

ORBIT-I



Presented by:-
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Introduction

- Orbits are a pair of bony cavities.

Location- on either side of root of nose.

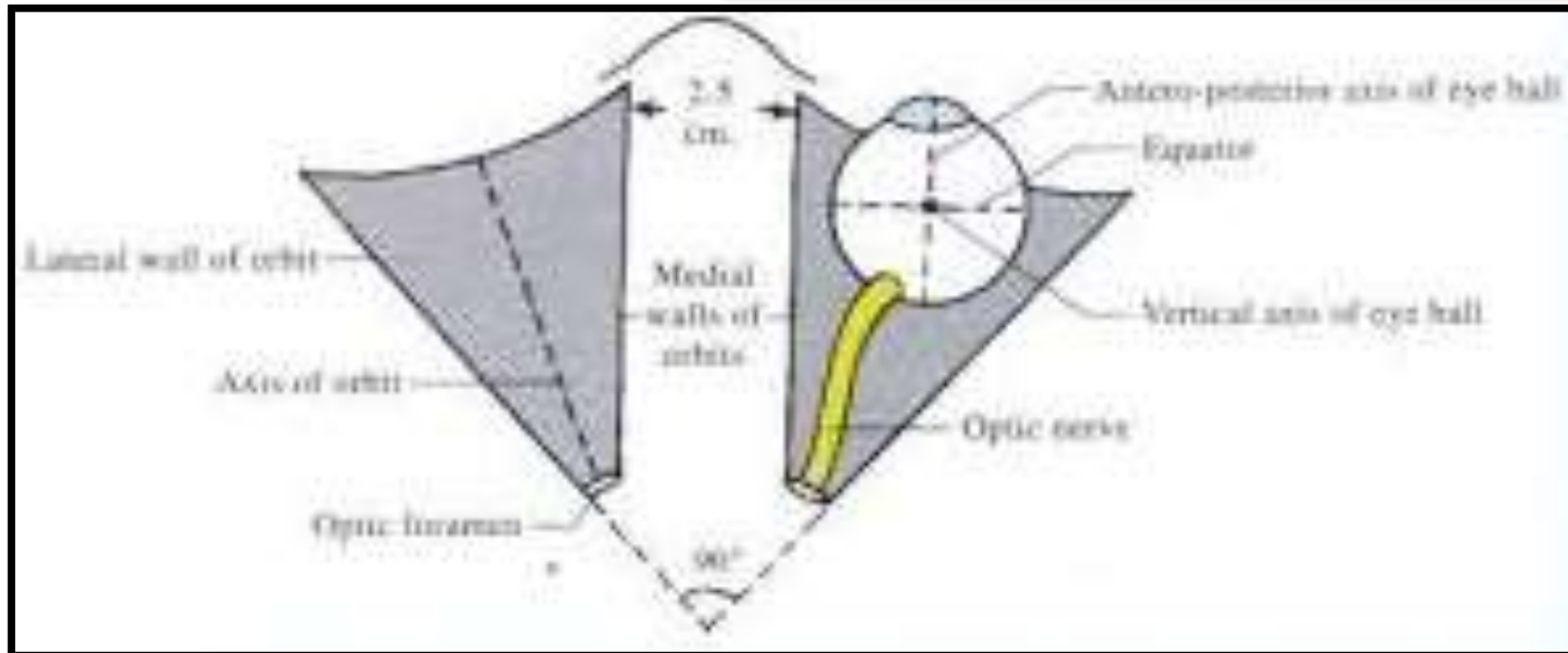
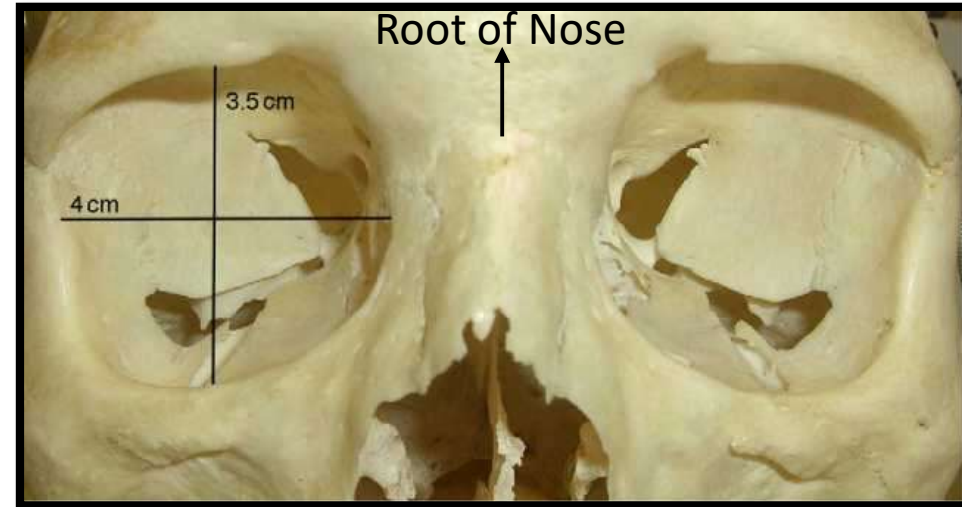
Shape- Four-sided pyramid.

Apex- directed at the optic canal.

Base- directed forward.

Medial walls- parallel to each other.

Lateral walls- at right angle to each other.



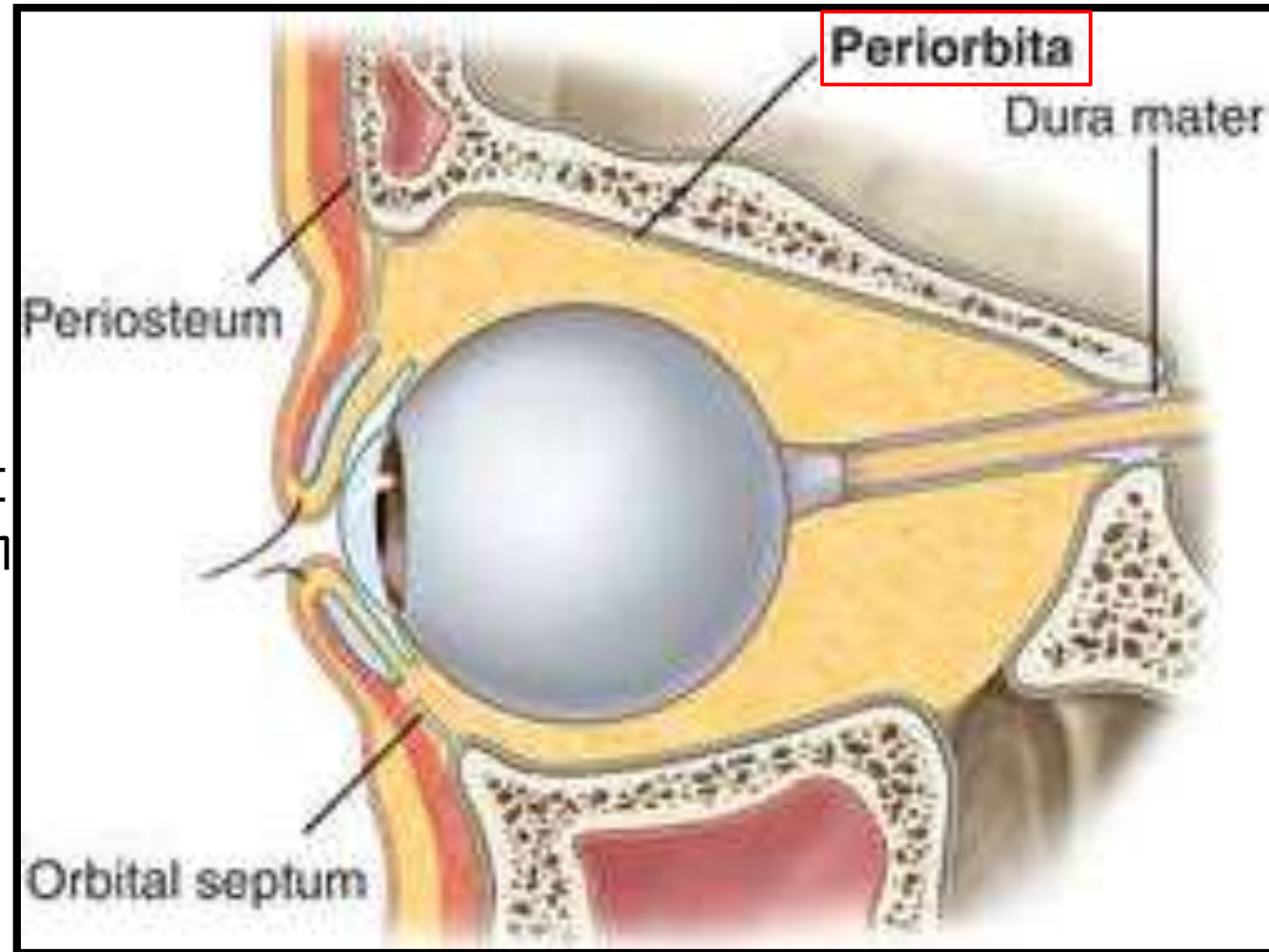
Contents of Orbit

- ❖ **Eyeball.**
- ❖ **Muscles-** Voluntary & Involuntary.
- ❖ **Fasciae of orbit-** Periorbita & Fascia Bulbi.
- ❖ **Nerves-**
 - Optic.
 - Oculomotor.
 - Trochlear.
 - Abducent.
 - Branches of Ophthalmic nerve.
 - Sympathetic nerves.
- ❖ **Parasympathetic ganglion-** Ciliary ganglion.
- ❖ **Vessels-**
 - Ophthalmic artery.
 - Superior and inferior Ophthalmic veins.
- ❖ **Lacrimal gland.**
- ❖ **Orbital fat.**

Fascial disposition of Orbit

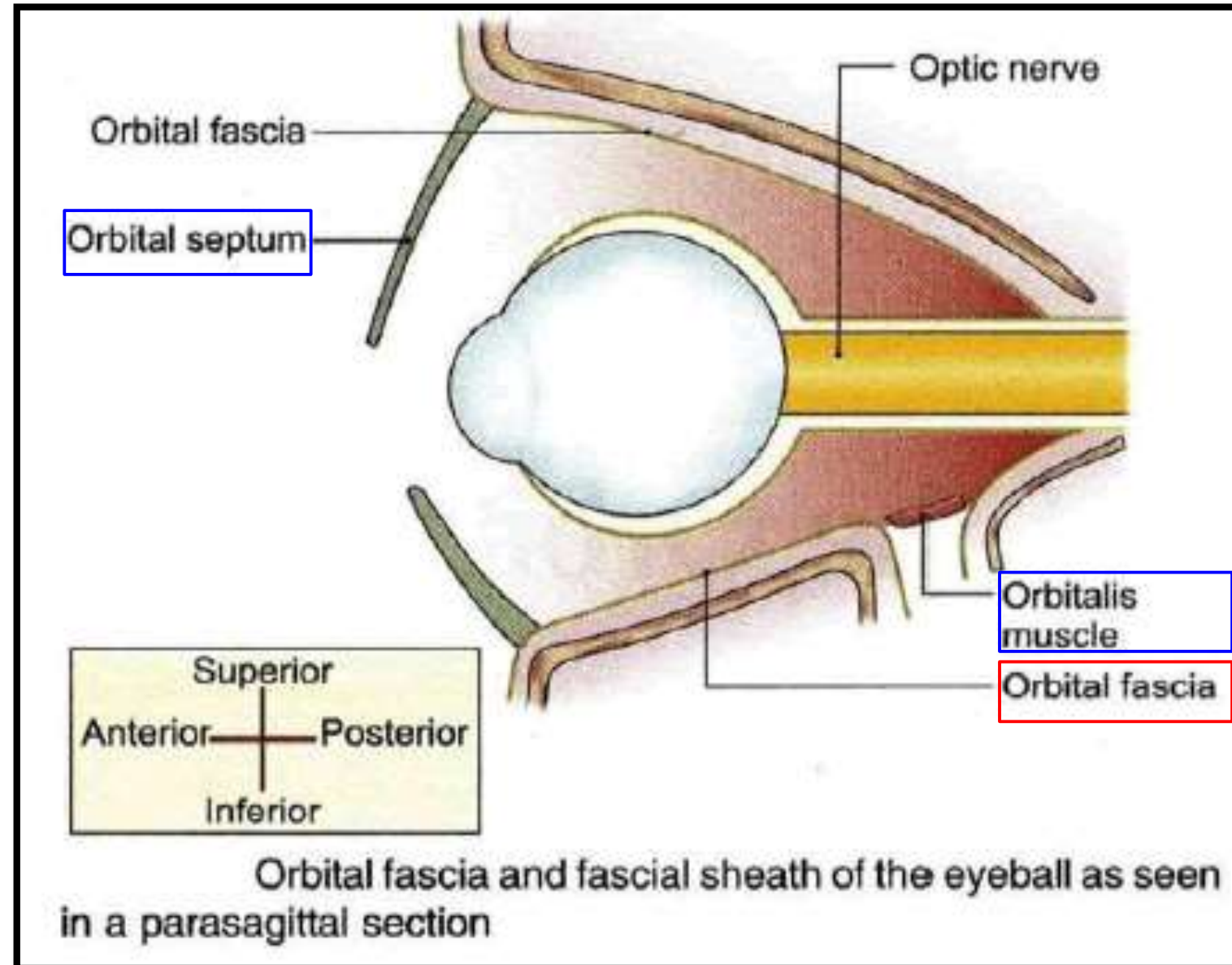
Periorbita (Orbital Fascia/Orbital Periosteum)-

- Loosely attached to the bones that form boundaries of the orbit.
- Easily stripped off from the bone.
- At the **optic canal** and **superior orbital fissure**, it is continuous with the **endocranium** (periosteum lining the interior of the skull).
- At the **orbital margins** and **inferior orbital fissure**, it is continuous with the periosteum covering the exterior of the skull.

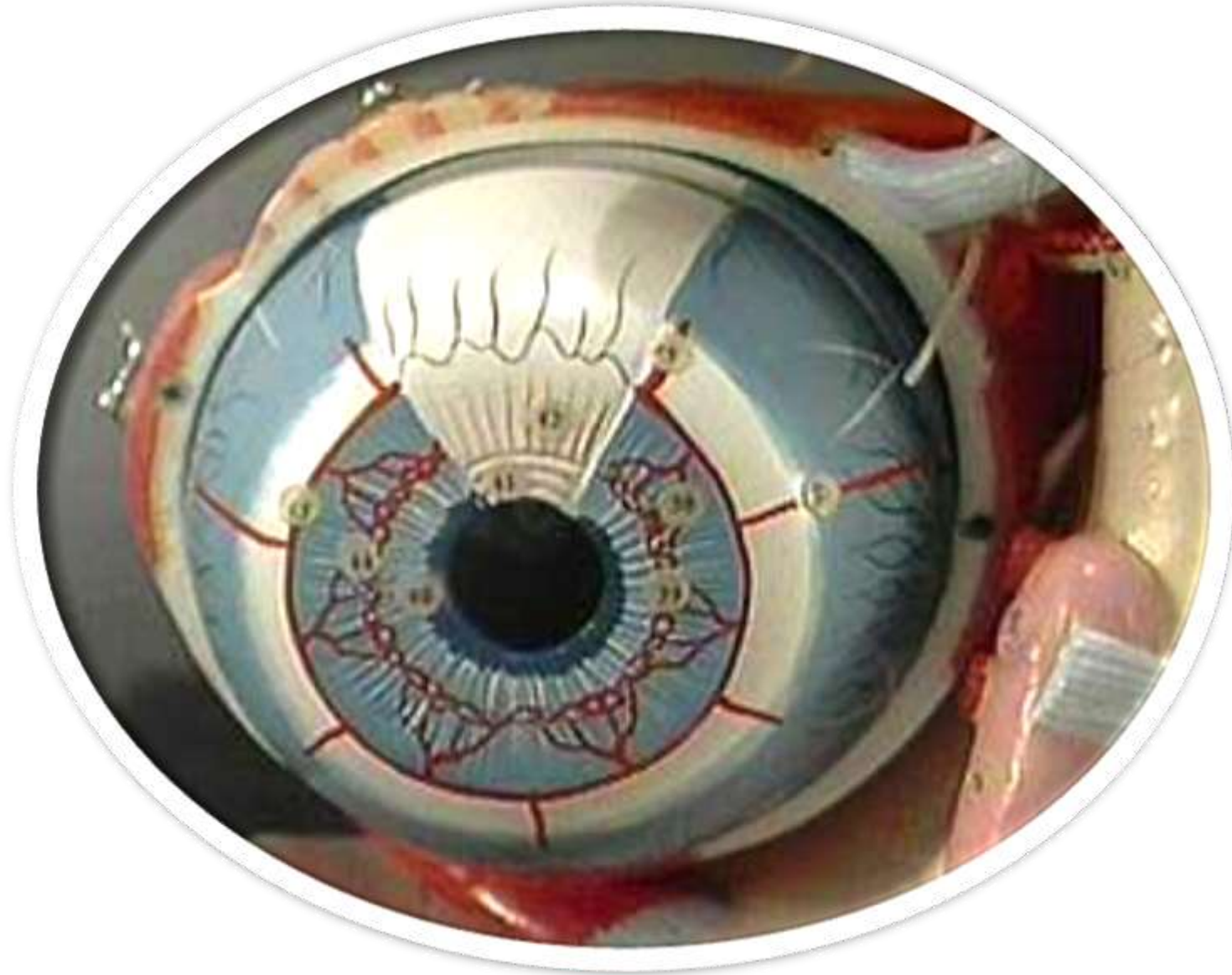


Periorbital contd...

- Across the inferior orbital fissure, it is supplemented by **orbitalis** muscle.
- At orbital margin, projects into both eyelids as **orbital septum**.
- Forms the **lacrimal fascia**.
- Sends one process to hold the **fibrous pulley** for the superior oblique muscle.



Eyeball



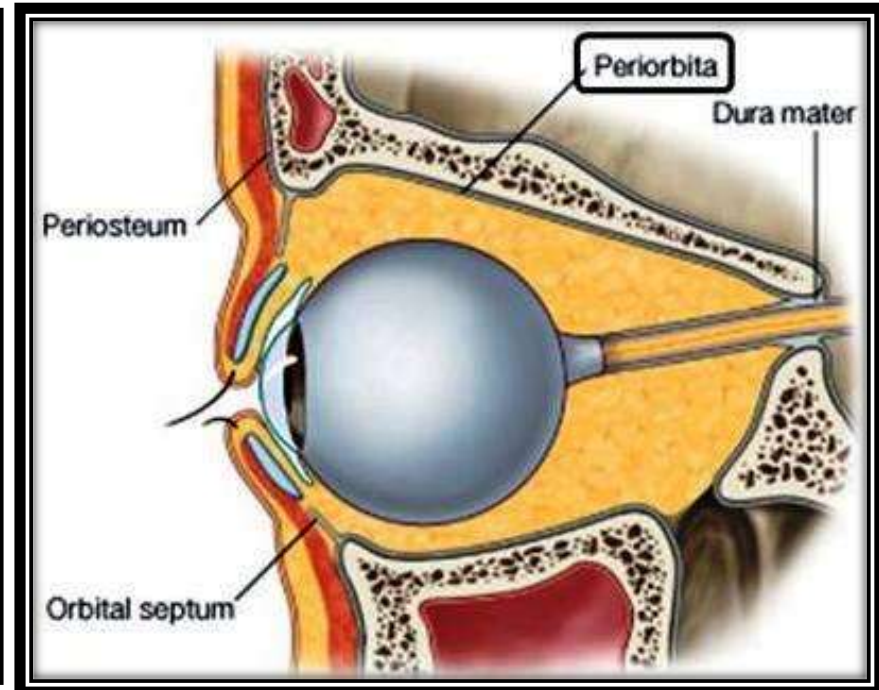
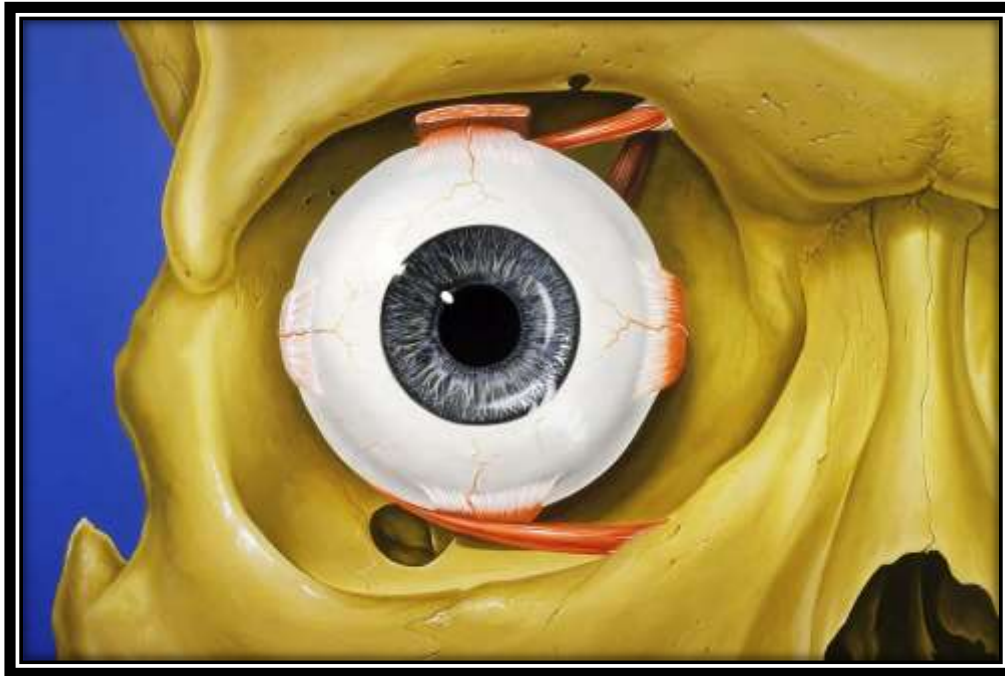
INTRODUCTION

❑ An organ of sight.

