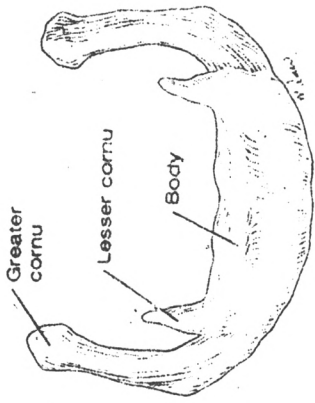
Human skull, superior view; top of the cranium removed.



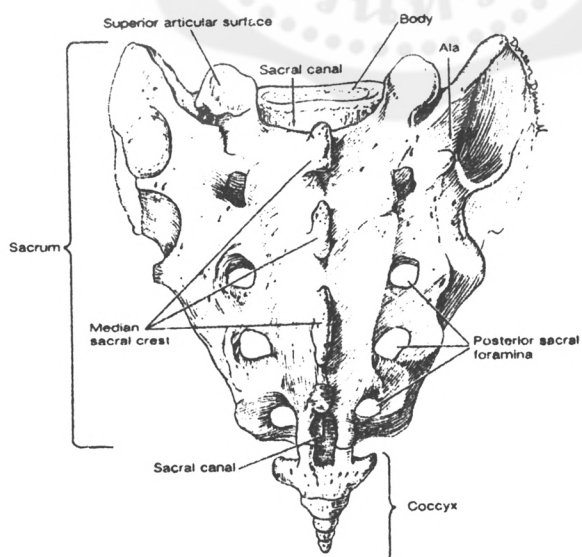
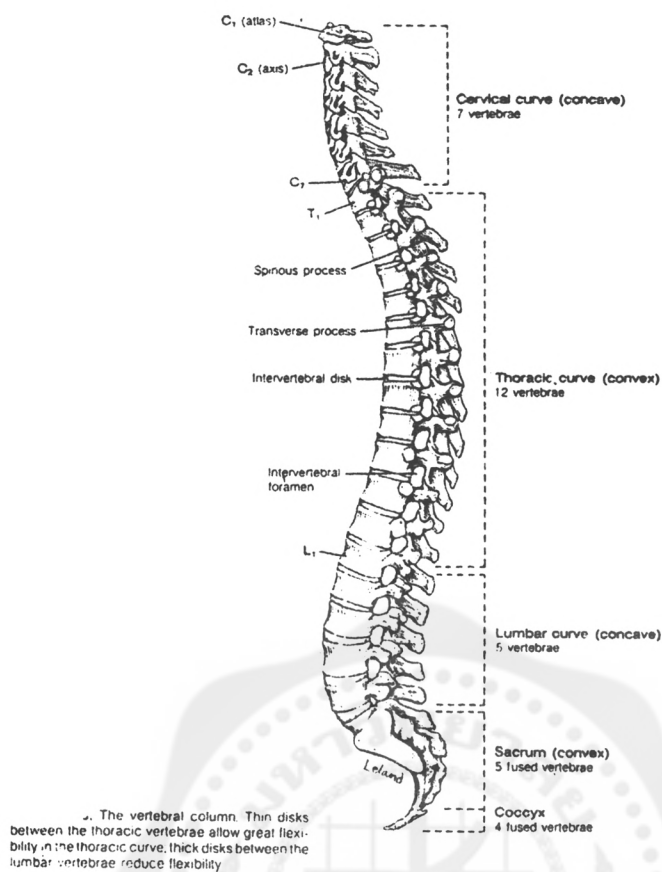
The fetal skull: (a) superior view; (b) lateral view.



Paranasal sinuses.

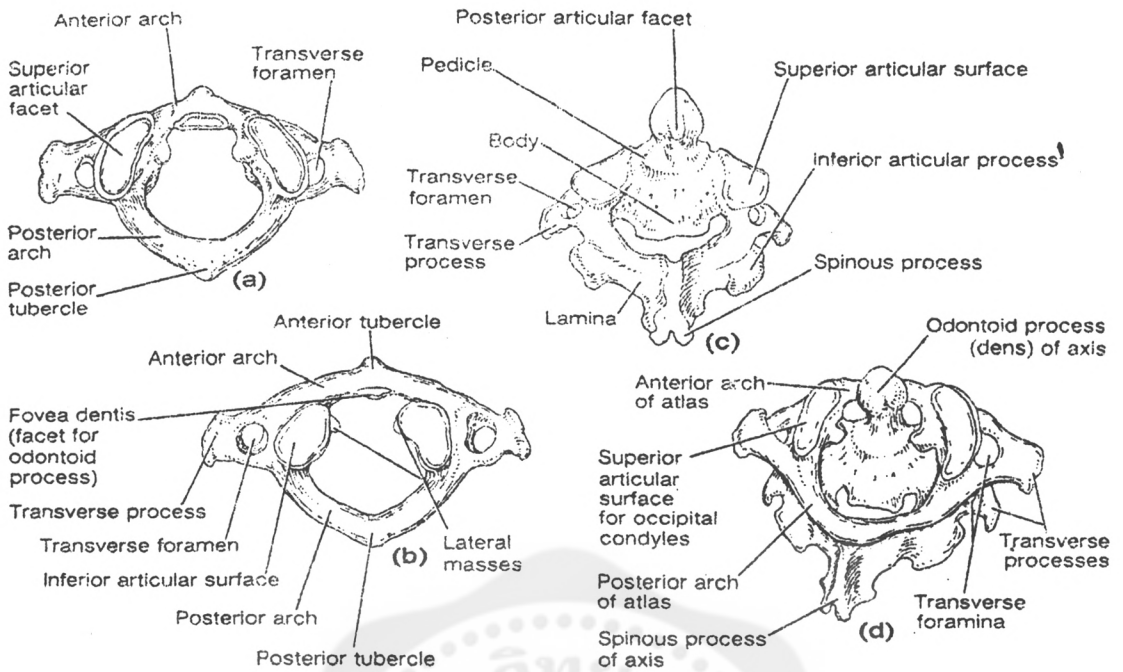


Hyoid bone



3. Sacrum and coccyx: posterior view

Cervical Vertebrae



Cervical vertebrae C₁ and C₂: (a) superior view of the atlas (C₁); (b) inferior view of the atlas (C₁); (c) superior view of the axis (C₂); (d) superior lateral view of the articulated atlas and axis.

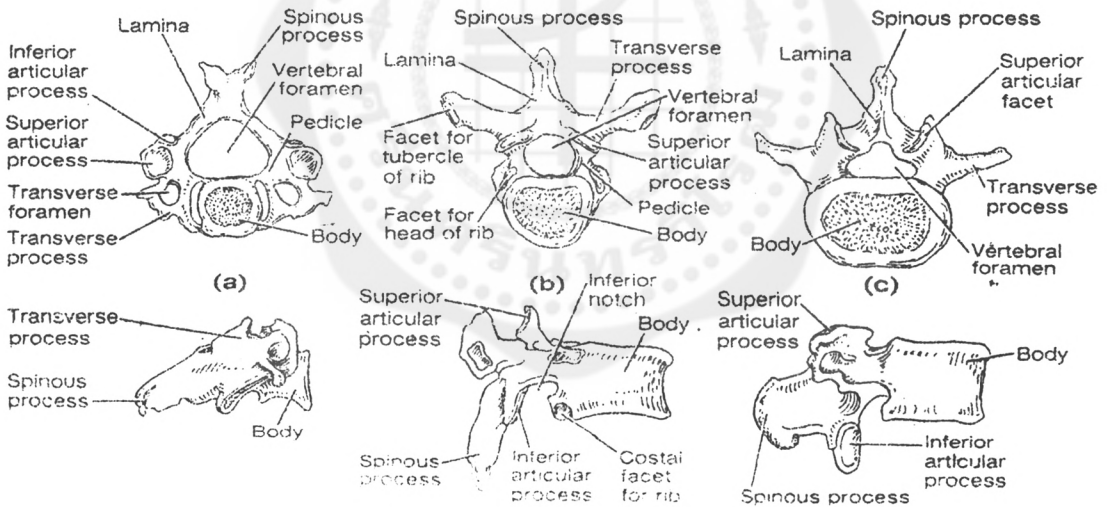


Diagram illustrating the structure of a typical cervical vertebra in various views: (a) superior view; (b) anterior view; (c) posterior view; (d) lateral view.

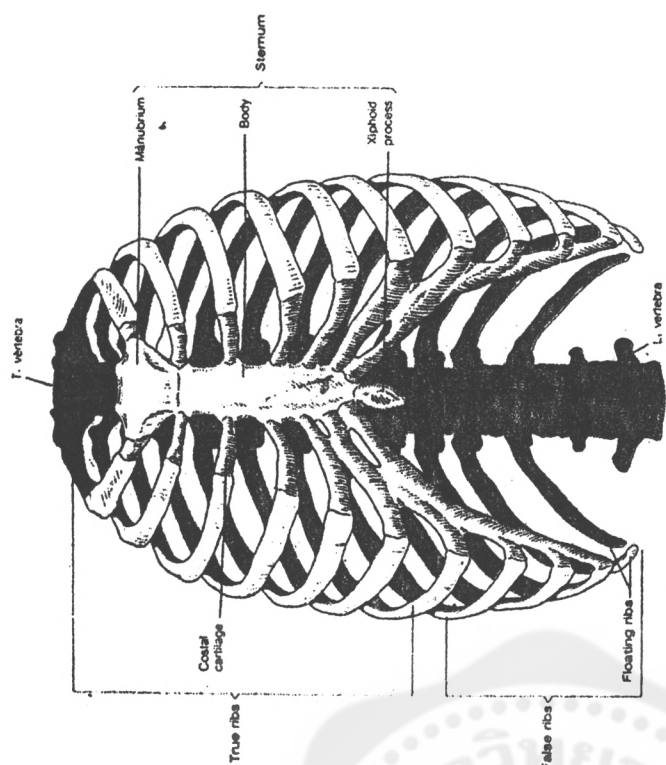
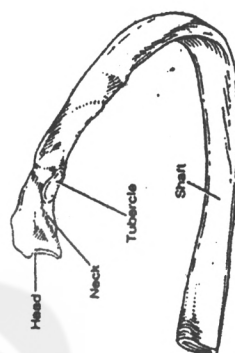
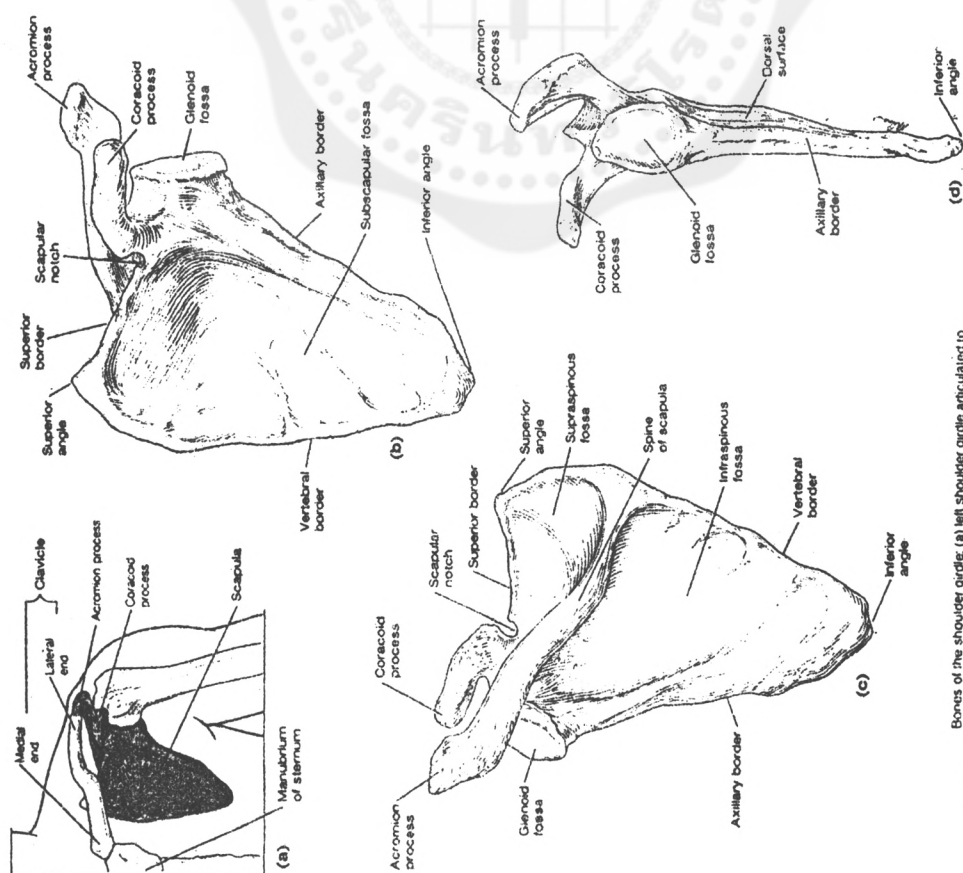


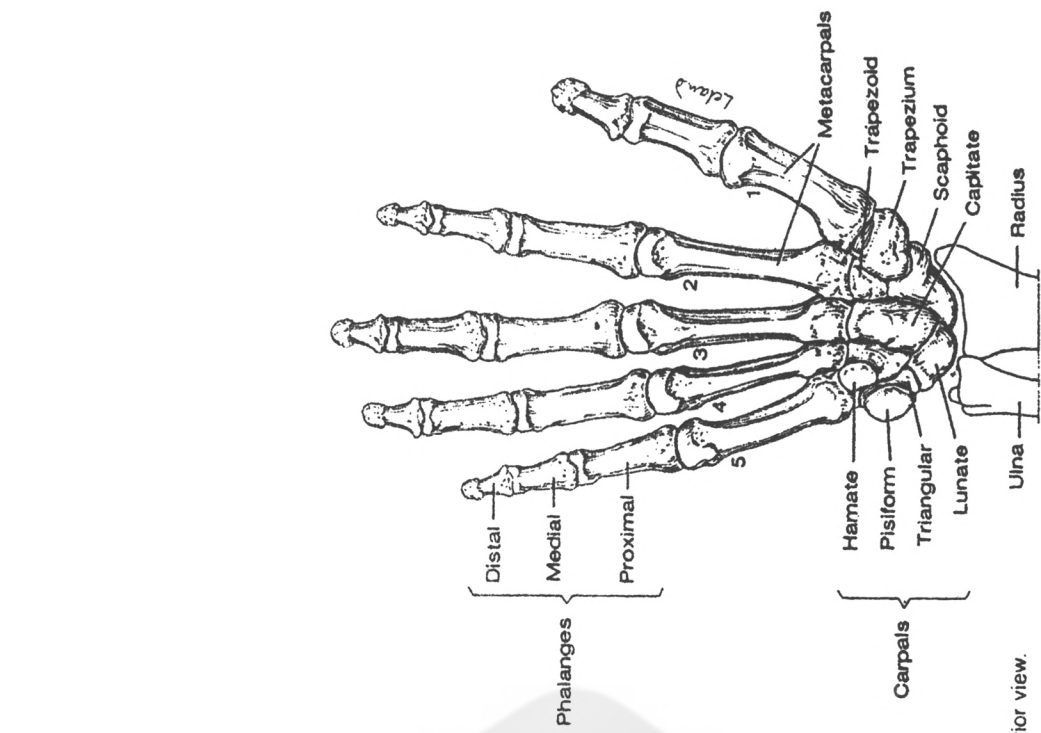
Figure 6-16. Bony thorax, anterior view



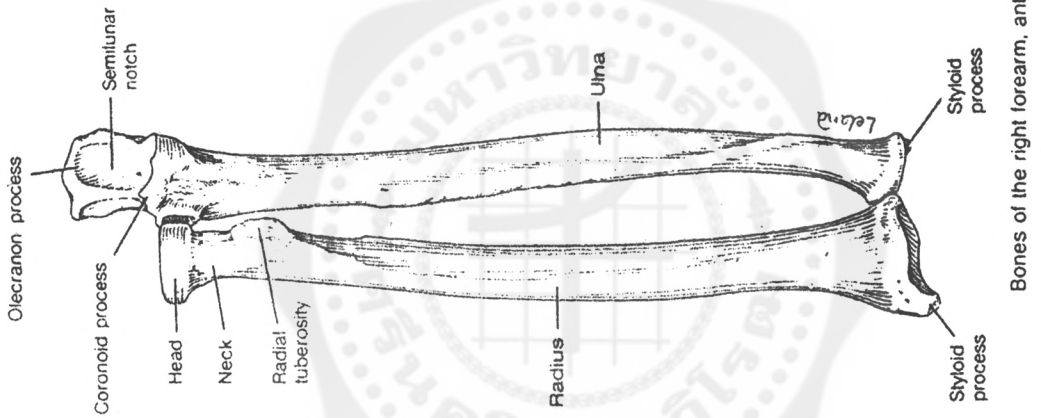
Typical true rib from right side of body
(costal cartilage not shown).



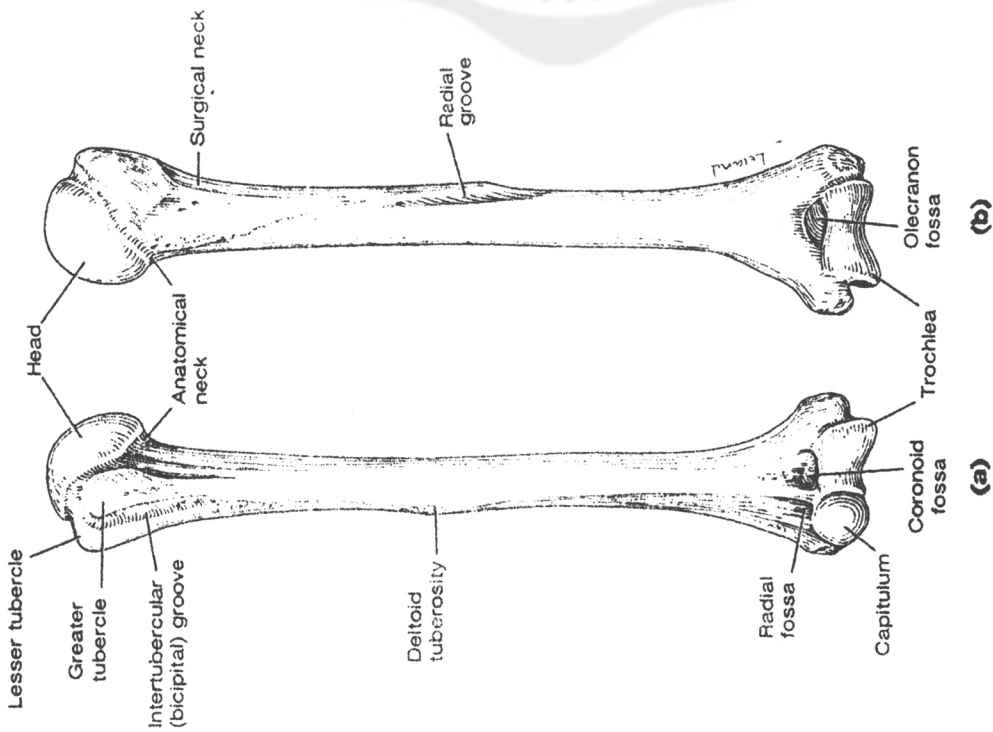
Bones of the shoulder girdle: (a) left shoulder girdle articulated to show the relationship of the girdle to the bones of the thorax and upper arm; (b) left scapula, anterior view; (c) left scapula, posterior view; (d) left scapula, lateral view



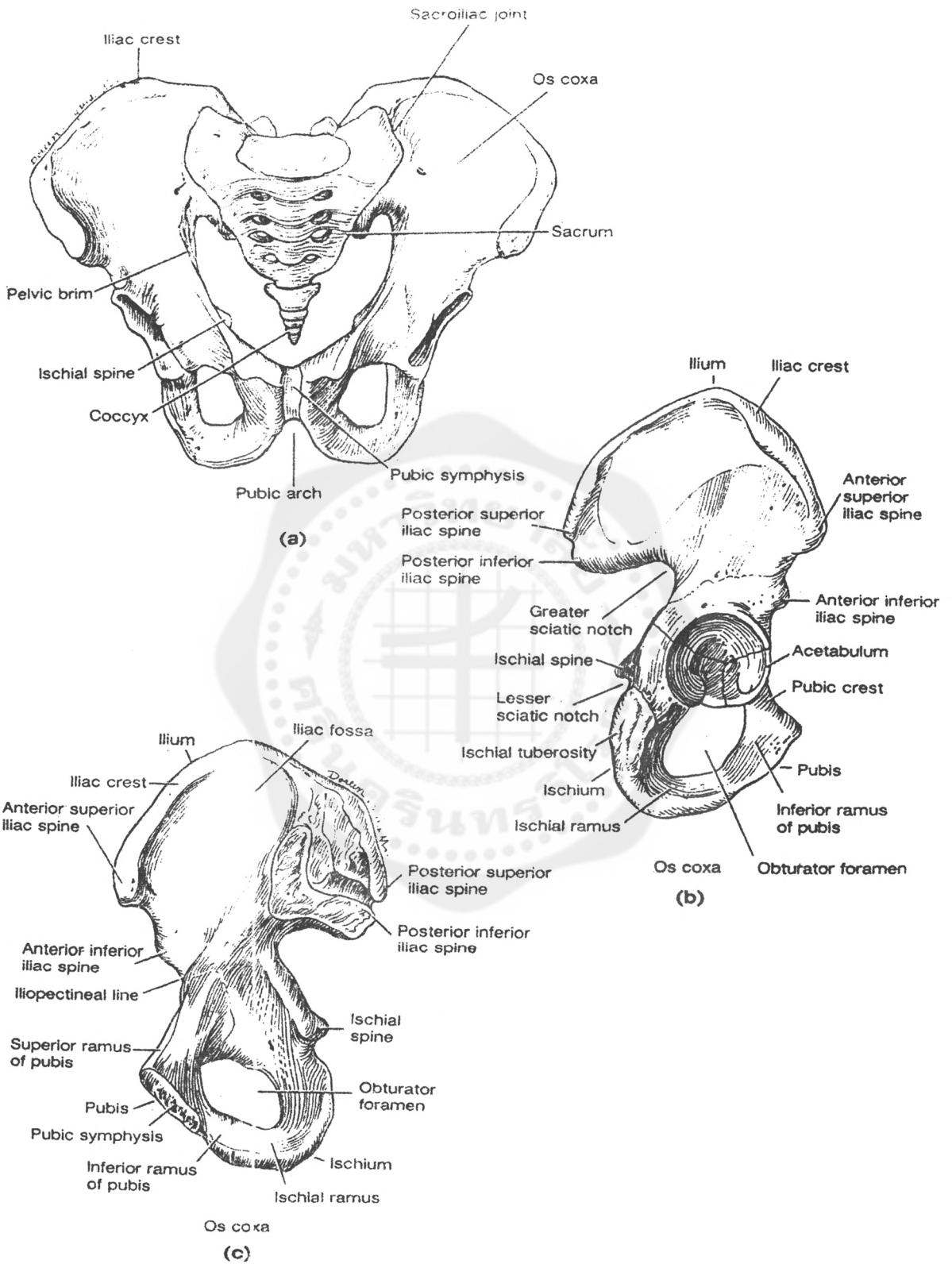
Bones of the right hand and wrist, anterior view.



Bones of the right forearm, anterior view.



Humerus of right arm: (a) anterior view; (b) posterior view.



Bones of the pelvic girdle: (a) articulated pelvis, showing the two os coxae and the sacrum; (b) right os coxa, showing the point of fusion of ilium, ischium, and pubis bones; (c) right os coxa, medial view

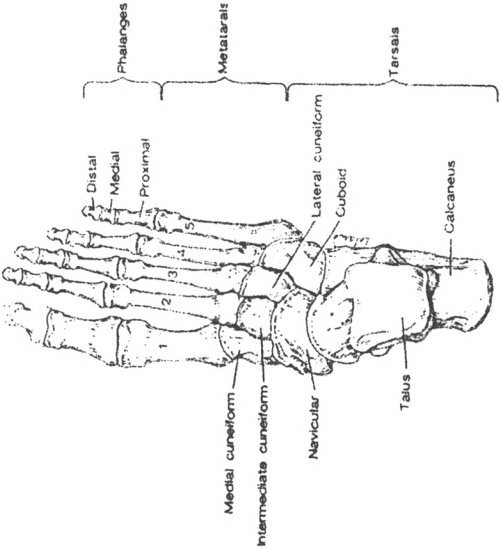
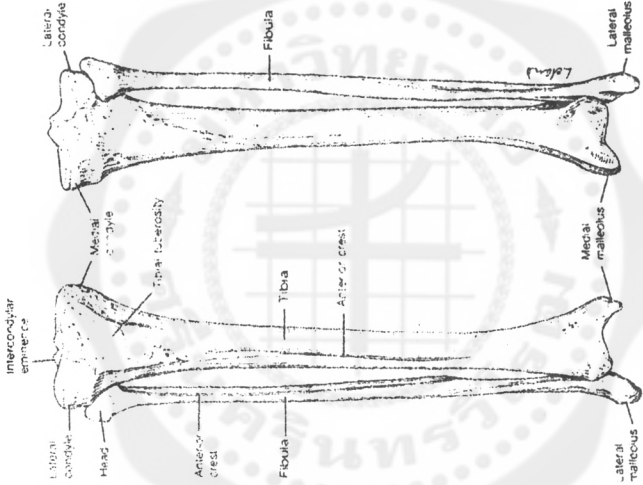
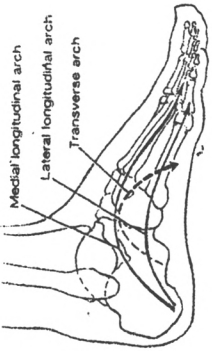
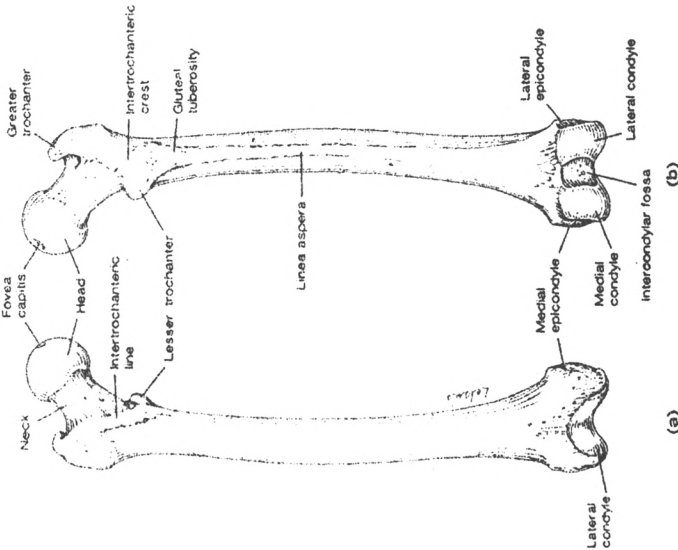


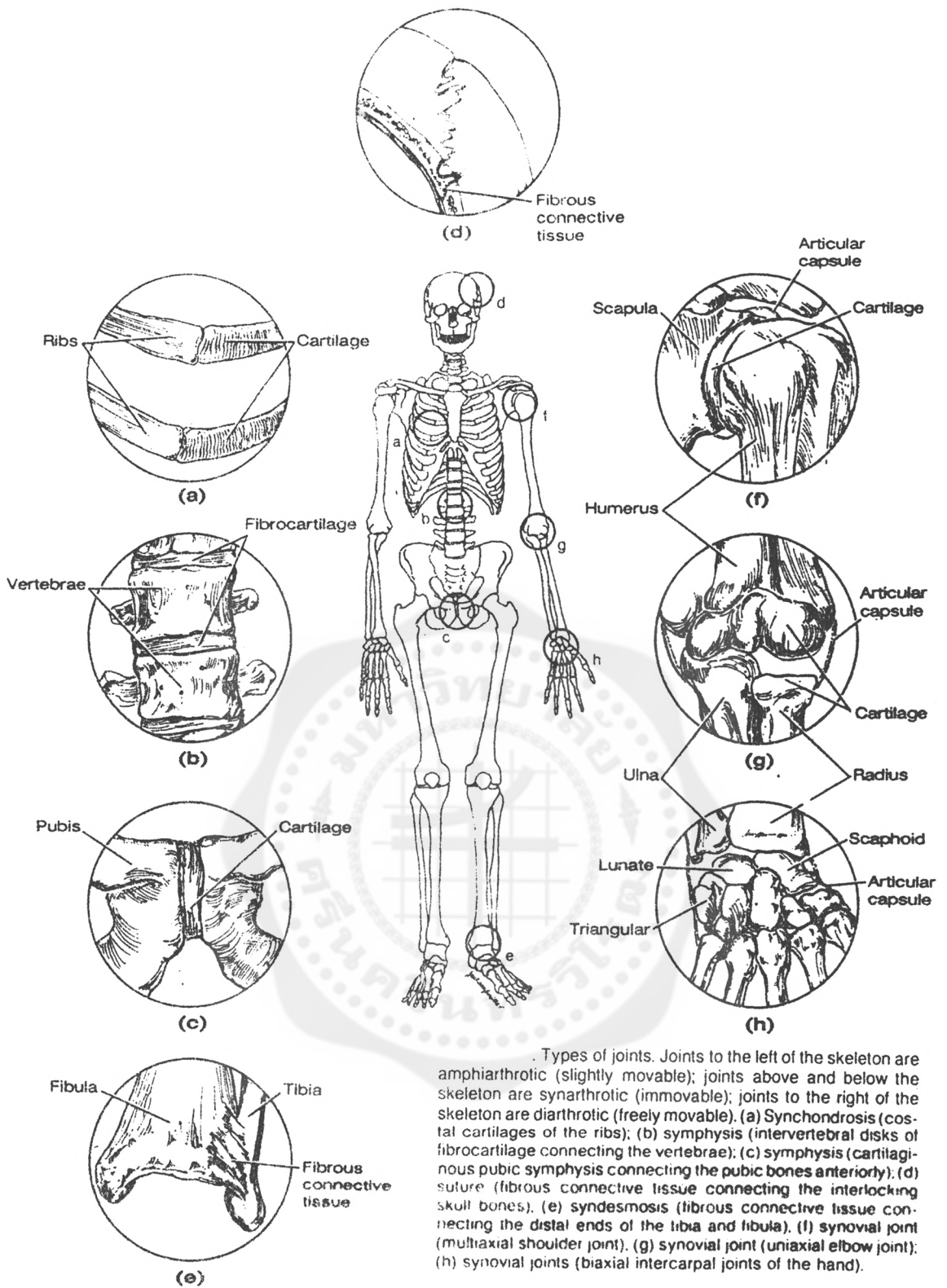
Figure 6-26. Bones of the right ankle and foot, superior view.



