EYE & EAR

Objectives

1. **Recognise and describe a section of neural retina, identifying areas of histogenesis with lamination/stratification and the adjacent choroid and scleral layers.**

2. **Recognise and describe a section of cornea, distinguishing areas of limbus-like character, as well as Descemet's and Bowman's membranes.**

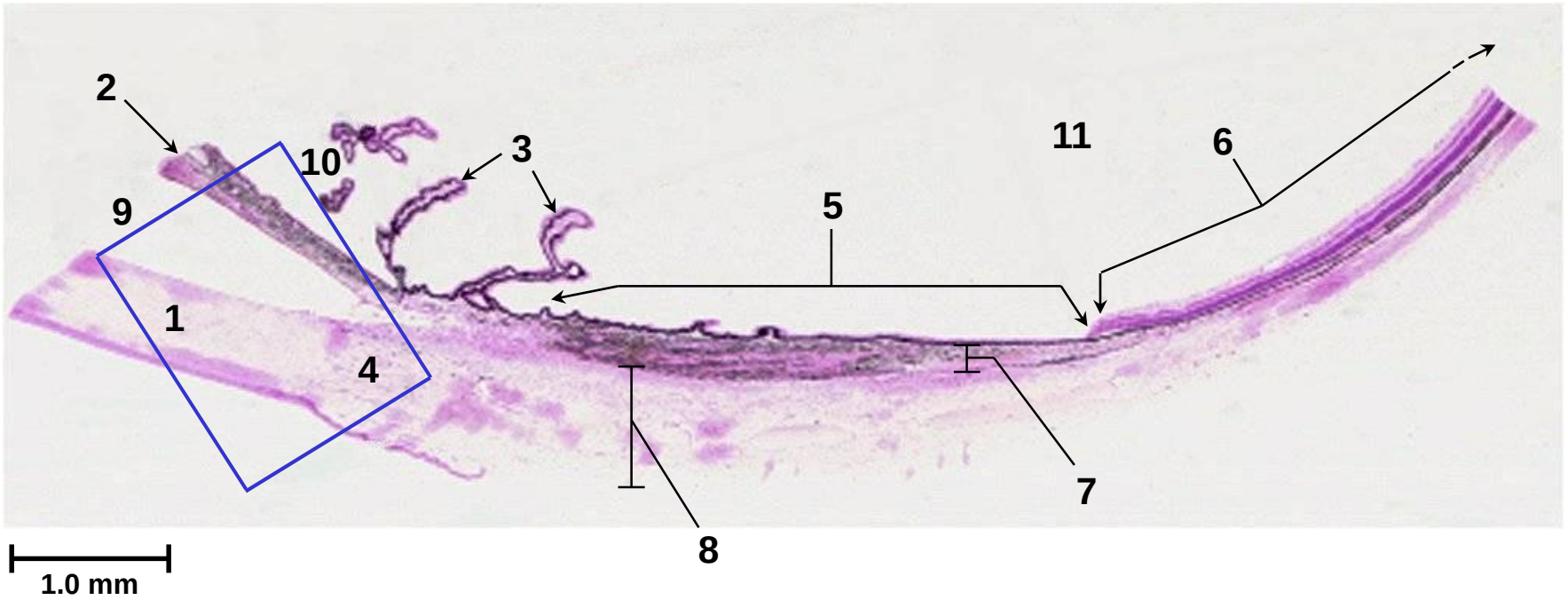
3. **Be able to describe and recognise various stages in the development of optic vesicles, the differentiation of the optic cup, lens and adjacent structures, including : developing ciliary body and anterior and posterior chambers of the eye.**

4. **Distinguish between otic vesicles at various stages of their development and their spatial relationship with portions of the pharynx and developing cochlea in histological section.**

Retina

Examine this section at low magnification and identify :