LOCATION:

❑ Anterior 1/3rd of orbital cavity.

❑ Embedded in the fat.

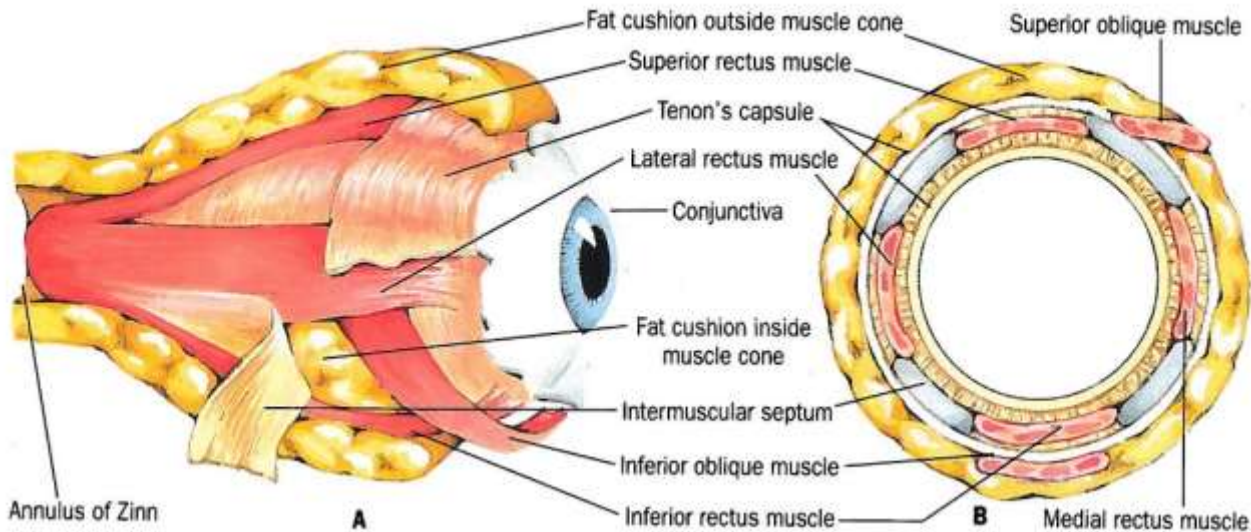
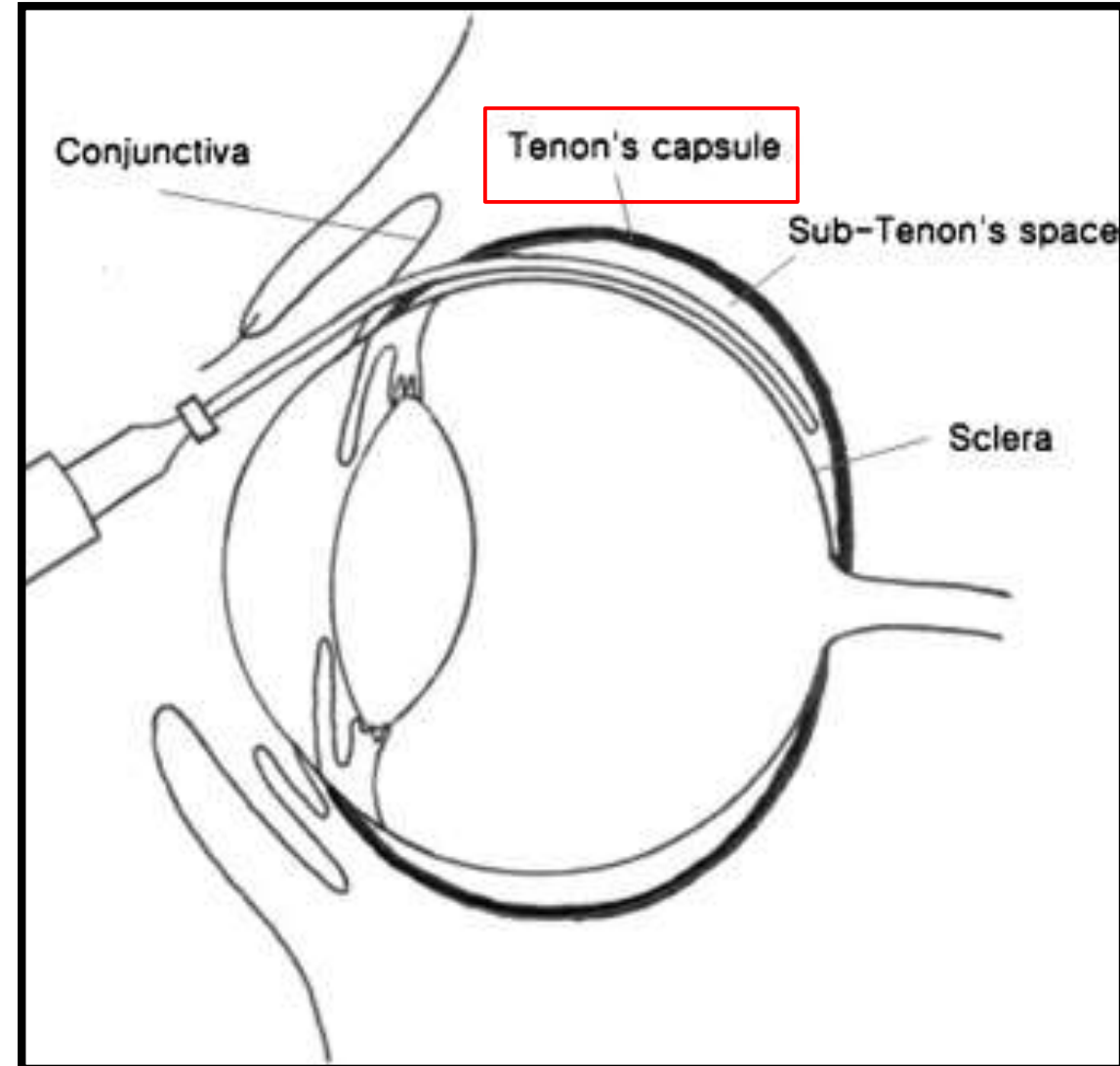


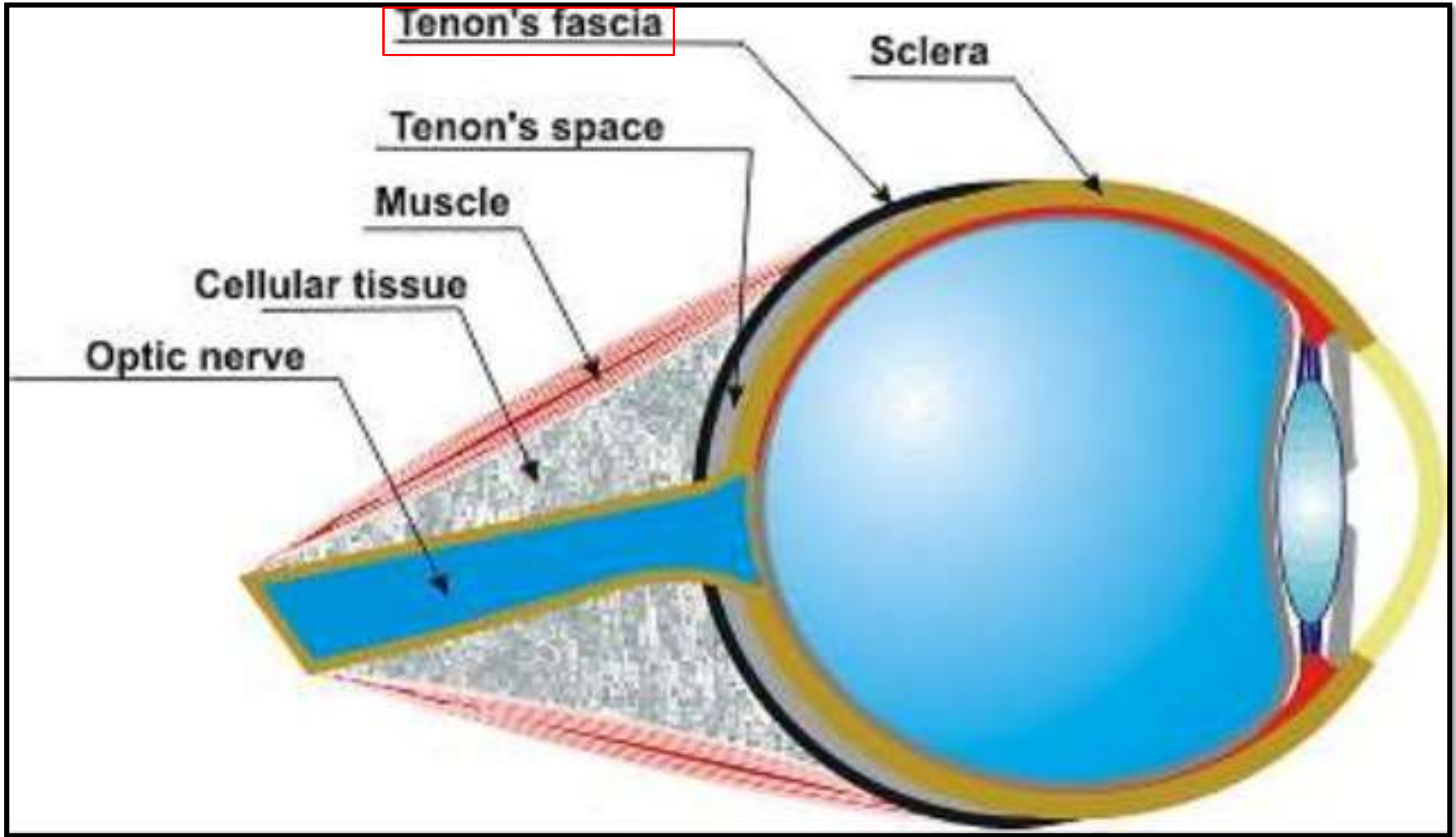
Fascia Bulbi (Tenon's capsule)

- Forms a membranous envelope of the eyeball.

Extent- From optic nerve to the limbus (sclerocorneal junction).

- Separates the eyeball from the orbital fat.
- Separated from sclera by the **episcleral space (Sub-Tenon's space)**.





Tenon's fascia

Sclera

Tenon's space

Muscle

Cellular tissue

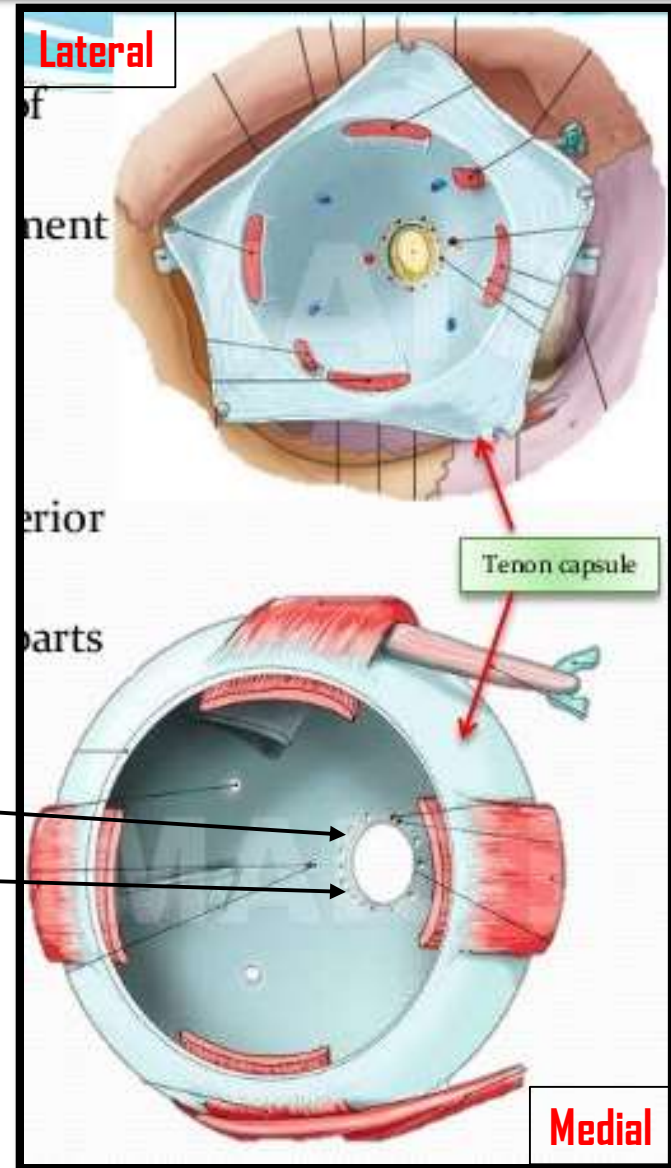
Optic nerve

Fascia bulbi contd...

Structures piercing the Fascial bulbi-

- Ciliary vessels and nerves.
- Tendons of four recti and two oblique muscles of the eyeball.

Perforations for Ciliary vessels and Nerves



Ligaments of Eyeball

- Lateral check ligament.
- Medial check ligament.
- Suspensory ligament.

Lateral check ligament-

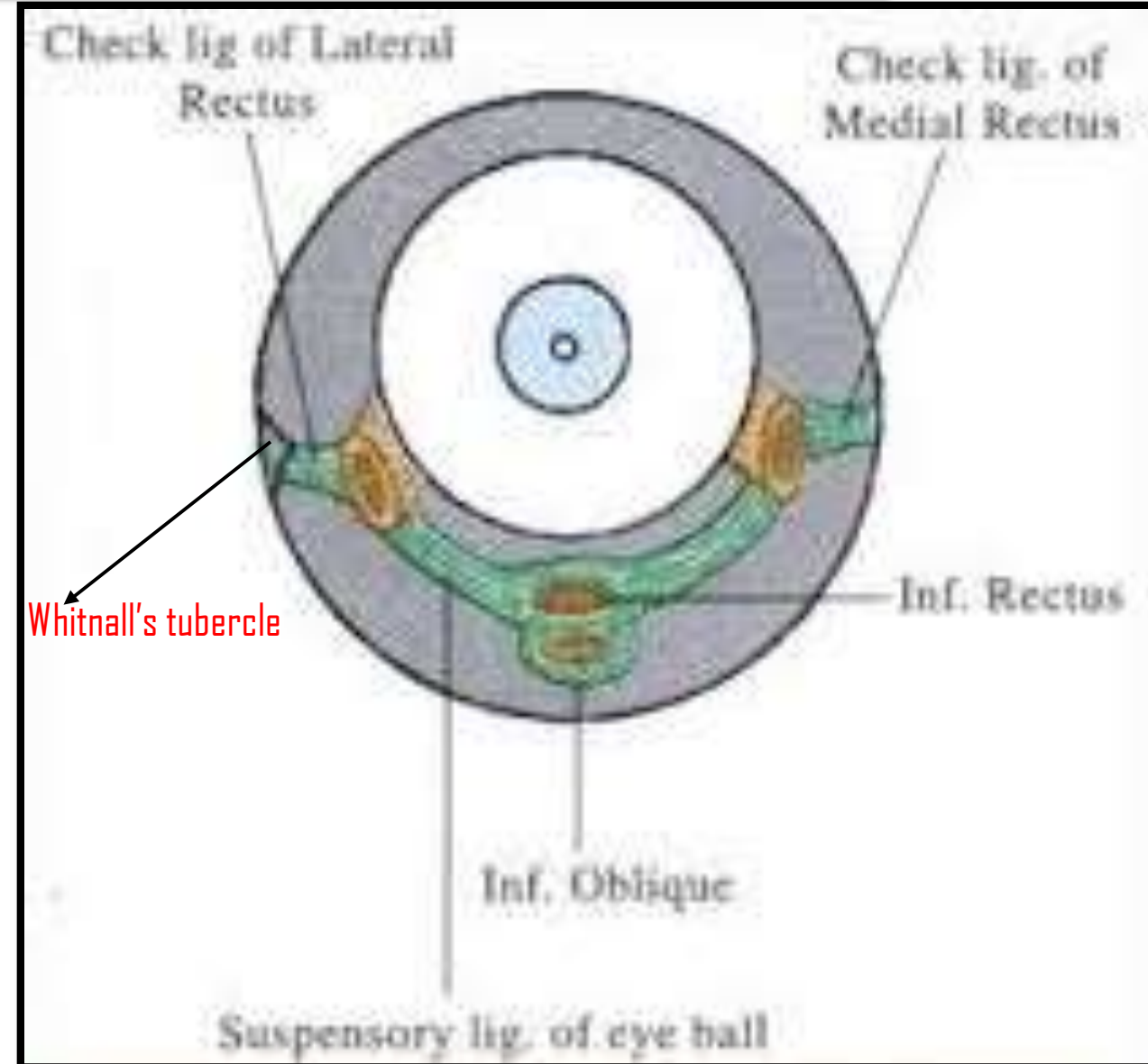
- From the fascial sheath of lateral rectus to the **Whitnall's** tubercle of **Zygomatic** bone.

Medial check ligament-

- From the fascial sheath of medial rectus to the **posterior lacrimal crest** of **Lacrimal** bone.

Suspensory ligament of Lockwood-

- It is a fascial hammock which connect both the check ligaments below the eyeball.
- It supports the eyeball.
- It is expanded in the middle and blends with the fascial sheaths of inferior rectus and inferior oblique.



POLES

❑ Anterior pole.