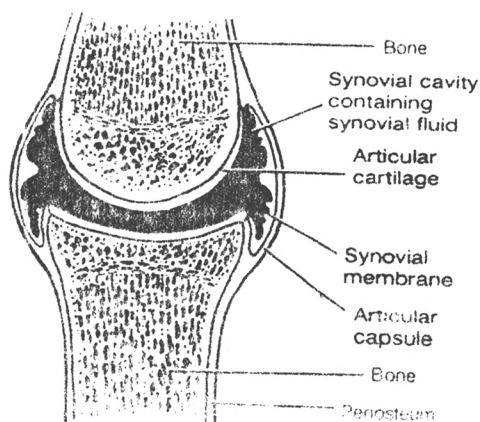
Figures of the right lower leg: (a) anterior view; (b) posterior view.



Right femur (thighbone): (a) anterior view; (b) posterior view.



Types of joints. Joints to the left of the skeleton are amphiarthrotic (slightly movable); joints above and below the skeleton are synarthrotic (immovable); joints to the right of the skeleton are diarthrotic (freely movable). (a) Synchondrosis (costal cartilages of the ribs); (b) symphysis (intervertebral disks of fibrocartilage connecting the vertebrae); (c) symphysis (cartilaginous pubic symphysis connecting the pubic bones anteriorly); (d) suture (fibrous connective tissue connecting the interlocking skull bones); (e) syndesmosis (fibrous connective tissue connecting the distal ends of the tibia and fibula); (f) synovial joint (multiaxial shoulder joint); (g) synovial joint (uniaxial elbow joint); (h) synovial joints (biaxial intercarpal joints of the hand).



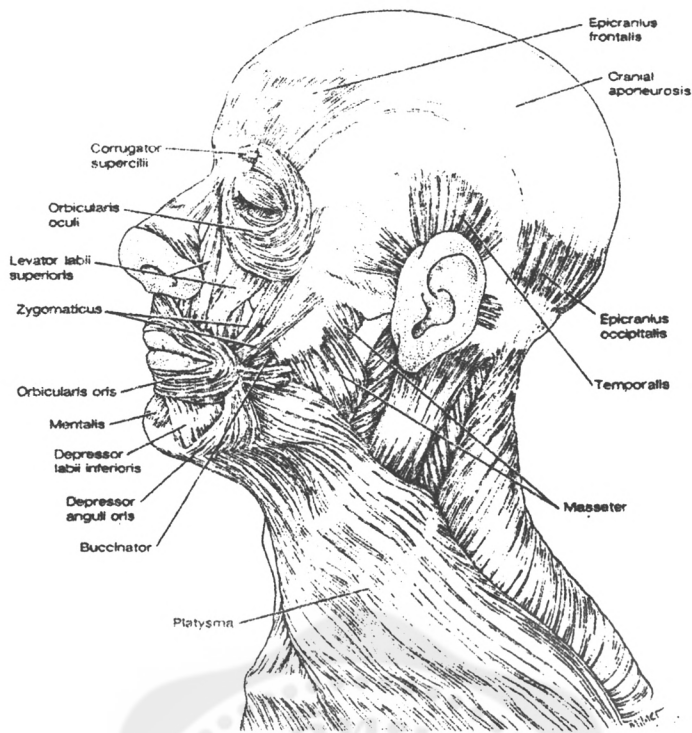


Fig. 1. Muscles of the human face and neck: (a) - superficial view; (b) superficial muscles removed and zygomatic arch and mandible cut away to reveal the deep pterygoid muscles*

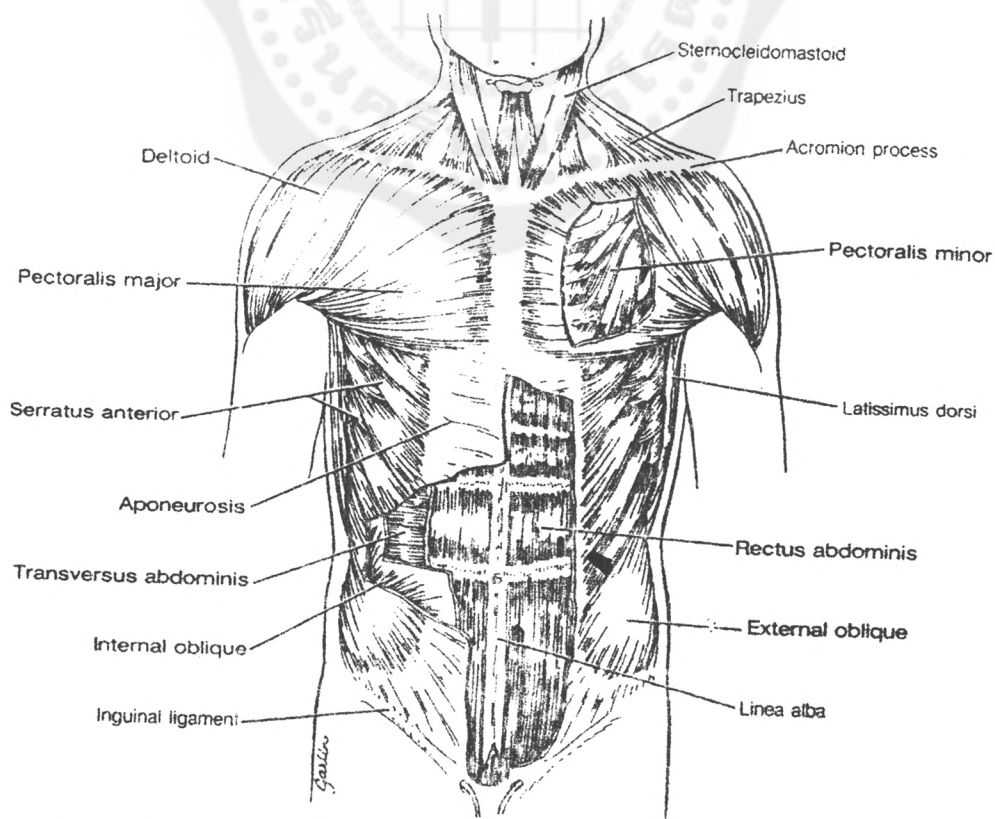
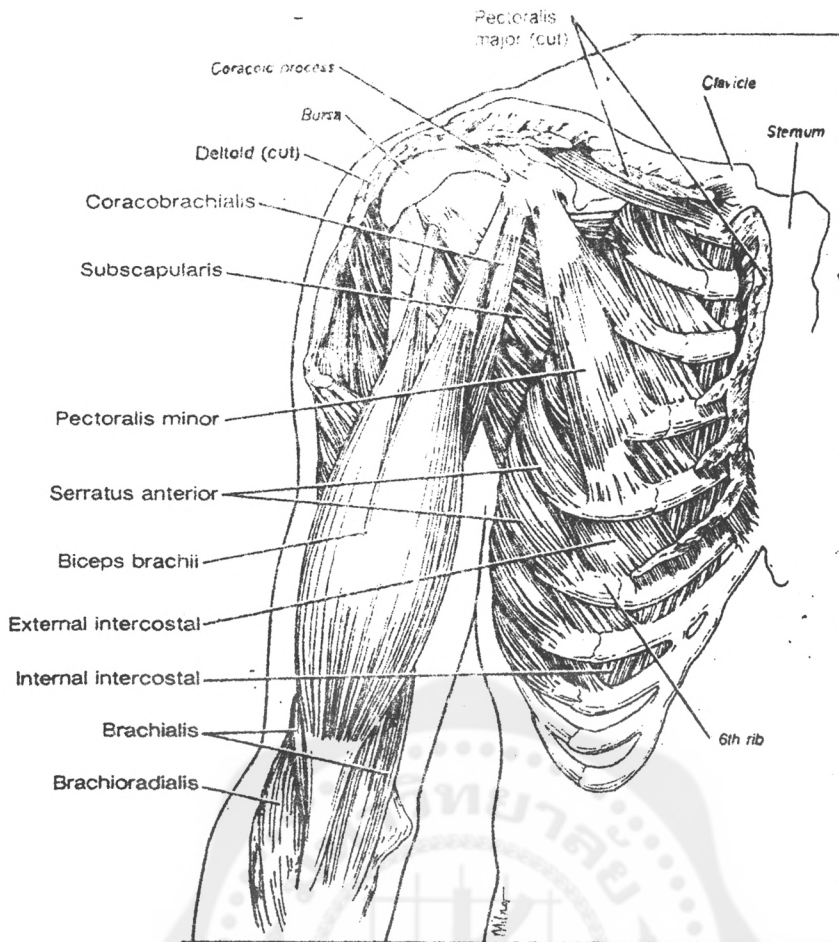
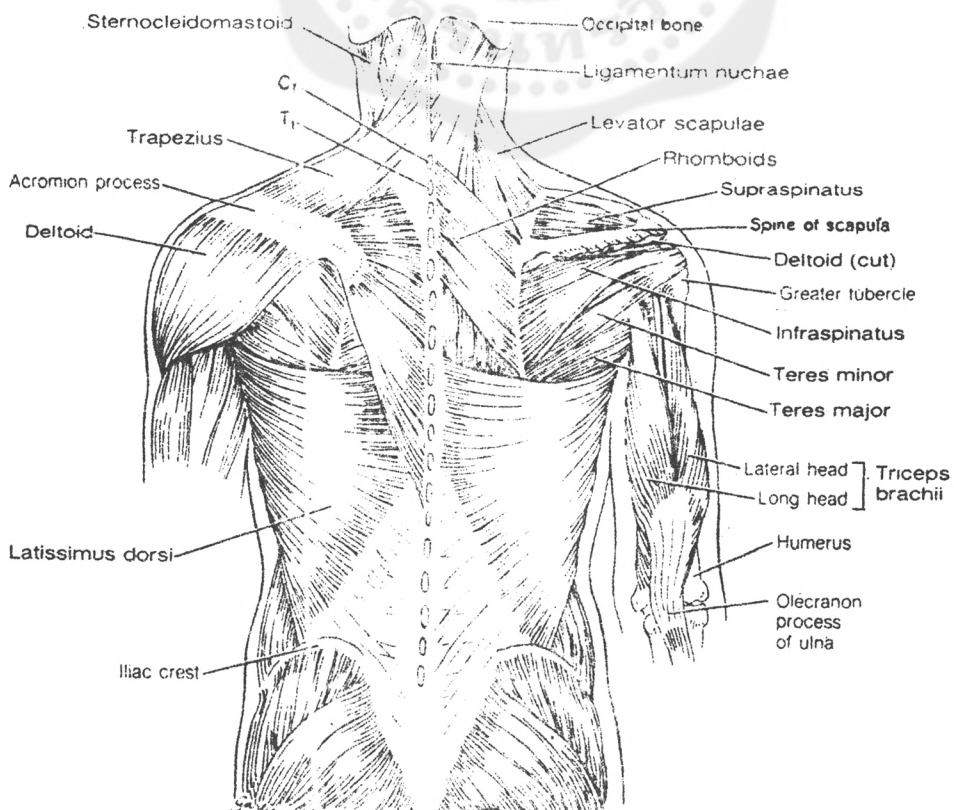


Fig. 2. Muscles of the human trunk and shoulder (anterior). Portions of the superficial muscles are cut away to reveal the deeper muscles.



Deep muscles of the human thorax and muscles that anchor the scapula and clavicle to the thorax (anterior). Superficial muscles of the arm are also shown.



5. Muscles of the human neck, trunk, and arm (posterior). Superficial muscles are shown on the left; deeper muscles are shown on the right.

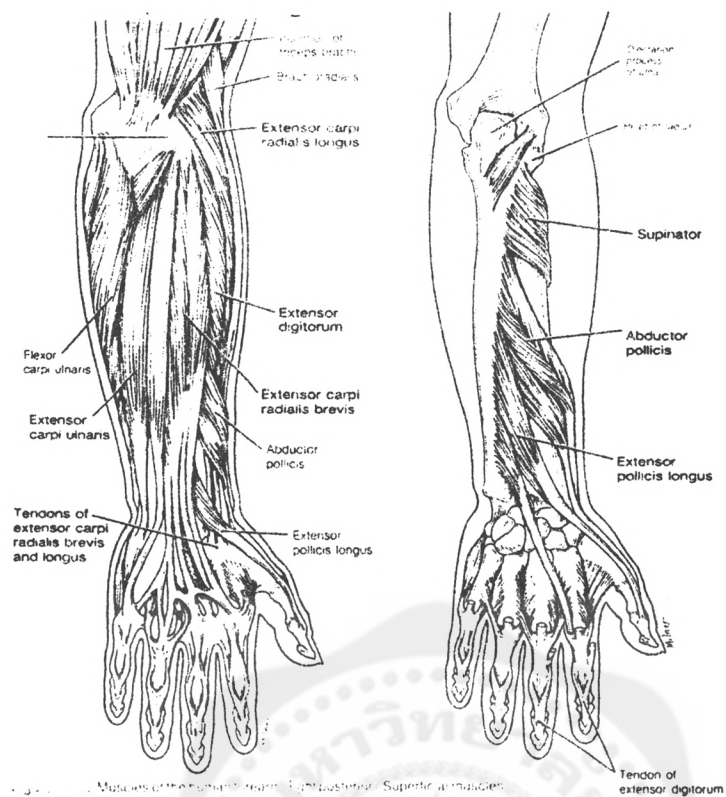
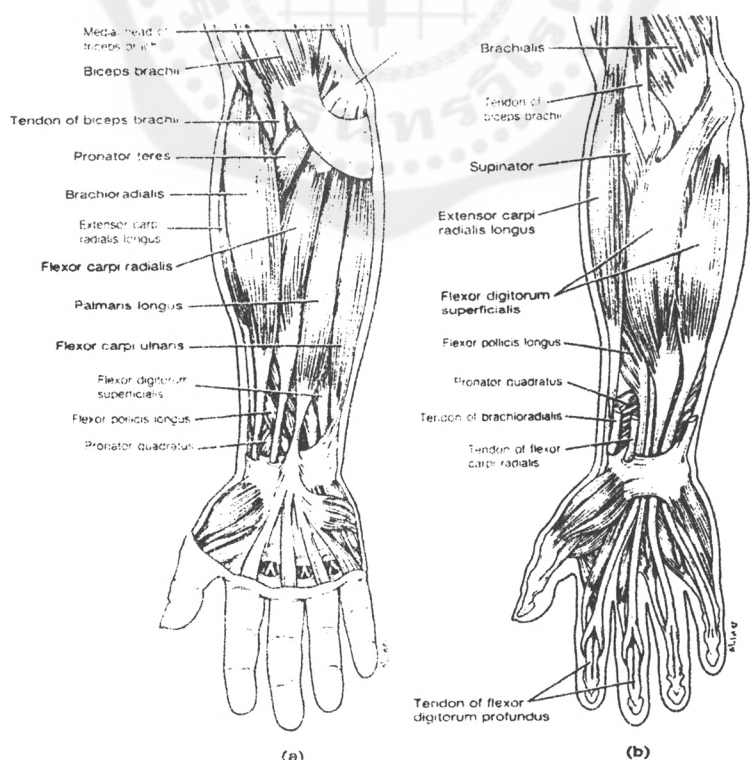
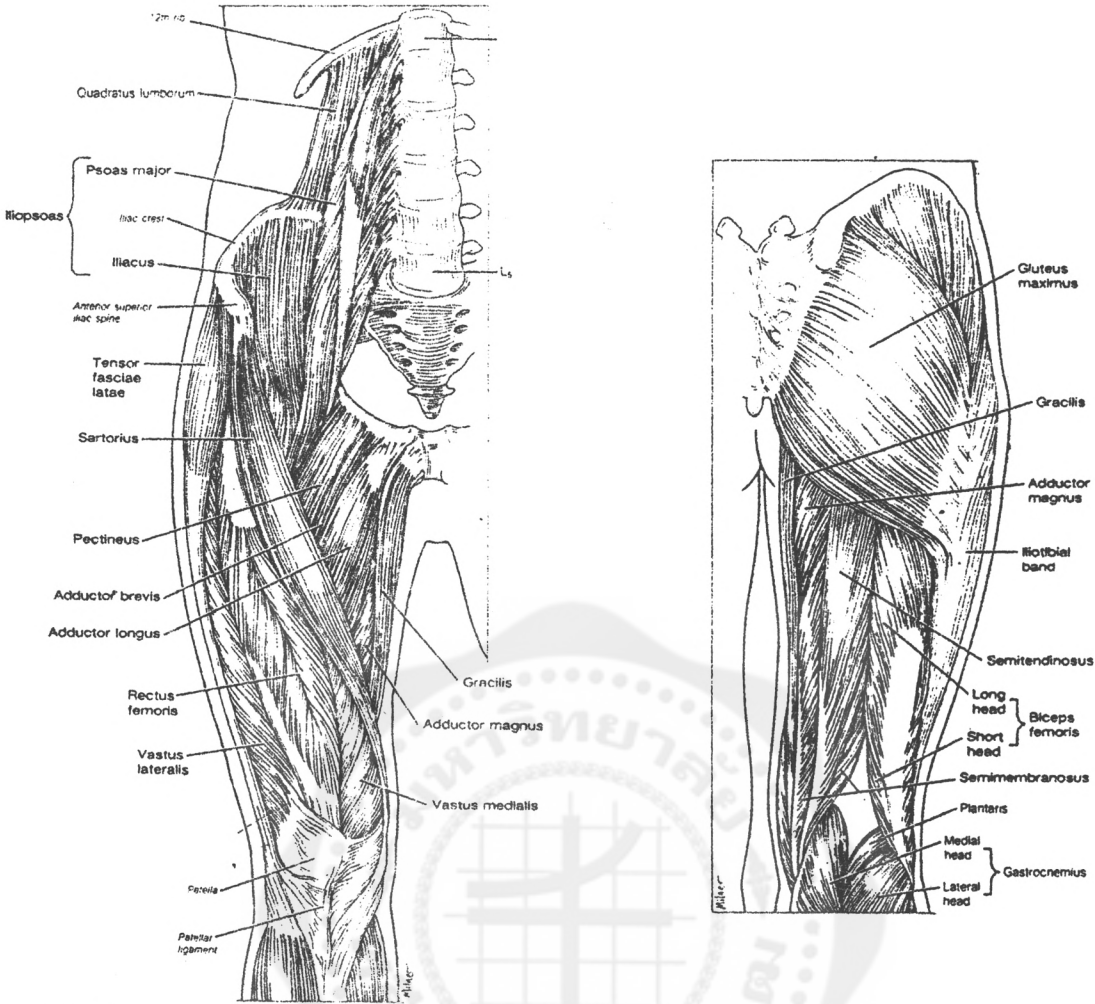


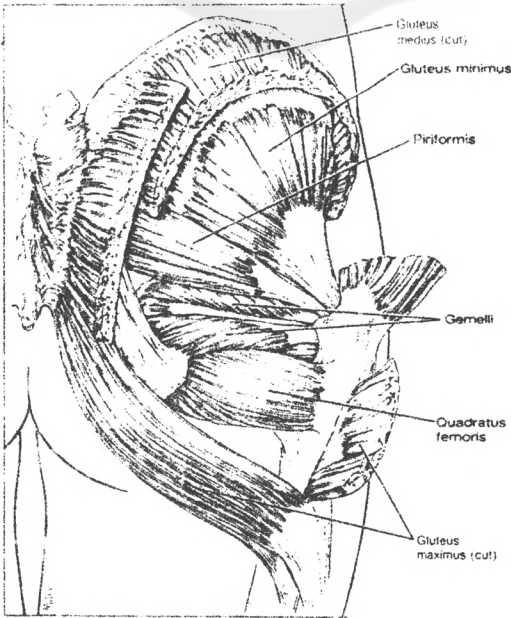
Figure 10.10 Muscles of the human right forearm (superior). Superior arm muscles are shown on the left; deep muscles are shown on the right.



Muscles of the human forearm (right anterior) (a) superficial; (b) second layer (deep).

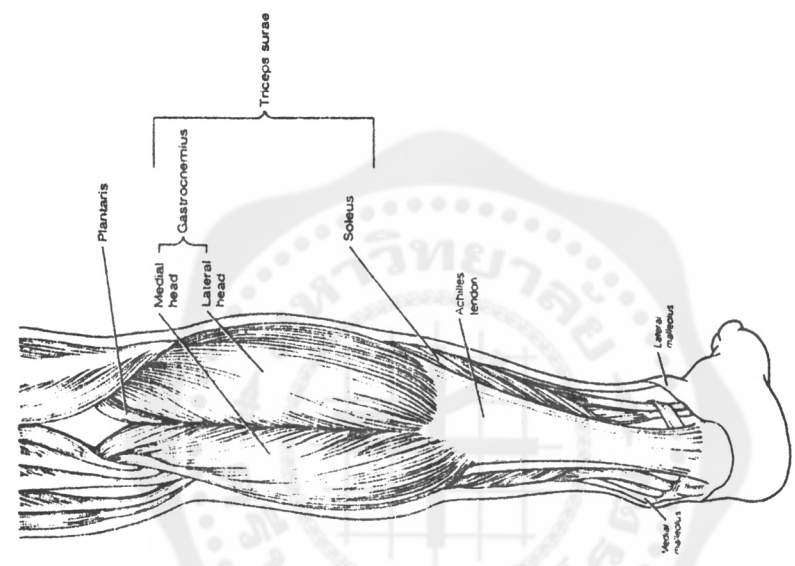
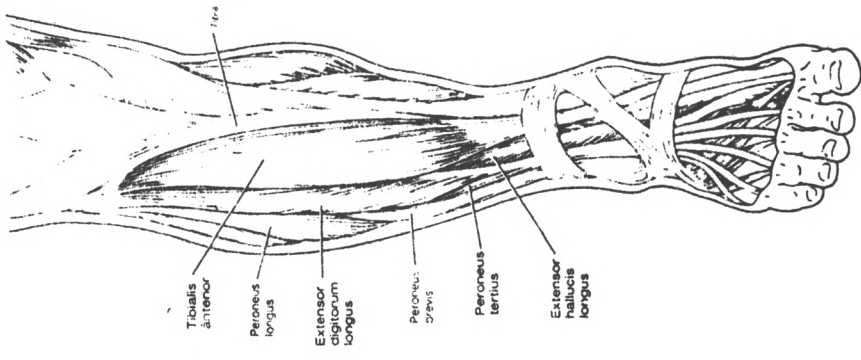


1. Pelvic and thigh muscles of the human leg (right anterior)

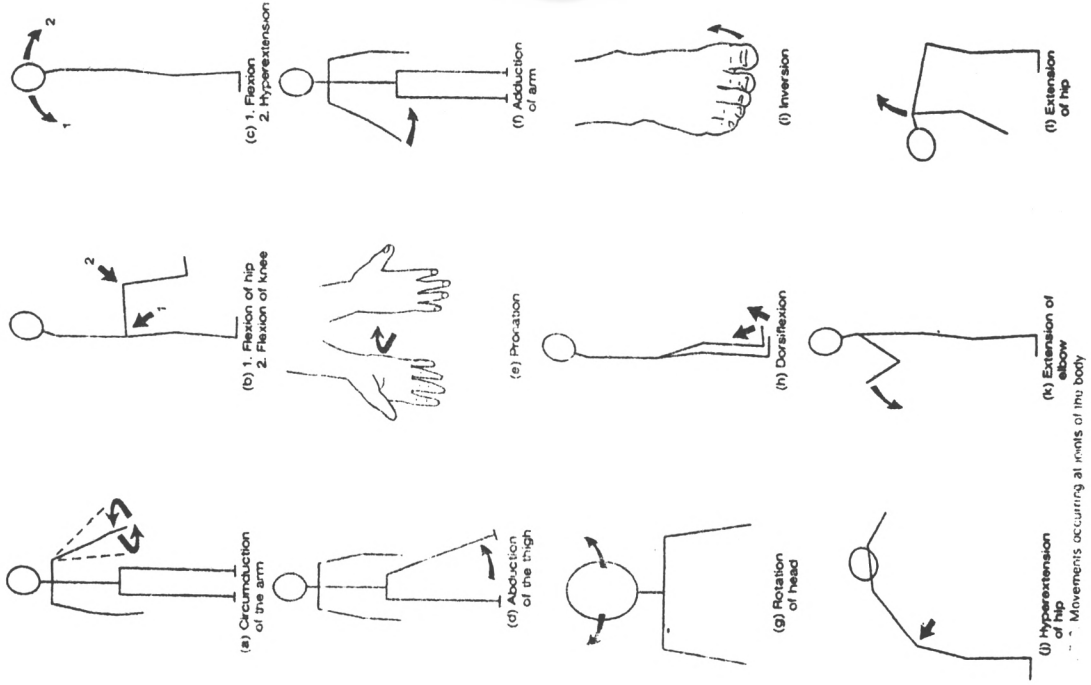


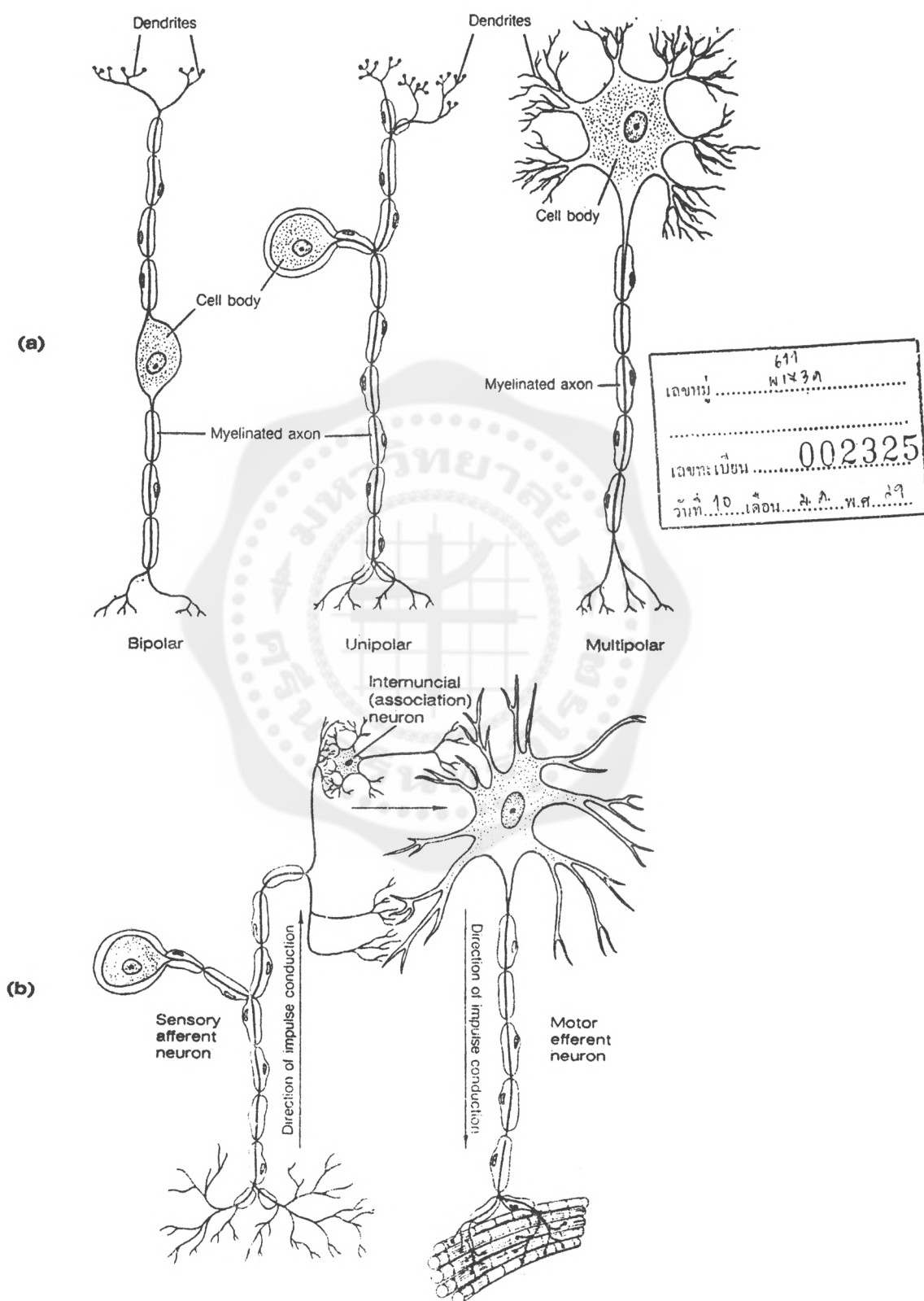
(b)