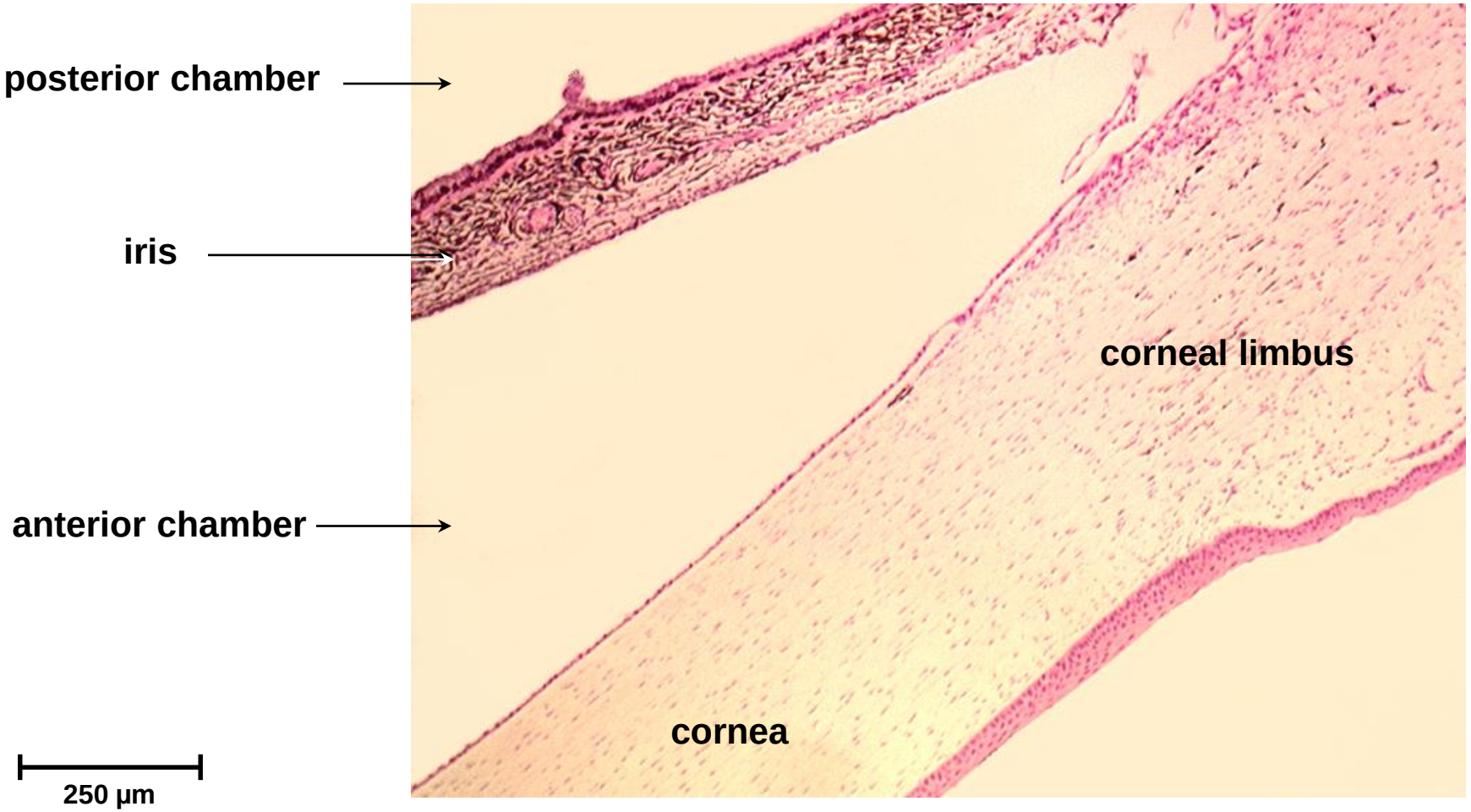
1.	Cornea.	5.	Non- neural retina.	9.	Anterior chamber.
2.	Iris.	6.	Neural retina.	10.	Posterior chamber.
3.	Ciliary apparatus.	7.	Choroid.	11.	Cavity of vitreous humor.
4.	Corneal limbus.	8.	Sclera.		



Cornea

Identify :