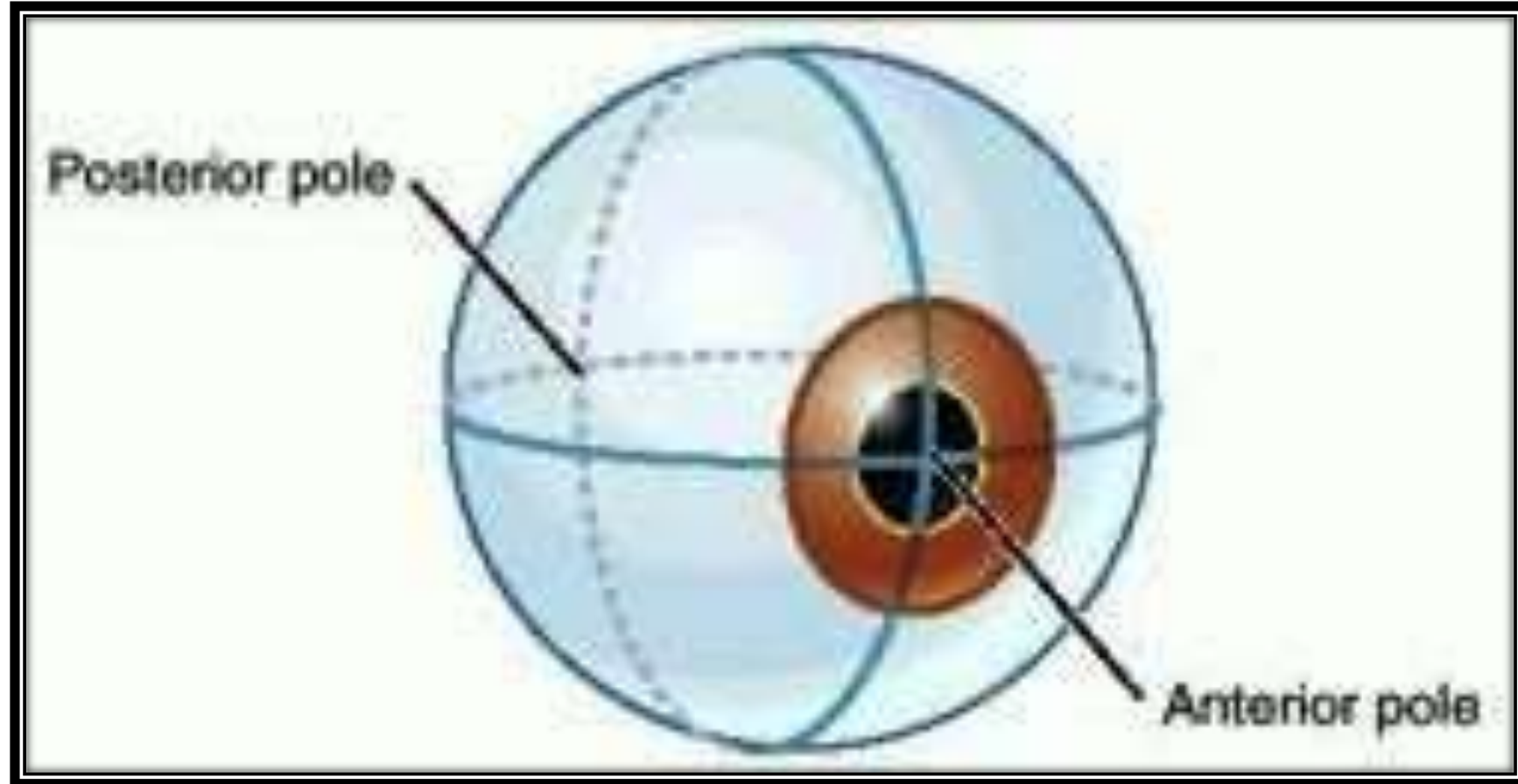
❑ Posterior pole.

Anterior Pole:-

- Central point of **corneal** curvature.

Posterior pole:-

- Central point of **scleral** curvature.



AXES

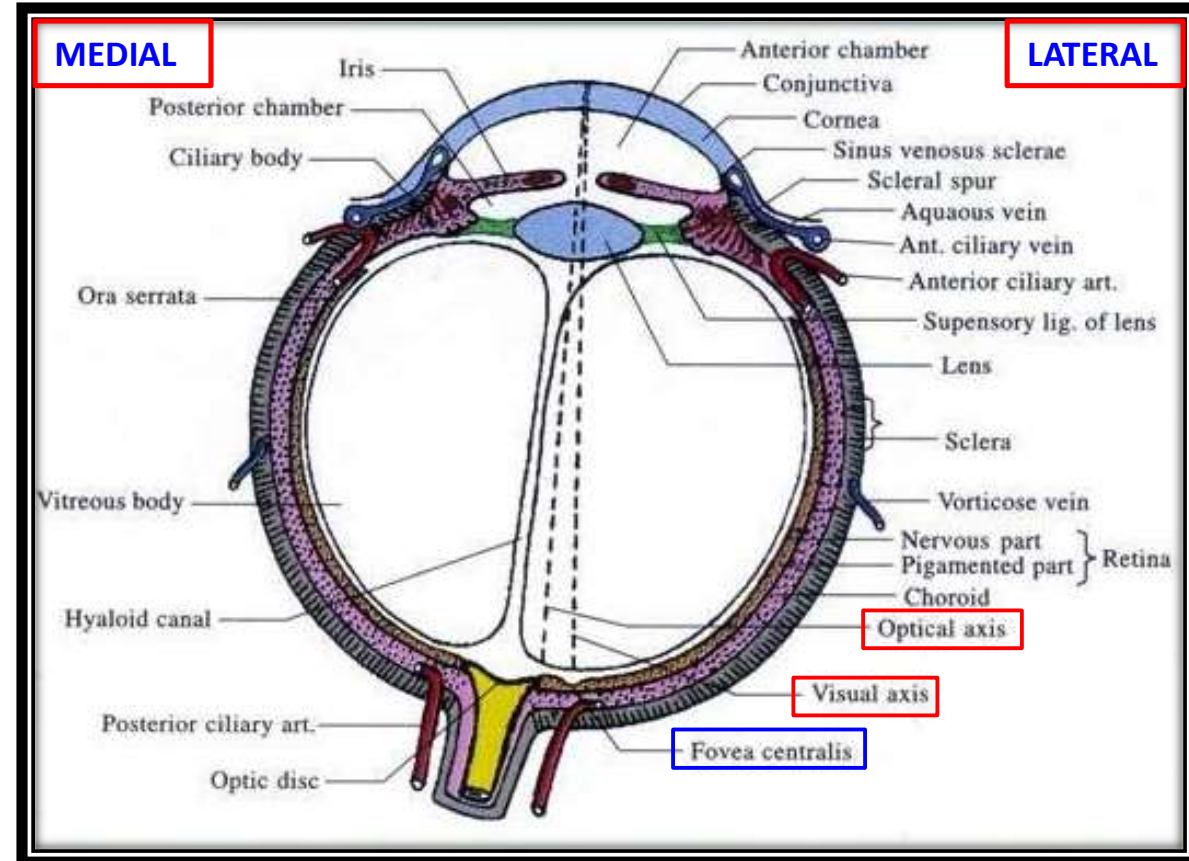
OPTICAL AXIS:

❑ An antero-posterior line joining both poles.

VISUAL AXIS:

❑ A line extending from anterior pole to the **fovea centralis**.

❑ Fovea centralis lies slightly **lateral** to the posterior pole.



EYEBALL

EQUATOR:

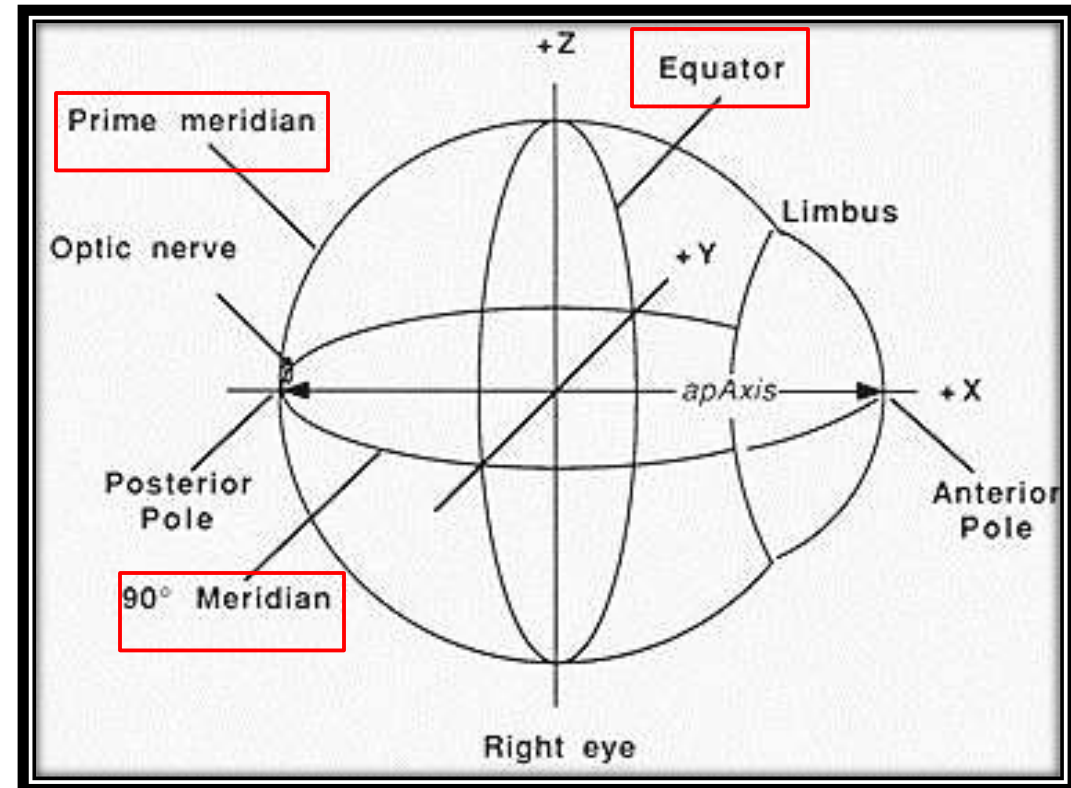
□ An imaginary line around the eyeball, equidistant from the two poles.

MERIDIAN:

□ Any imaginary plane from pole to pole and cutting the equator at right angle.

□ A meridional section may be horizontal or sagittal.

DIAMETER: ~24 mm.



TUNICS (COATS) OF EYEBALL

- 3 tunics- outer tunic.
 - intermediate tunic.
 - inner tunic.

OUTER TUNIC:

- Consists of:-
 - Sclera.
 - Cornea.

□ Fibrous in nature.

INTERMEDIATE TUNIC:

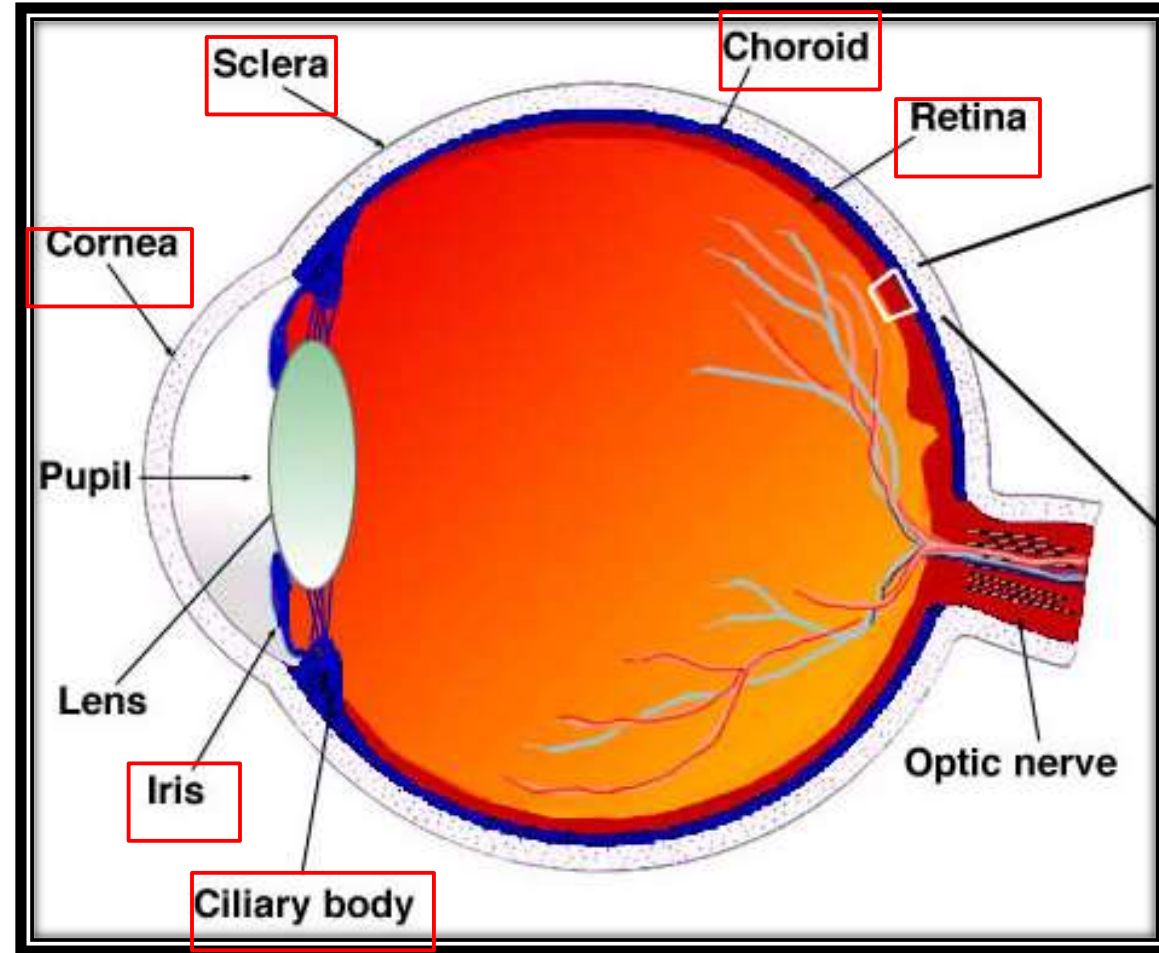
- Consists of (from behind forwards):
 - Choroid.
 - Ciliary body.
 - Iris.

□ Pigmented and vascular.

INNER TUNIC:

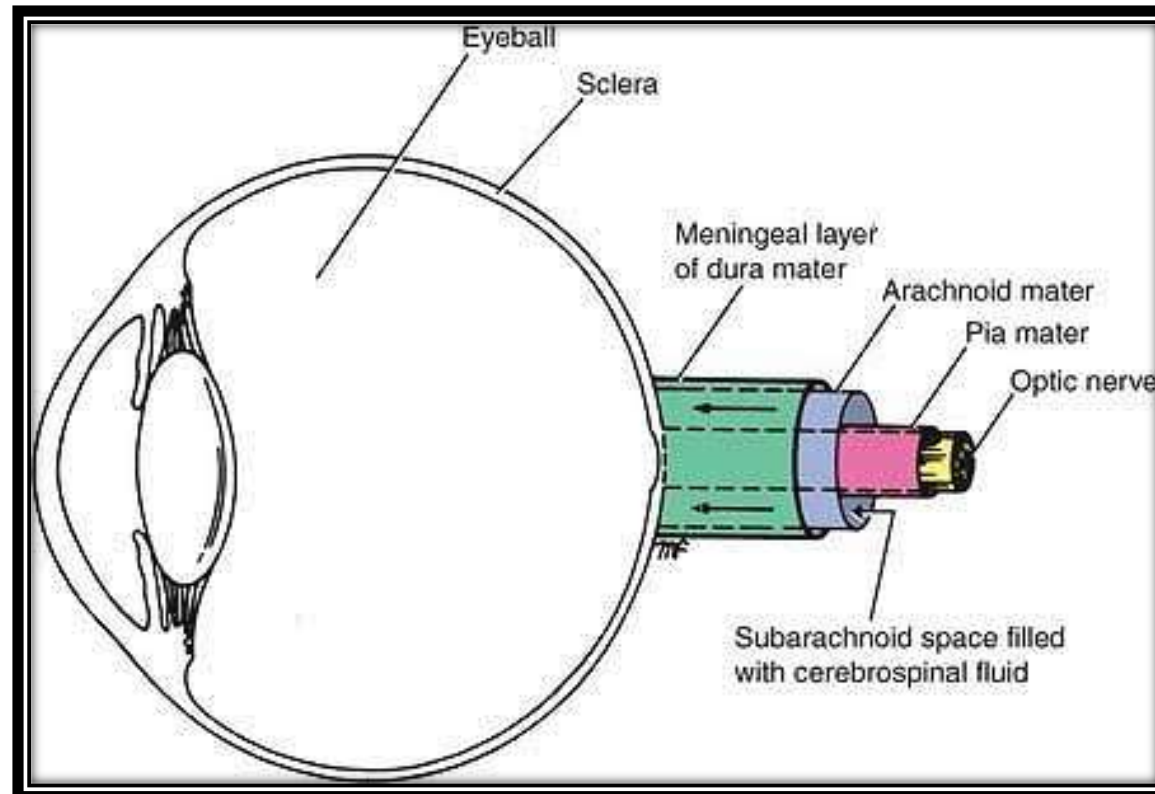
- Consists of:-
 - Retina.

□ Nervous in nature.



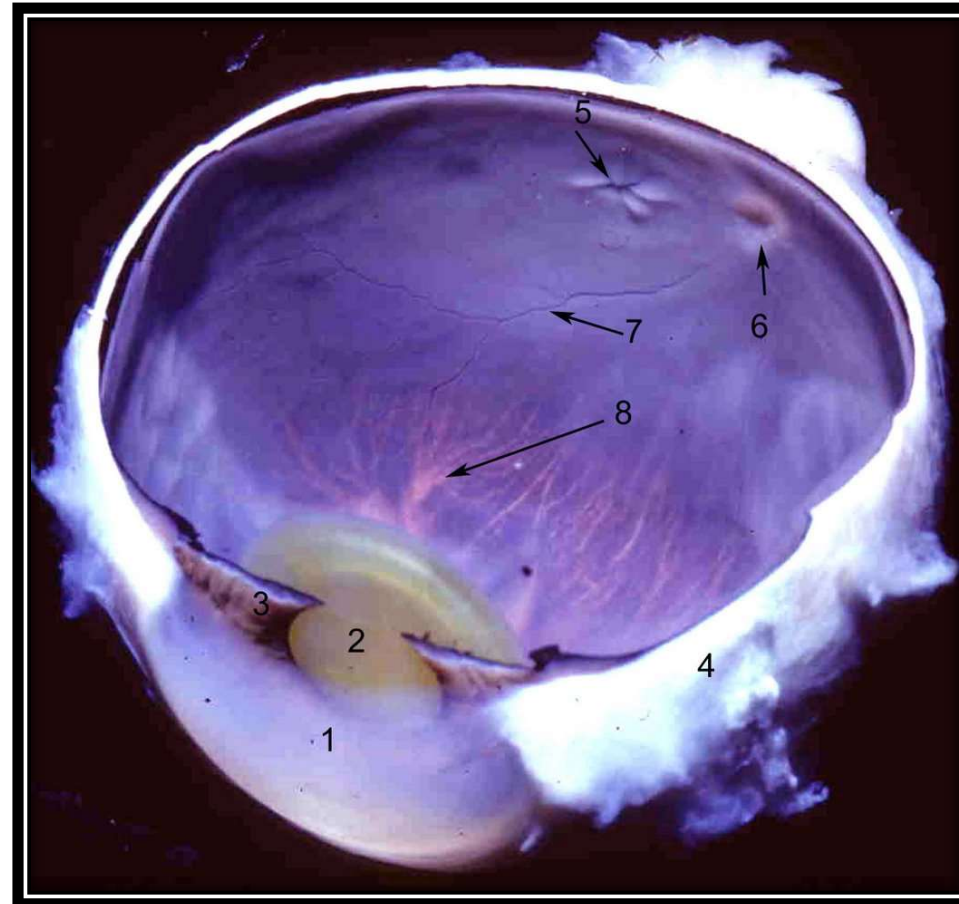
TUNICS (COATS) OF EYEBALL CONTD...

- ❑ **Sclera** represents an expansion of dural sheath of optic nerve.
- ❑ **Choroid** is derived from an expansion of pia-arachnoid.
- ❑ **Retina** is developmentally a part of brain and is derived from diencephalon.