2. Muscles of the human hip and thigh (right posterior) (a) superficial muscles (b) deep muscles

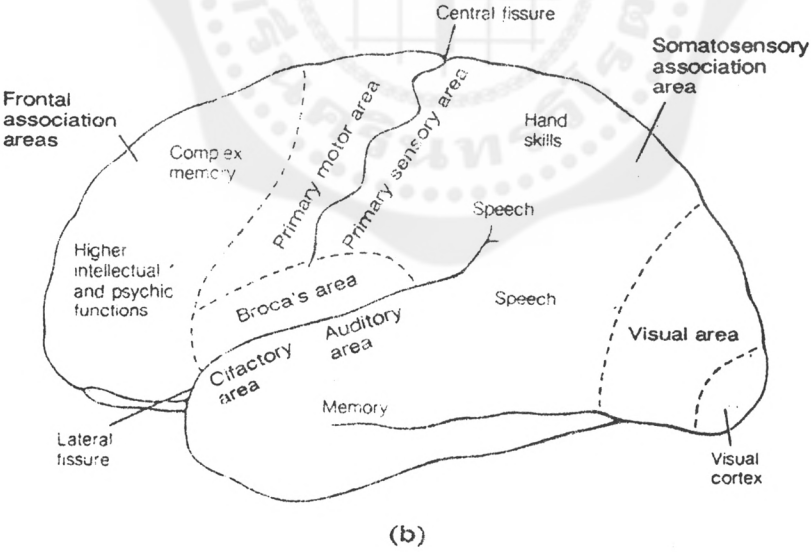
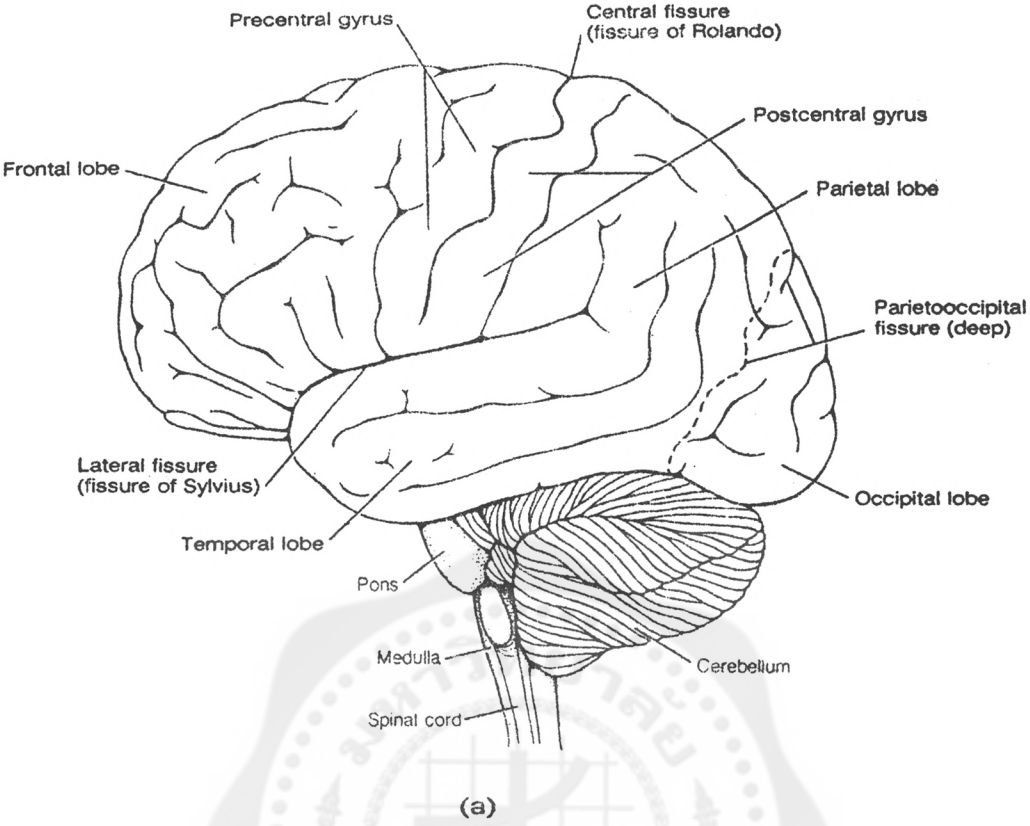


Call muscles of the human leg (right posterior). Superficial muscles are shown on the left, deep muscles are shown on the right with the triceps surae removed. In the small diagrams at far right, which show the attachments of two individual muscles, O indicates the point of origin and I the point of insertion.

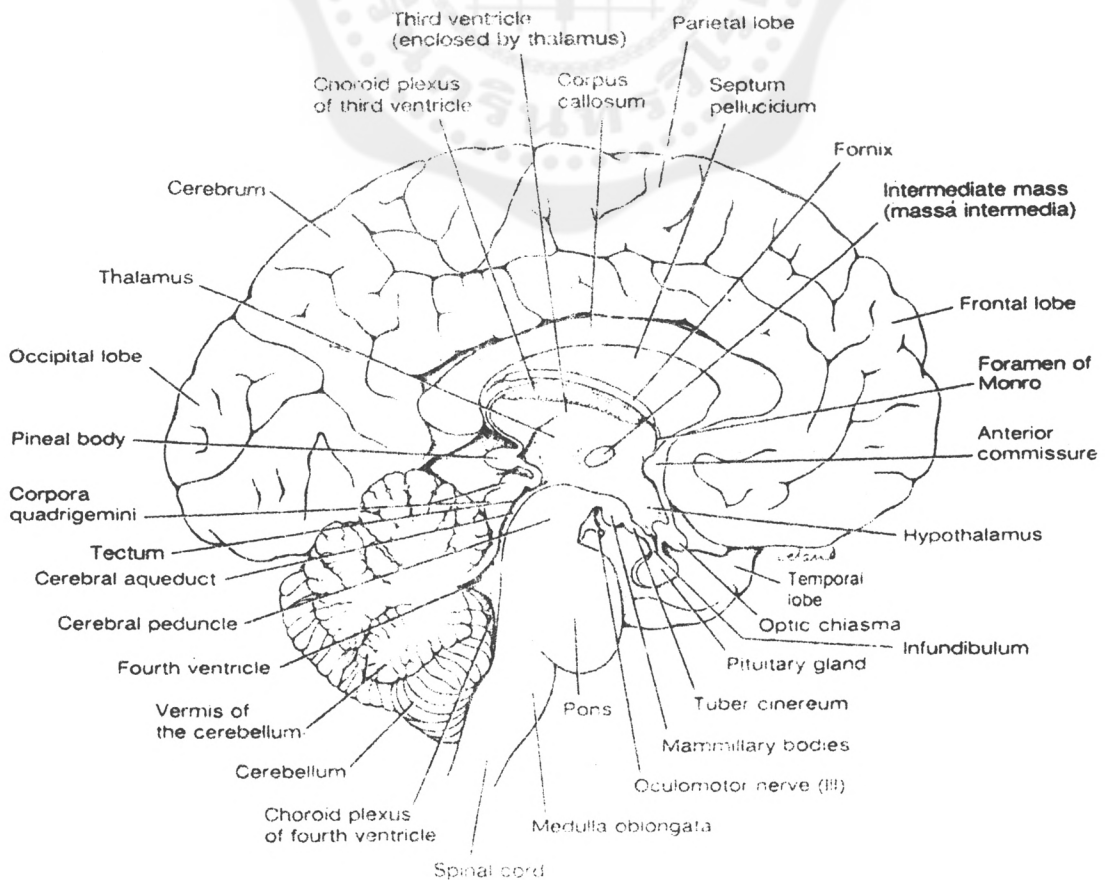
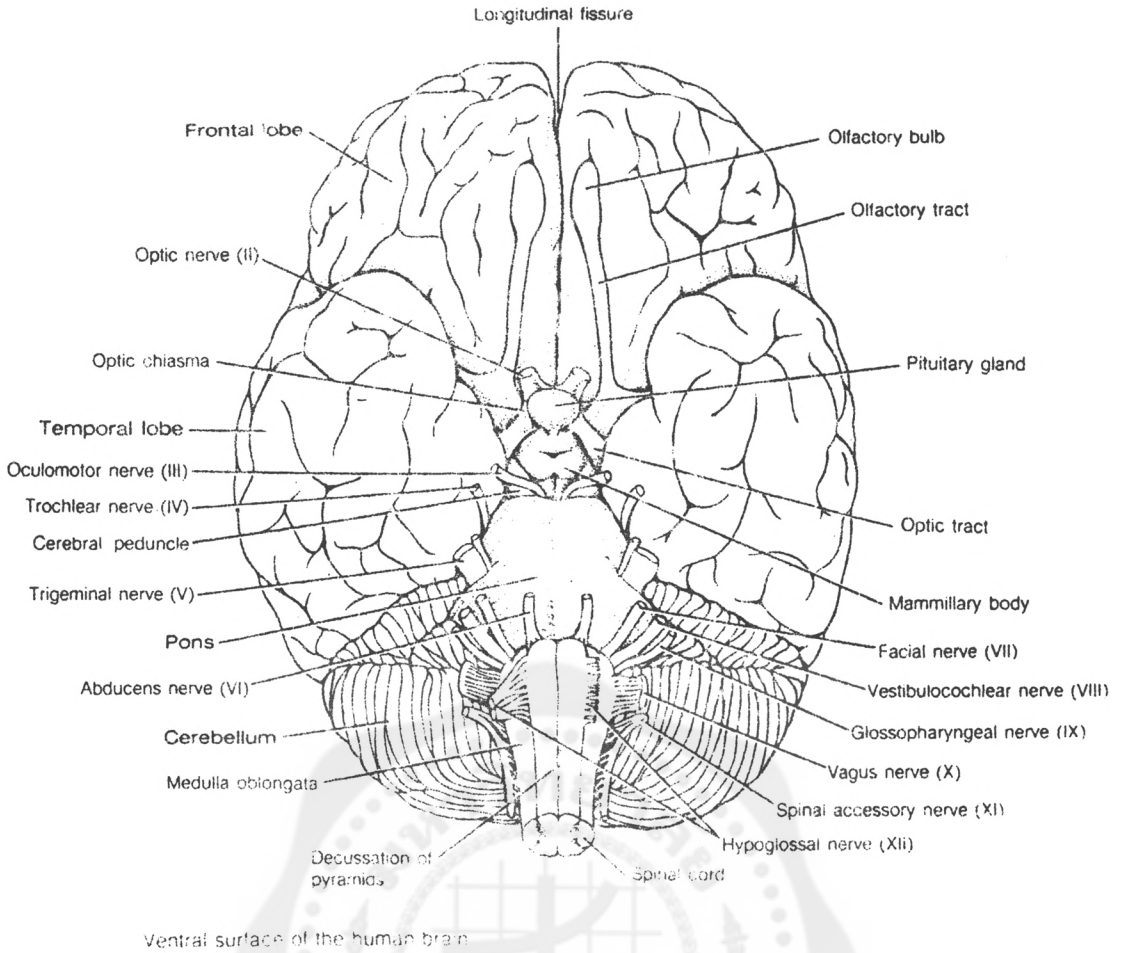




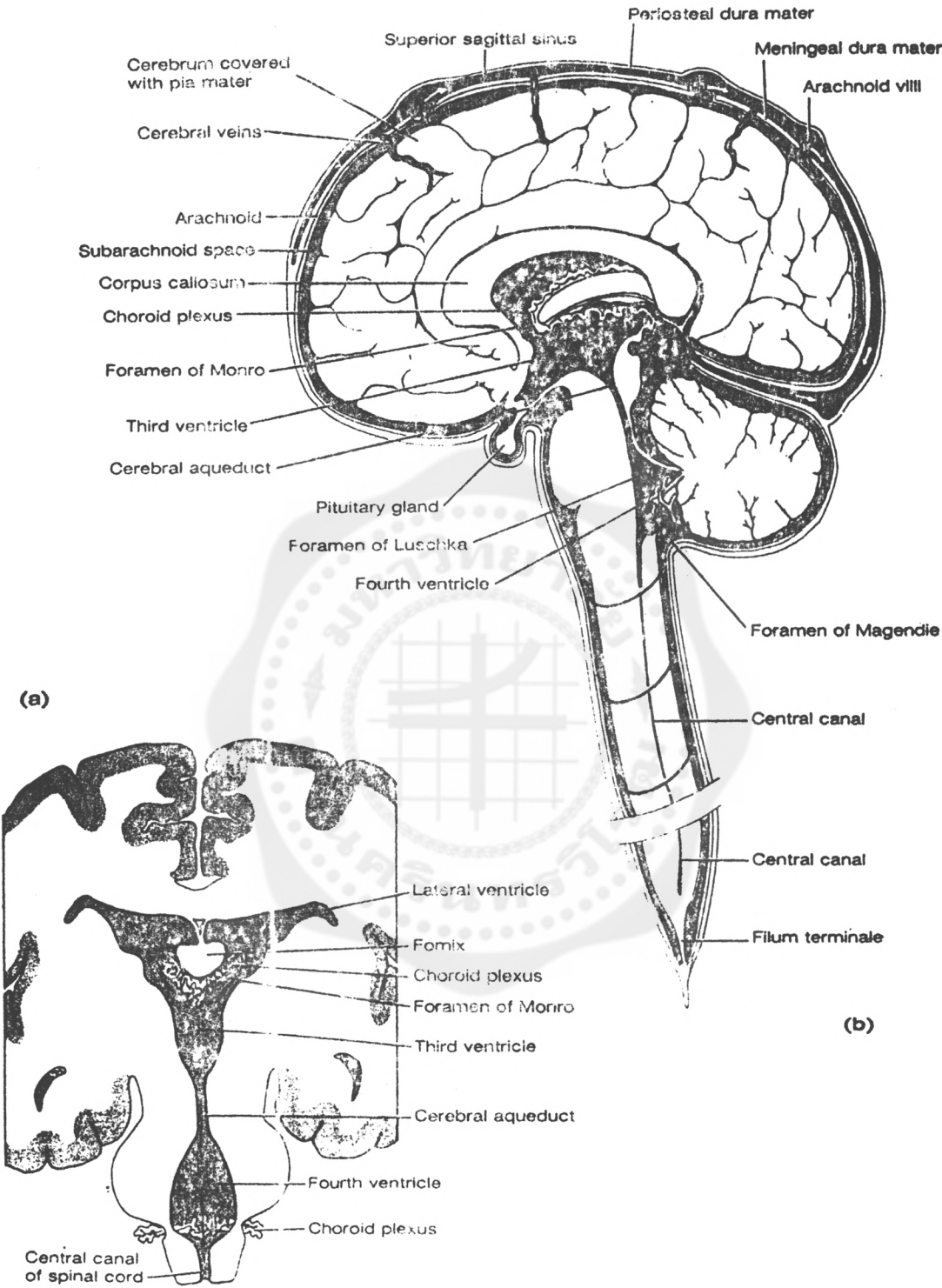
Classification of neurons (a) on the basis of structure (b) on the basis of function.



Left lateral view of the human brain (a) major structural areas:
(b) major functional areas of the cerebrum



Midsagittal section of the human brain



4. The cerebrospinal fluid surrounds the brain and spinal cord (circulatory pathway indicated by arrows). (a) frontal view of lateral ventricles illustrates the flow through the foramina of Monro; (b) sagittal view of the brain and cord

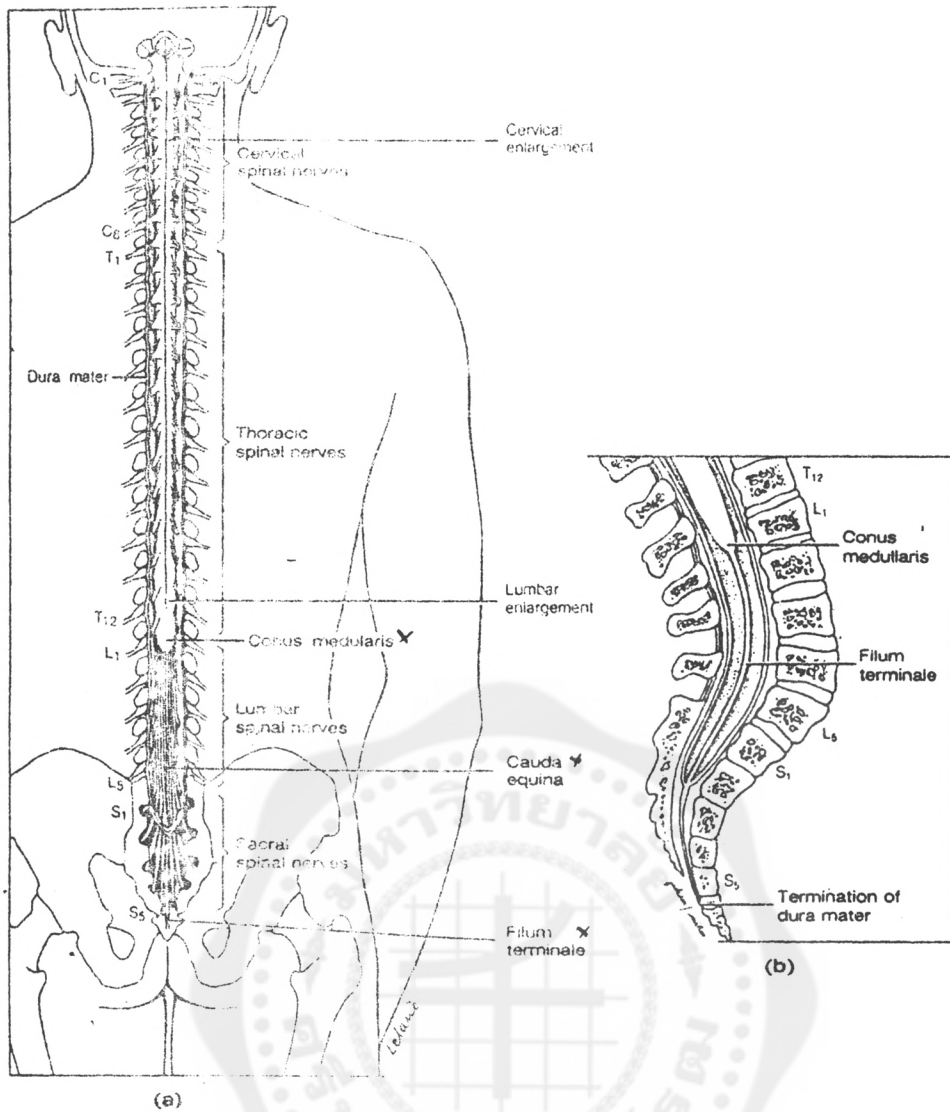
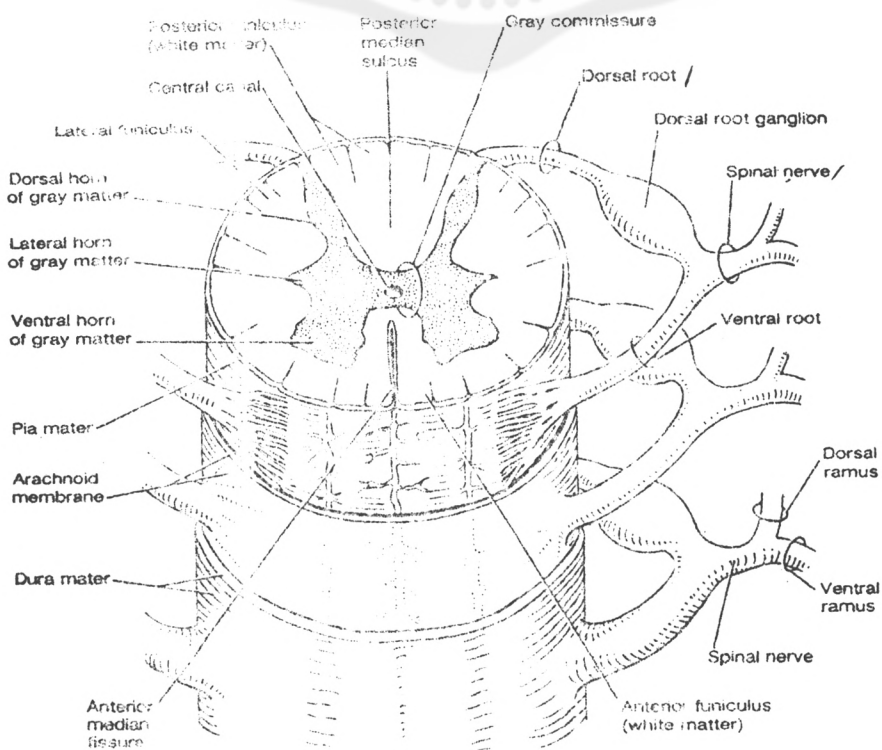


Figure 11.1 Anatomy of the human spinal cord. (a) dorsal view; (b) lateral view showing the extent of the filum terminale.



Anatomy of the human spinal cord (cross section)

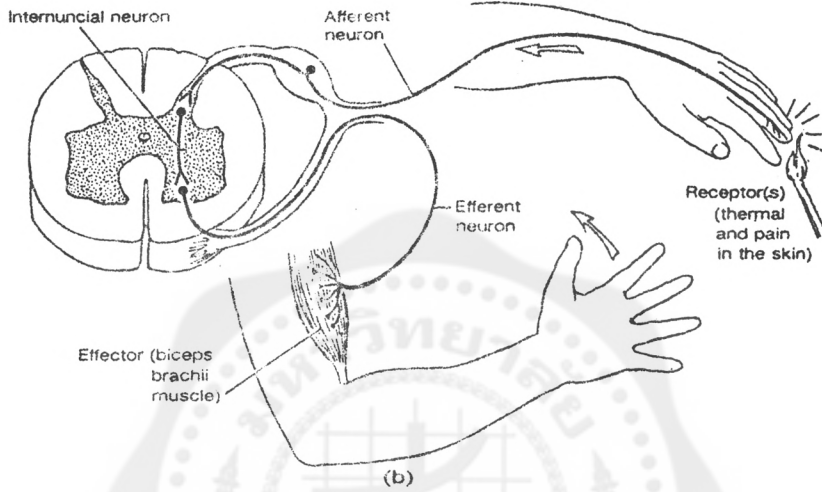
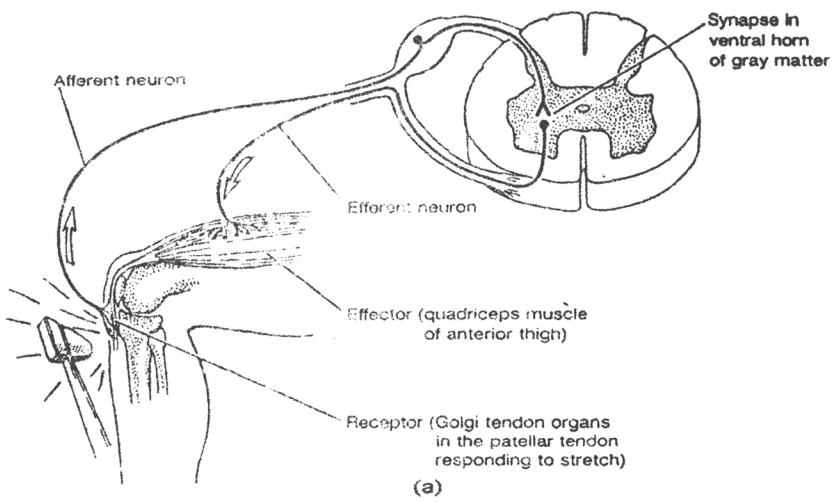
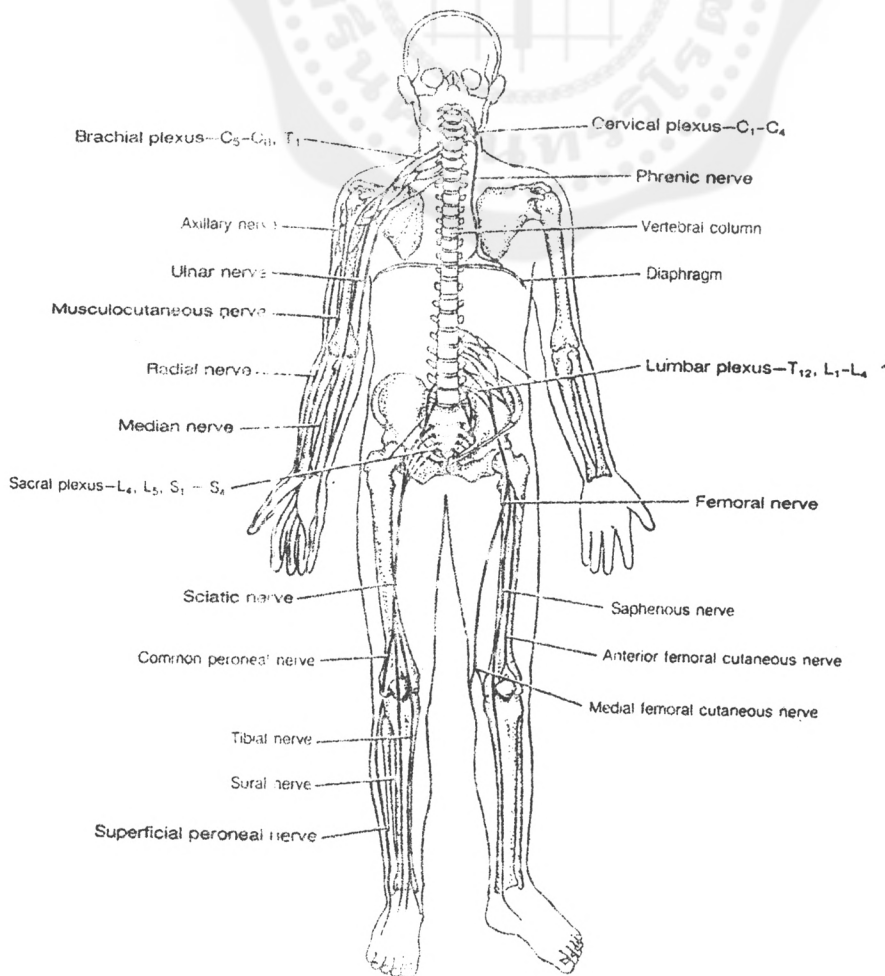
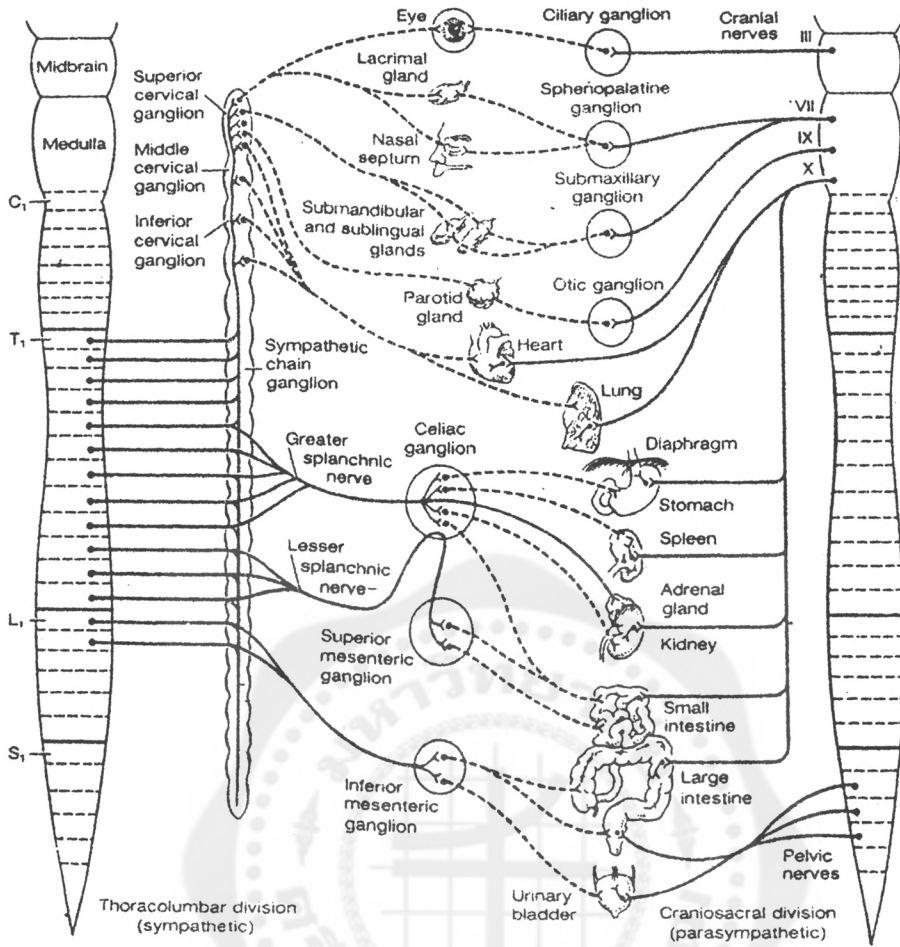


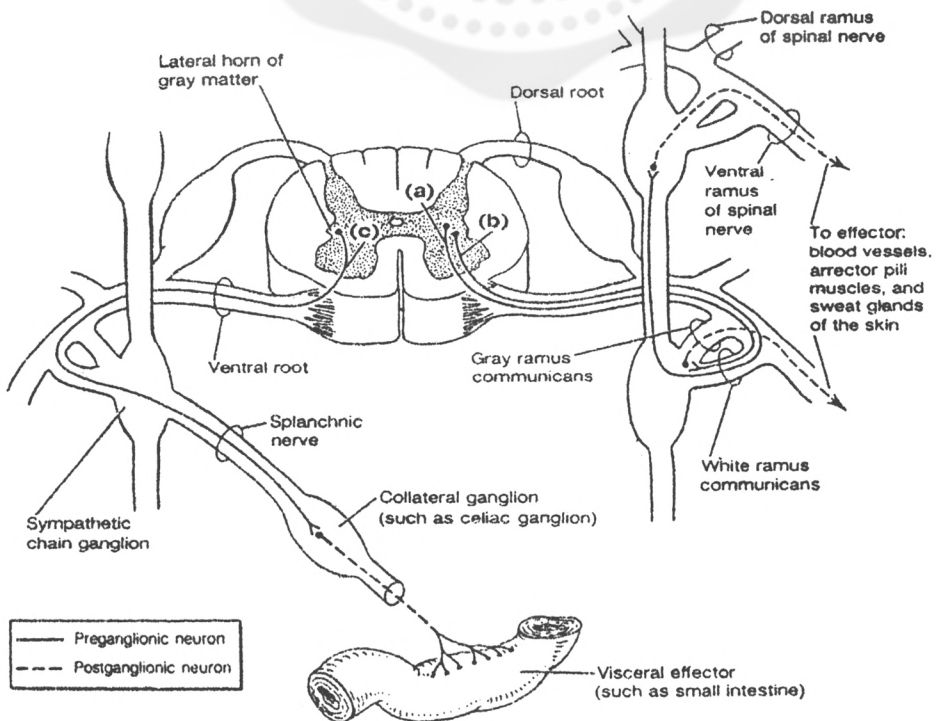
Fig. 1. Simple reflex arcs: (a) two-neuron reflex arc, (b) three-neuron reflex arc.