1. Cornea.
2. Iris.
3. Corneal limbus.
4. Anterior chamber.
5. Posterior chamber.



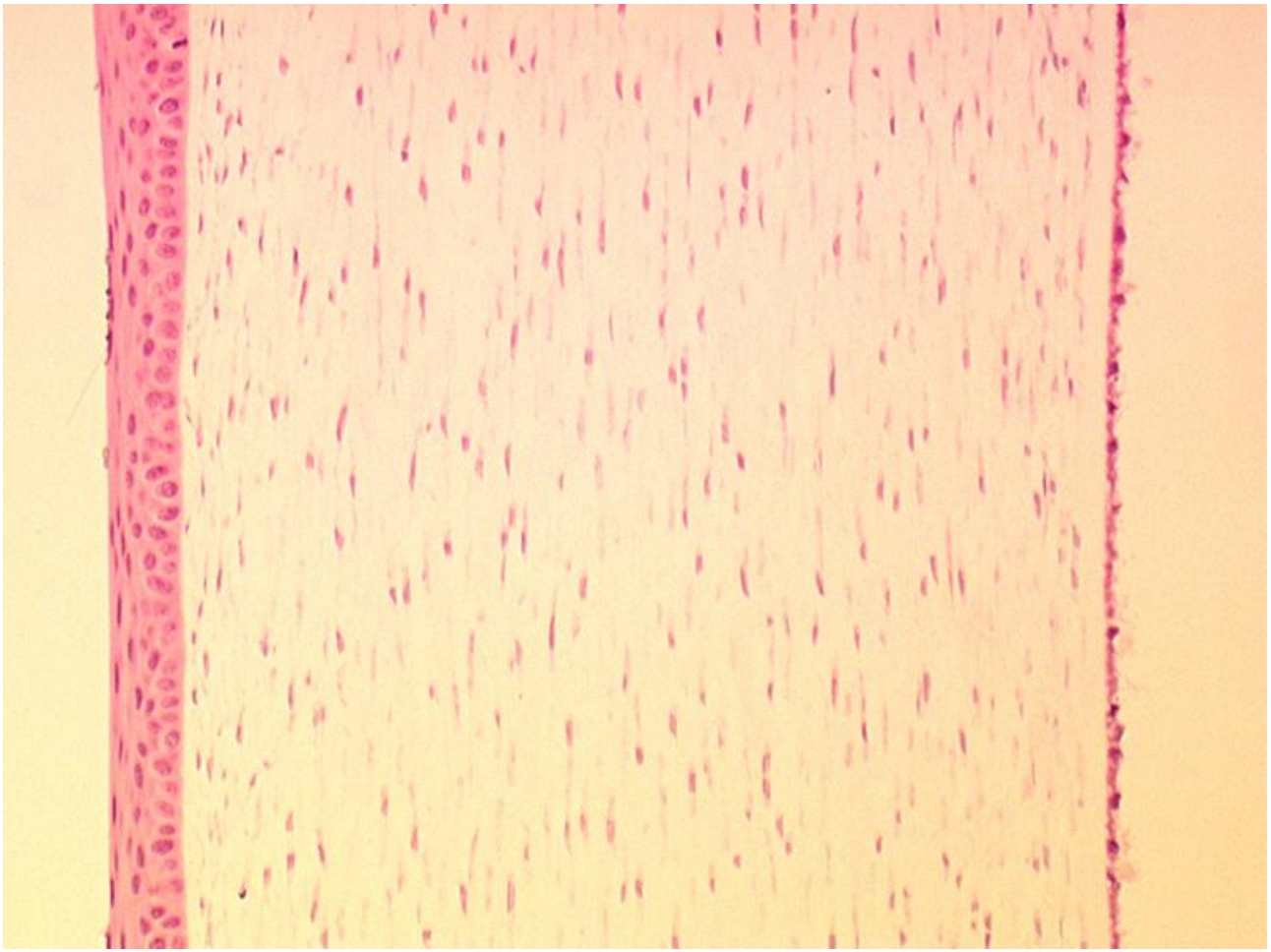
Cornea

Examine the cornea at higher magnification.

The function of the cornea is …….

The cornea has an important role in image formation, it forms a primary refractive element in the eye.

anterior



posterior

100 µm

Cornea

Five layers can be identified in the cornea :