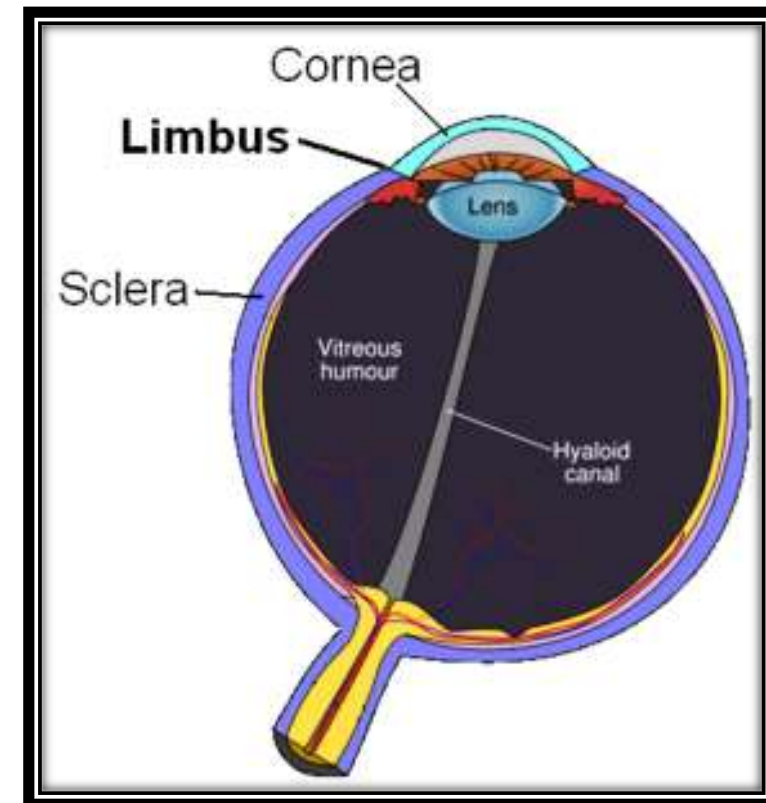
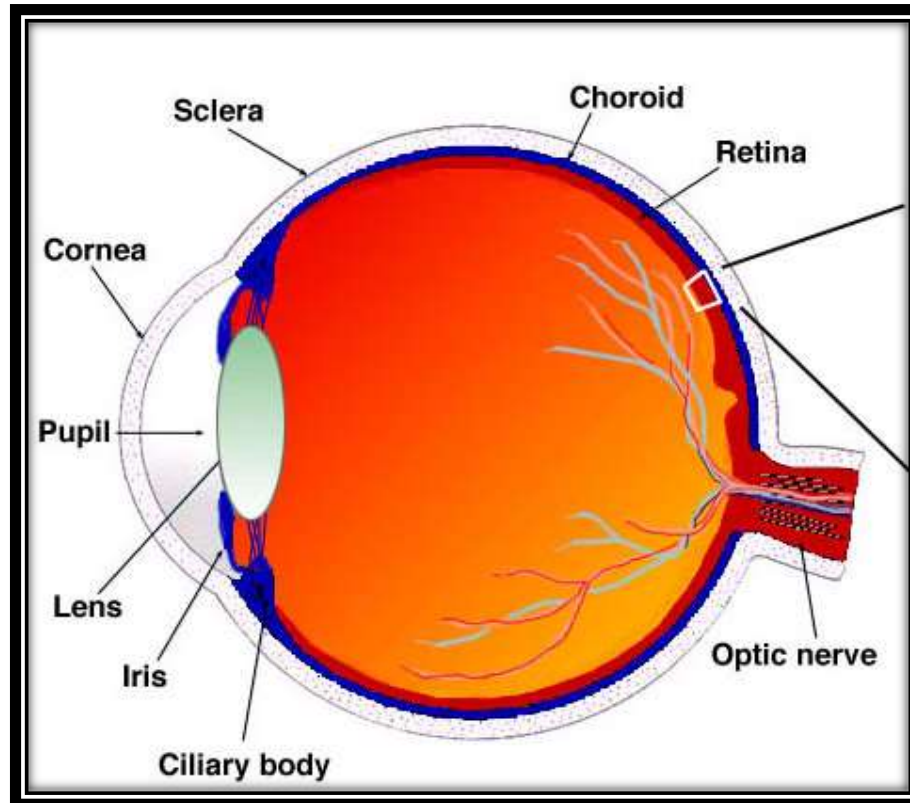
SCLERA

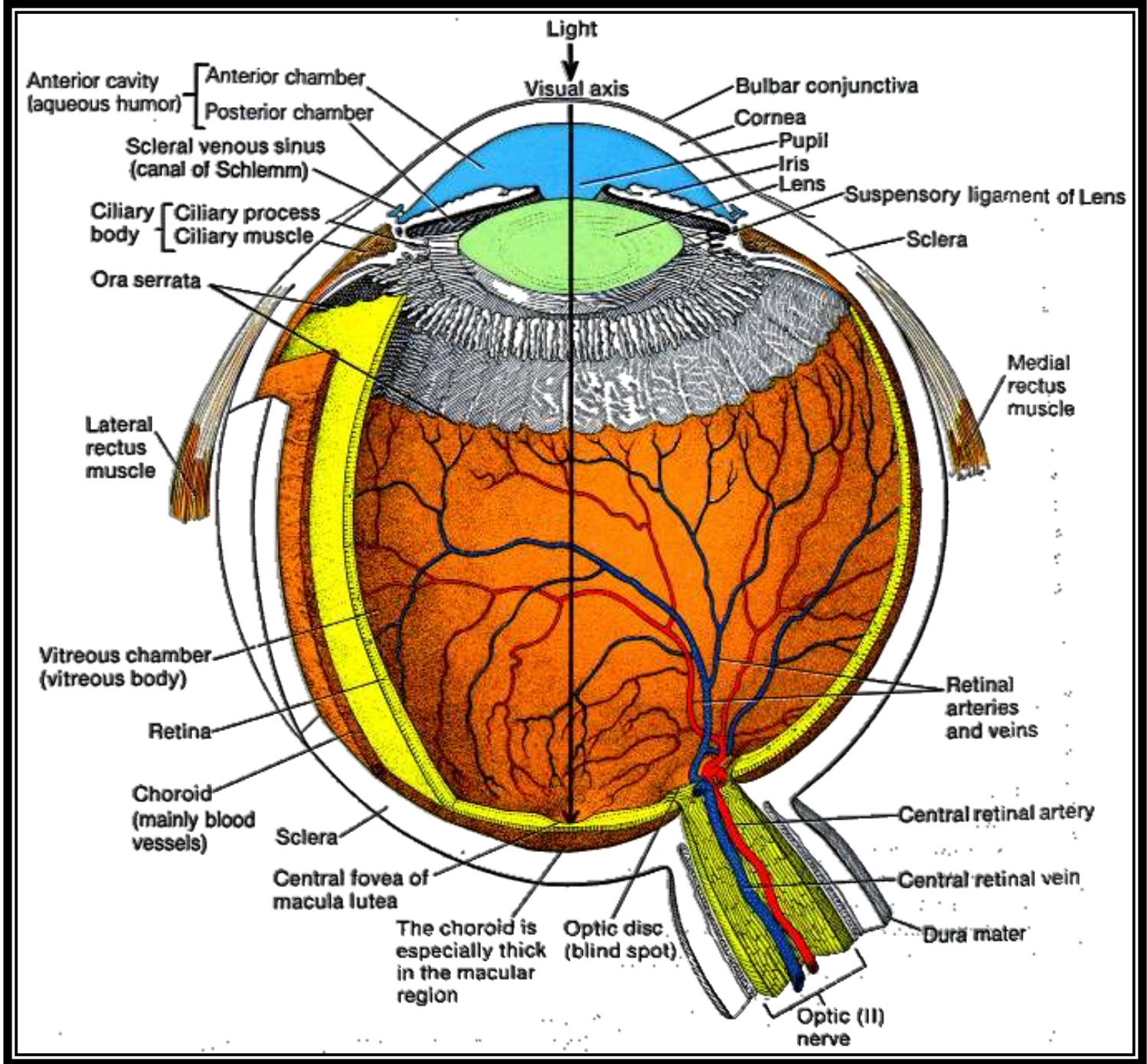
- The thick, tough, white outer covering of the eyeball.
- Opaque and forms posterior 5/6th of outer tunic of eyeball.



SCLERA CONTD...

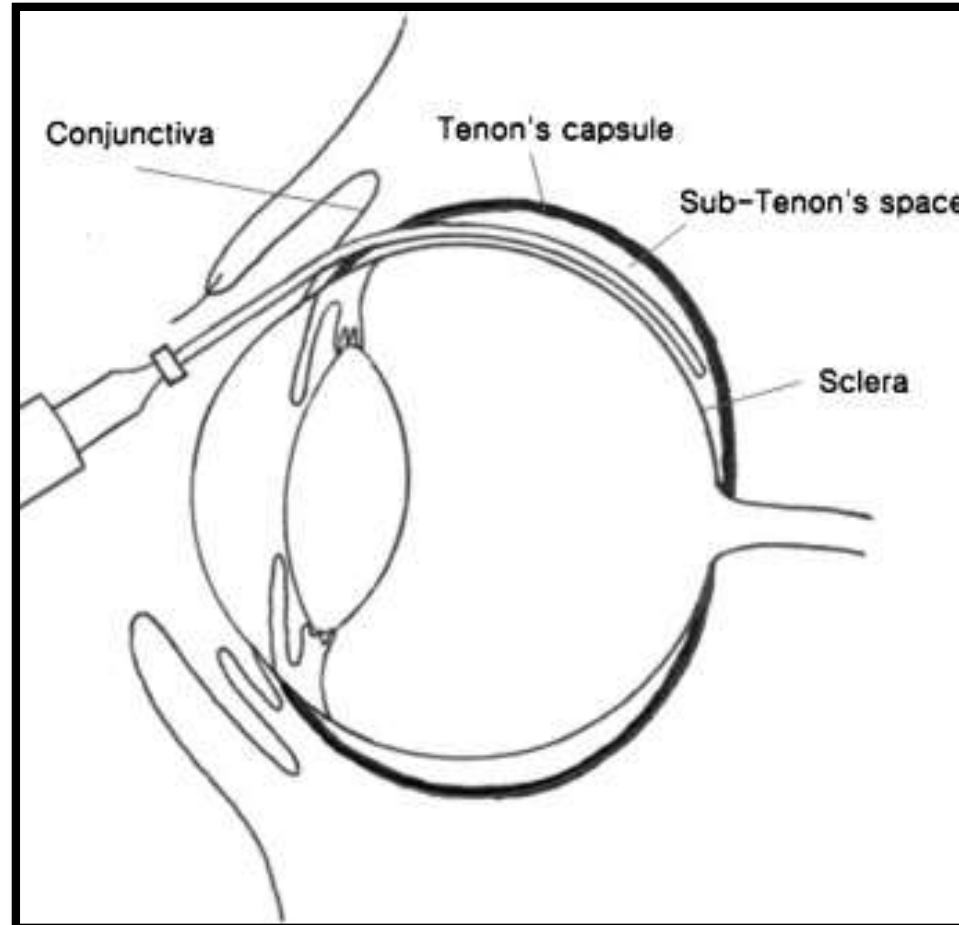
- ❑ In front, continuous with the cornea at **sclero-corneal junction (limbus)**.
- ❑ Behind, continuous with the dural sheath of optic nerve.
- ❑ Composed of a dense network of **collagen** fibers.





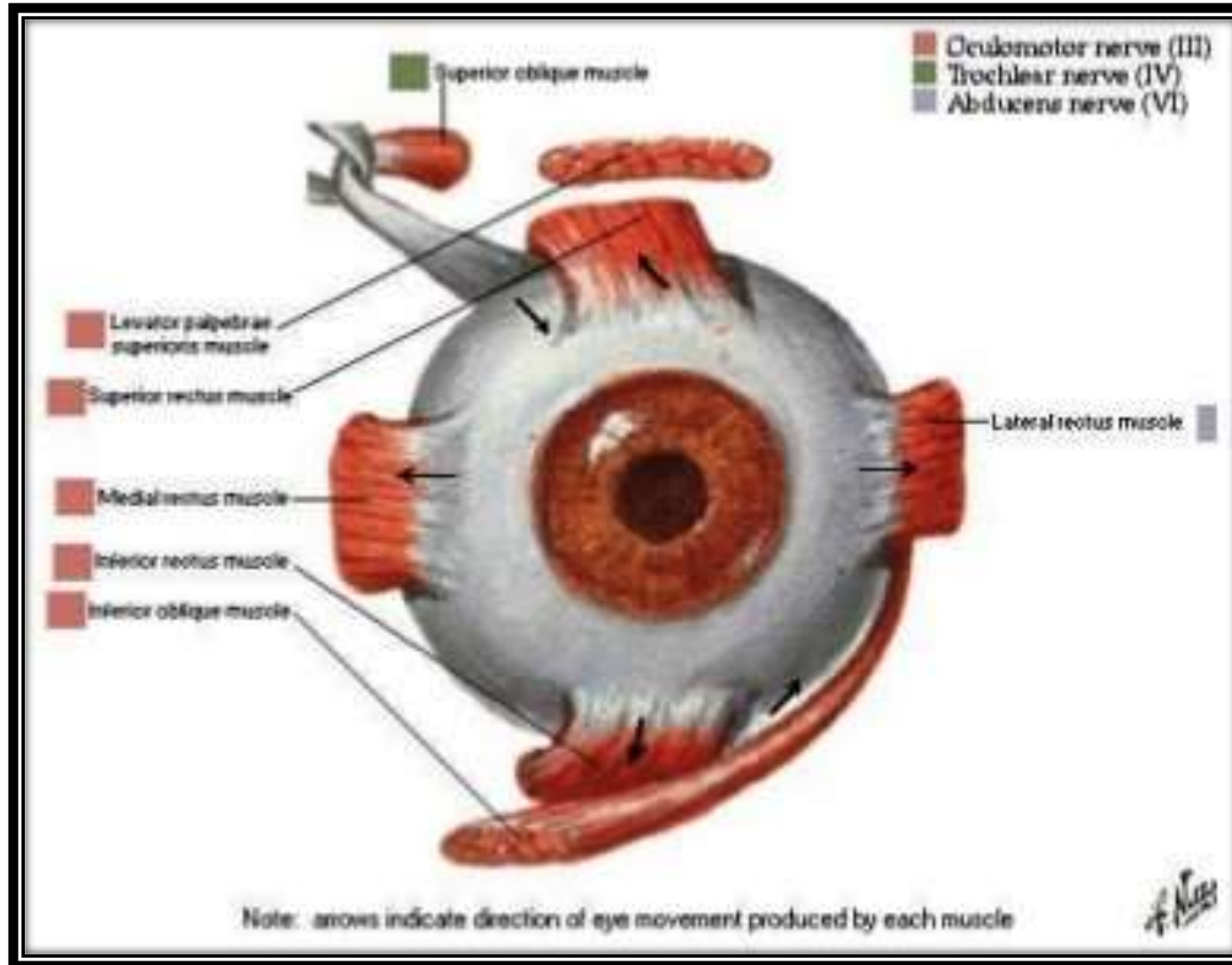
SCLERA CONTD...

- ❑ External surface is covered by **fascia bulbi (Tenon's capsule)**.
- ❑ Separated from fascia bulbi by **episcleral space**.



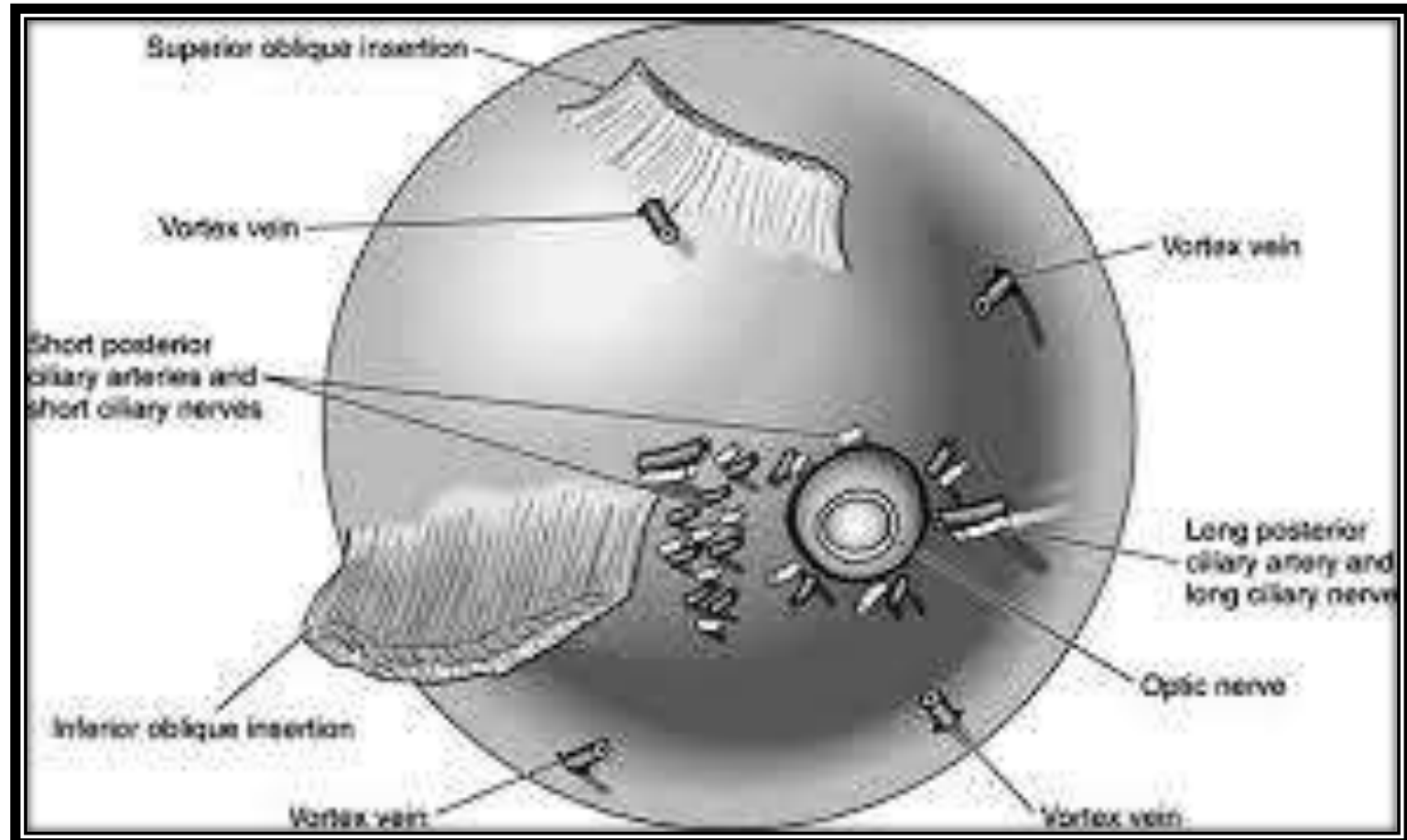
SCLERA CONTD...

- Receives the insertion of **6** extra-ocular muscles (**4** recti and **2** obliqui).



STRUCTURES PIERCING THE SCLERA

- Optic nerve.
- Posterior ciliary vessels and nerves.
- Venae vorticosae
- Anterior ciliary arteries.
- Aqueous veins.

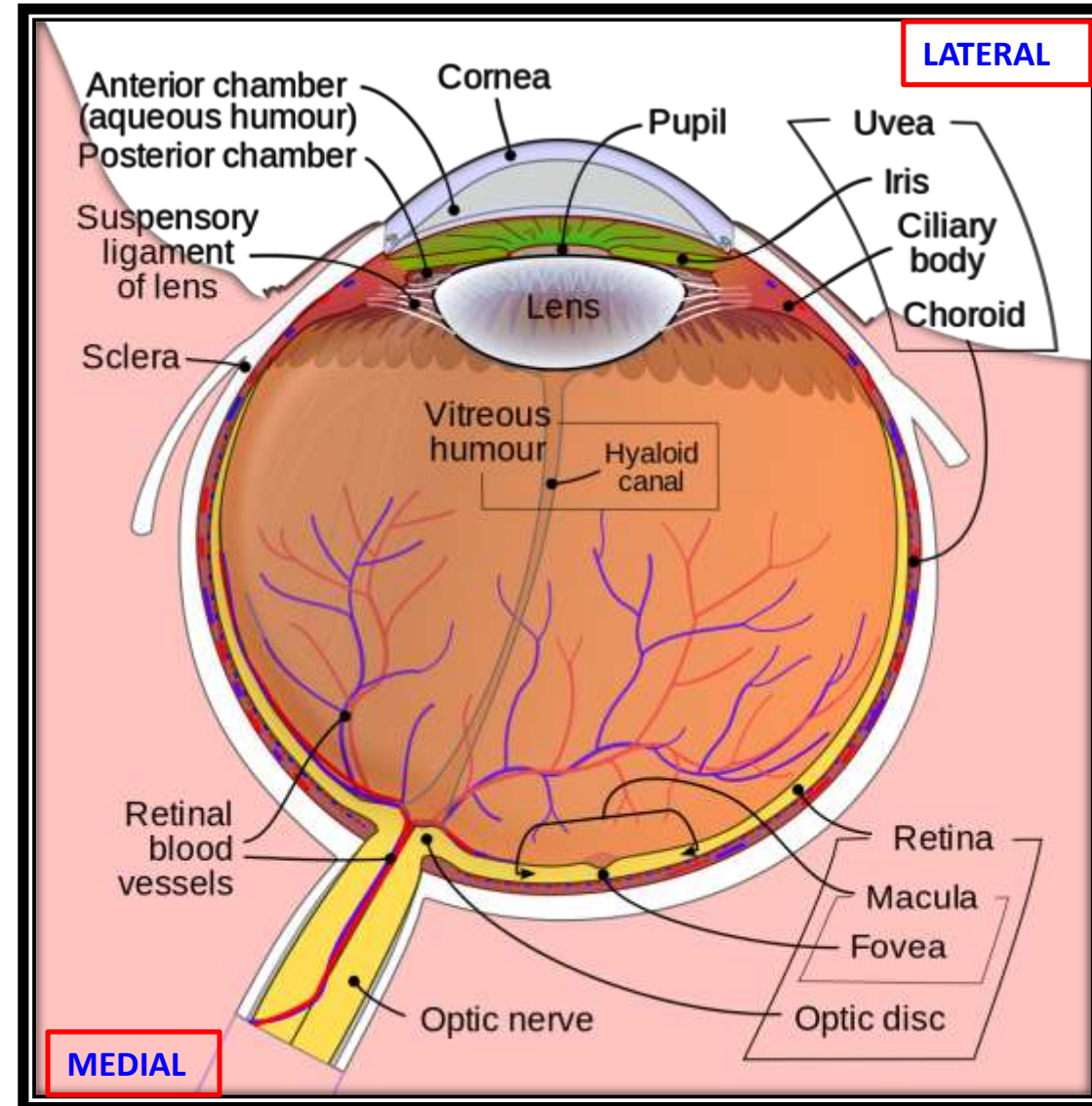


STRUCTURES PIERCING THE SCLERA

CONTD...