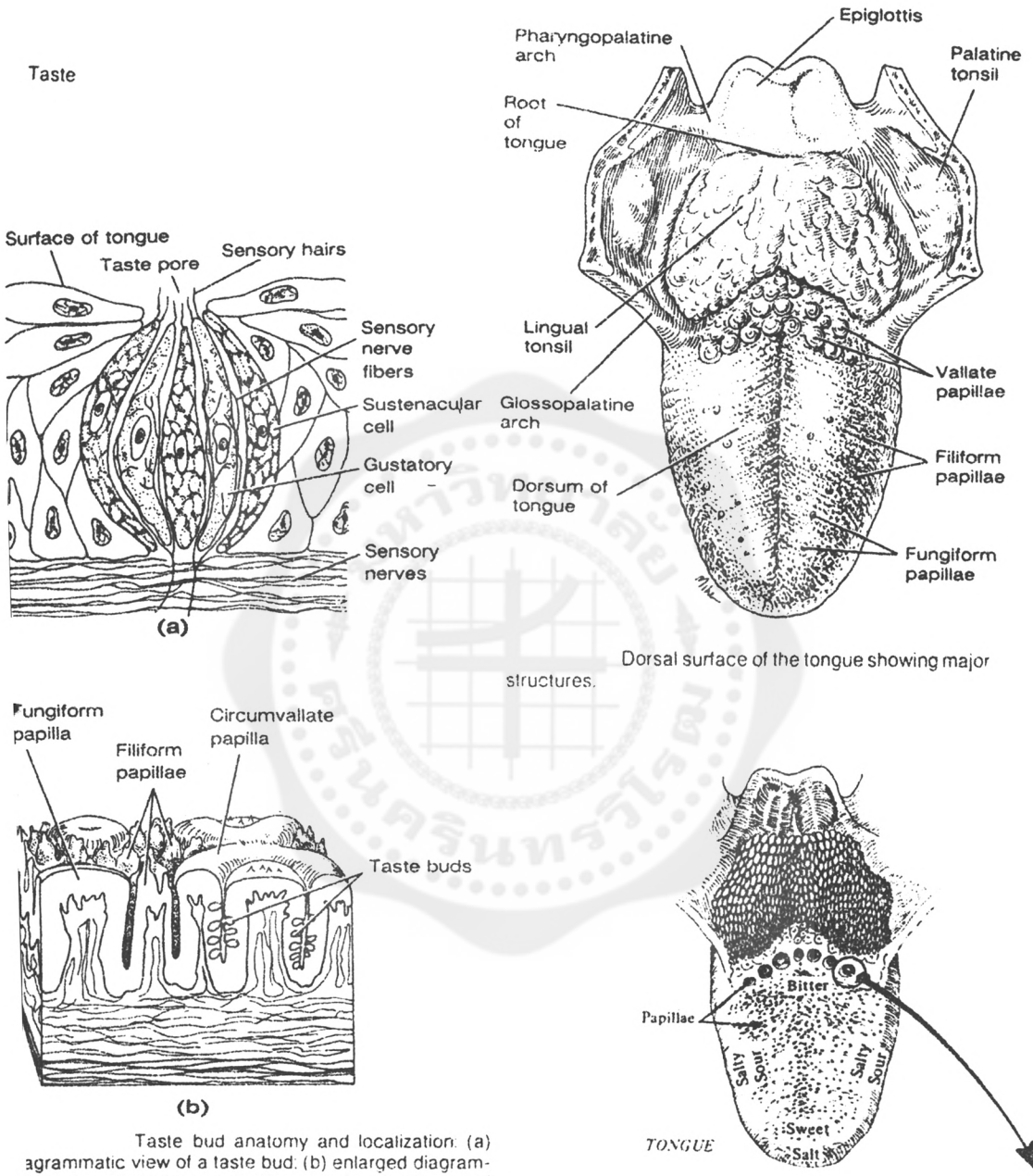
Nerve plexuses and the major nerves arising from each.



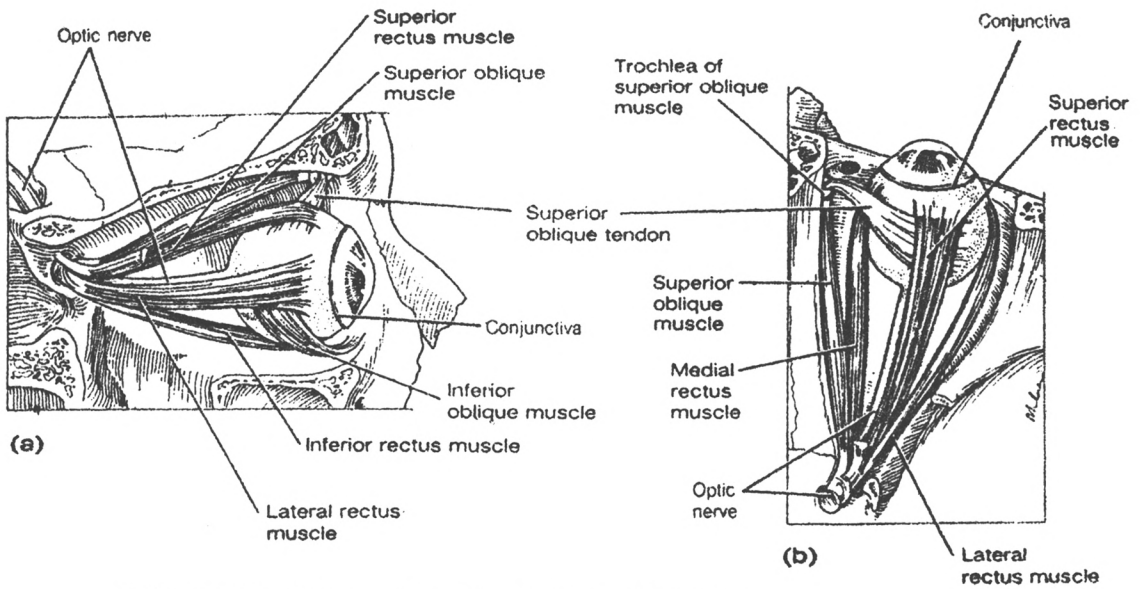
2. The autonomic nervous system



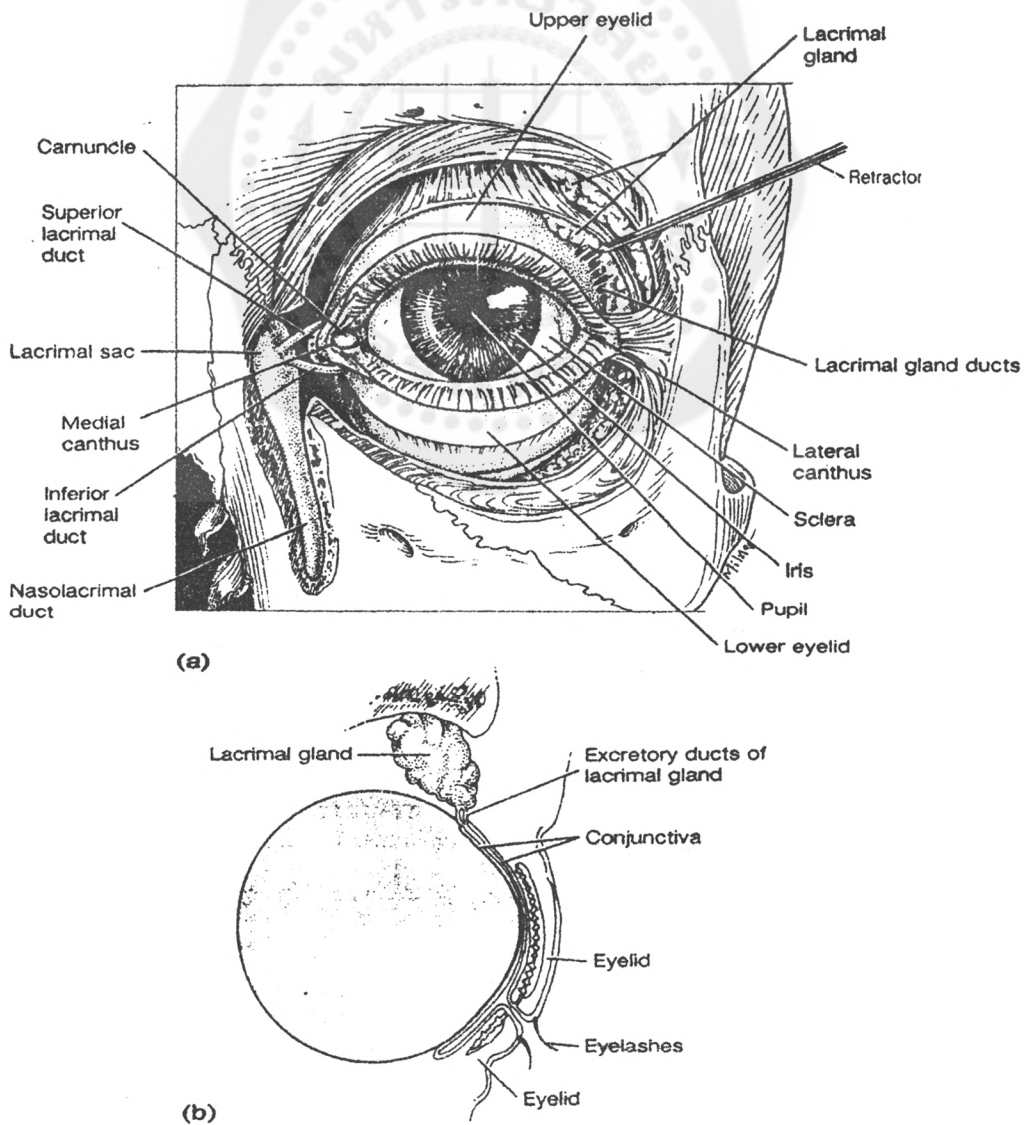
Sympathetic pathways: (a) synapse in a sympathetic chain ganglion at the same level; (b) synapse in a sympathetic chain ganglion at a different level; (c) synapse in a collateral ganglion



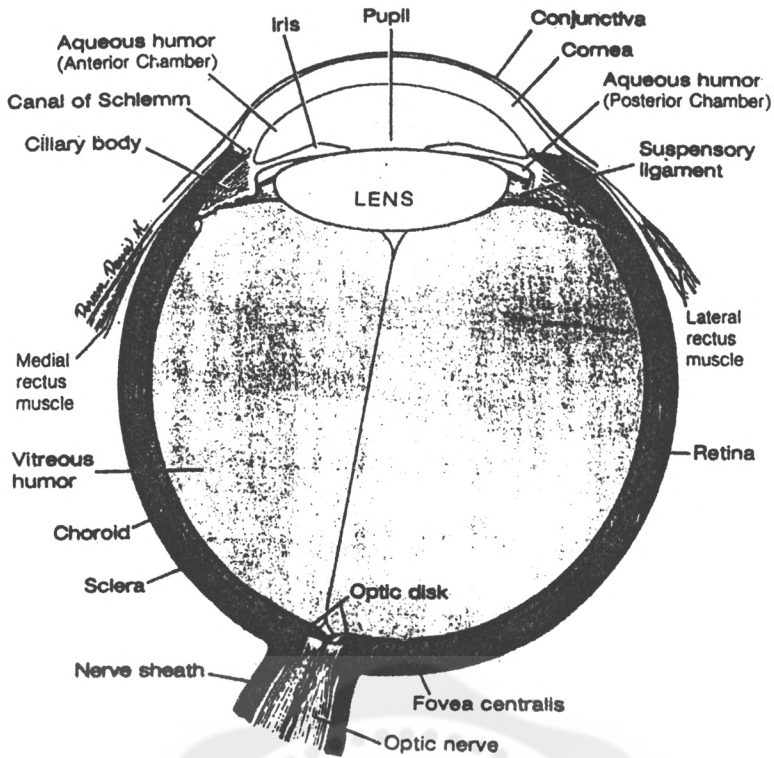
Taste bud anatomy and localization: (a) diagrammatic view of a taste bud; (b) enlarged diagrammatic view of the tongue papillae showing positioning of taste buds.



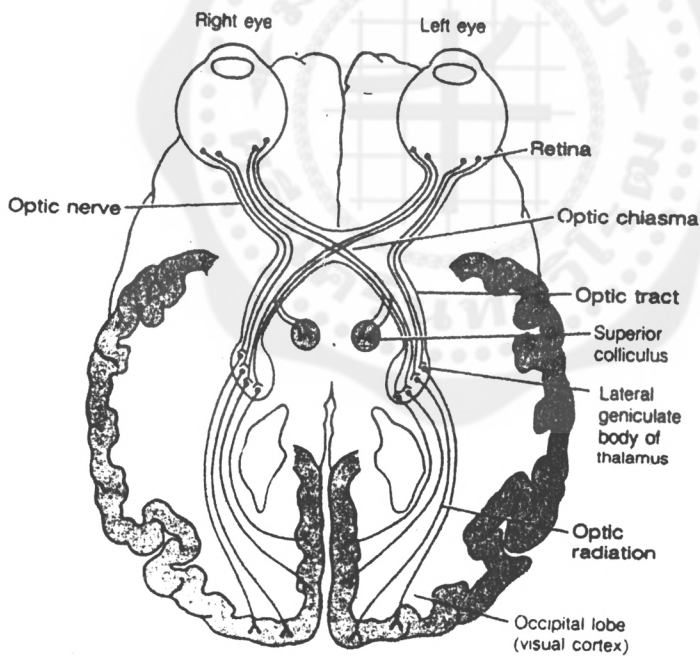
∴ Extrinsic muscles of the eye: (a) lateral view of right eye; (b) superior view of right eye.



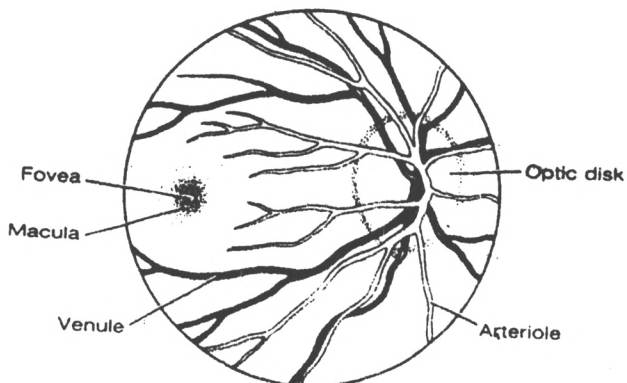
∴ External anatomy of the eye and accessory structures: (a) anterior view; (b) sagittal section.

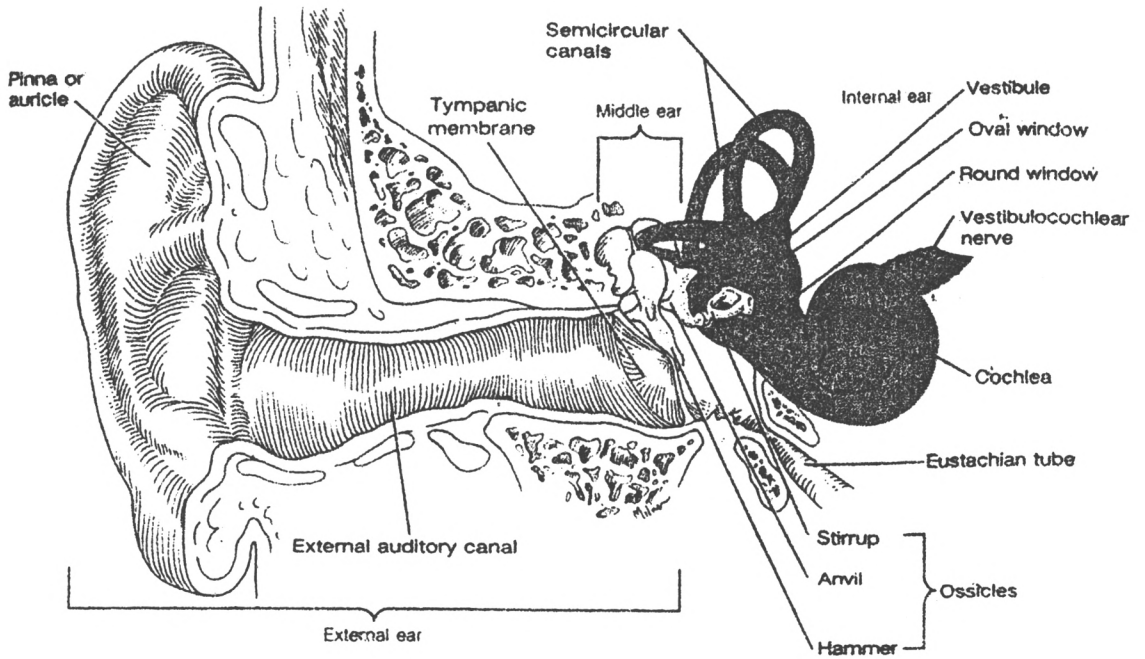


. Internal anatomy of the eye (midsagittal section).

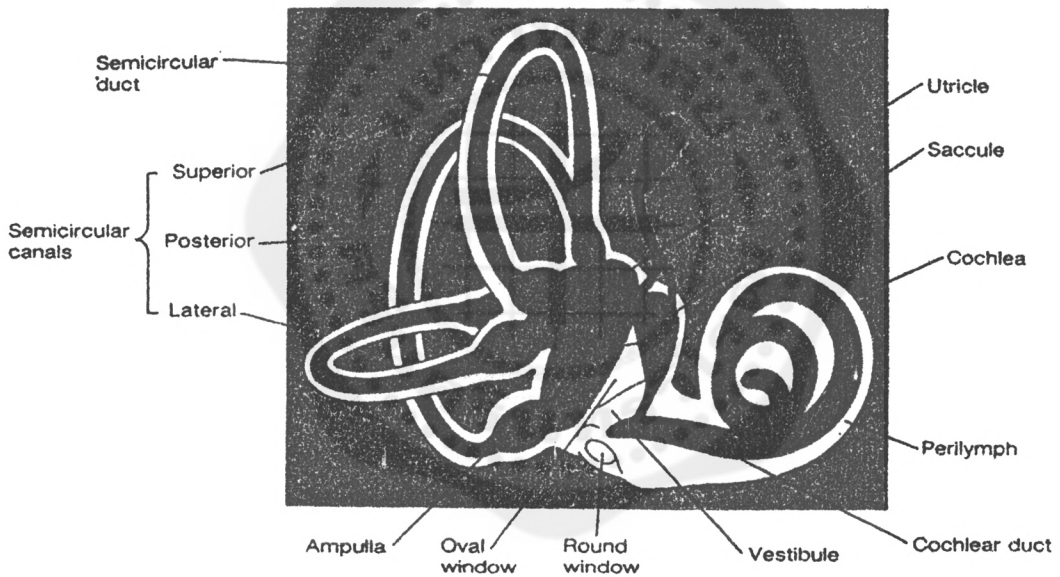


. Visual pathway to the brain. (Note that fibers from the lateral portion of each retinal field do not cross at the optic chiasma.)

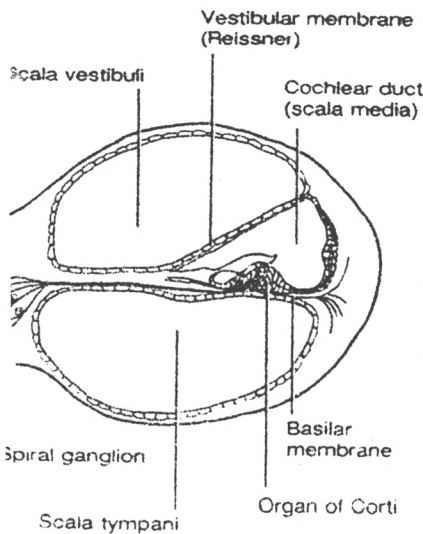




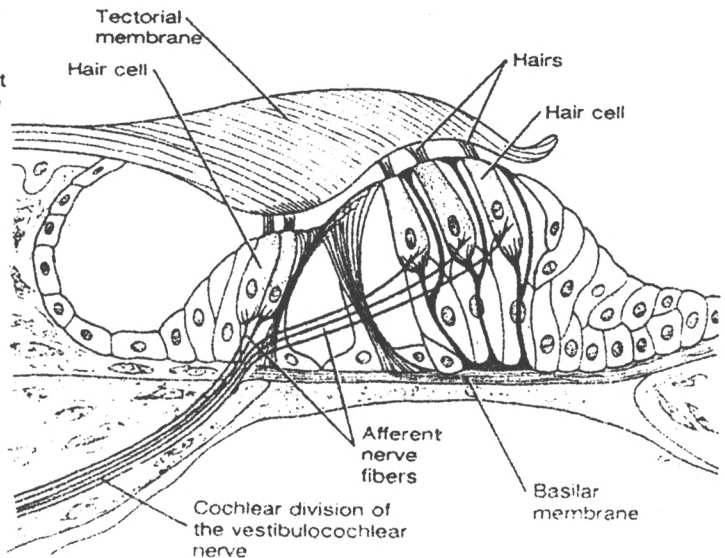
Anatomy of the Ear -



Inner ear. Right membranous labyrinth shown within the bony labyrinth.

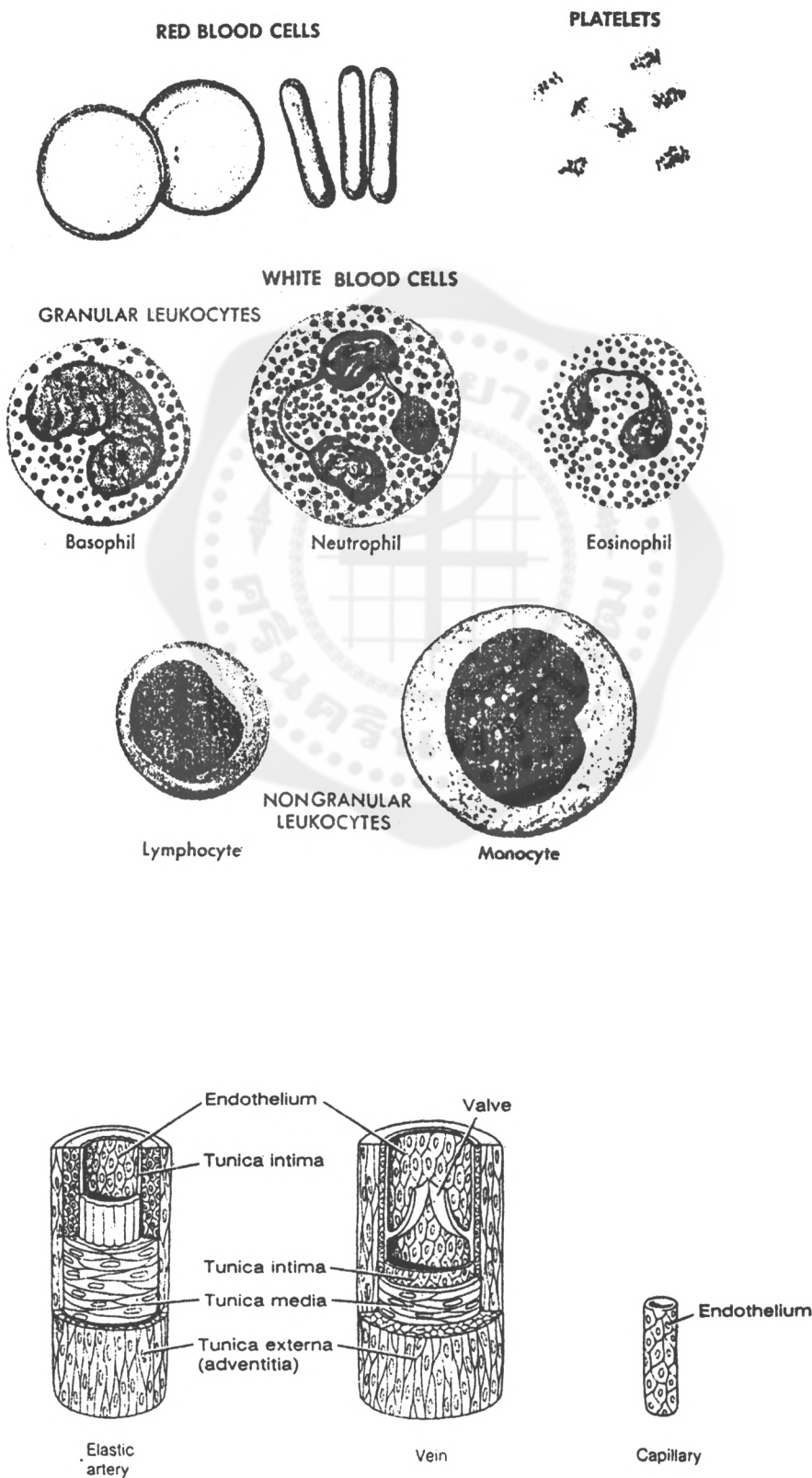


(a)