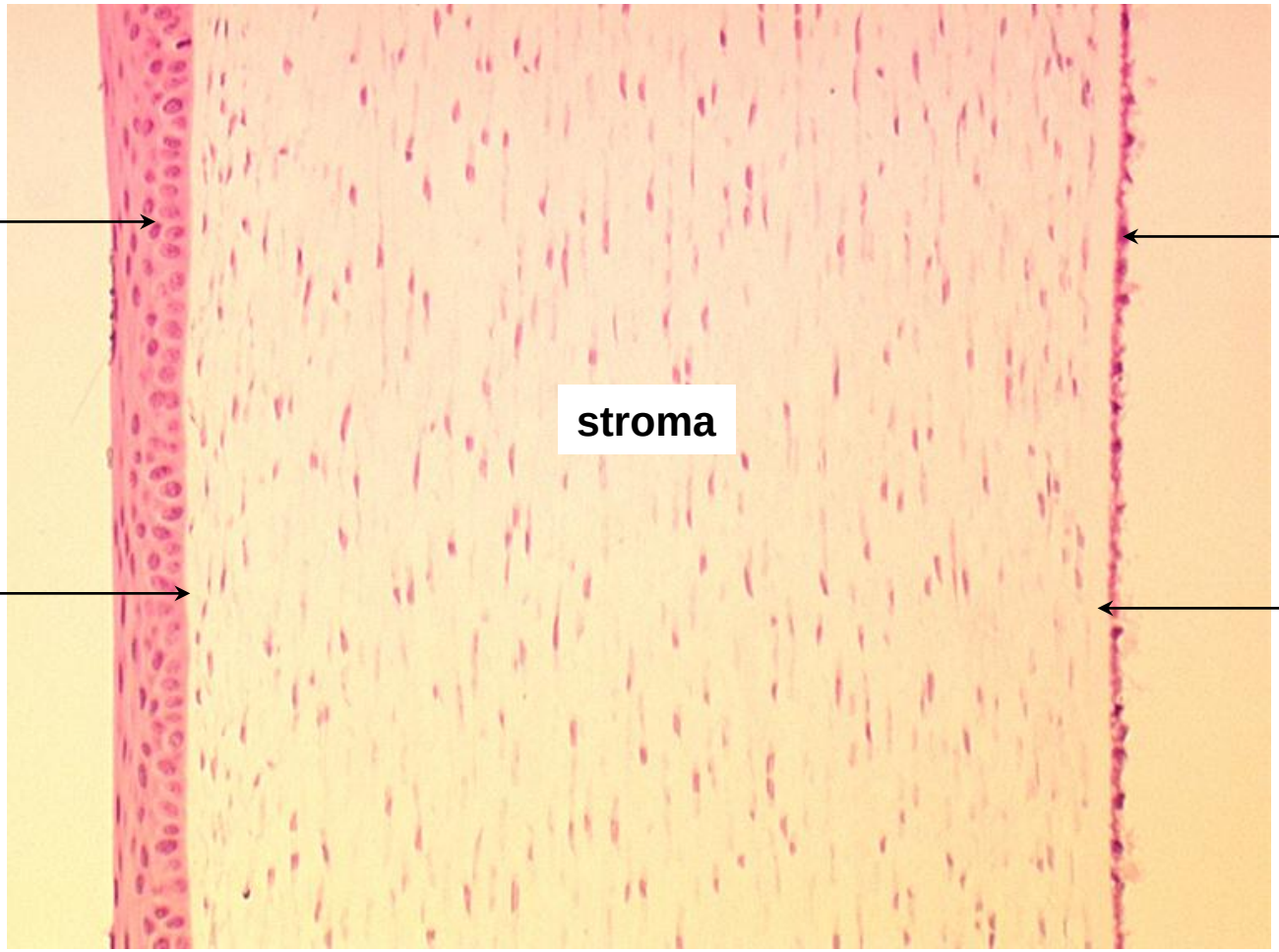
a). anterior epithelium

b). anterior sub-epithelial membrane (lamina)

c). stroma

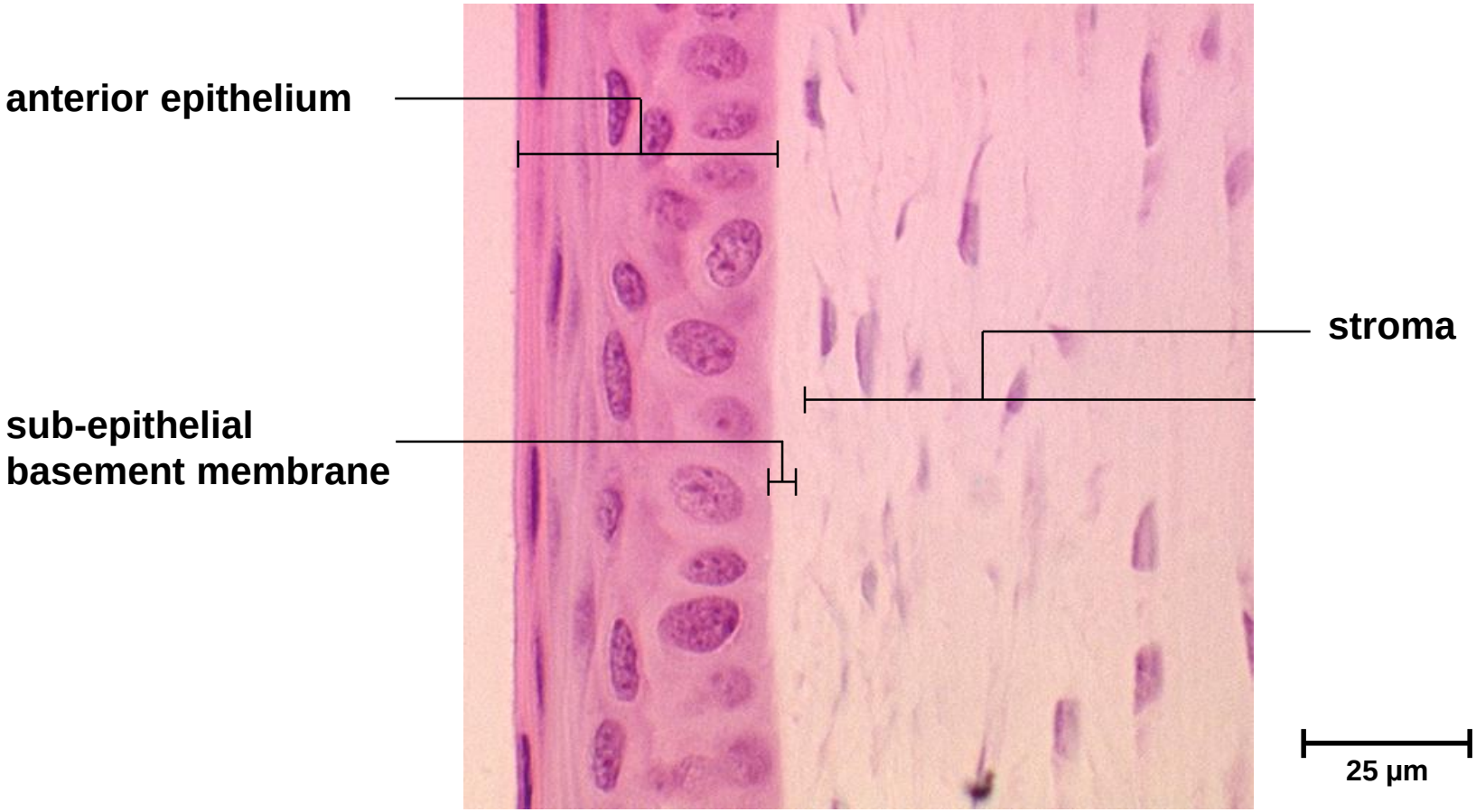
d). posterior limiting membrane (Descemet's)

e). posterior epithelium (corneal endothelium)