OPTIC NERVE:

- Pierces the sclera **3 mm.** to the **nasal (medial) side of posterior pole.**
- **Central artery** and **vein of retina** also pierces the sclera within the substance of optic nerve.
- Where the fibers of optic nerve pierce the sclera that area is sieve like; hence called **lamina cribrosa sclerae.**

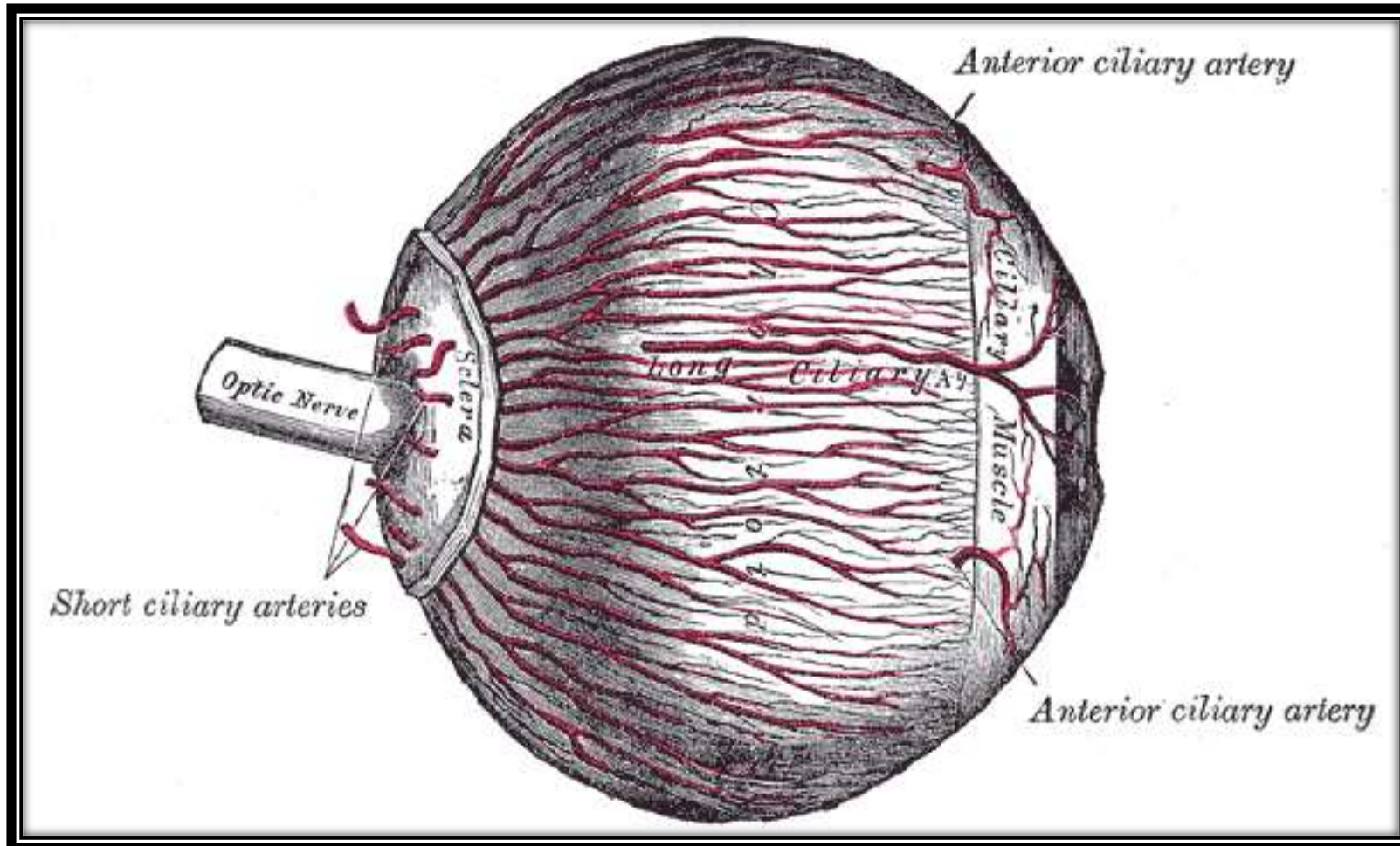


STRUCTURES PIERCING THE SCLERA

CONTD...

POSTERIOR CILIARY VESSELS AND NERVES:

- ❑ Pierce the sclera around the optic nerve.



STRUCTURES PIERCING THE SCLERA CONTD...

VENAE VORTICOSAE:

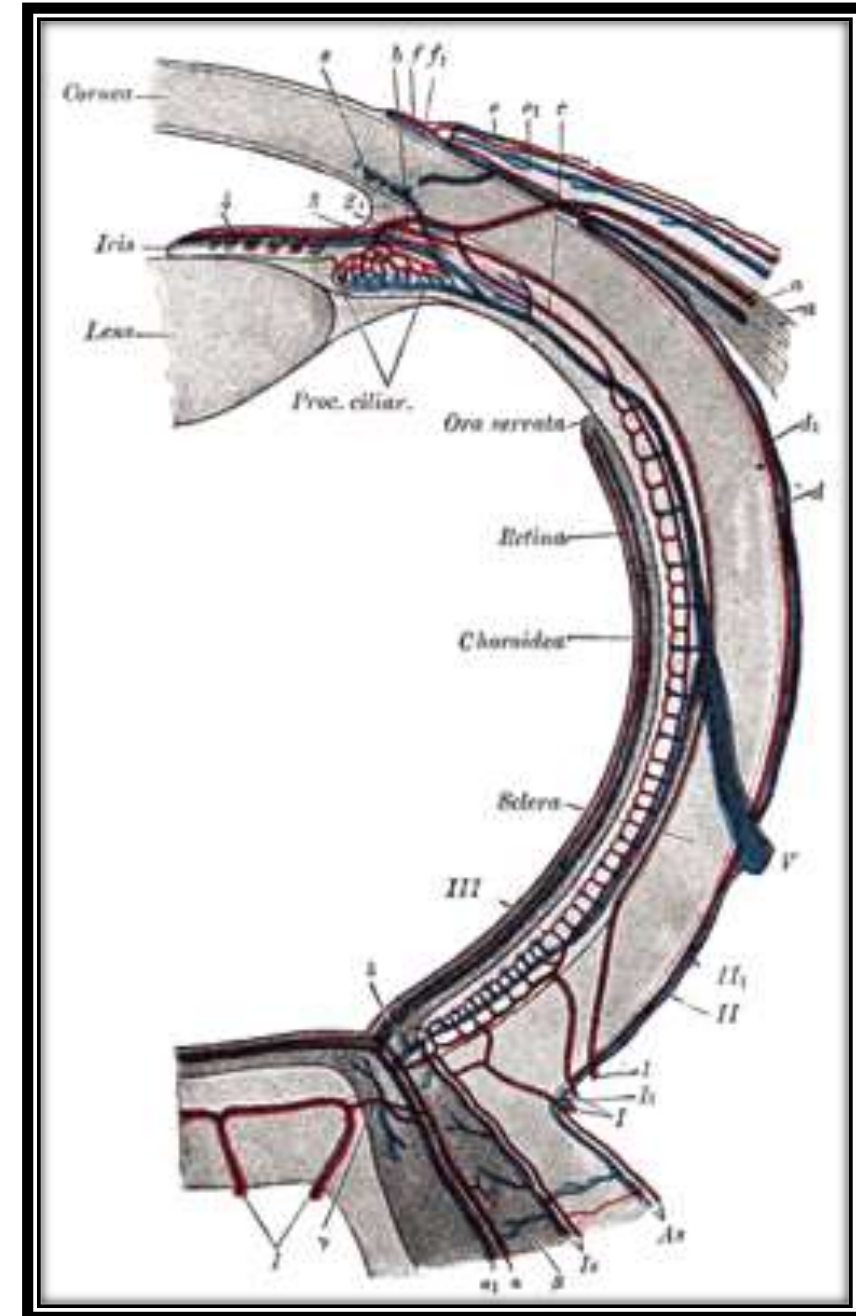
- ~4-5 in number.
- Pierce the sclera midway between the attachment of optic nerve and the sclero-corneal junction.

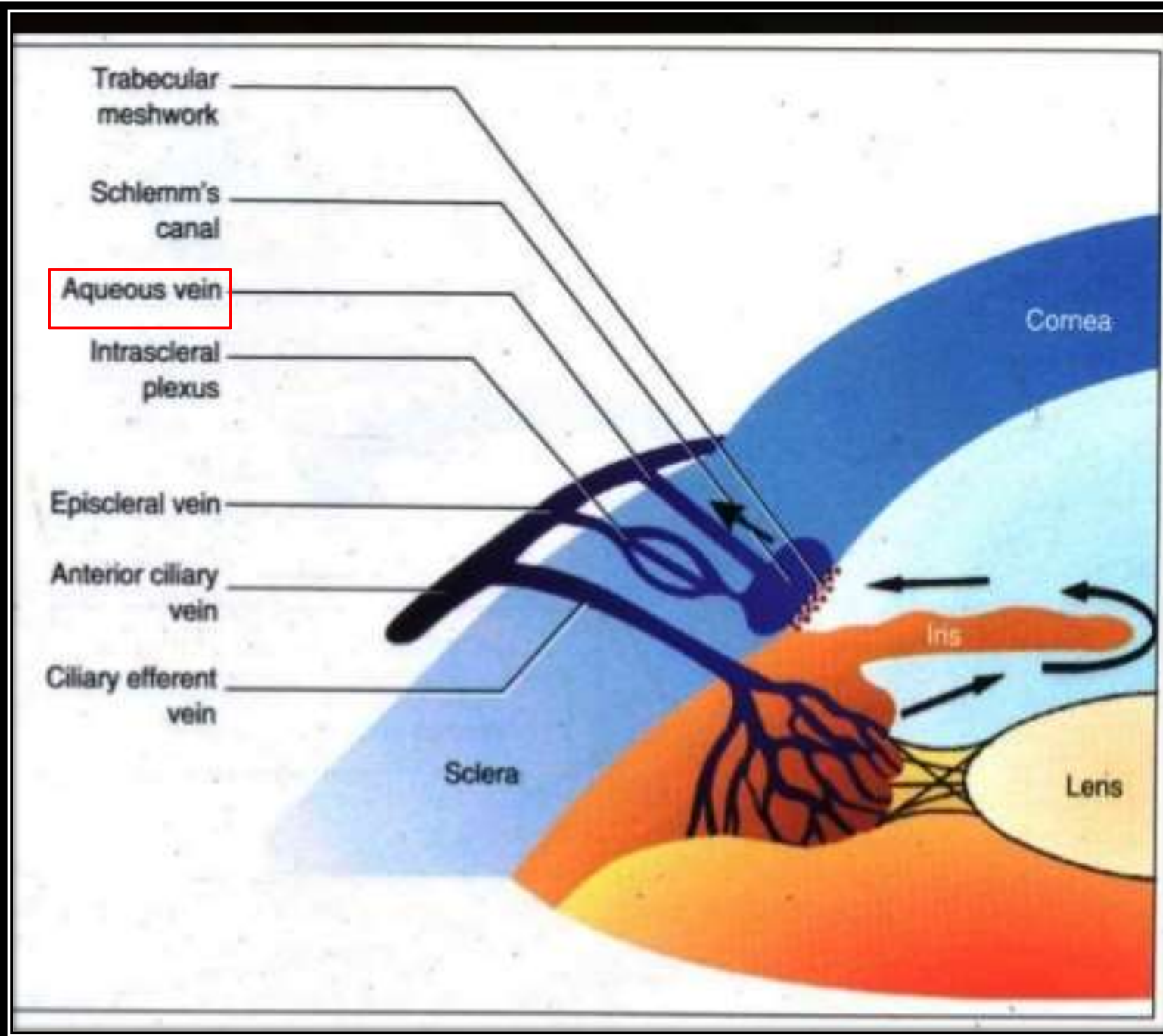
ANTERIOR CILIARY ARTERIES:

- Derived from muscular arteries of 4 recti.
- Pierce the sclera close to the sclero-corneal junction.

AQUEOUS VEINS:

- Drain the aqueous humor from the sinus venosus sclerae.
- Pierce the sclera close to the sclero-corneal junction.





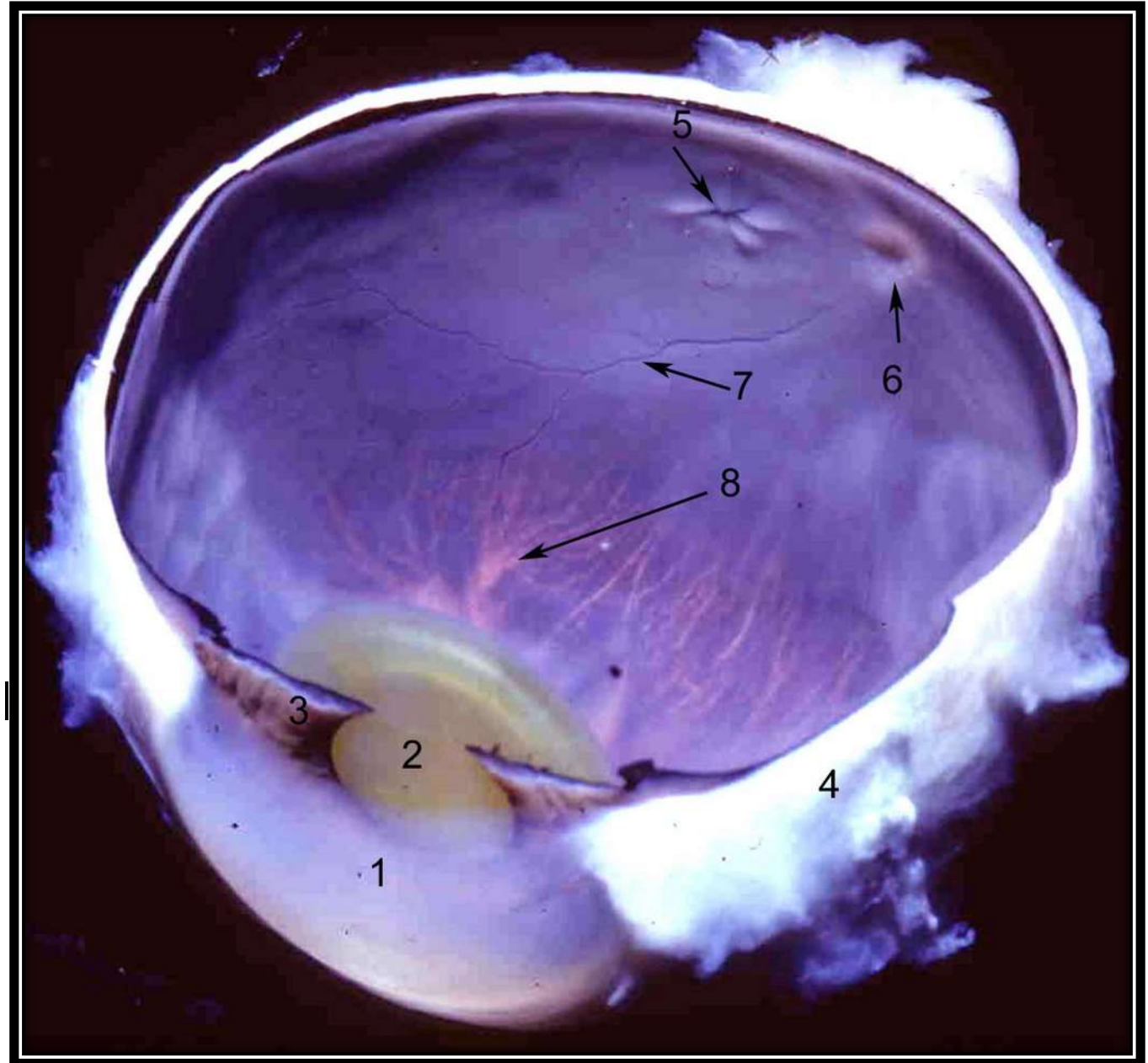
CORNEA

- ❑ The clear front window of the eye.
- ❑ Transparent and **avascular** structure.
- ❑ Forms **anterior 1/6th** of the outer tunic of eyeball.
- ❑ The cornea transmits and focuses light into the eye.

NUTRITION OF CORNEA:

❑ **3** sources:-

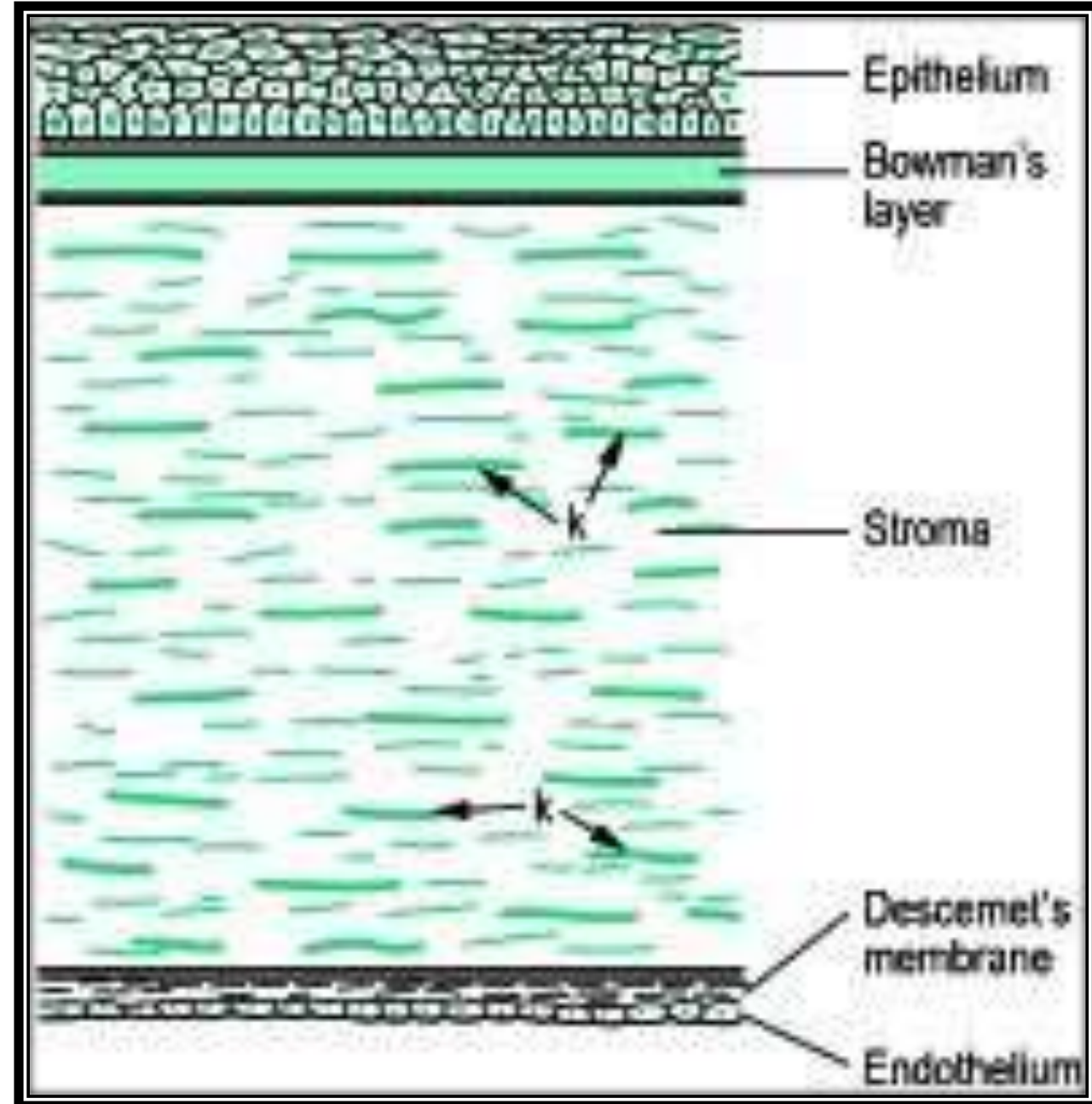
- Loops of capillaries at the periphery of conjunctivo-corneal junction.
- Aqueous humor.
- Lacrimal secretions.