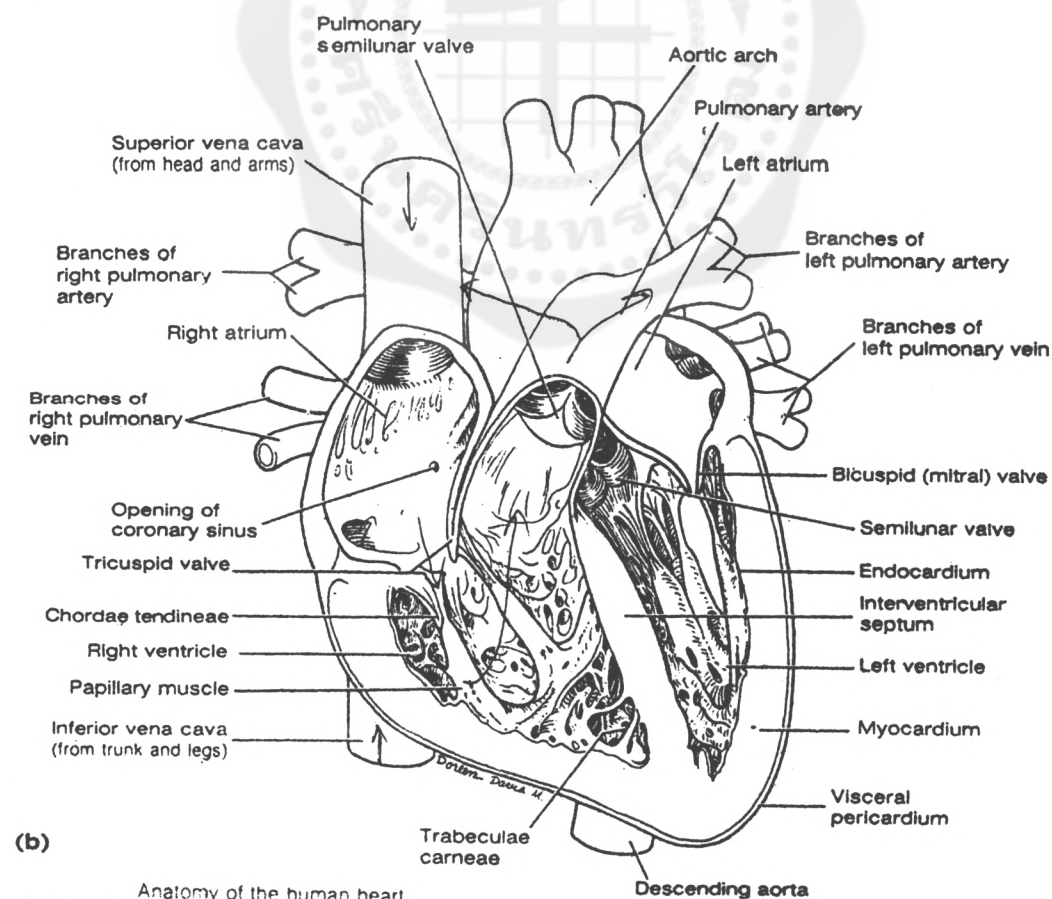
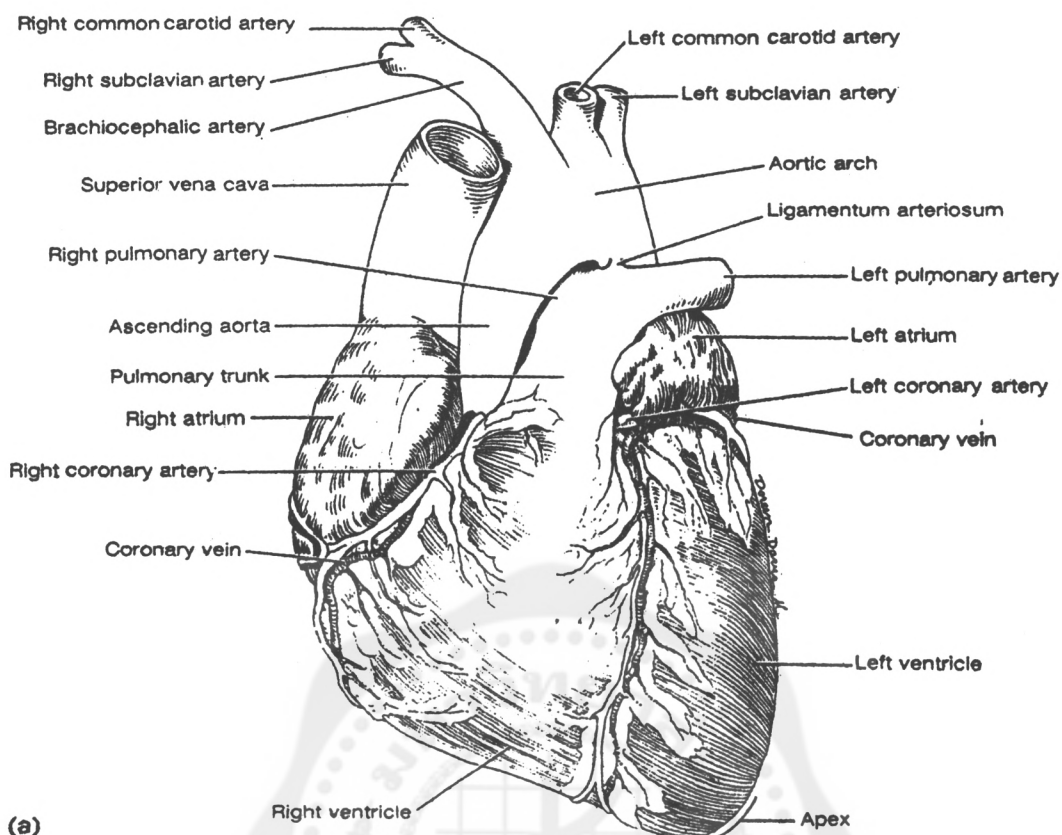


(b)

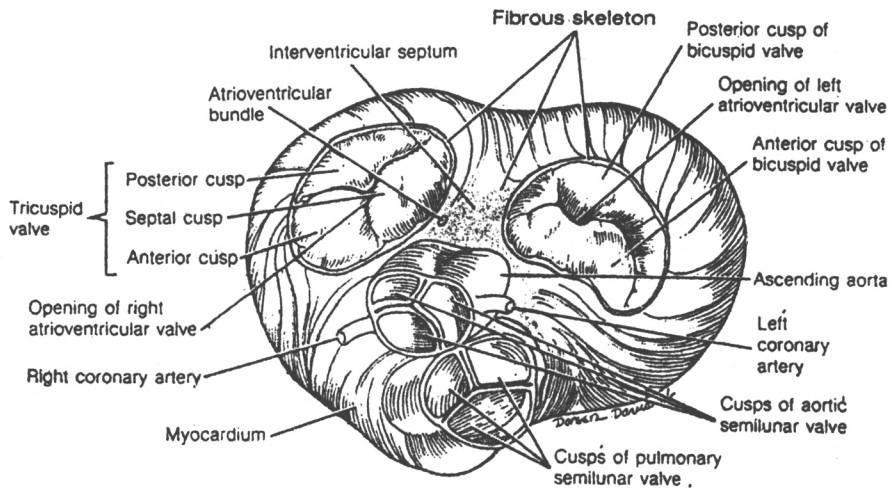
THE CIRCULATORY SYSTEM



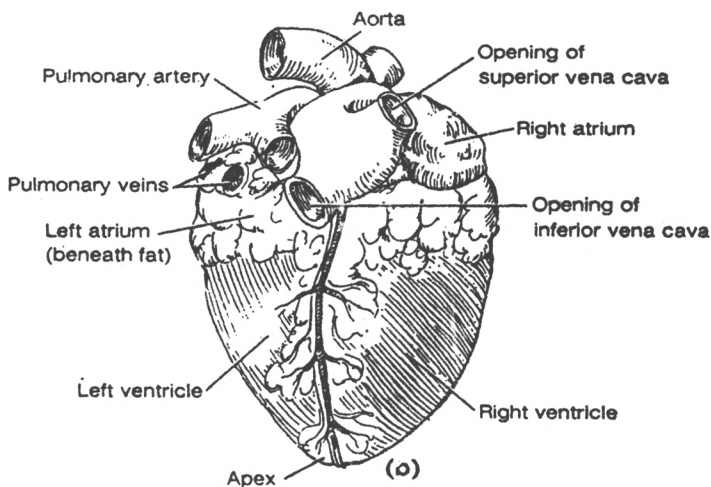
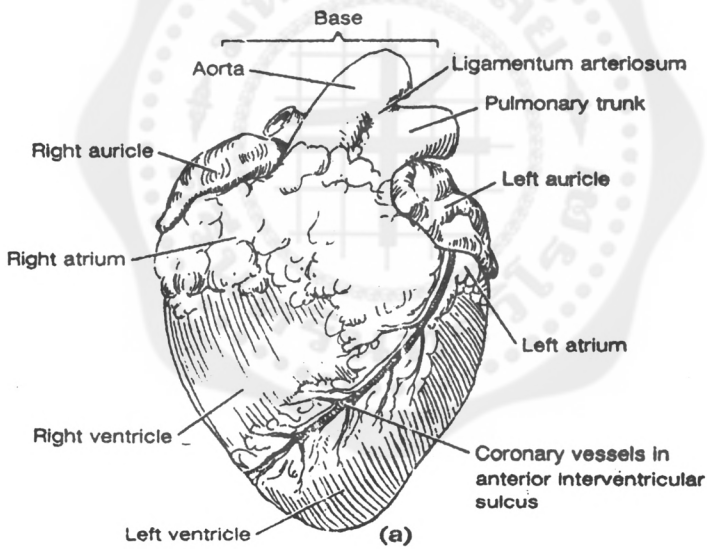
Structure of arteries, veins, and capillaries



Anatomy of the human heart.
(a) external anterior view; (b) frontal section

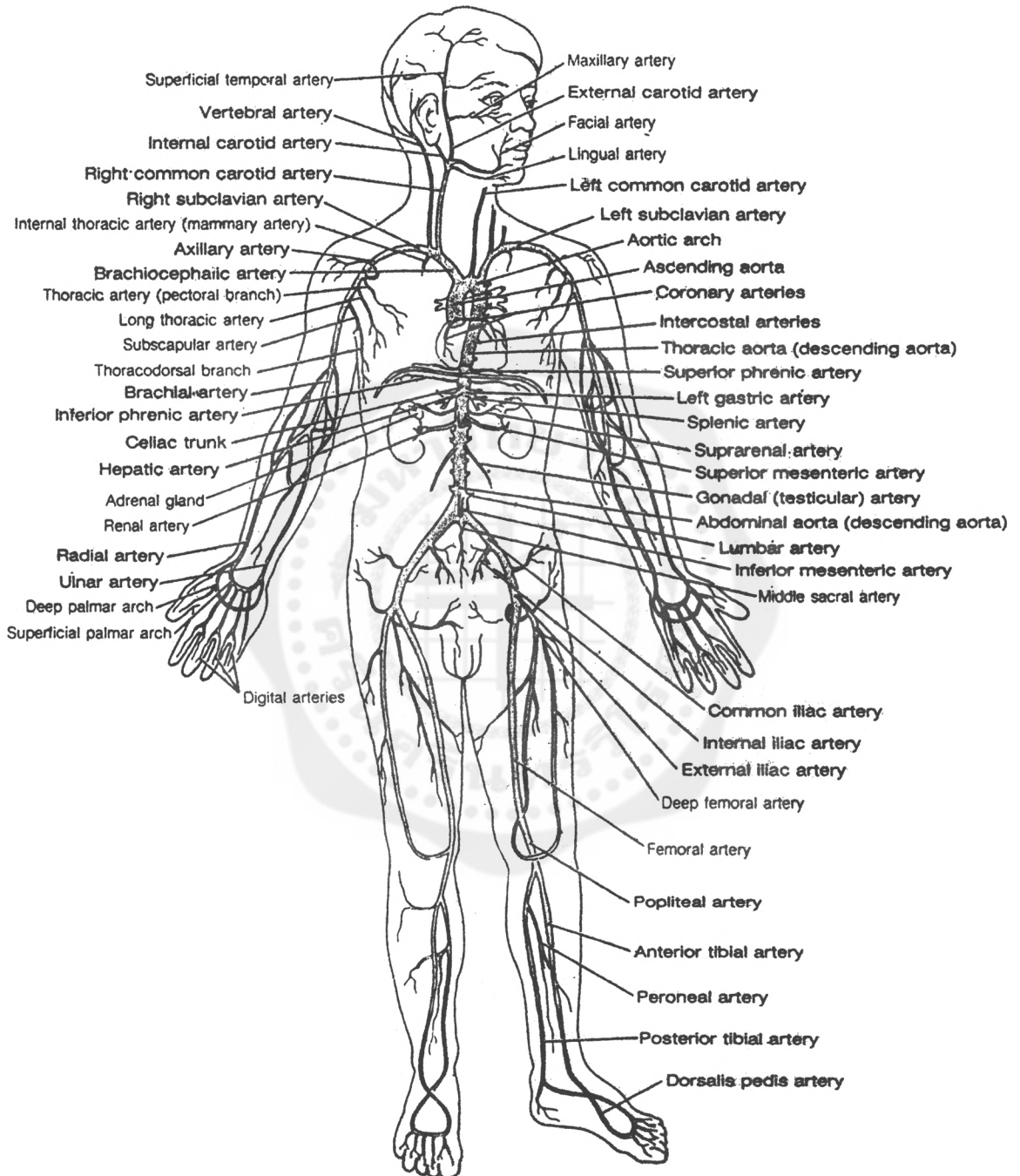


Superior view of the valves of the heart.

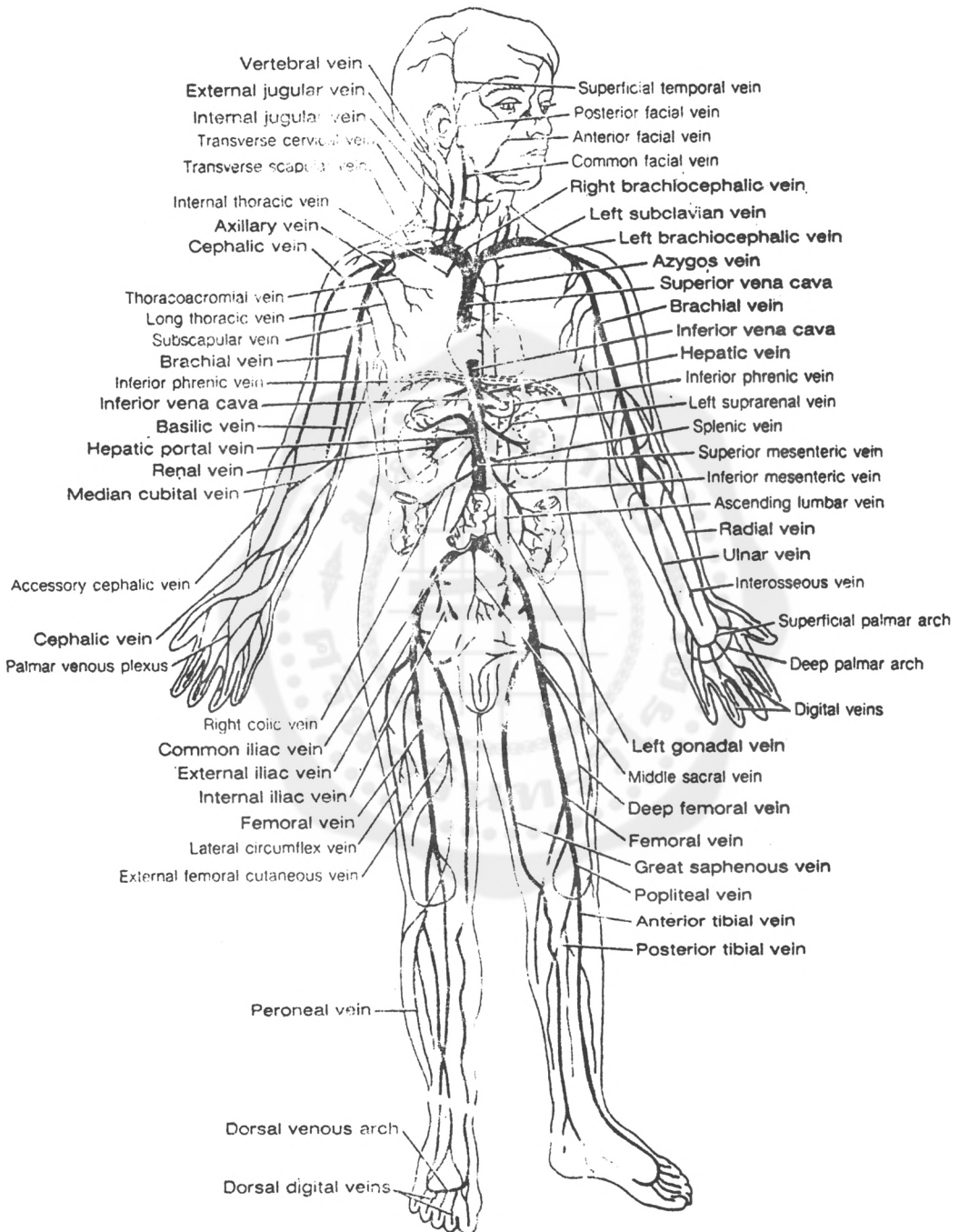


Anatomy of the sheep heart: (a) anterior surface; (b) posterior

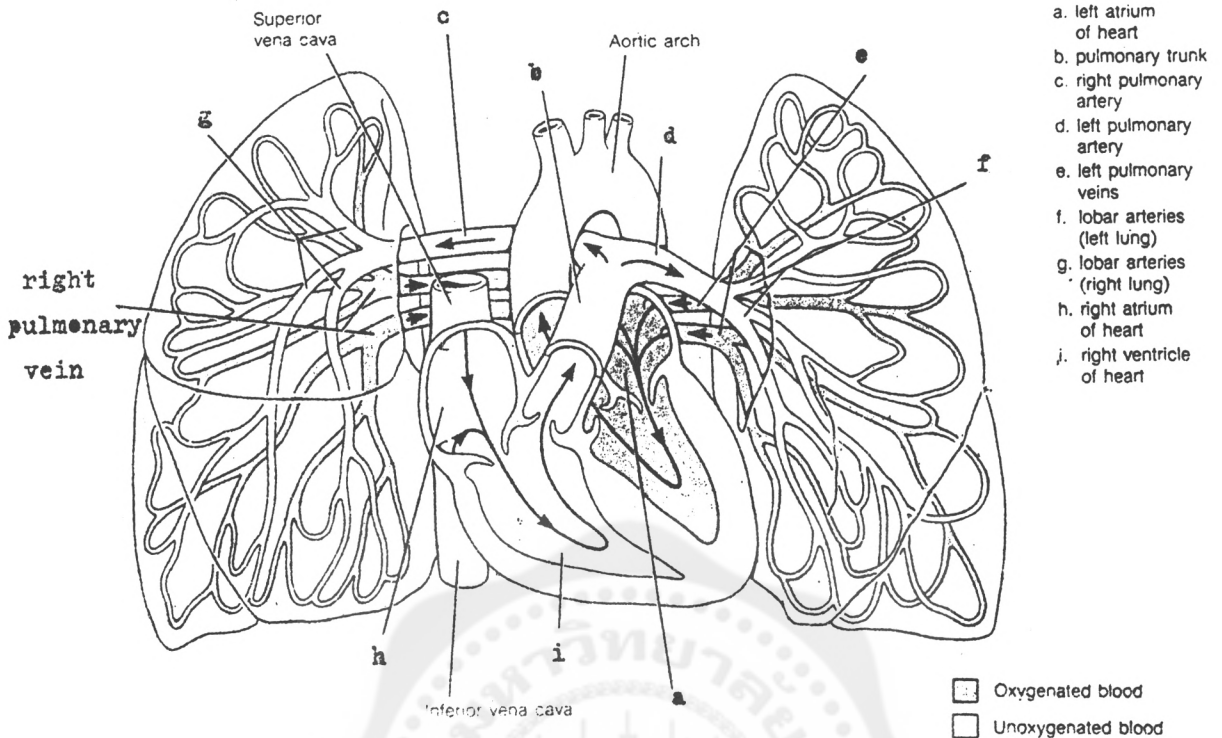
surface.



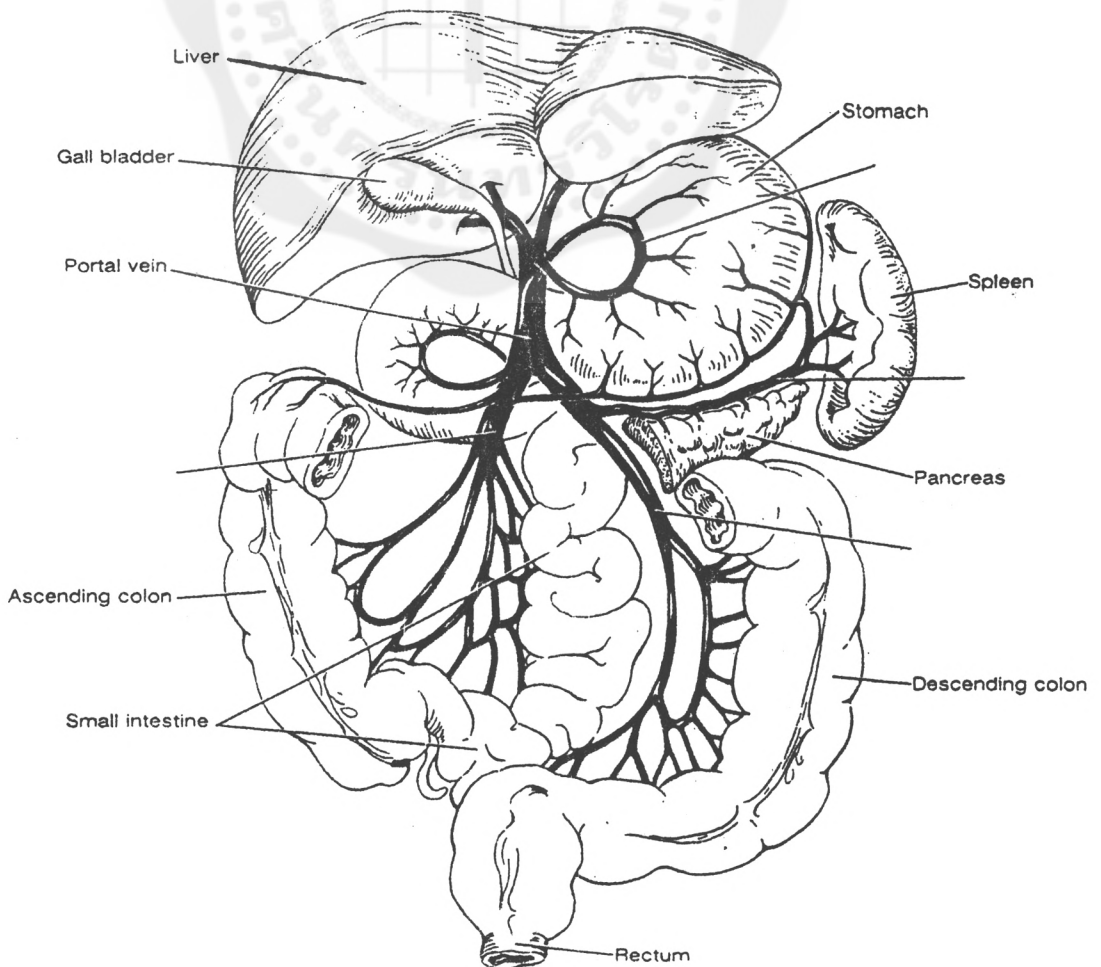
Major systemic arteries of the body.



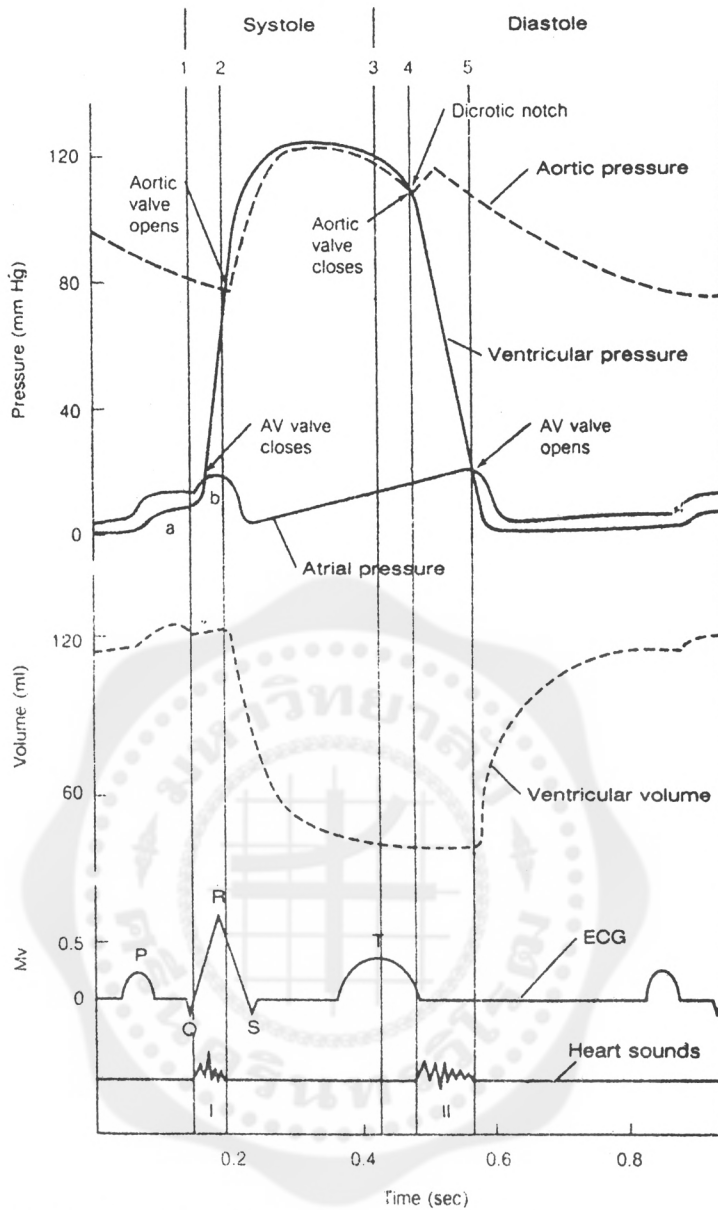
Major systemic veins of the body



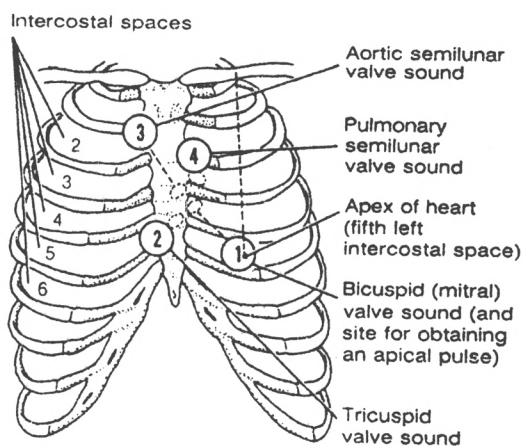
The pulmonary circulation



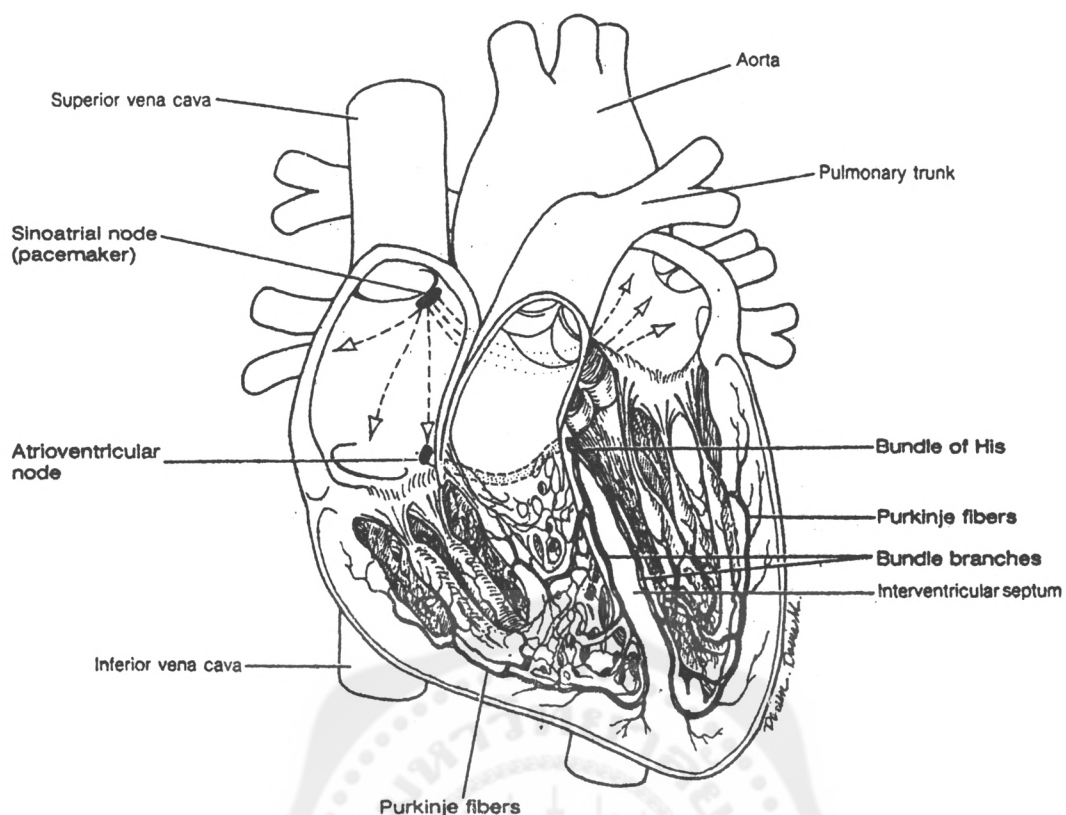
The hepatic portal circulation



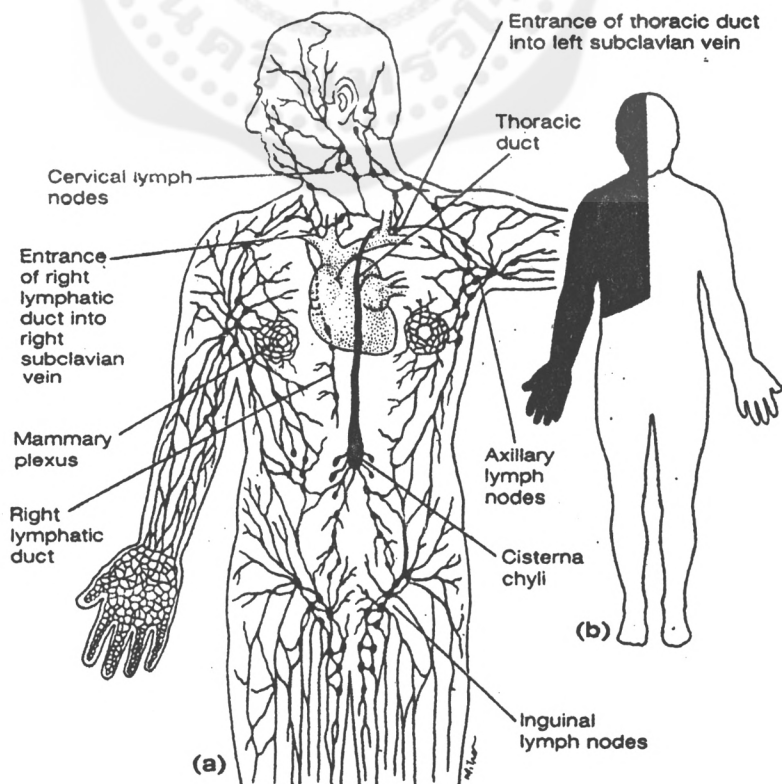
Graphic representation of pressure and volume changes in the left ventricle during one cardiac cycle. Depicts valvular events and correlates changes to ECG and heart sounds.