Cornea

Identify : Anterior epithelium and anterior sub-epithelial basement membrane.
What type of epithelium covers this surface?
Non-keratinised stratified squamous epithelium.
Consider the cellularity and the extent of the extracellular matrix in these compartments and the cornea 'proper'.



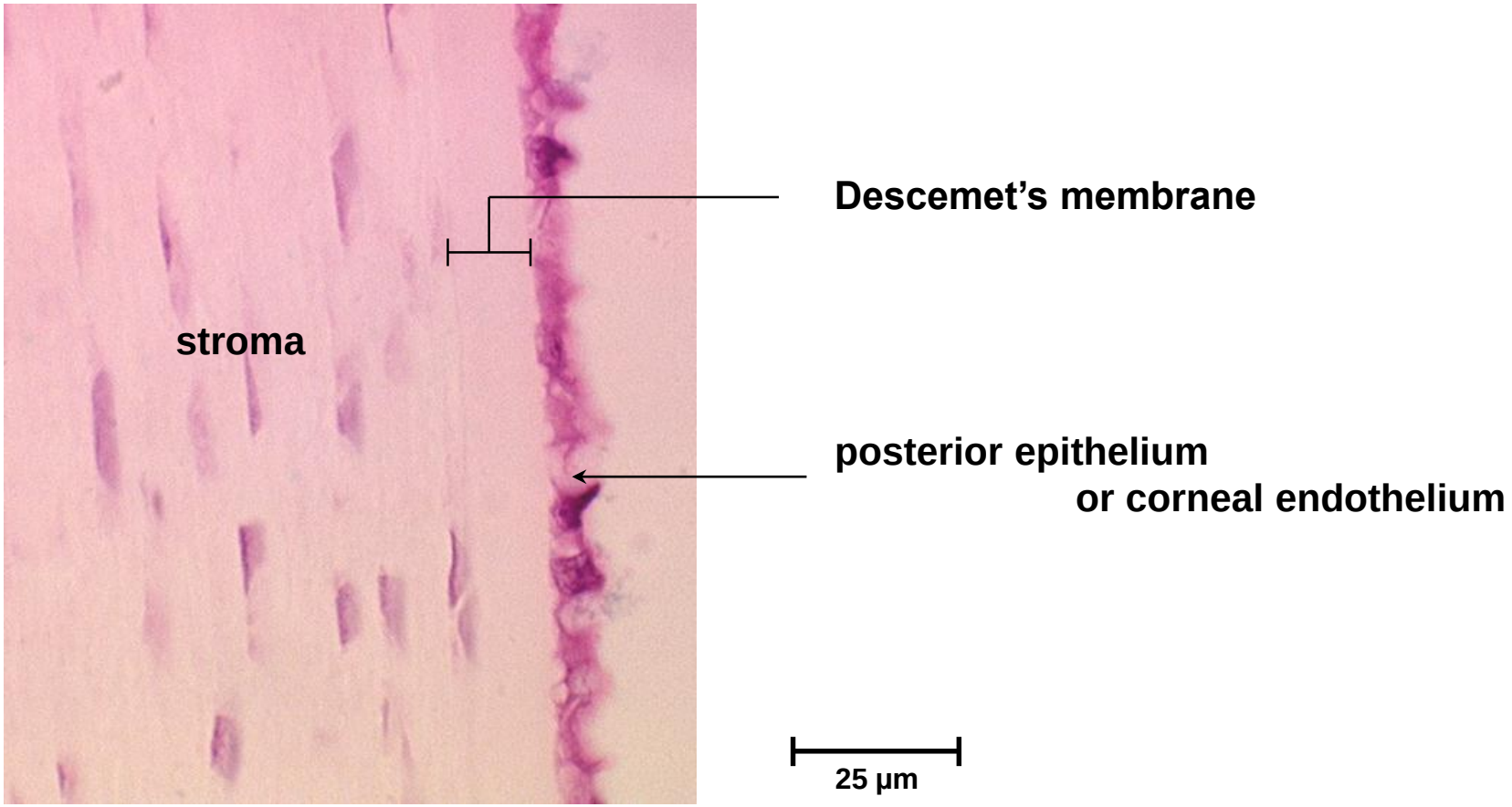
Cornea

Identify : Posterior epithelium (corneal endothelium) and posterior limiting membrane (Descemet's membrane).