LAYERS OF CORNEA

□ Composed of 5 layers (from outside inwards):-

- 1) **A**-Corneal epithelium.
- 2) **B**-Bowman's membrane or anterior limiting membrane.
- 3) **C**-Substantia propria (stroma) [Connective tissue].
- 4) **D**-Descemet's membrane or posterior limiting membrane.
- 5) **E**-Endothelium.



LAYERS OF CORNEA CONTD...

CORNEAL EPITHELIUM:

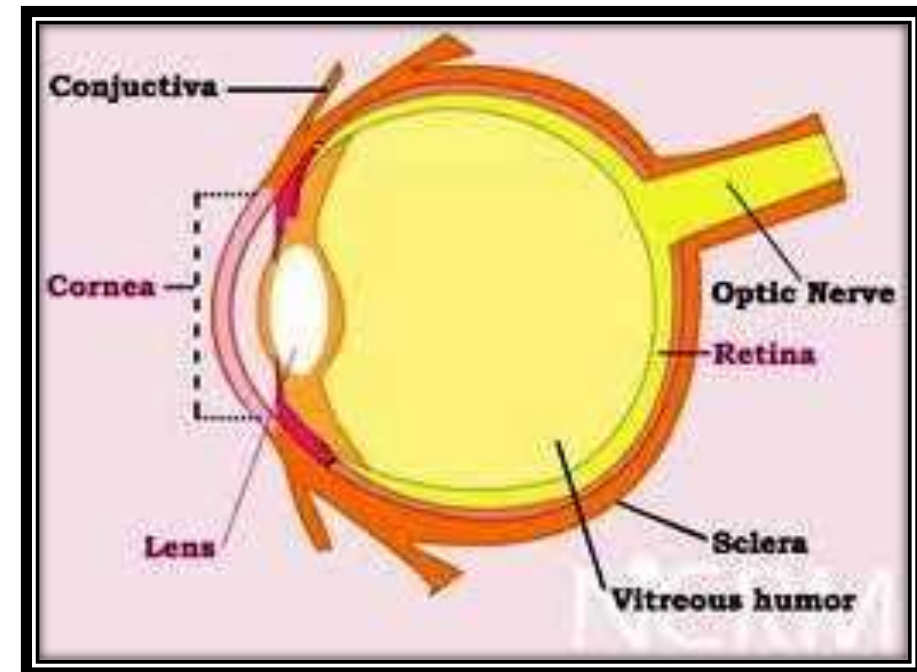
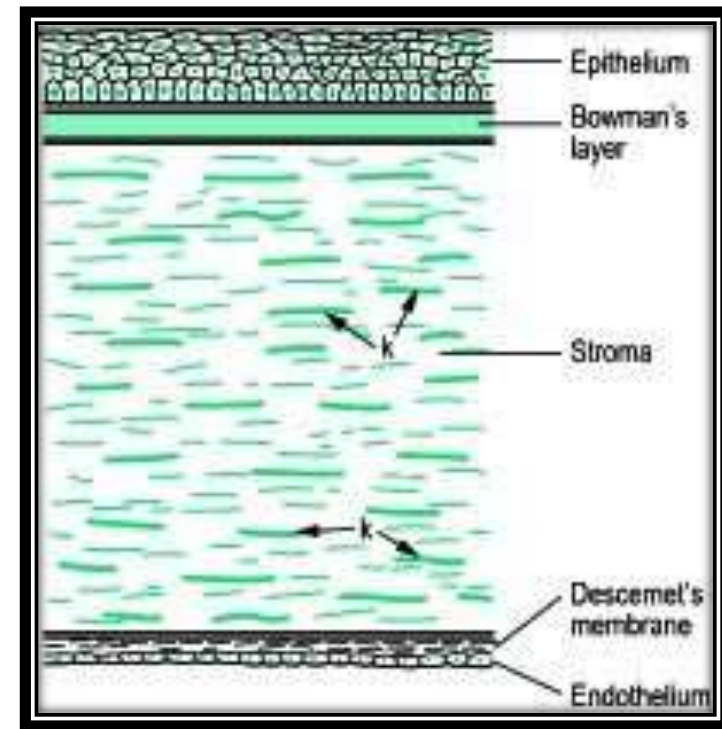
- Non-keratinized **stratified squamous epithelium**.
- Surface cells present microvilli.
- At sclero-corneal junction, continuous with the conjunctiva.

BOWMAN'S MEMBRANE:

- Acellular**, densely packed layer of fine collagen fibers.

SUBSTANTIA PROPRIA:

- Composed of ~200-250 superimposed flattened lamellae of collagen fibers.
- Collagen fibers are embedded in ground substance rich in **chondroitin sulphate** and **keratosulphate**.
- Ground substance also contains **fibroblasts**.



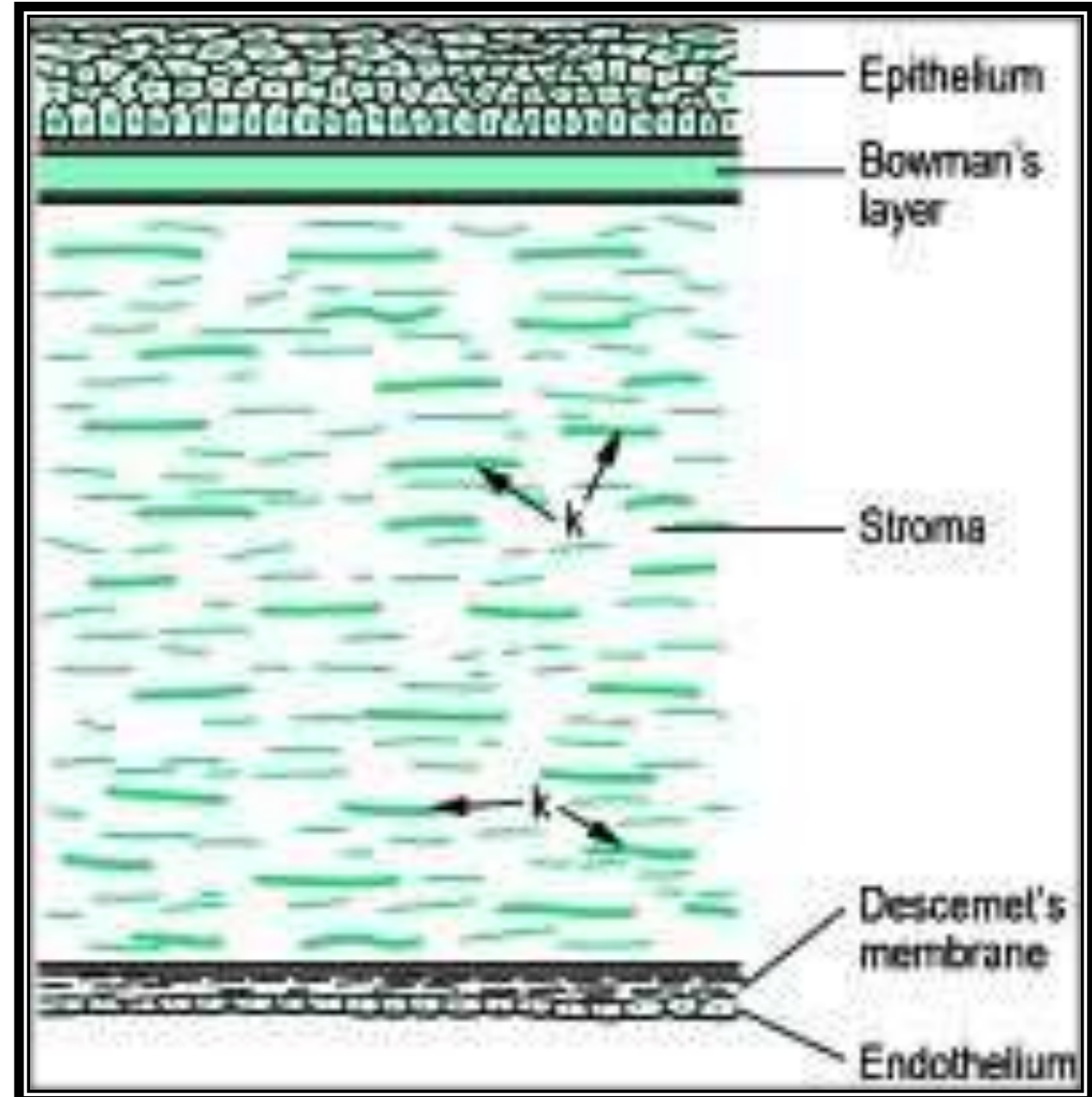
LAYERS OF CORNEA CONTD...

DESCEMET'S MEMBRANE:

□ **Acellular**, homogenous, collagenous layer.

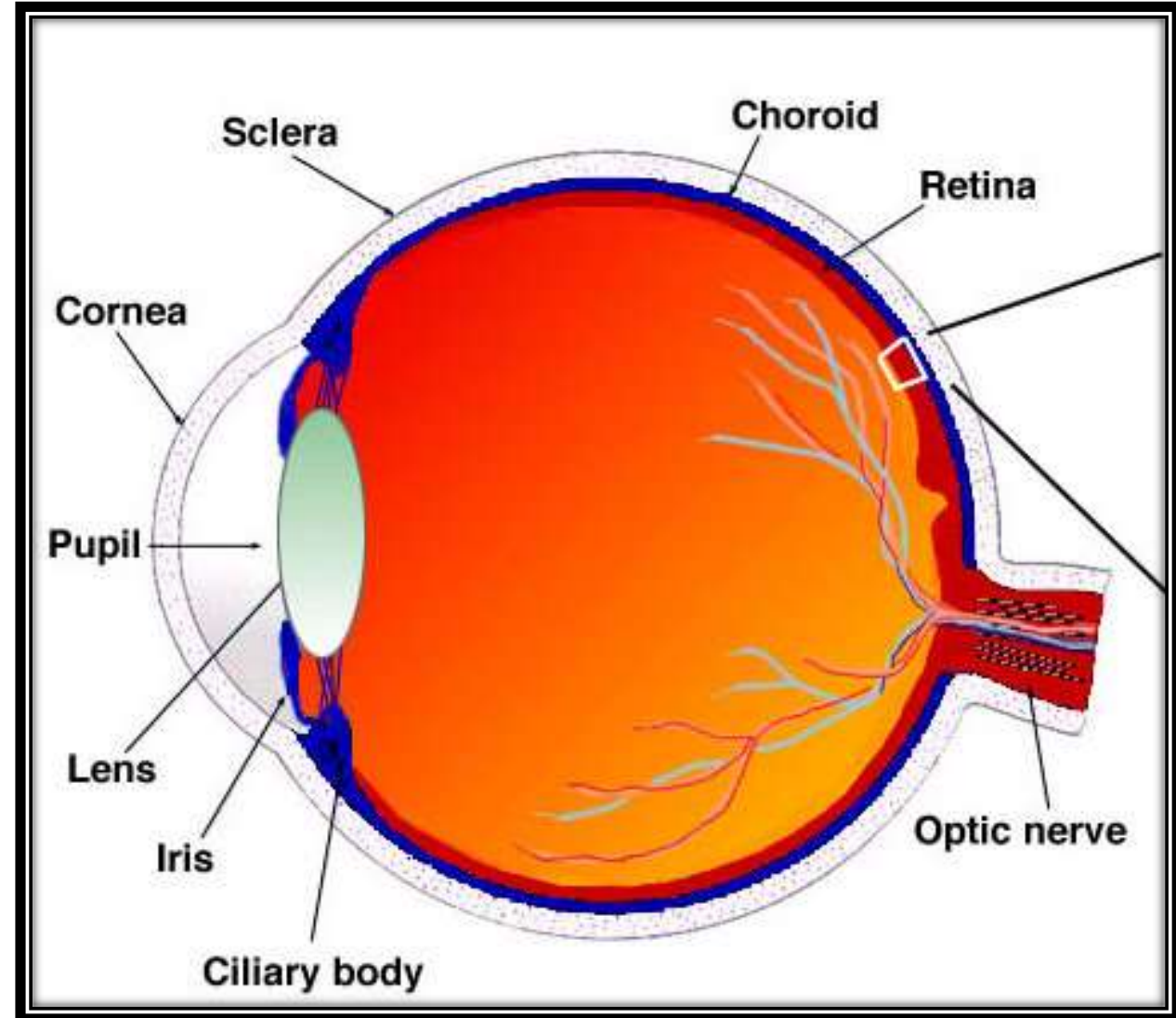
ENDOTHELIUM:

□ Single layer of cuboidal cells.



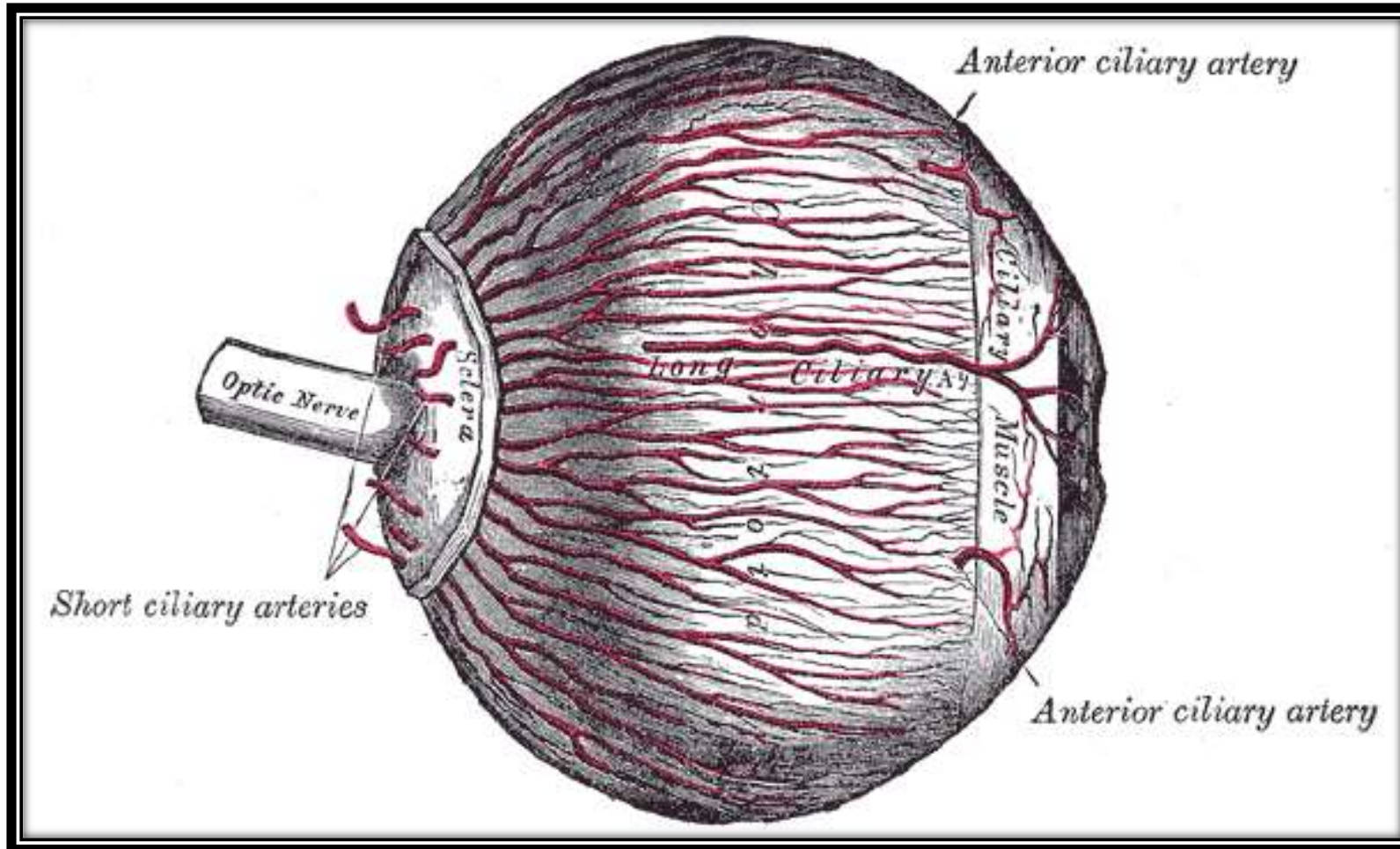
CHOROID

- ❑ Sandwiched between the sclera and the retina.
- ❑ Dark-brown in colour.
- ❑ Posteriorly, it is pierced by the optic nerve.
- ❑ External surface is separated from the sclera by **supra-choroid lamina**.
- ❑ **Supra-choroid lamina** is composed of loose network of **elastic** and **collagen** fibers.



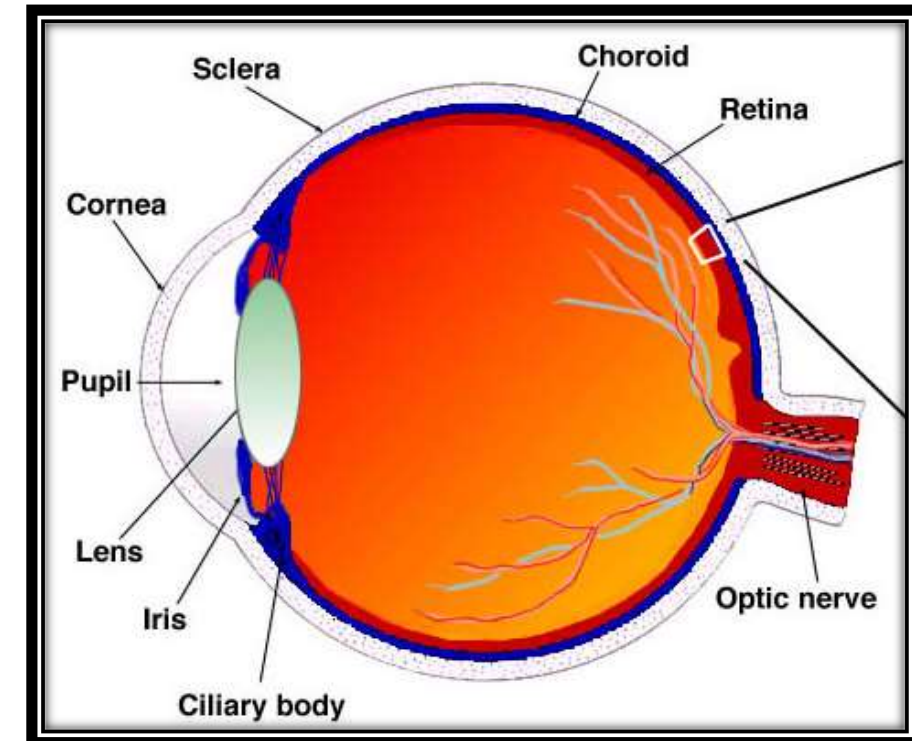
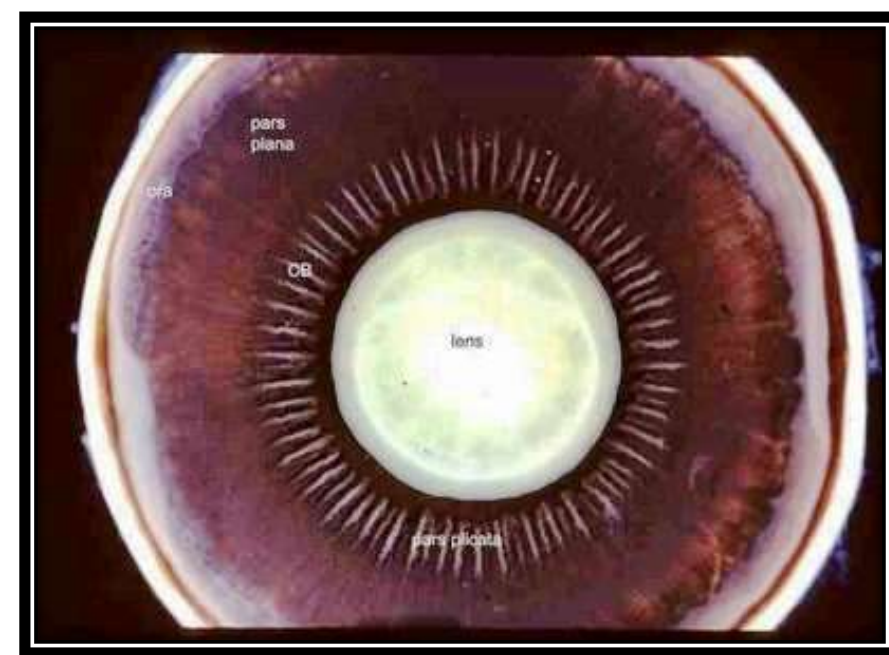
CHOROID CONTD...