Sites on thorax where valvular sounds are best auscultated. (1. bicuspid valve; 2. tricuspid valve; 3. aortic semilunar valve; 4. pulmonary semilunar valve)

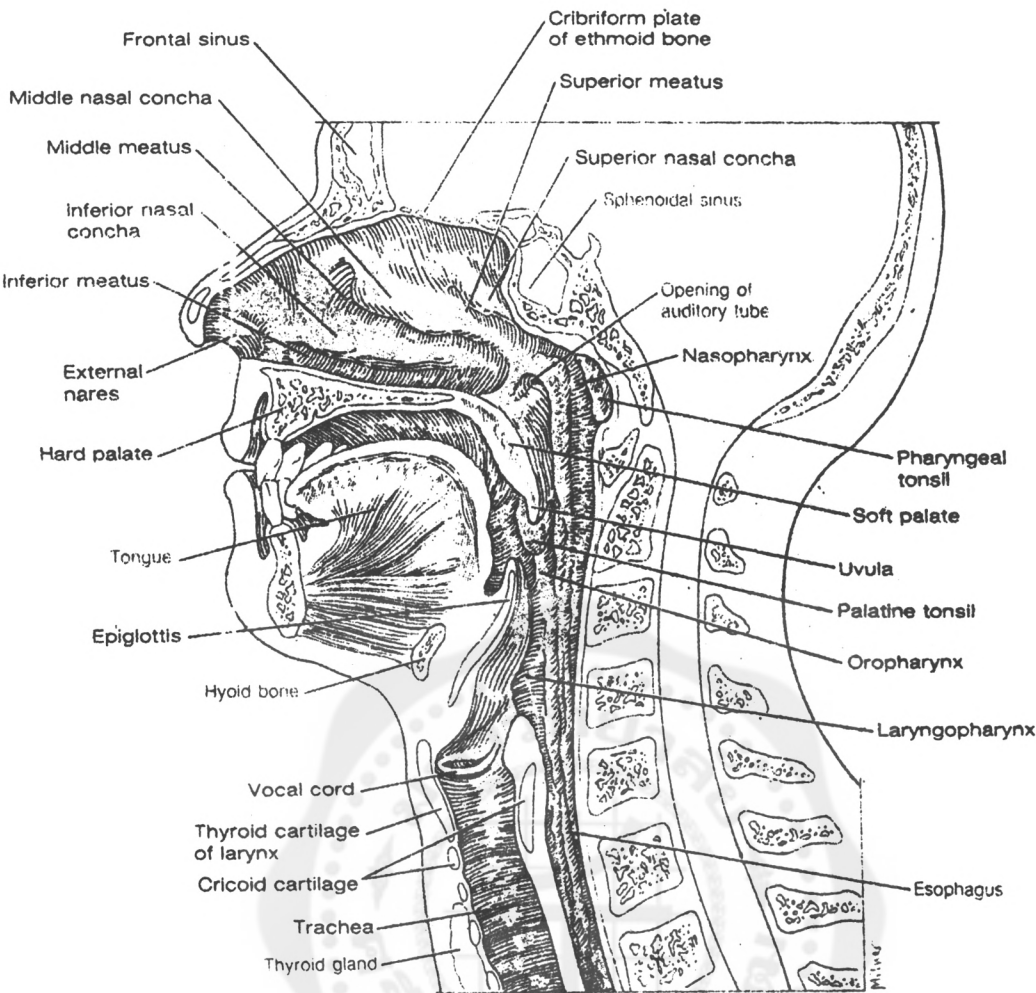


The Purkinje, or nodal, system of the heart. Dotted lines indicate the transmission of the impulse from the SA node through the atria.

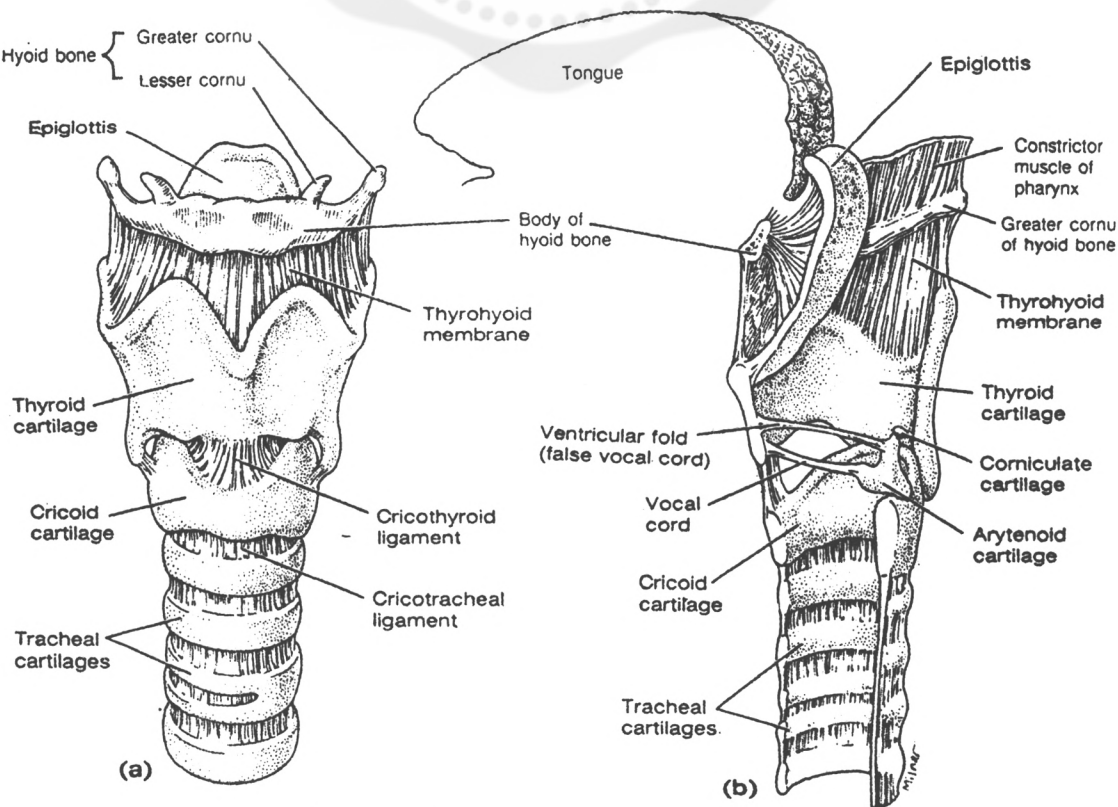


Lymphatic system: (a) distribution of lymphatic vessels and lymph nodes; (b) dark area represents body area drained by right lymphatic duct

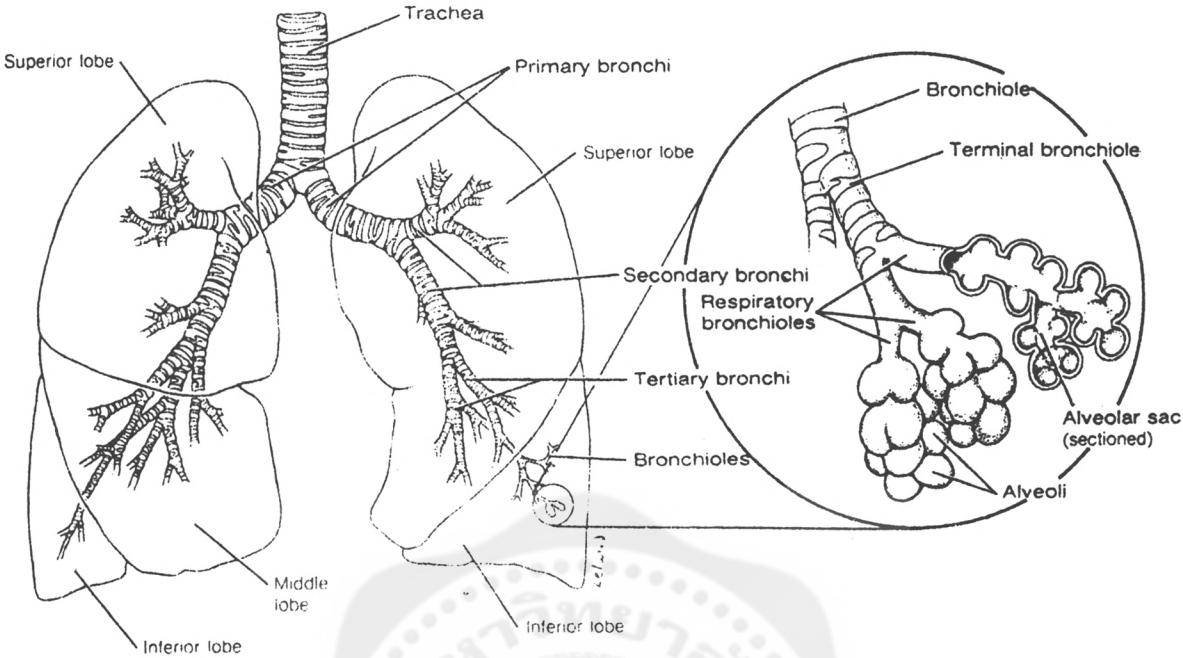
THE RESPIRATORY SYSTEM



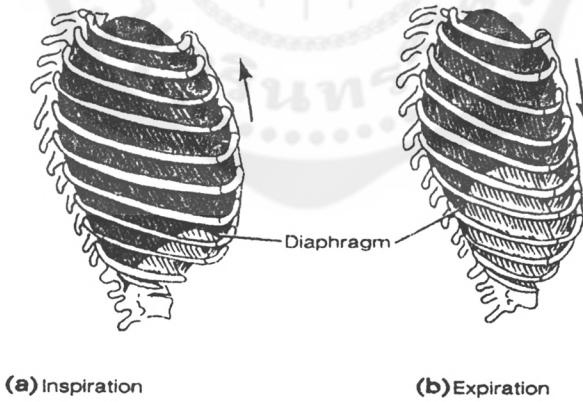
Structures of the upper respiratory tract (sagittal section)



Structure of the larynx: (a) anterior view. (b) sagittal section

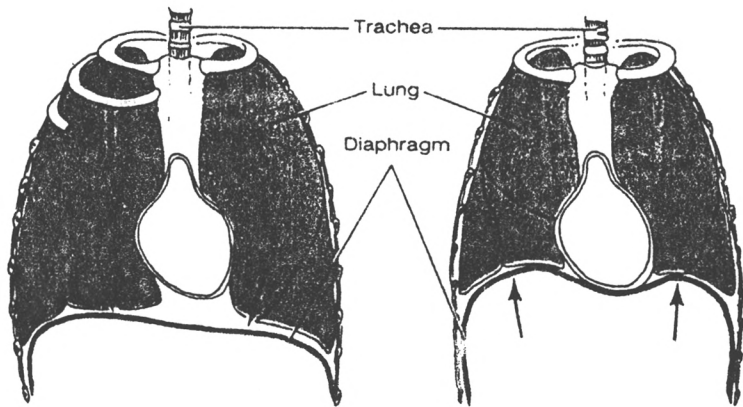


Structures of the lower respiratory tract. Inset shows enlarged view of alveoli.



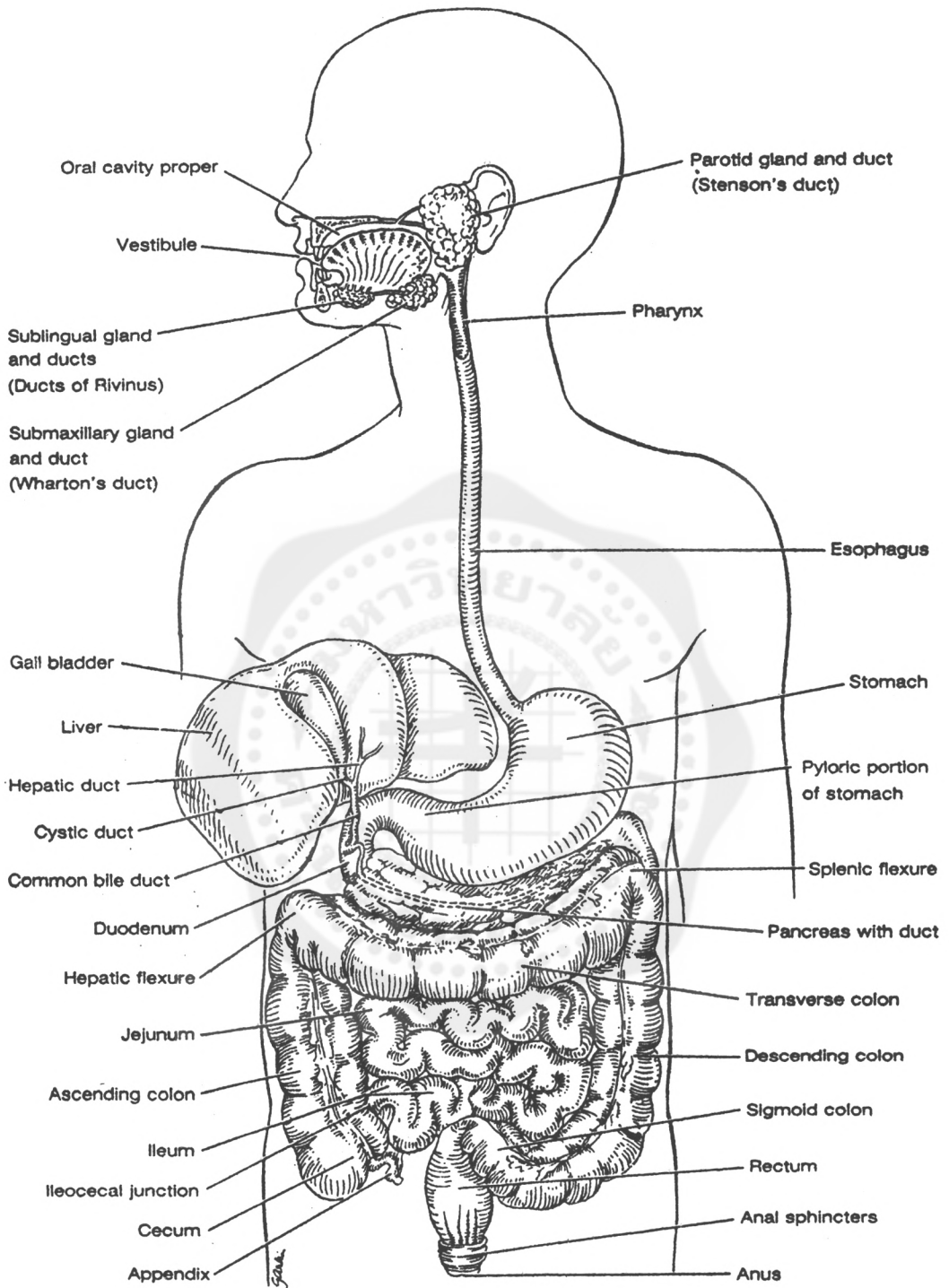
(a) Inspiration

(b) Expiration

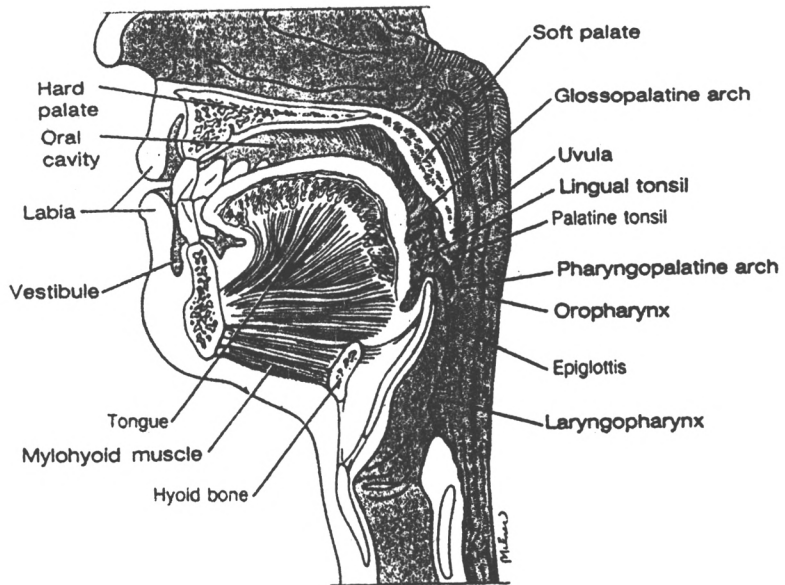


Rib cage and diaphragm positions during breathing: (a) at the end of a normal inspiration; chest expanded, diaphragm depressed; (b) at the end of a normal expiration; chest depressed, diaphragm elevated.

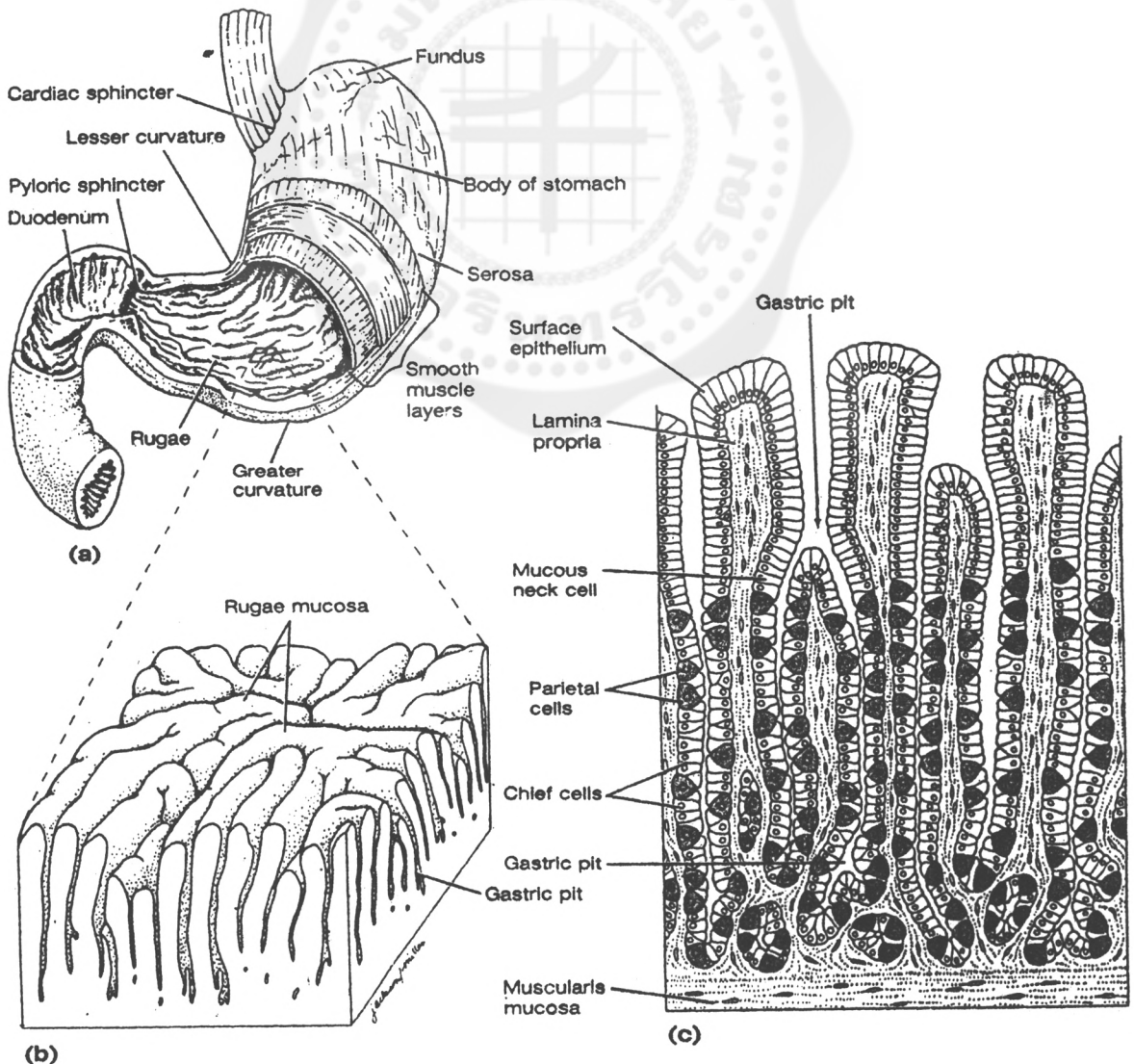
THE DIGESTIVE SYSTEM



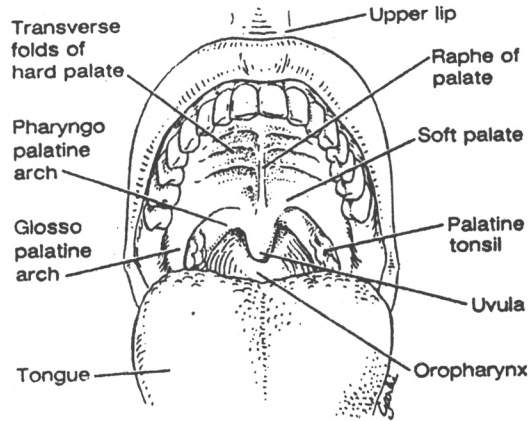
The human digestive system: alimentary tube and accessory organs. (Liver and gallbladder are reflected superiorly and to the right.)



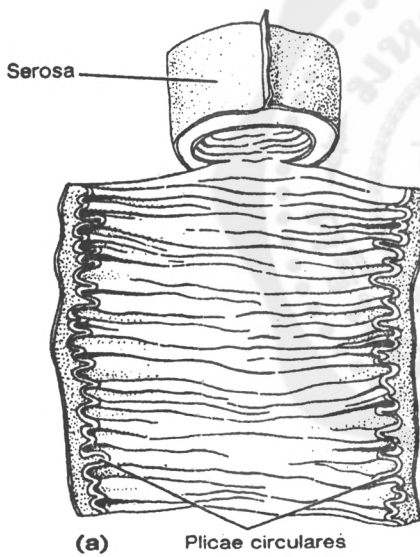
Sagittal view of the head showing oral, nasal, and pharyngeal cavities.



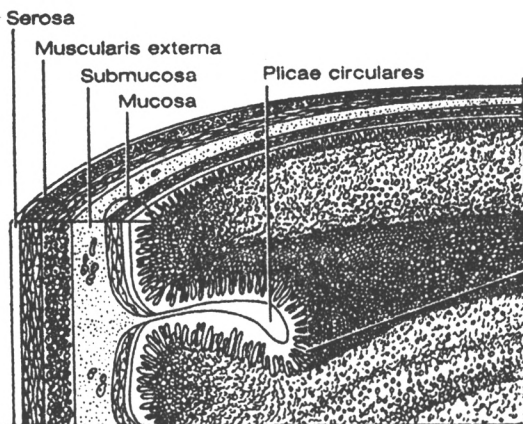
Anatomy of the stomach: (a) gross internal and external anatomy; (b) section of the stomach wall showing rugae and gastric pits; (c) enlarged view of gastric pits (longitudinal section).



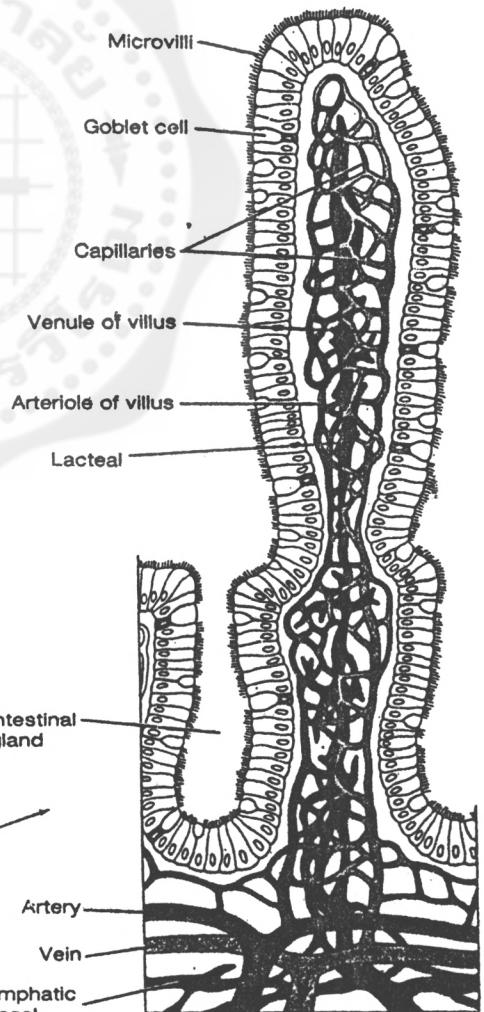
Anterior view of the oral cavity.



(a) Plicae circulares

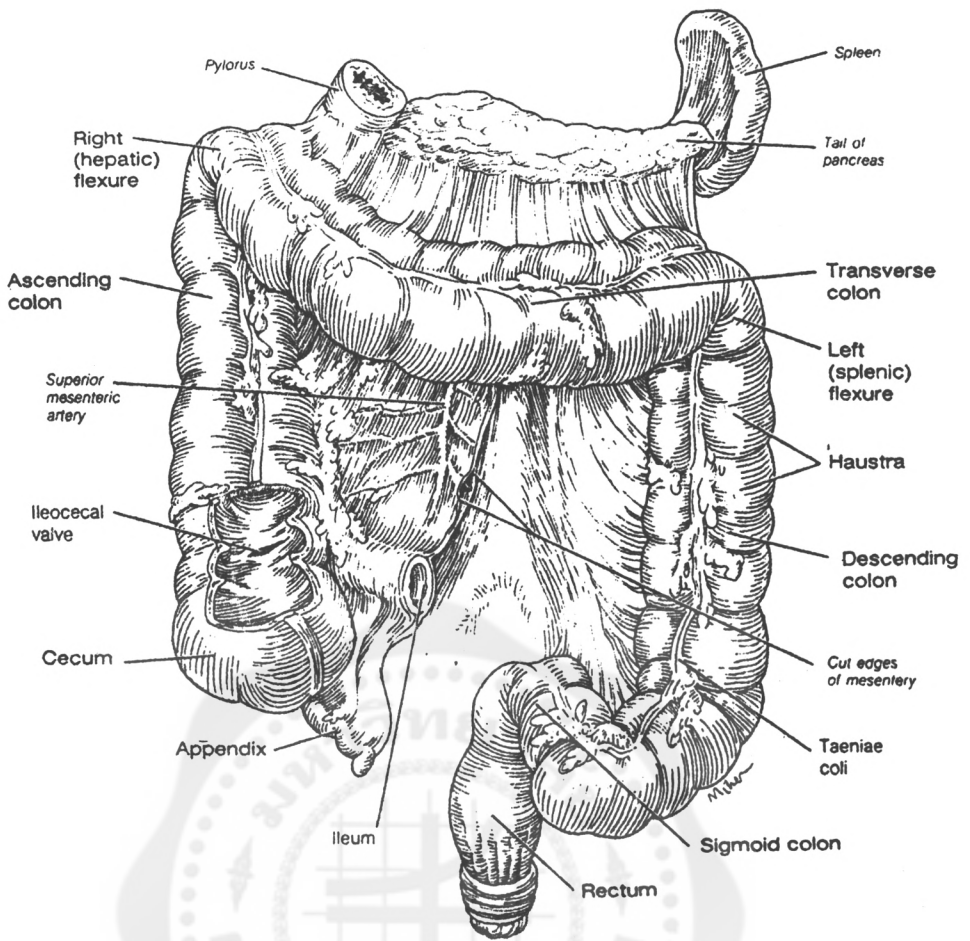


(b)

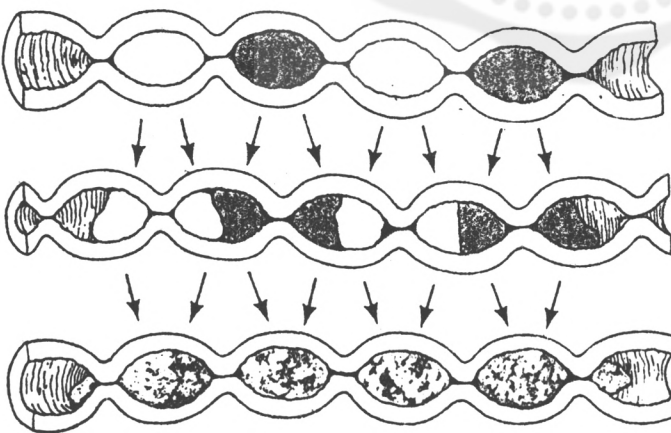


(c)

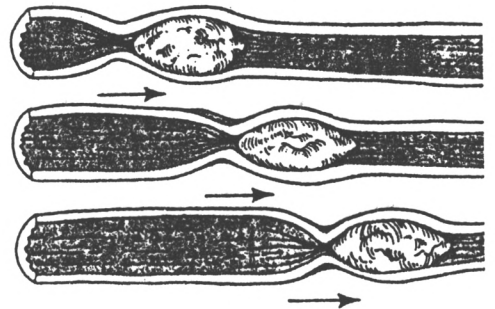
Structural modifications of the small intestine (a) plicae circulares (circular folds) seen on the inner surface of small intestine; (b) enlargement of one plicae circulares to show villi; (c) detailed anatomy of a villus.