What type of epithelium covers this surface?

Simple squamous epithelium.

Note the lack of vasculature in the cornea.



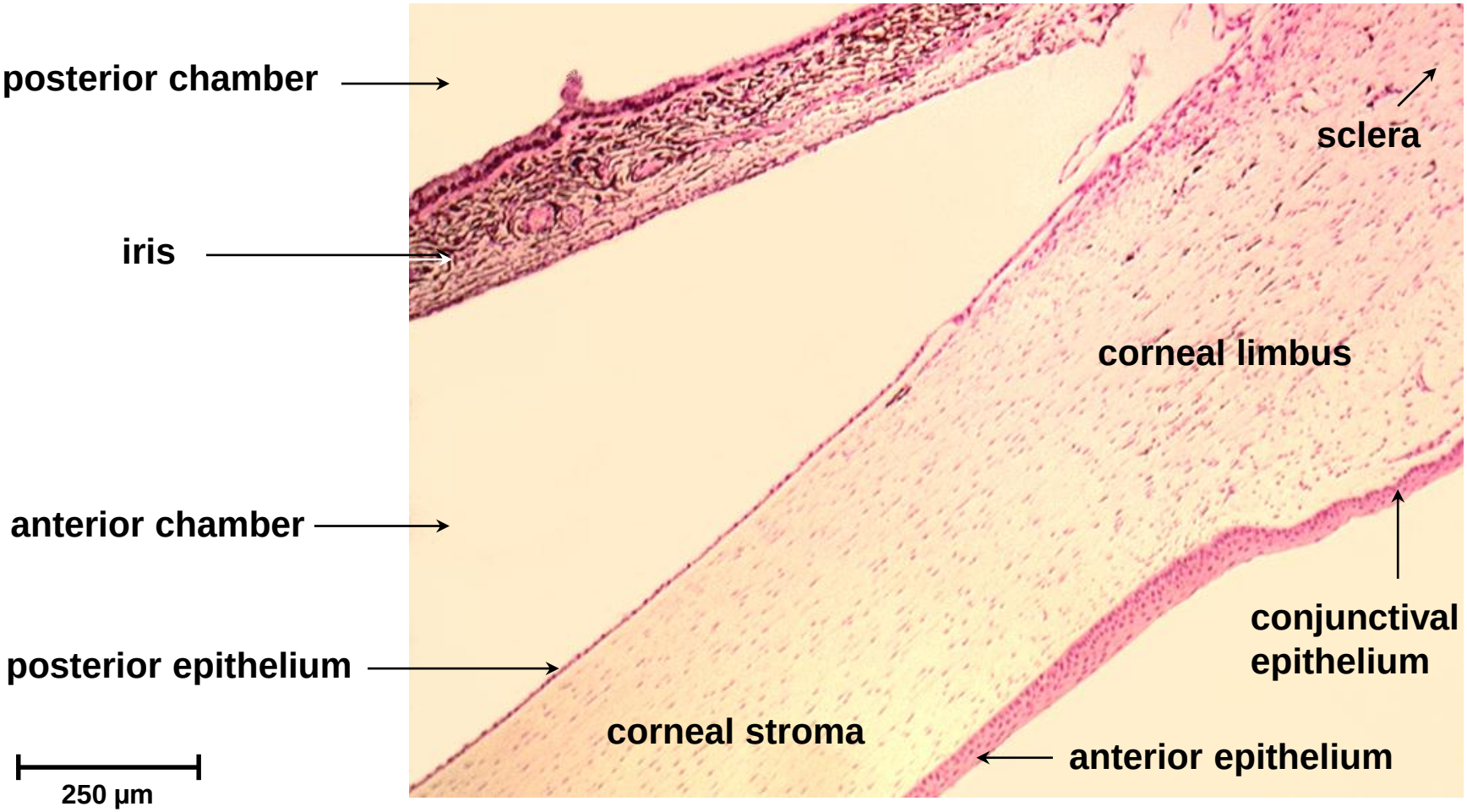
Cornea

What is the corneal limbus?

The corneo-scleral junction.