- ❑ **Supra-choroid lamina** is traversed by long posterior ciliary vessels and nerves.
- ❑ Internally, choroid is firmly adherent to the pigmented layer of retina.



CILIARY BODY

- ❑ Extends as a complete ring from the anterior part of choroid at the **ora serrata** of retina to the periphery of iris at sclero-corneal junction.
- ❑ **Triangular** in section.
- ❑ Apex is directed posteriorly to join the choroid.
- ❑ Outer surface is in contact with the sclera.
- ❑ Inner surface faces the vitreous body.

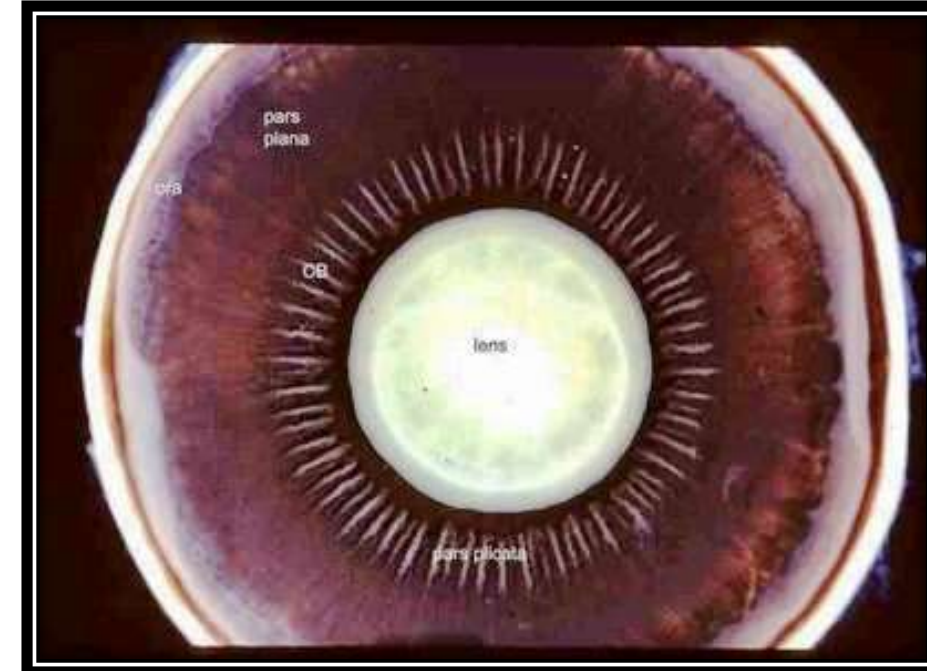
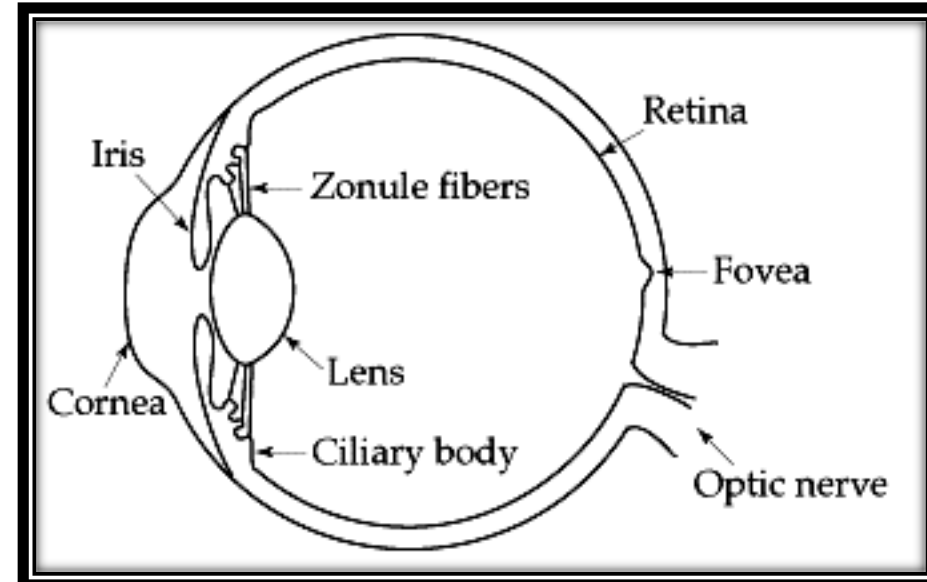


CILIARY BODY CONTD...

❑ Provides attachments to the suspensory ligament (zonular fibers) of lens and the peripheral margin of the iris.

❑ Inner surface is divisible into 2 annular zones:-

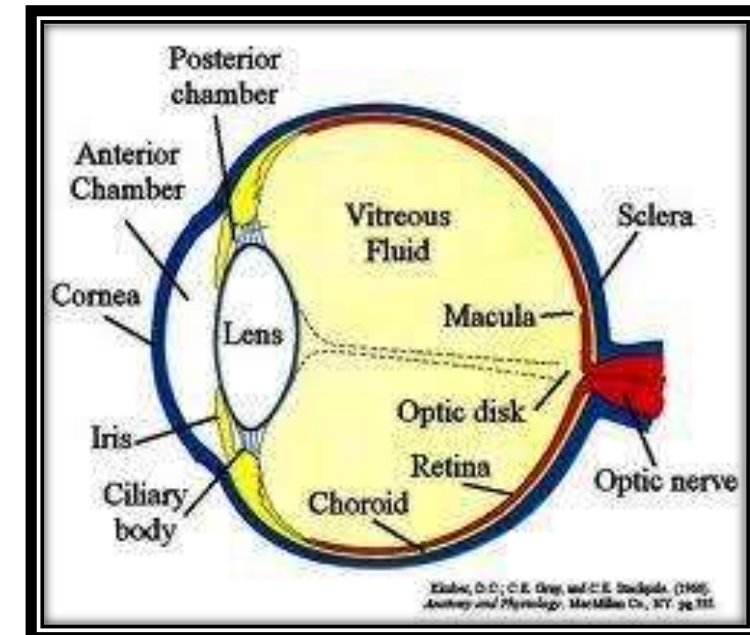
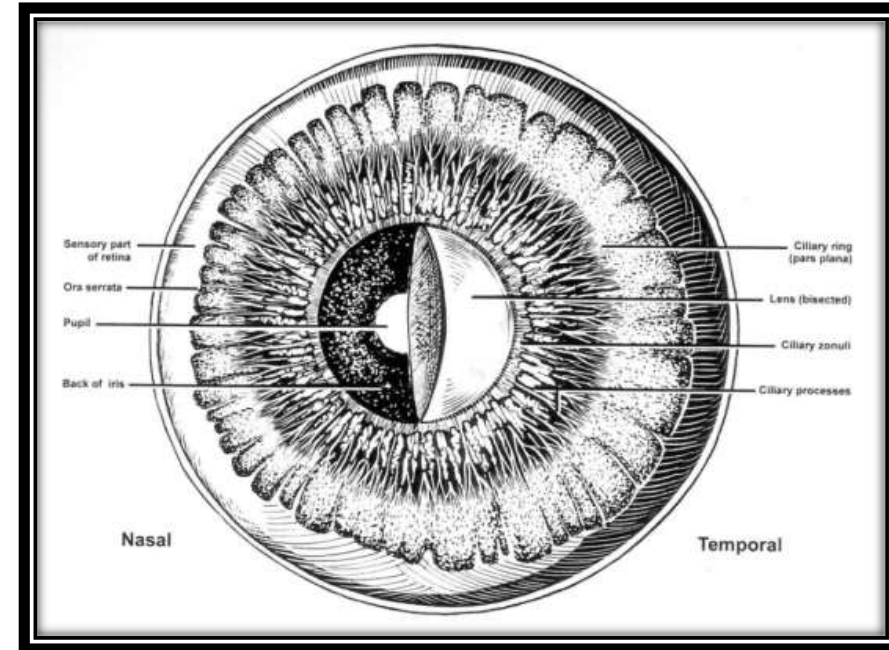
- i. Pars plana (outer zone).
- ii. Pars plicata (inner zone).



CILIARY BODY CONTD...

PARS PLICATA:

- In anterior 1/3rd .
- Presents 70-80 ciliary processes.
- Ciliary processes radiate meridionally from the periphery of the iris.
- Inner ends of ciliary processes project into the periphery of posterior chamber of eye and secrete aqueous humor.

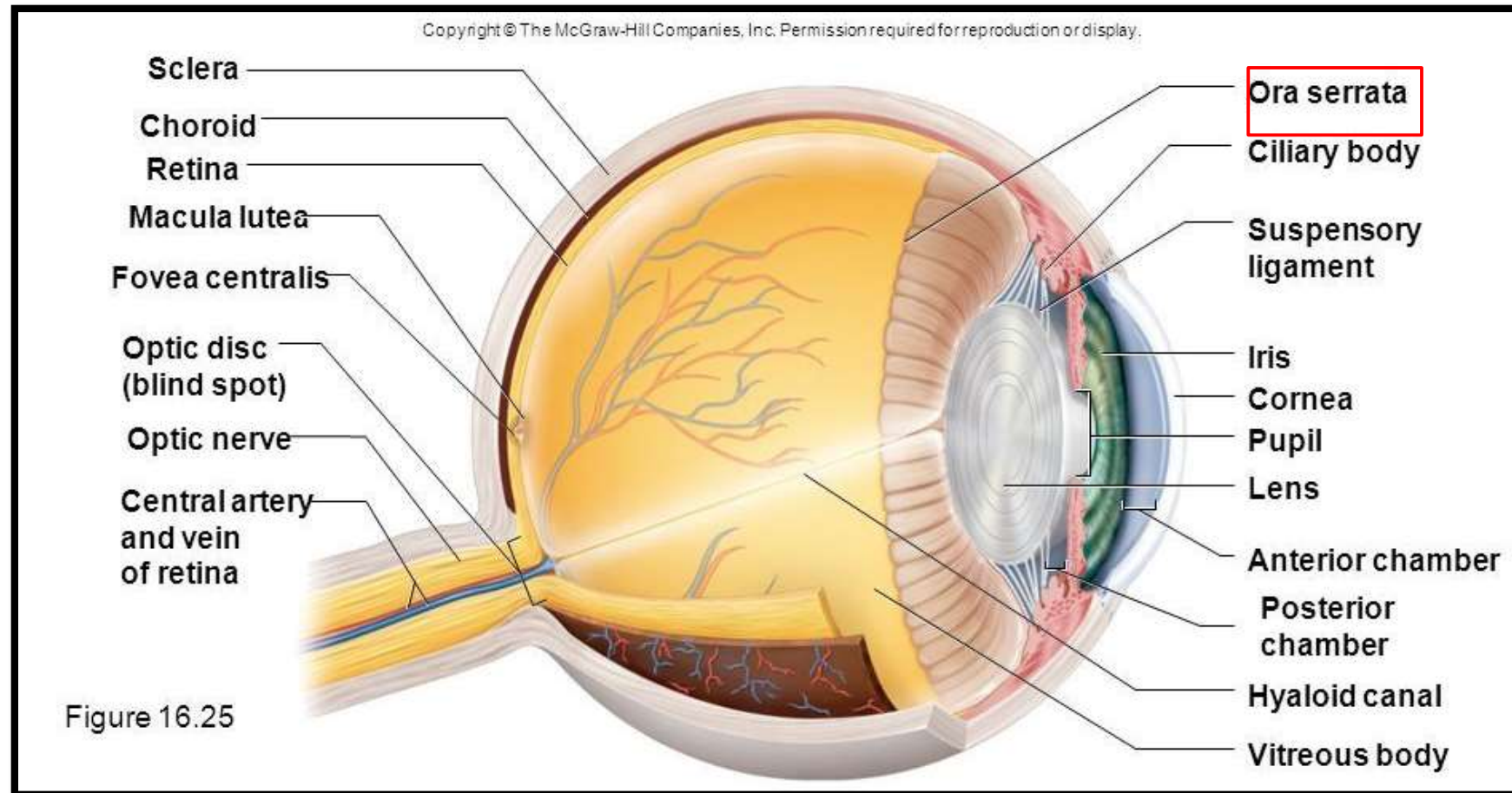


CILIARY BODY CONTD...

PARS PLANA:

❑ Limited at the periphery by ora serrata.

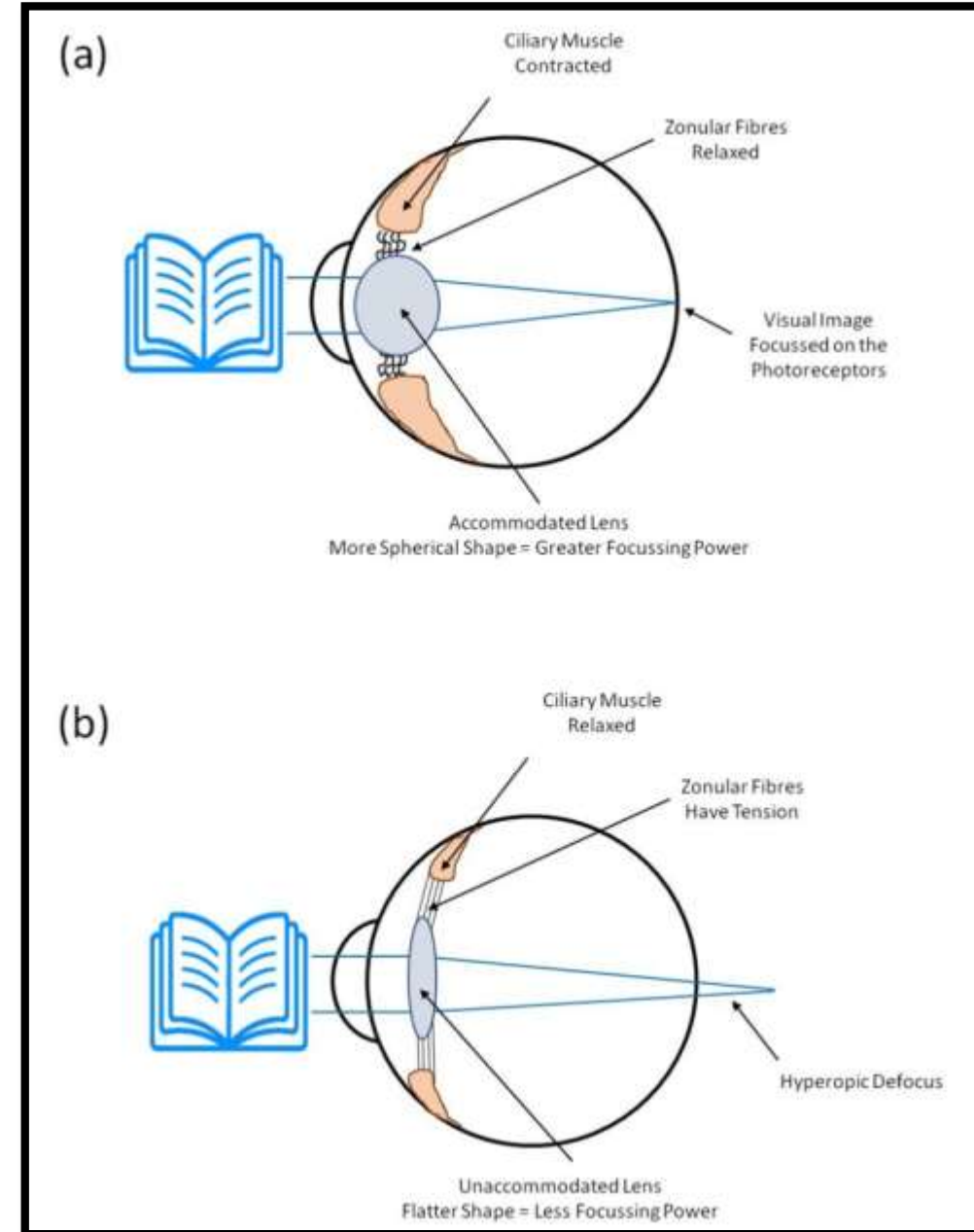
➤ Base of the ciliary body gives attachment to periphery of iris near its centre.



STRUCTURE OF CILIARY BODY

□ Consists of:-

- Stroma- consists of loose fasciculi of collagen fibers.
- **Ciliaris** muscle-
 - Unstriated muscle.
 - Muscle of **accomodation**.
- Bilaminar epithelium.