The large intestine (section of the cecum removed to show the ileocecal valve).

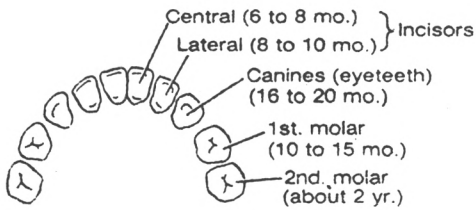


(a)

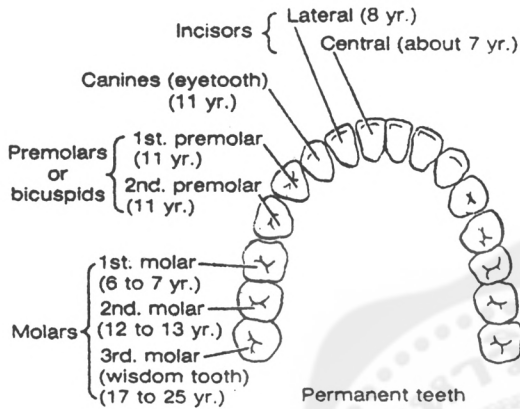


(b)

Segmental and peristaltic movements of the digestive tract: (a) segmentation. Single segments of intestine alternately contract and relax. As inactive segments exist between active segments, the food is mixed but not moved along the tract: (b) peristalsis. Superimposed on segmentation. Neighboring segments of the intestine alternately contract and relax, moving food along the tract.



Deciduous (milk) teeth

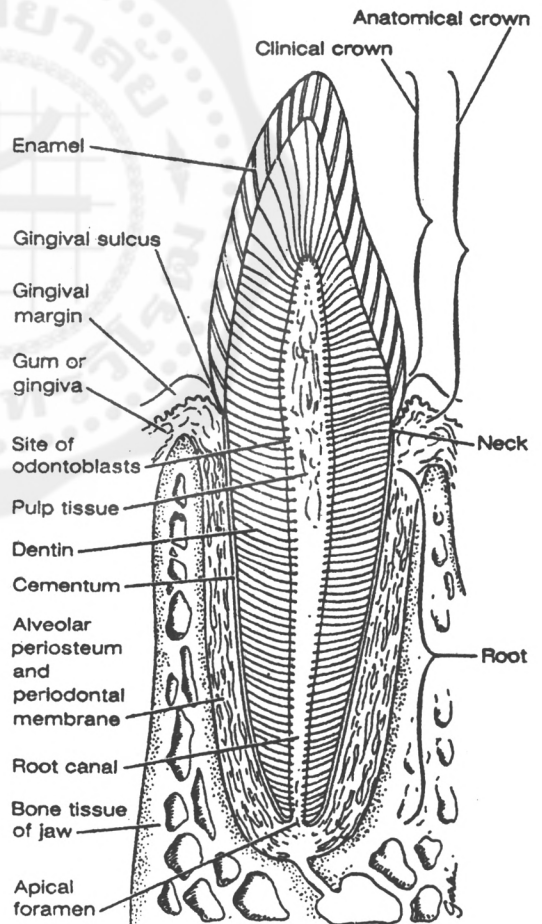
Human deciduous and permanent teeth
Approximate time of teeth eruption shown in parentheses.

This formula is generally abbreviated to read as follows:

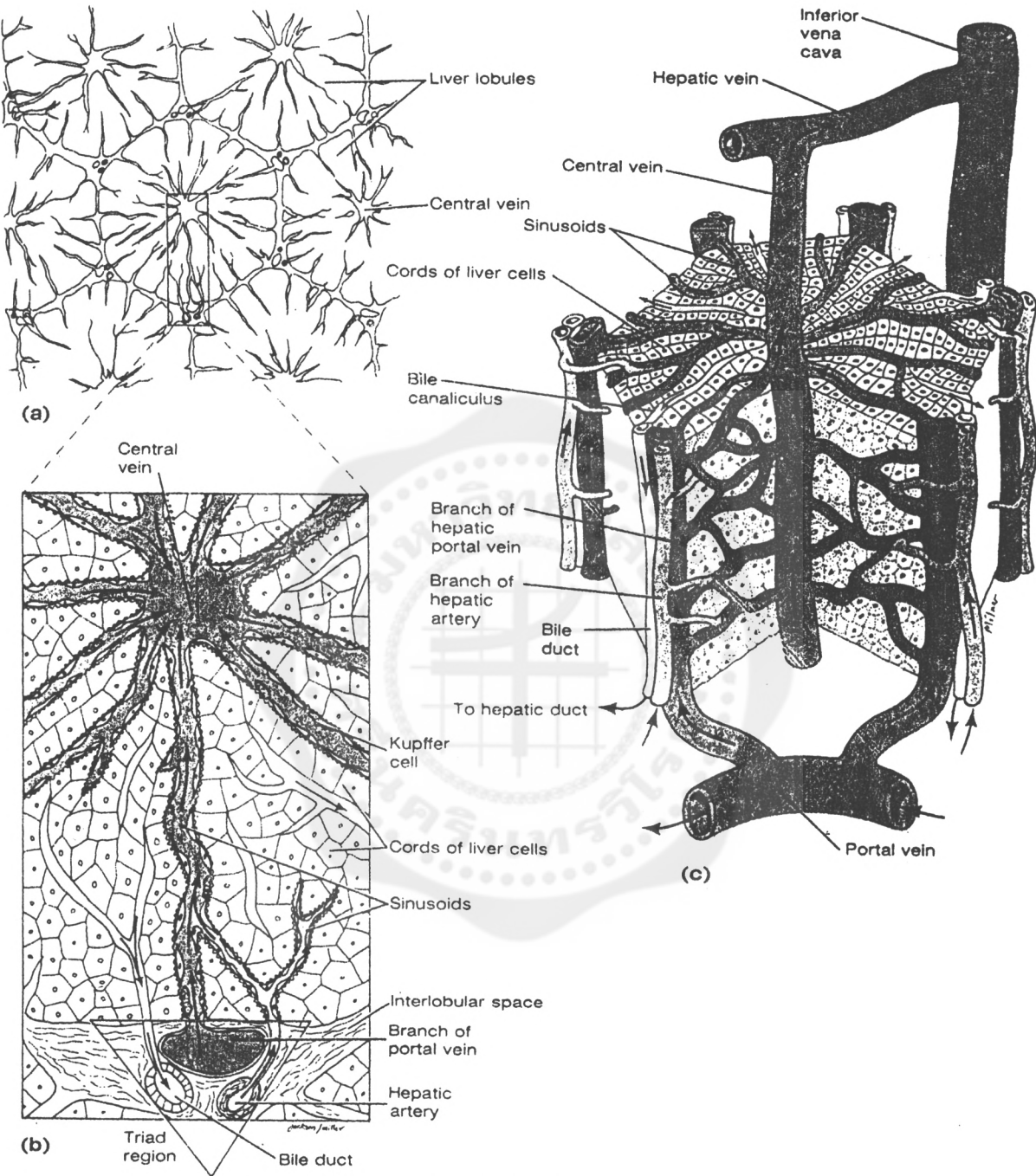
$$\frac{2,1,0,2}{2,1,0,2} \times 2 = 20 \text{ (number of deciduous teeth)}$$

The 32 permanent teeth are then described by the following dental formula:

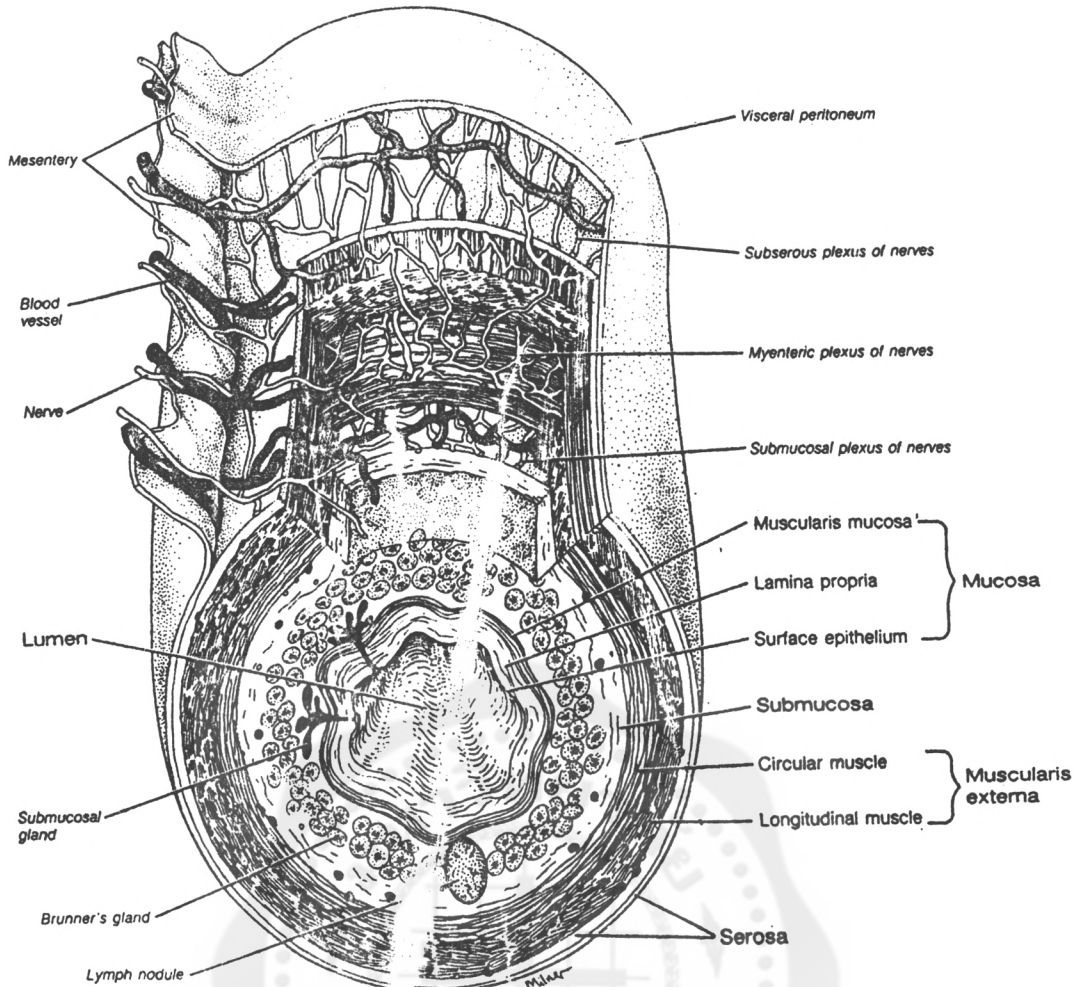
$$\frac{2,1,2,3}{2,1,2,3} \times 2 = 32 \text{ (number of permanent teeth)}$$



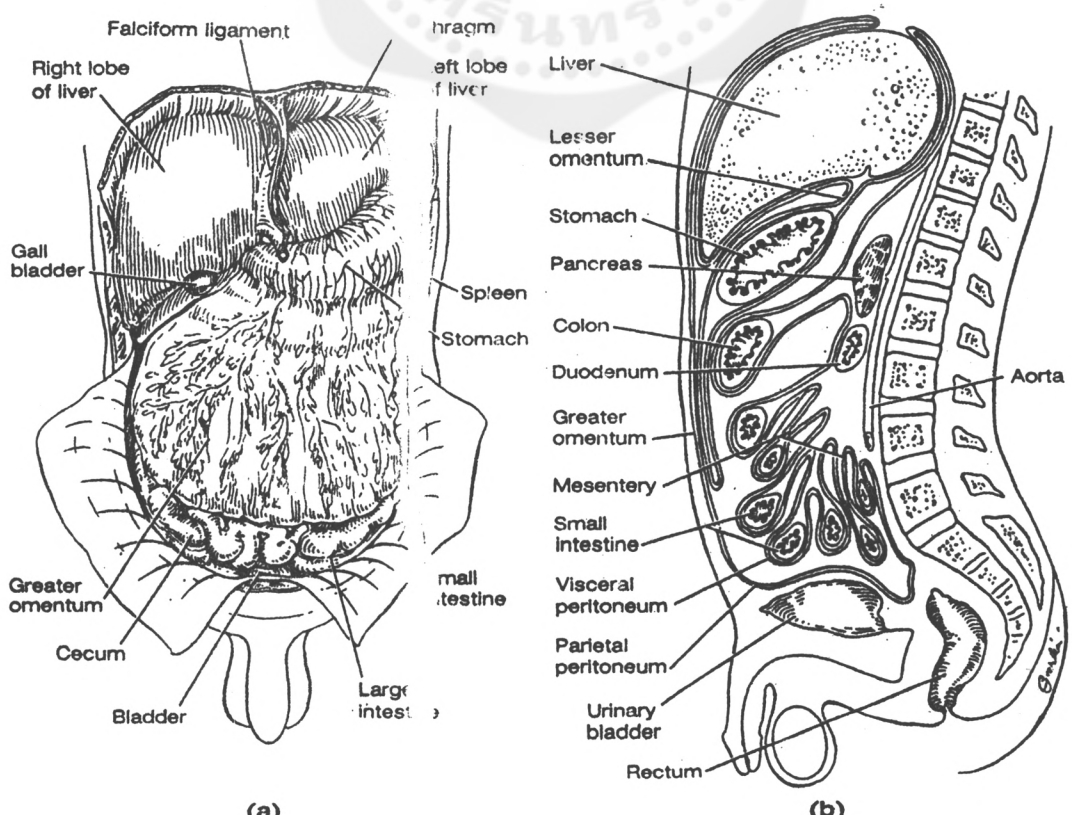
Longitudinal section of human canine tooth.



Microscopic anatomy of the liver (diagrammatic view): (a) several liver lobules (cross section); (b) enlarged view of a portion of one liver lobule (cross section); (c) portion of one liver lobule (longitudinal section). Arrows show direction of bile and blood flow

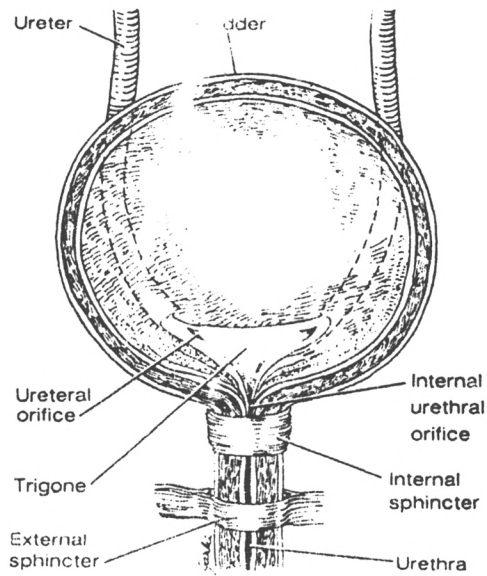
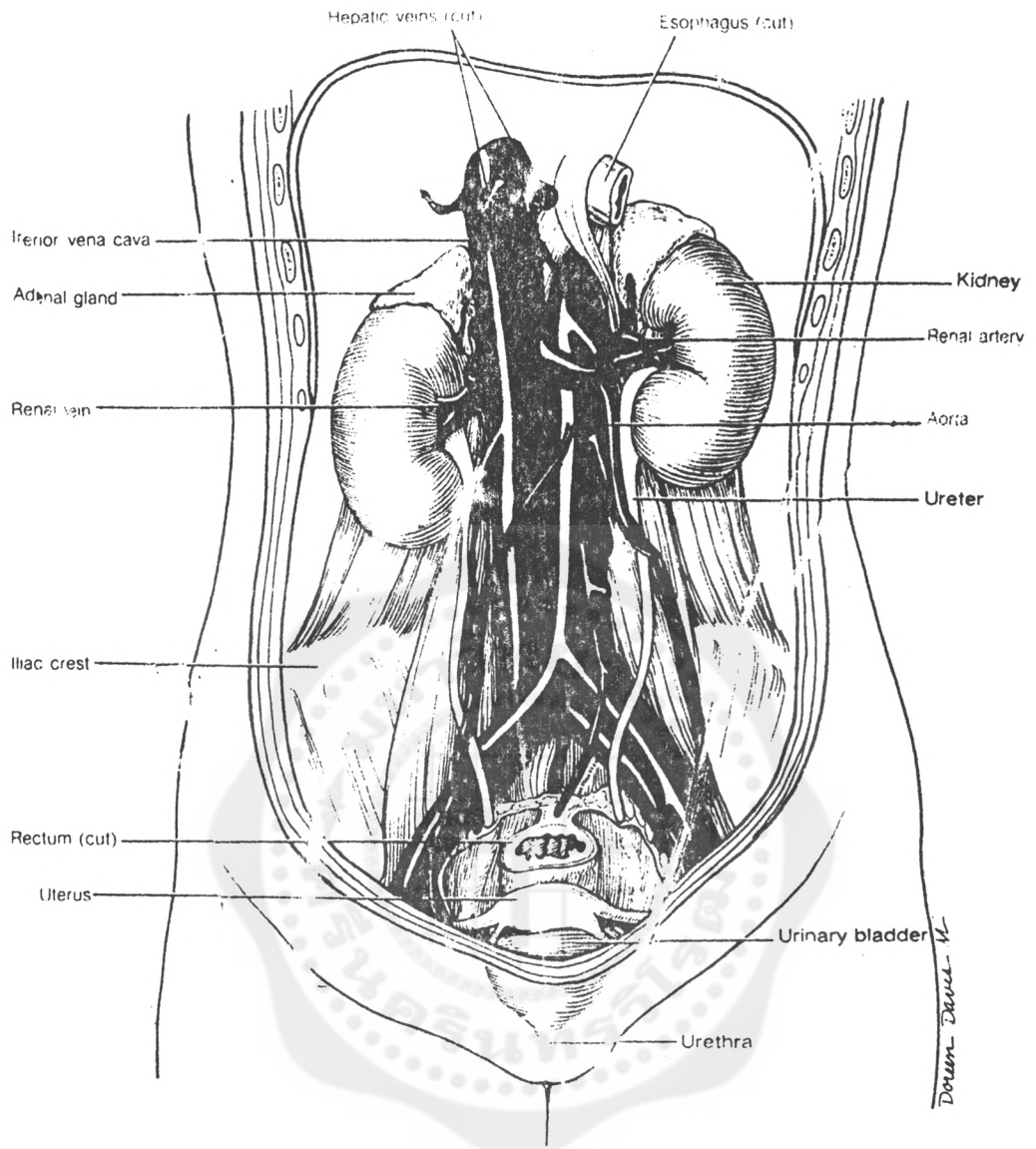


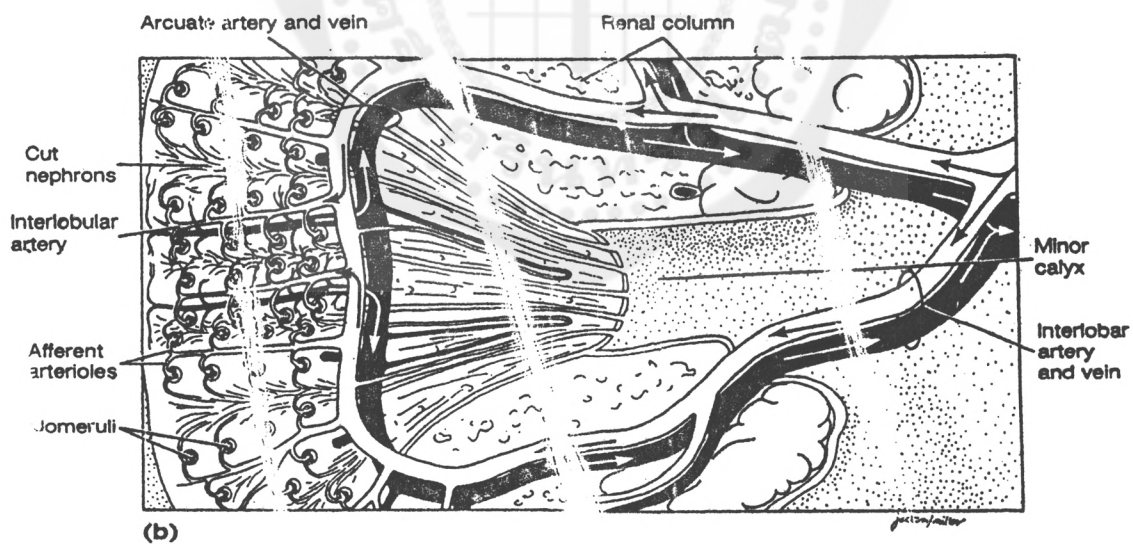
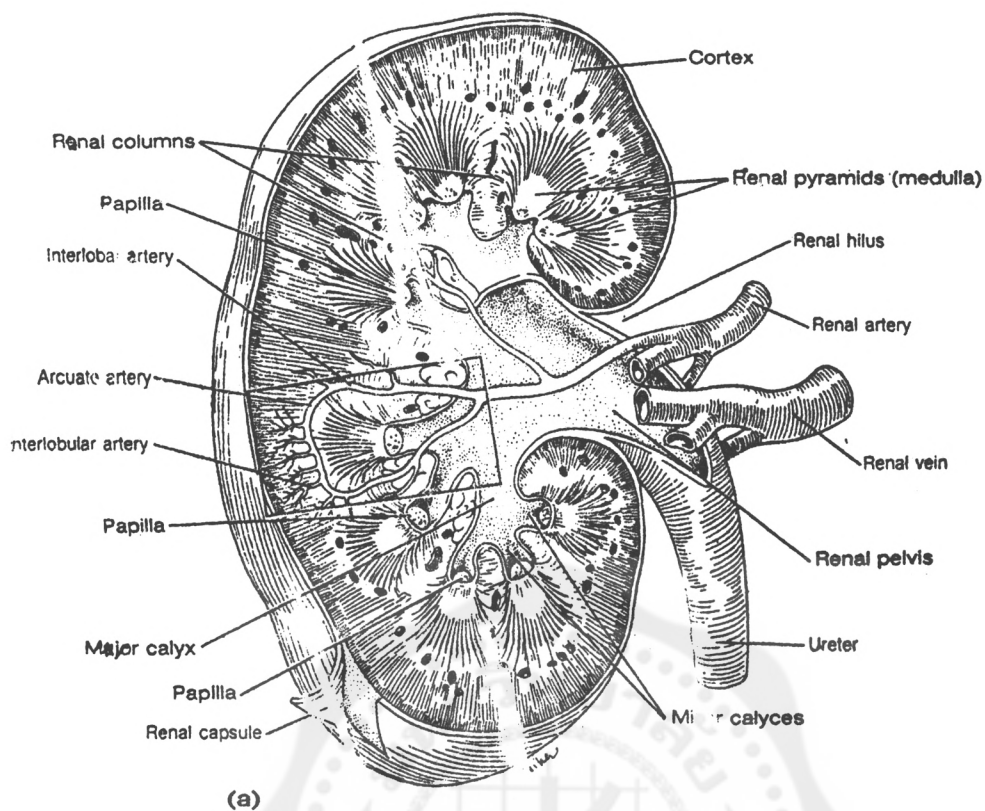
Structural pattern of the alimentary canal wall.



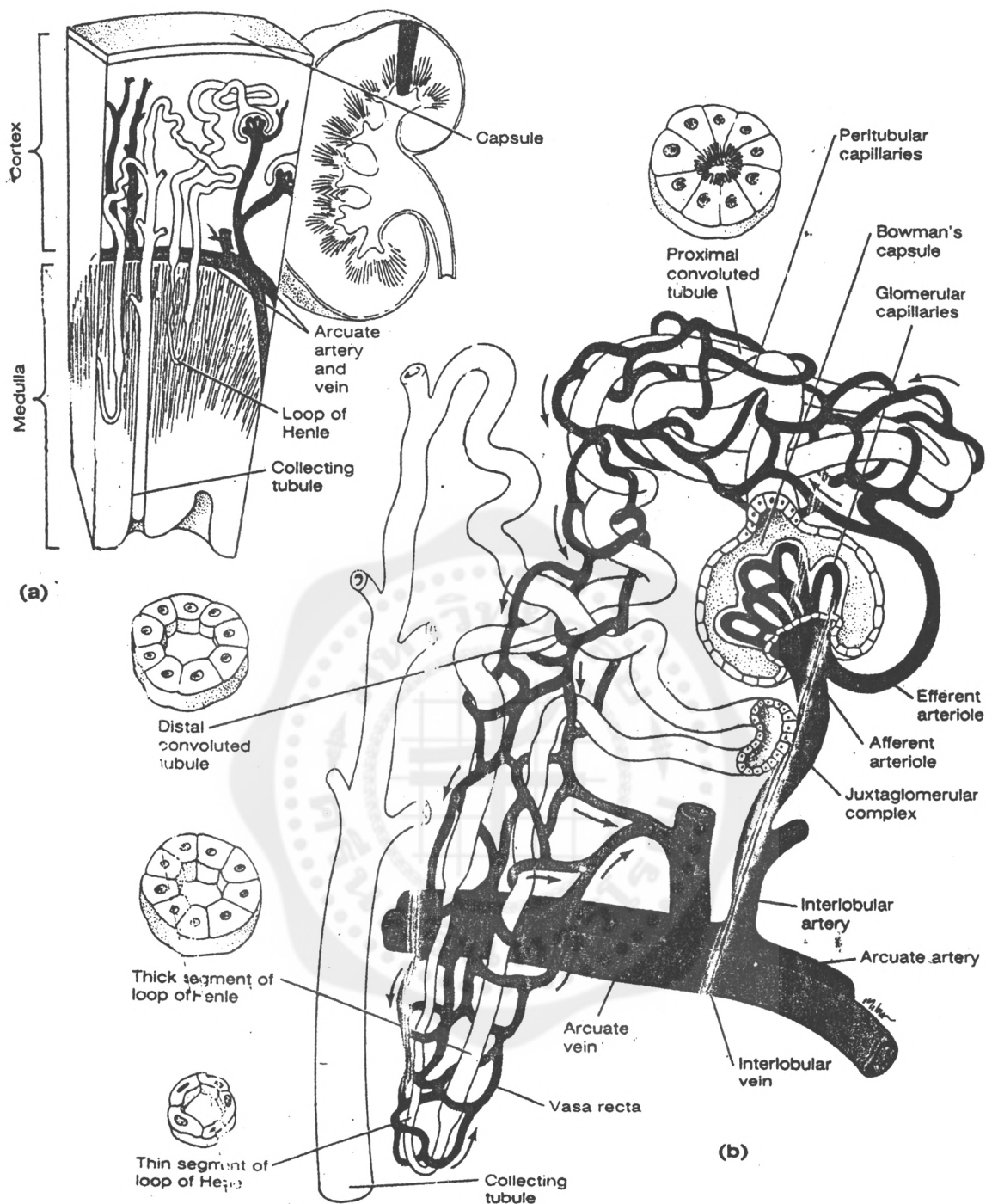
Peritoneal attachments of the abdominal organs: (a) anterior view, omentum in place; (b) sagittal view of a male torso.

THE URINARY SYSTEM



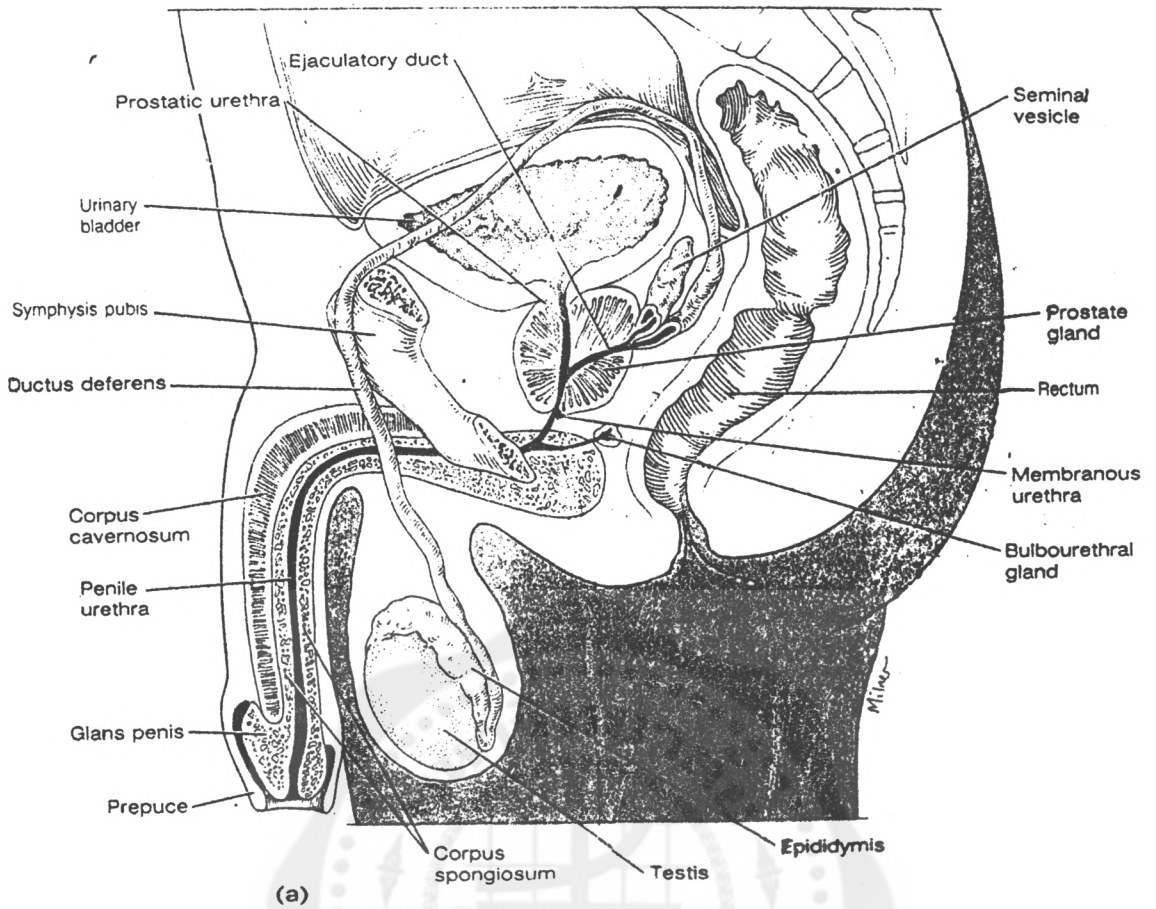


The kidney and its vascular supply: (a) frontal section of kidney showing larger arteries supplying the kidney tissue; (b) enlarged detail of small section of the vascular supply.