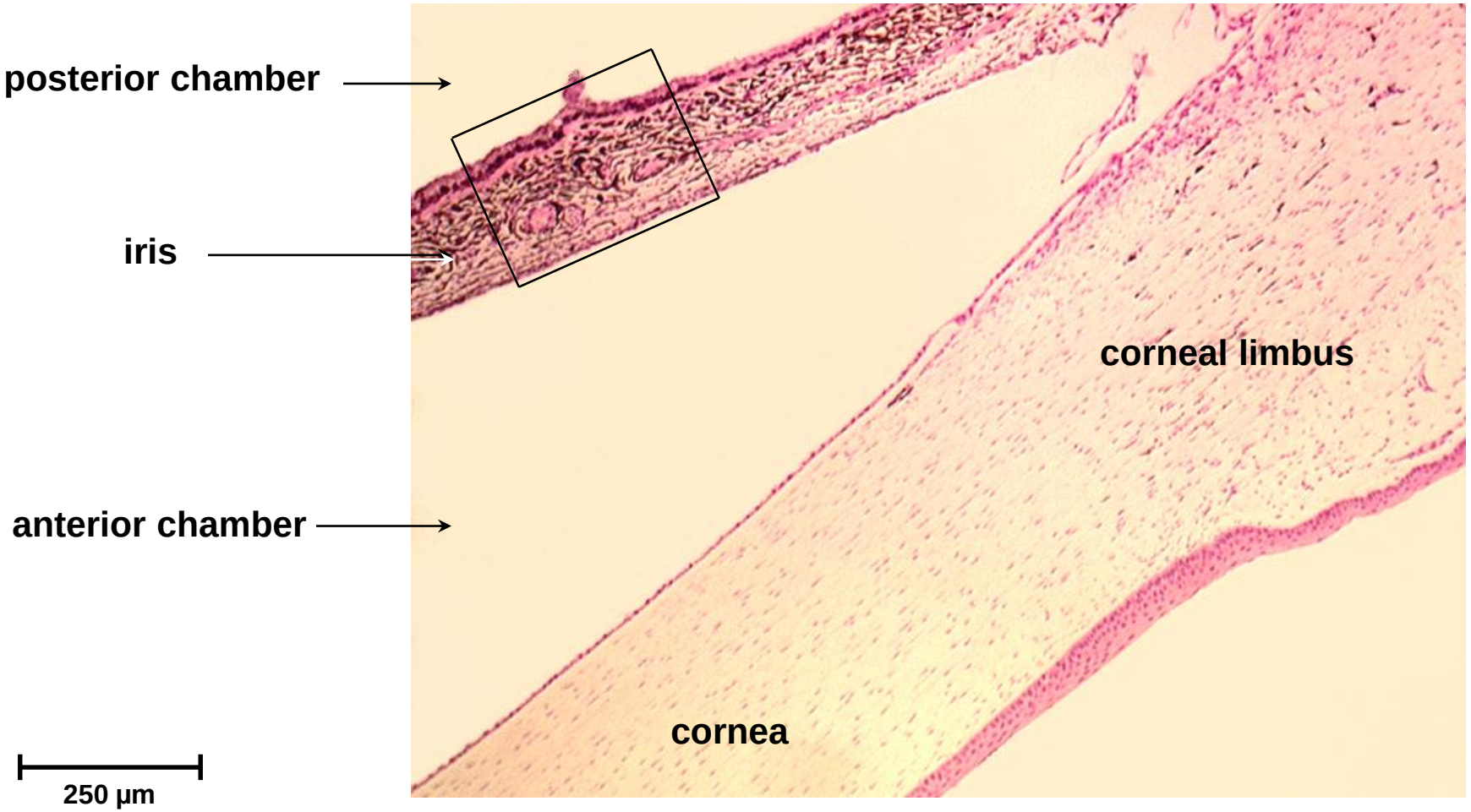
Here the collagen fibres of the corneal stroma become irregular and blood vessels supplying nutrients to the cornea are seen.

The anterior epithelium becomes the conjunctival epithelium.