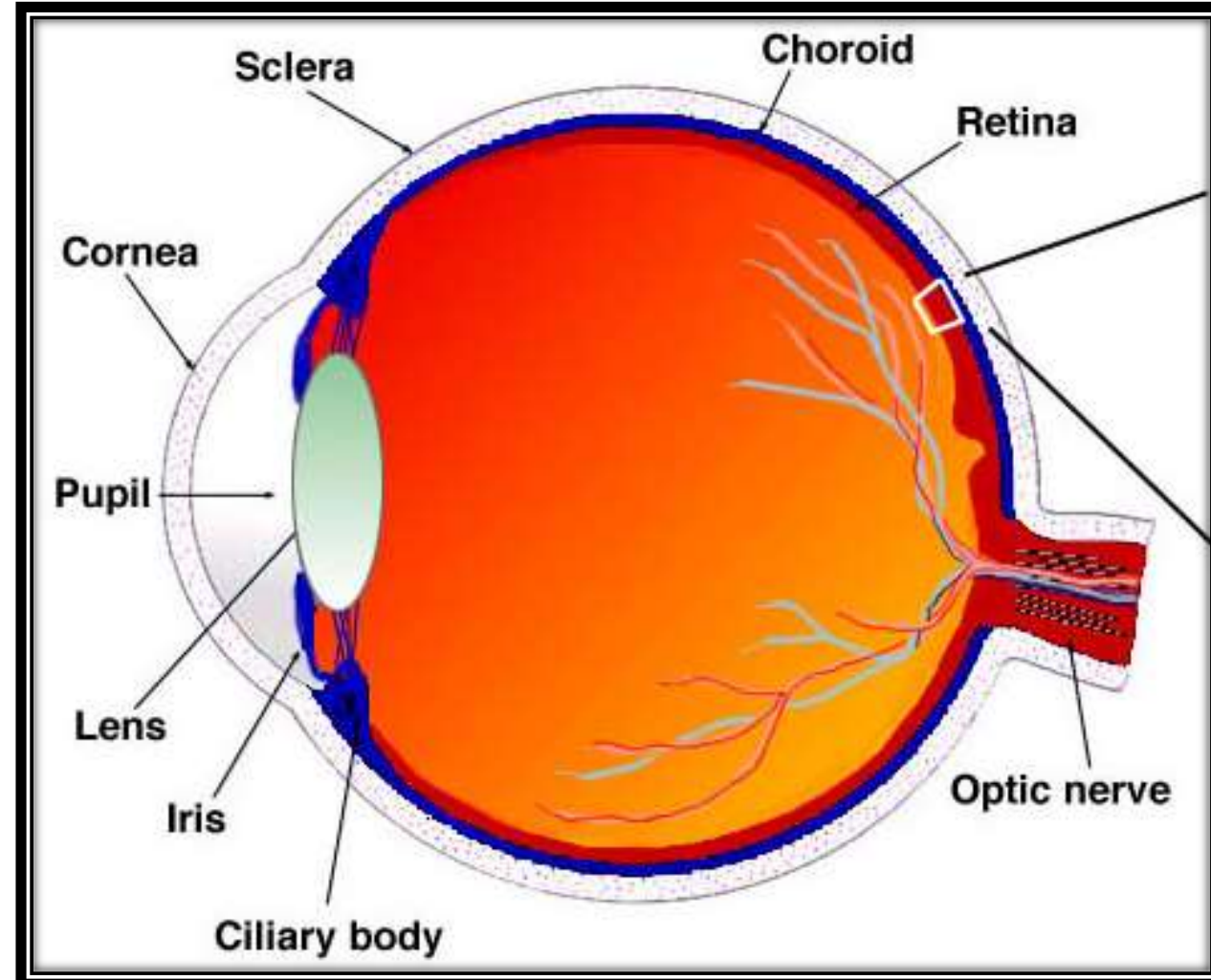
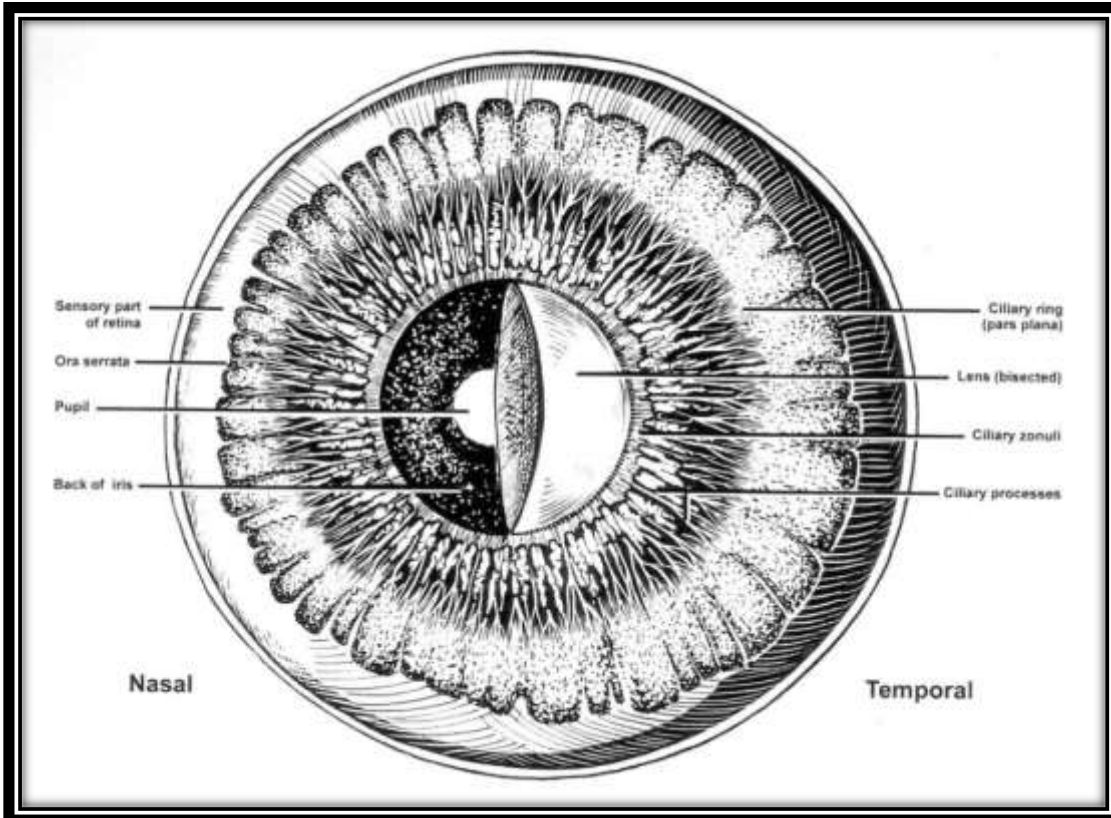


IRIS

- ❑ Circular, pigmented and contractile diaphragm.
- ❑ Immersed in aqueous humor between cornea and lens.
- ❑ Peripheral margin is attached to the base of ciliary body near its centre.

PUPIL:

- A circular aperture near the centre of iris.



MUSCLES OF IRIS

Sphincter pupillae.

Dilator pupillae.

circular muscles
contract



bright light
circular muscle contracts

Parasympathetic nerve
radial muscle relax
pupil constricts

contraction of
radial
muscles

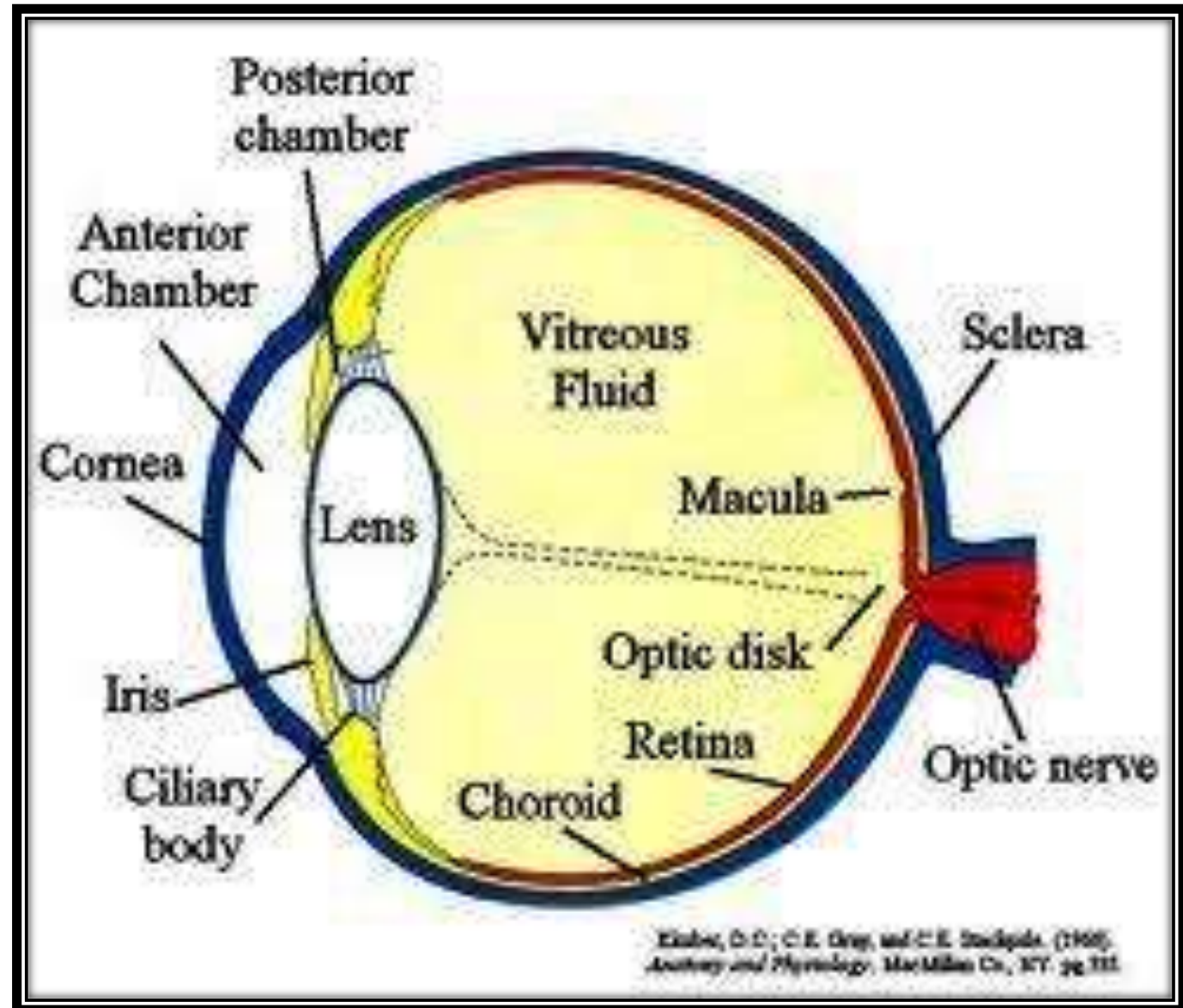


dim light
circular muscles relax

Sympathetic nerve
radial muscles contract
pupil dilates

CHAMBERS OF EYEBALL

- Anterior chamber.
- Posterior chamber.



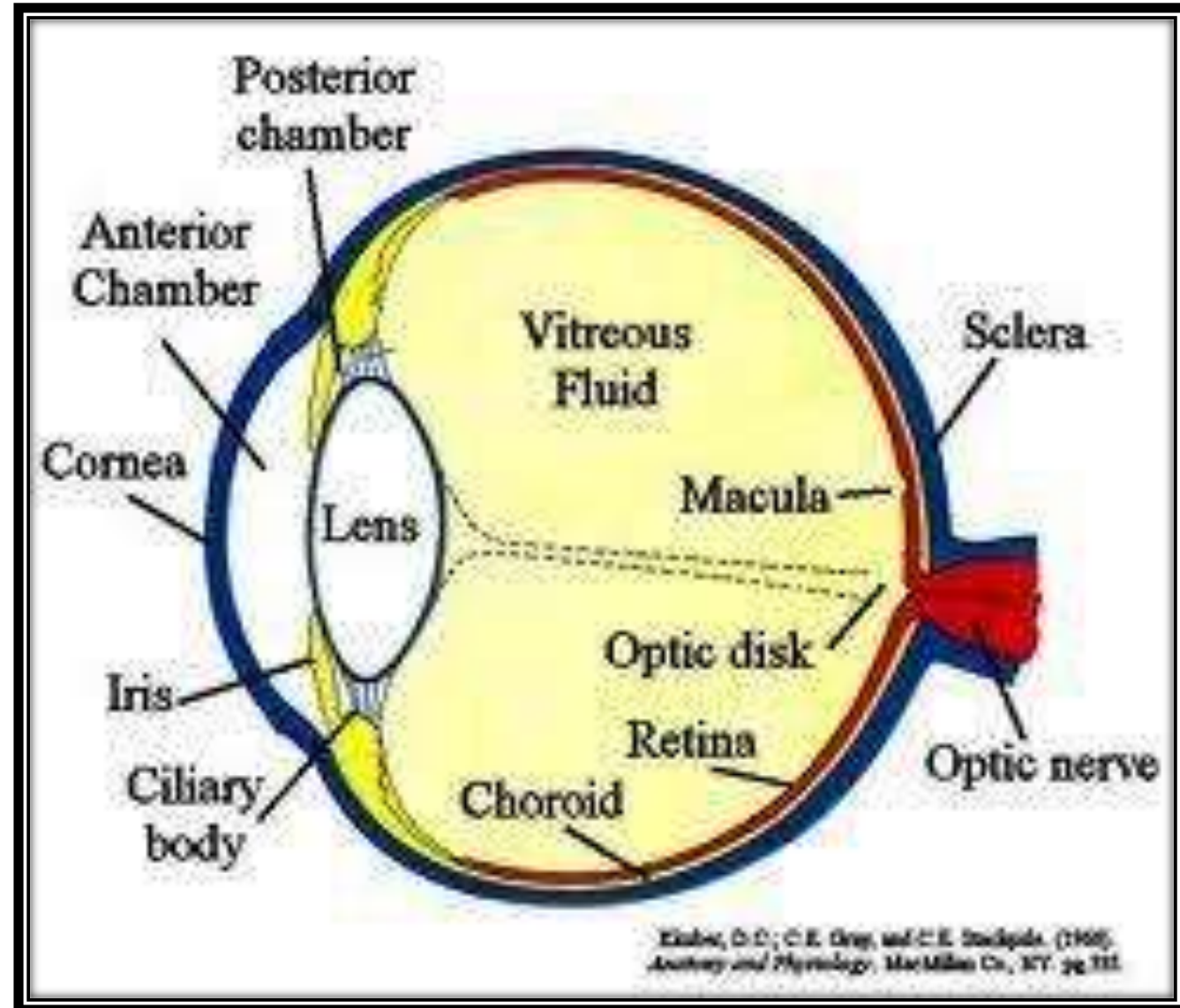
RETINA

□ Posterior part of retina is called **optic part**.

□ It consists of:-

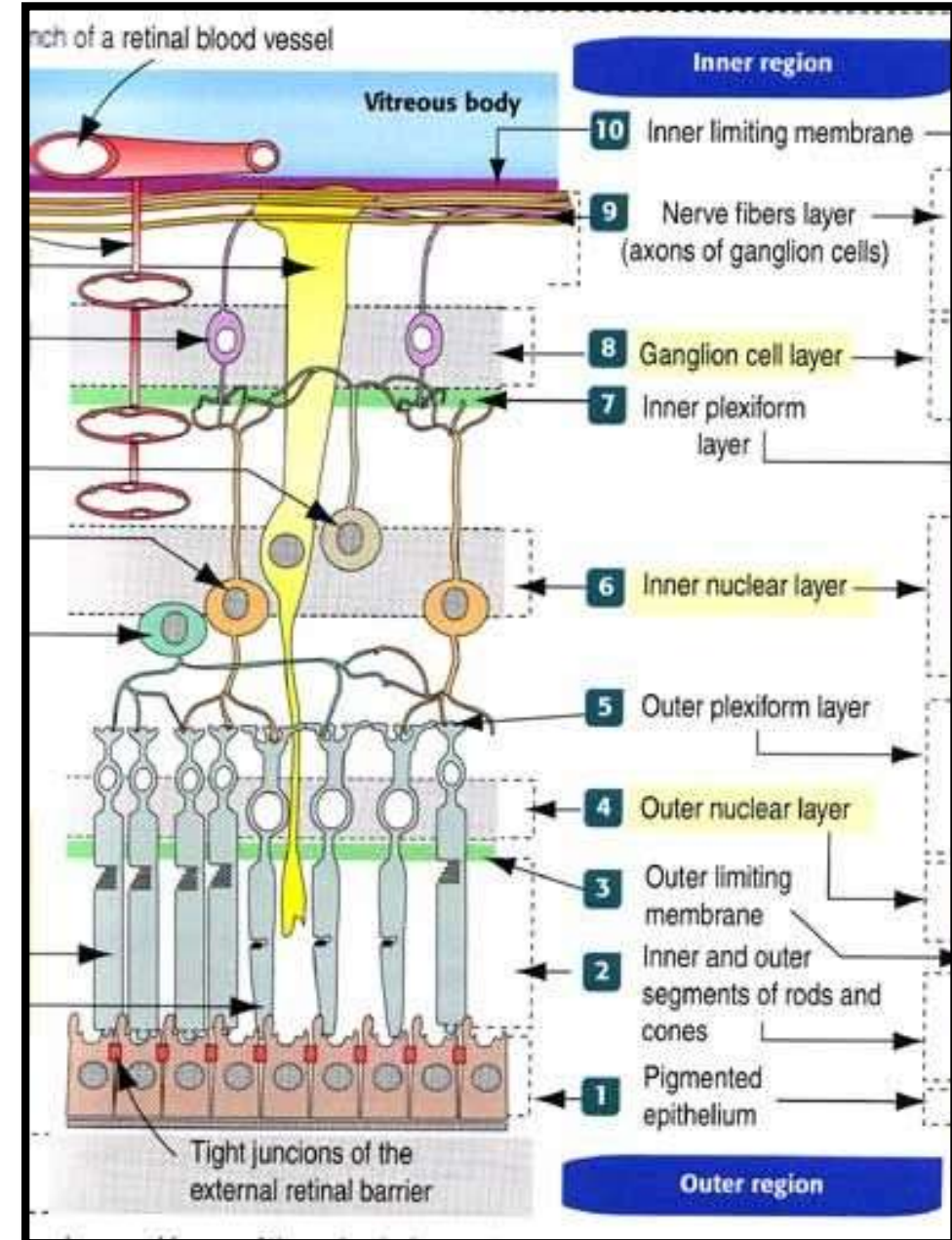
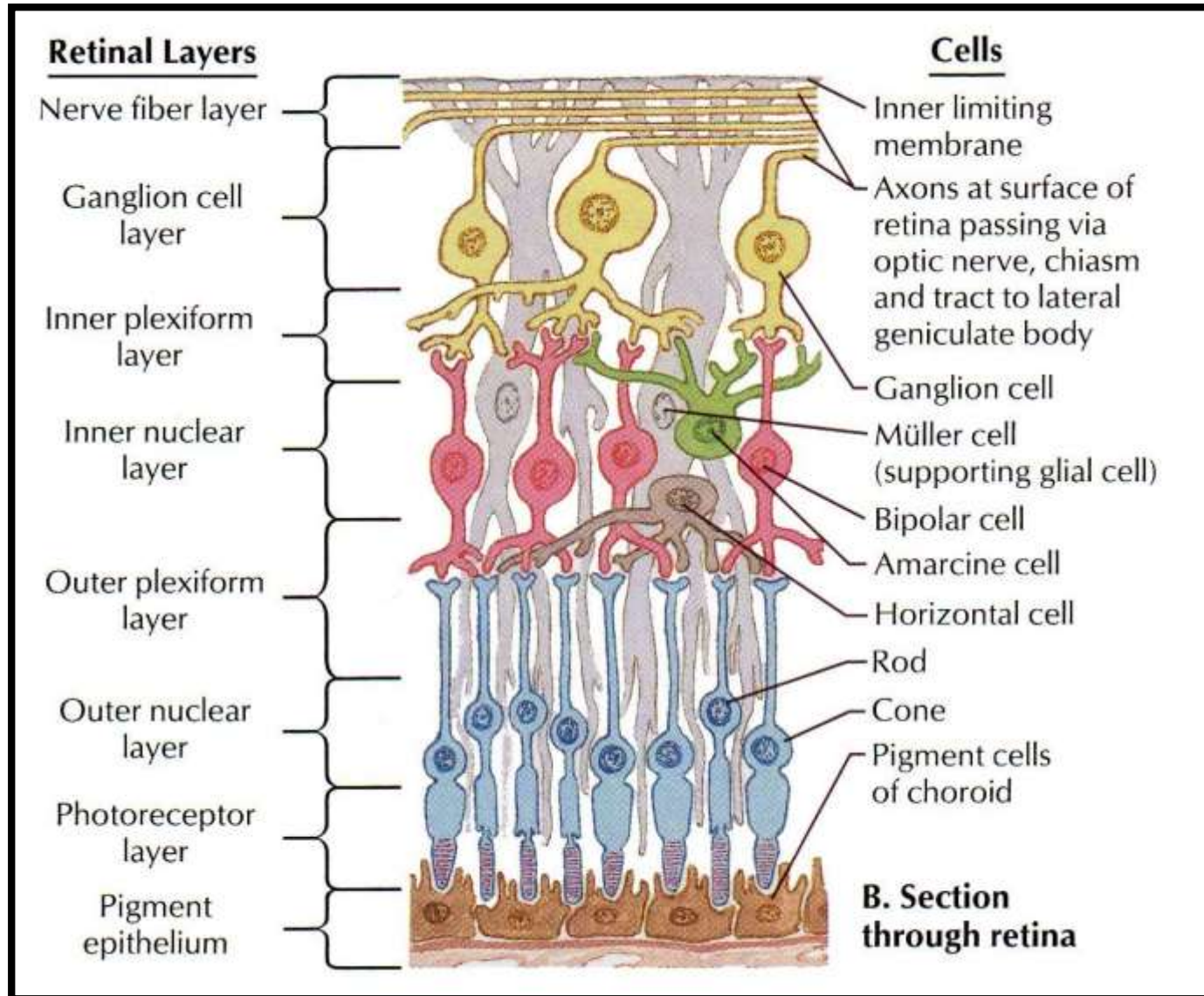
- Outer pigmented part.
- Inner nervous part (**neuro-retina**).

□ It extends from attachment of optic nerve (**optic disc**) **behind** to the crenated margin, **ora serrata**, in **front** where the neuro-retina ceases.



STRUCTURE OF OPTIC PART OF RETINA

10 layers:-



Thank
You