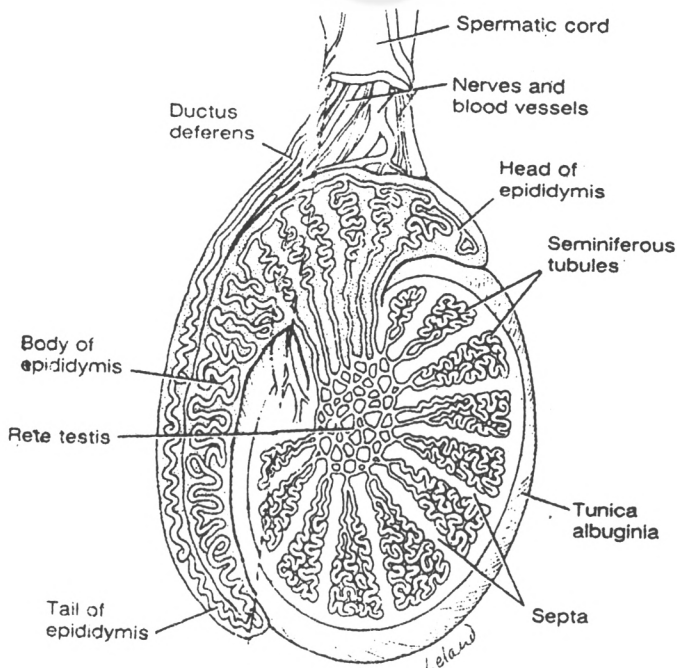


Structure of nephron (a) wedge-shaped section of kidney tissue indicating the positioning of the nephrons in the kidney. (b) detailed nephron anatomy and associated blood supply

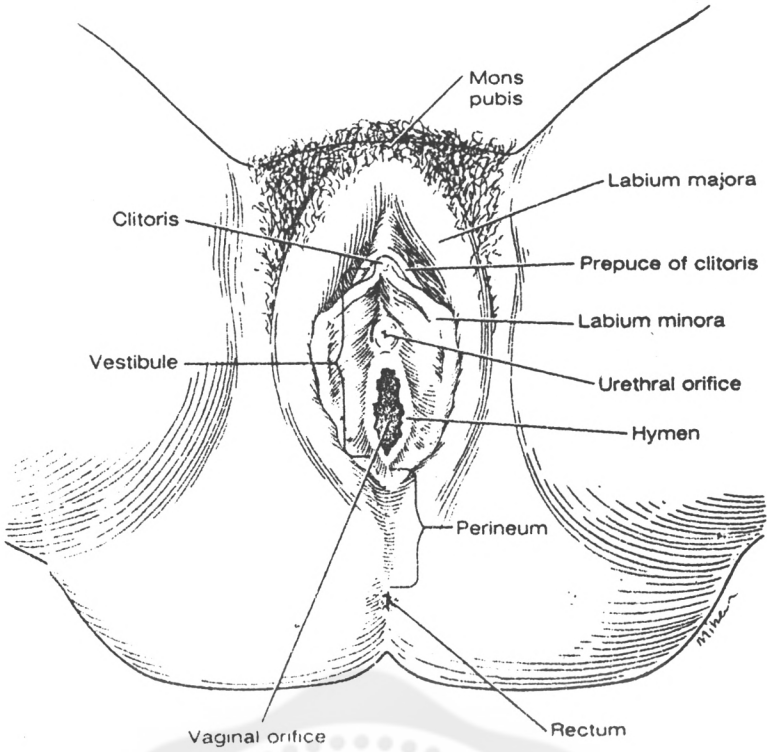
THE REPRODUCTIVE SYSTEM



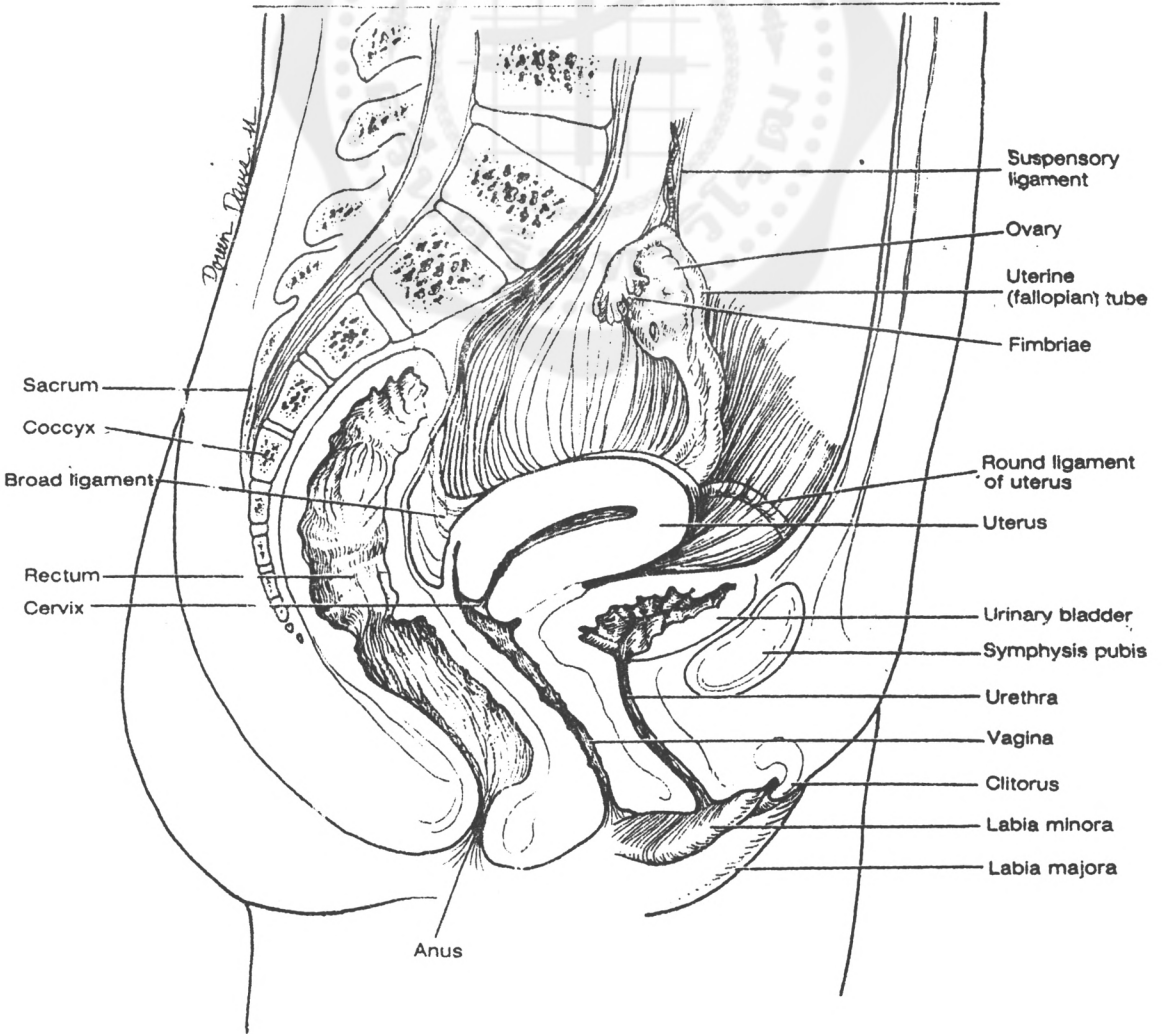
Reproductive system of the human male
(a) median sagittal section:
penis.



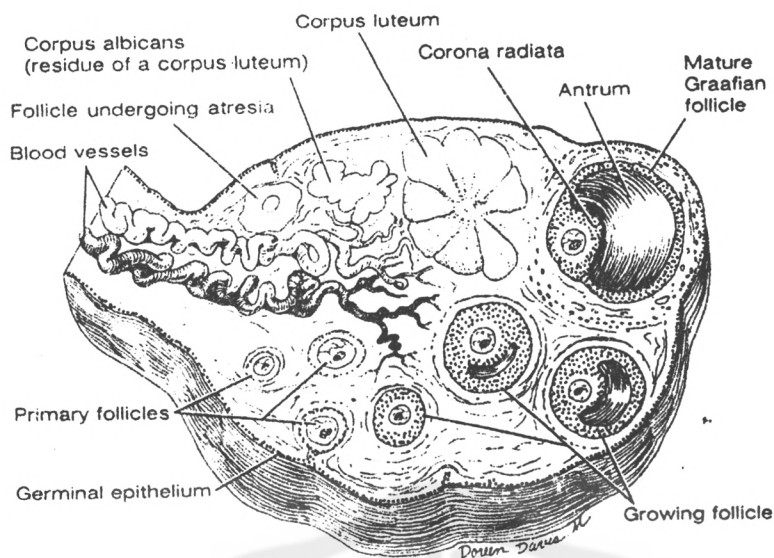
Structure of the human testis: sagittal section showing internal structure: epididymis and ductus deferens also shown.



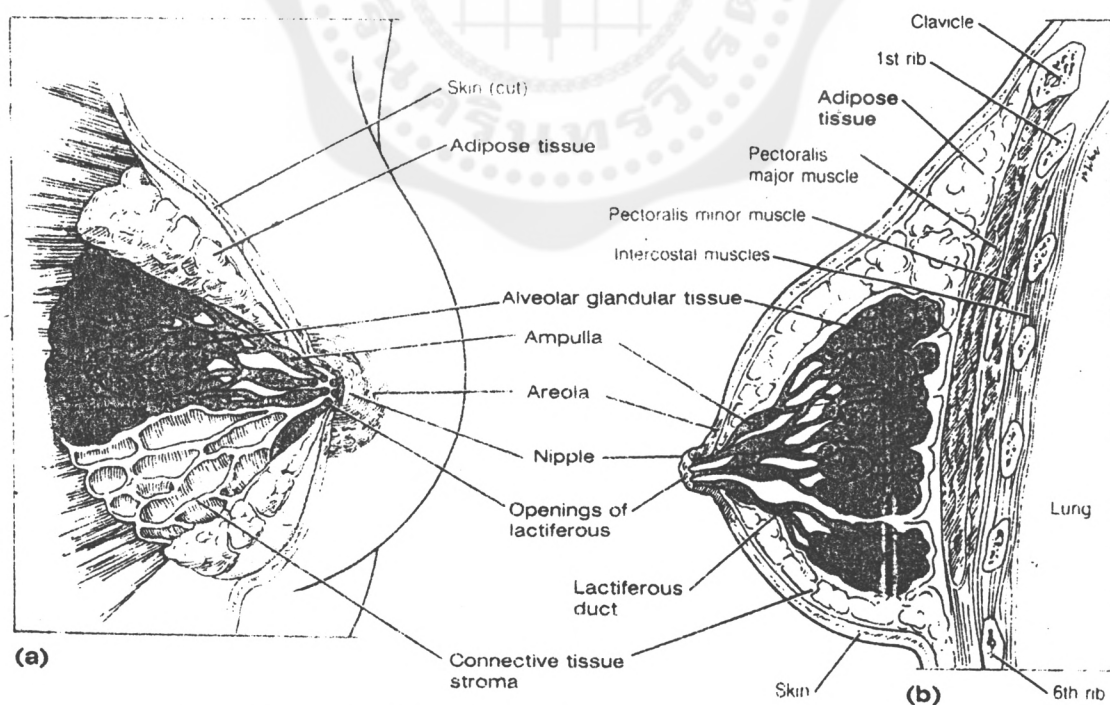
External genitalia of the human female



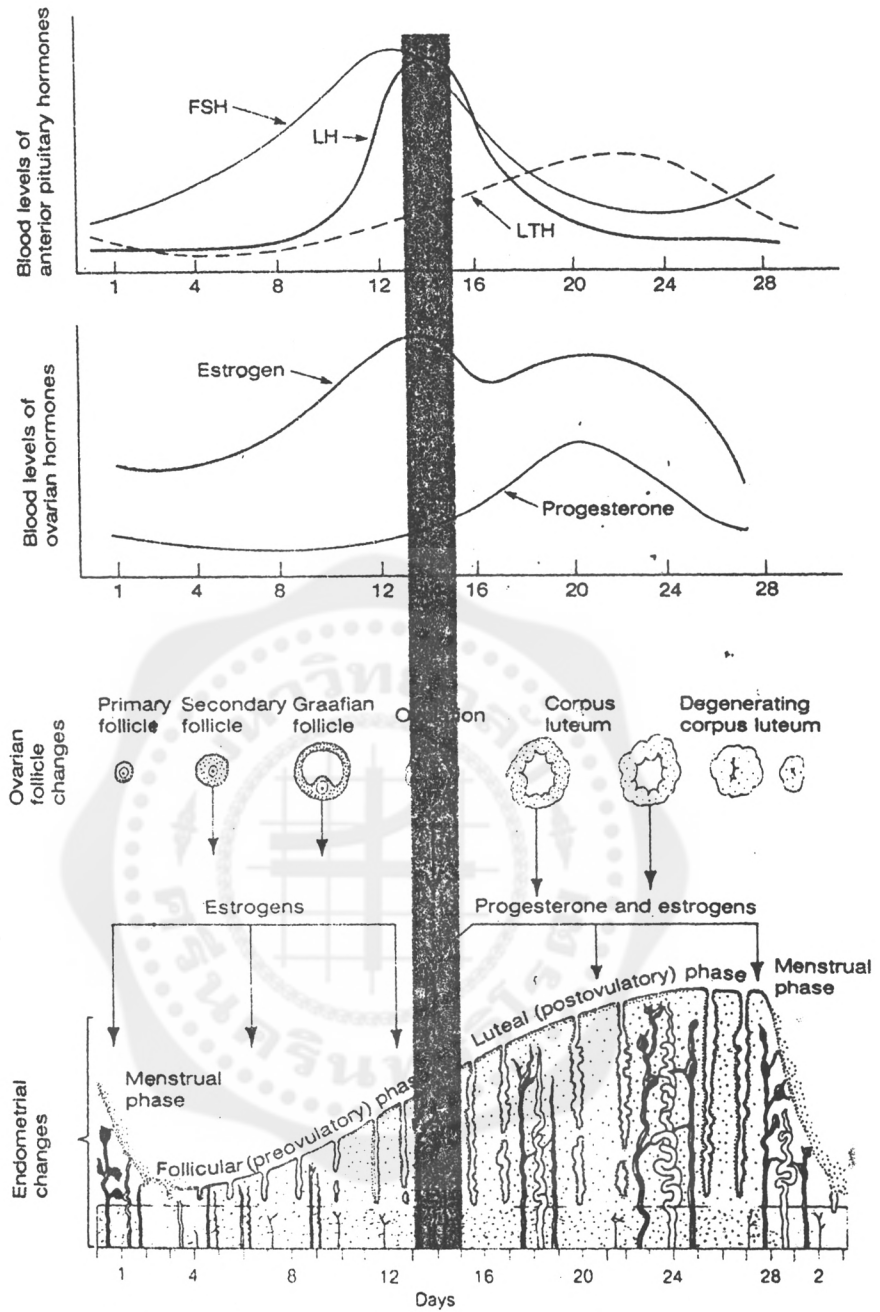
Sagittal section of the human female reproductive system



Diagrammatic view of a human ovary

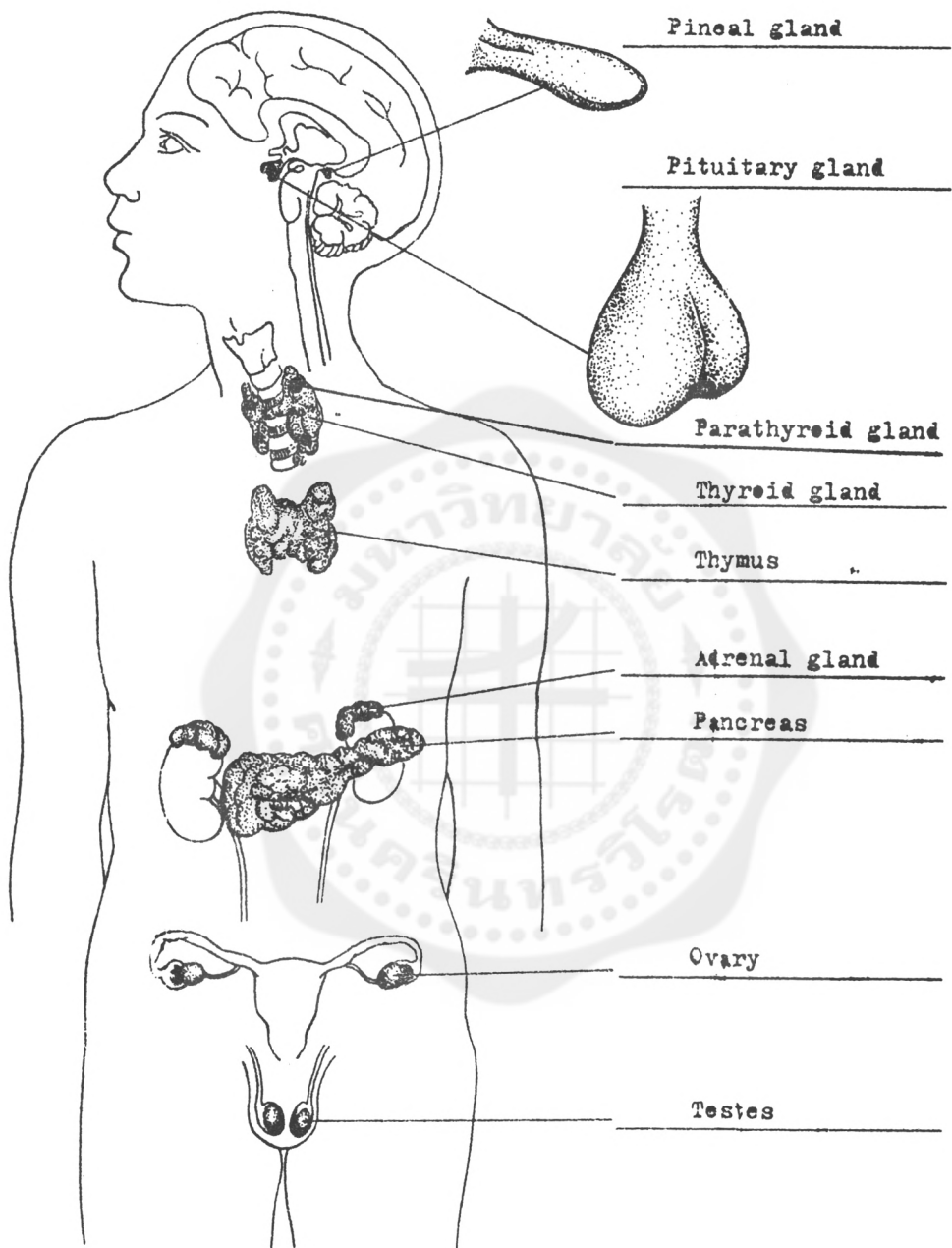


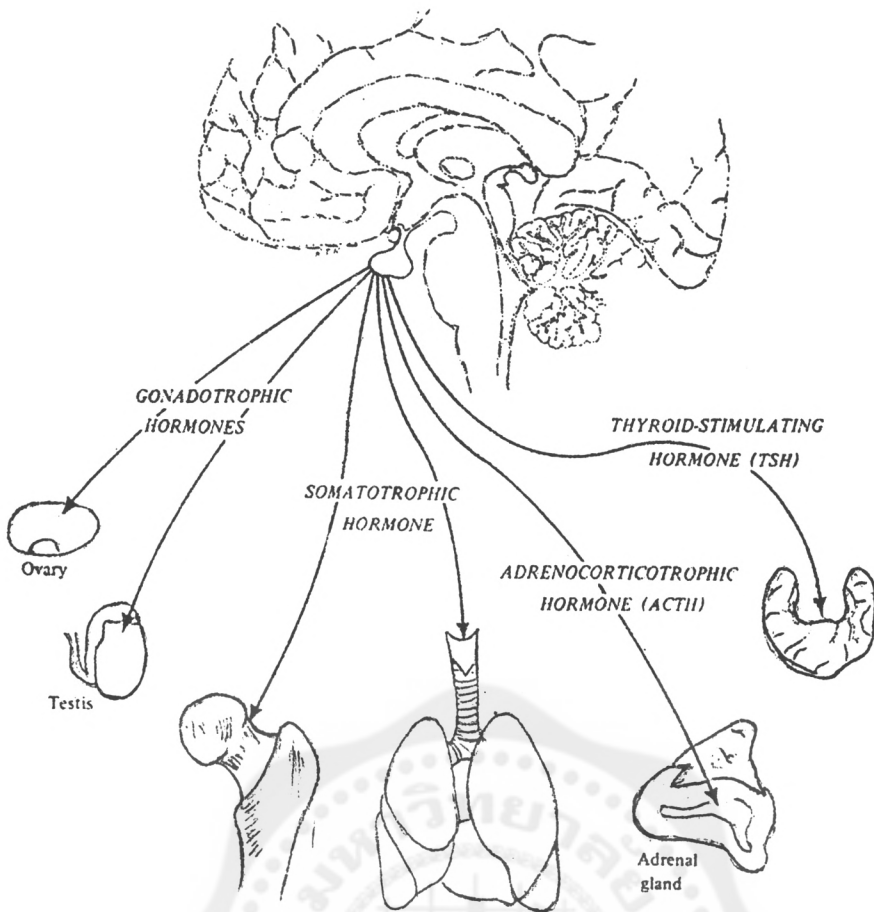
Female mammary gland: (a) anterior view (b) sagittal section.



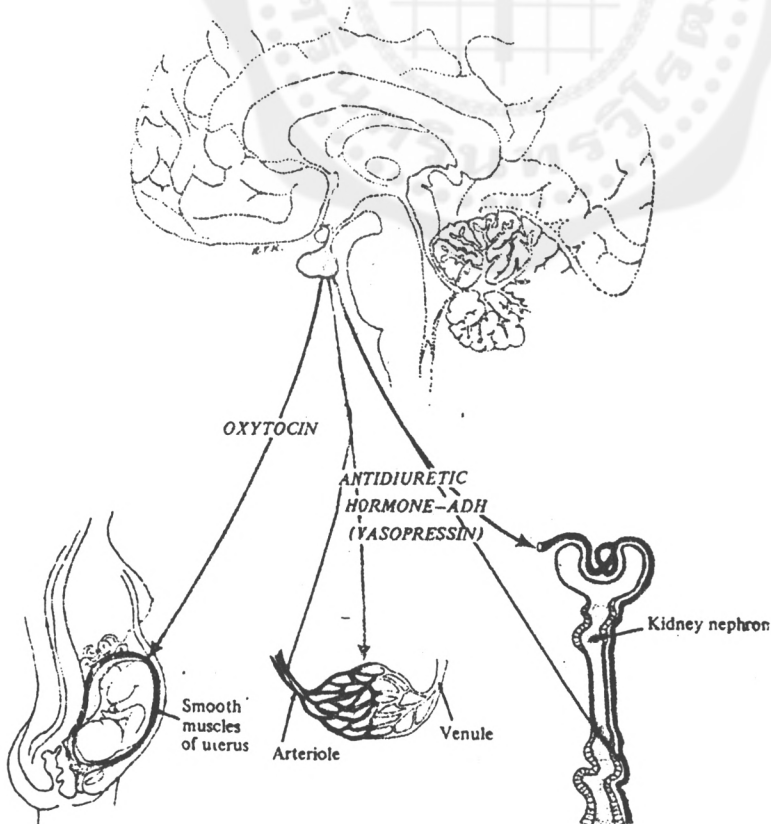
Hormonal interactions of the female cycles. Relative levels of anterior pituitary hormones correlated with follicular and hormonal changes of the ovary. Menstrual cycle also depicted.

THE ENDOCRINE SYSTEM

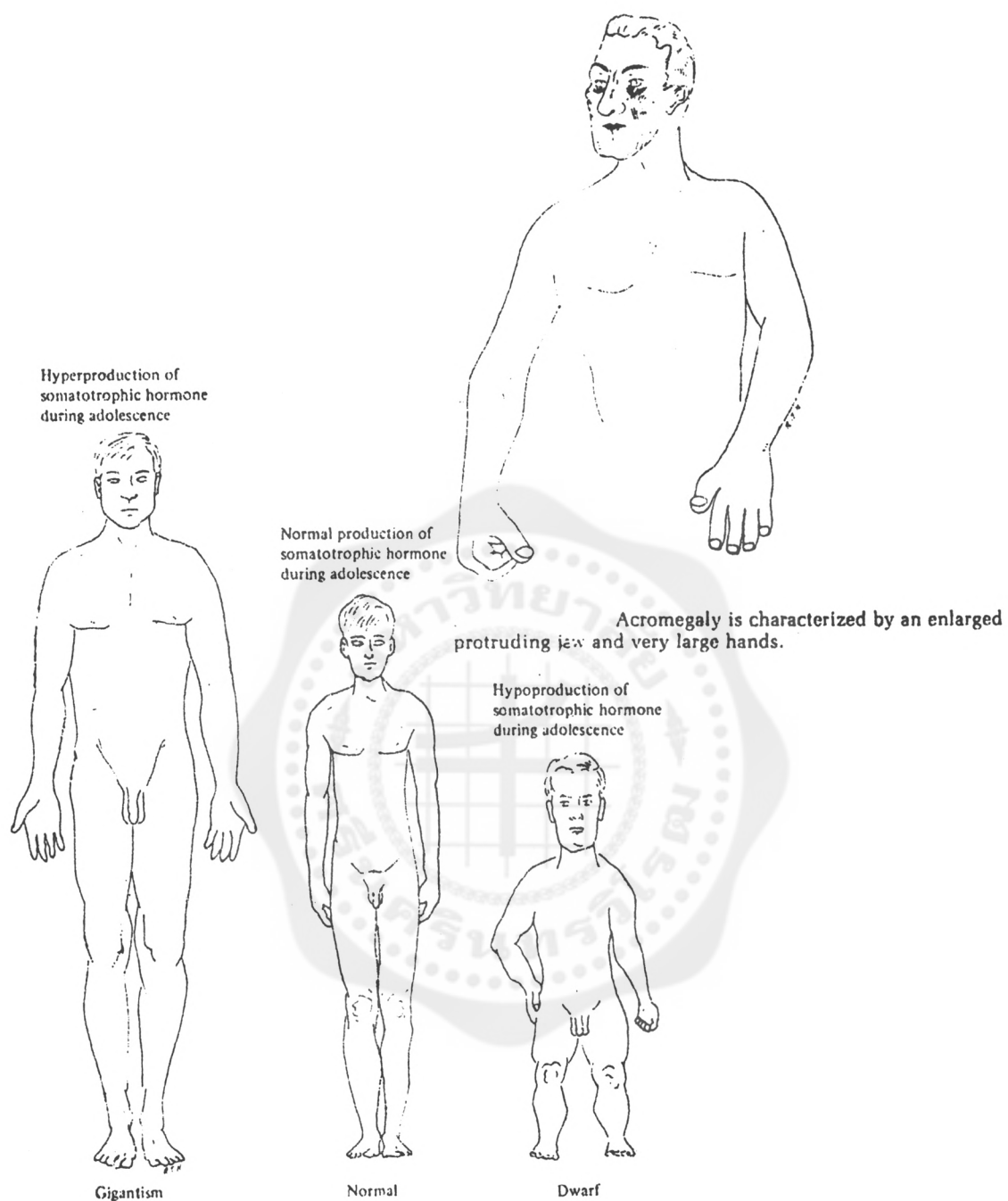




Some of the hormones secreted by the anterior pituitary and their target organs.



The posterior pituitary secretes oxytocin during pregnancy which stimulates muscles of the uterus. It also secretes ADH or vasopressin which increases absorption of water out of kidney nephrons and contraction of arterioles which increases blood pressure.



The results of hyper, normal and hyposecretions of somatotrophic hormone.