Iris

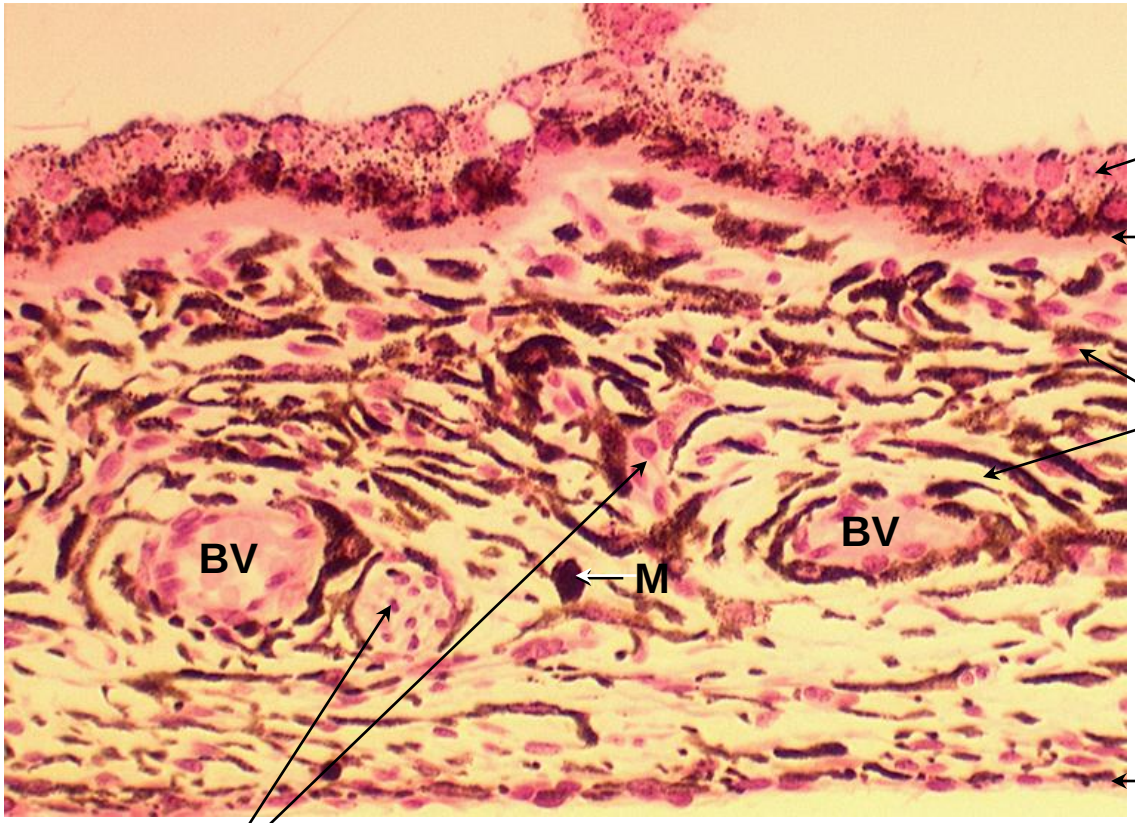
The iris is the most anterior part of the vascular tunic (uvea) a continuation of the choroid layer.



Iris

Examine the iris at higher magnification.

posterior chamber



pars iridica retinae

myoepithelial cells

connective tissue stroma

BV : blood vessels

M : melanocytes

anterior surface of iris

sphincter muscle

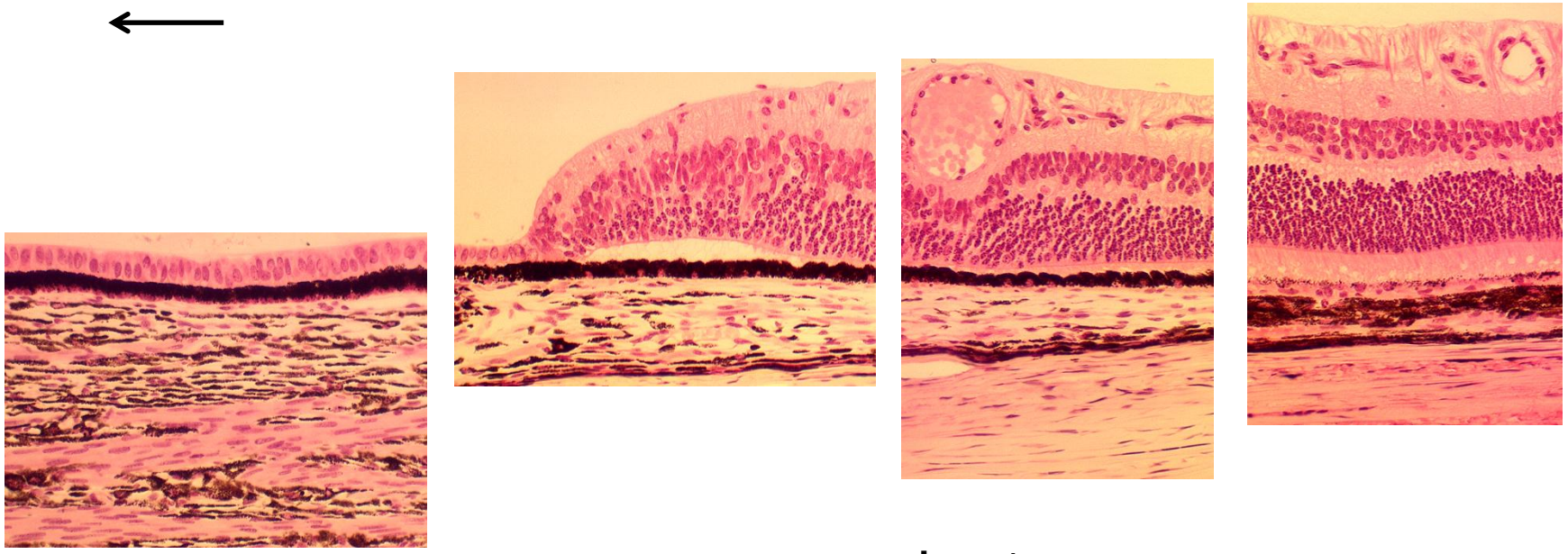
anterior chamber

50 µm

Retina

Through examination observe whether different areas of the retina exhibits neural (thicker) and non neural (thinner) organisation approaching the iris.

towards iris

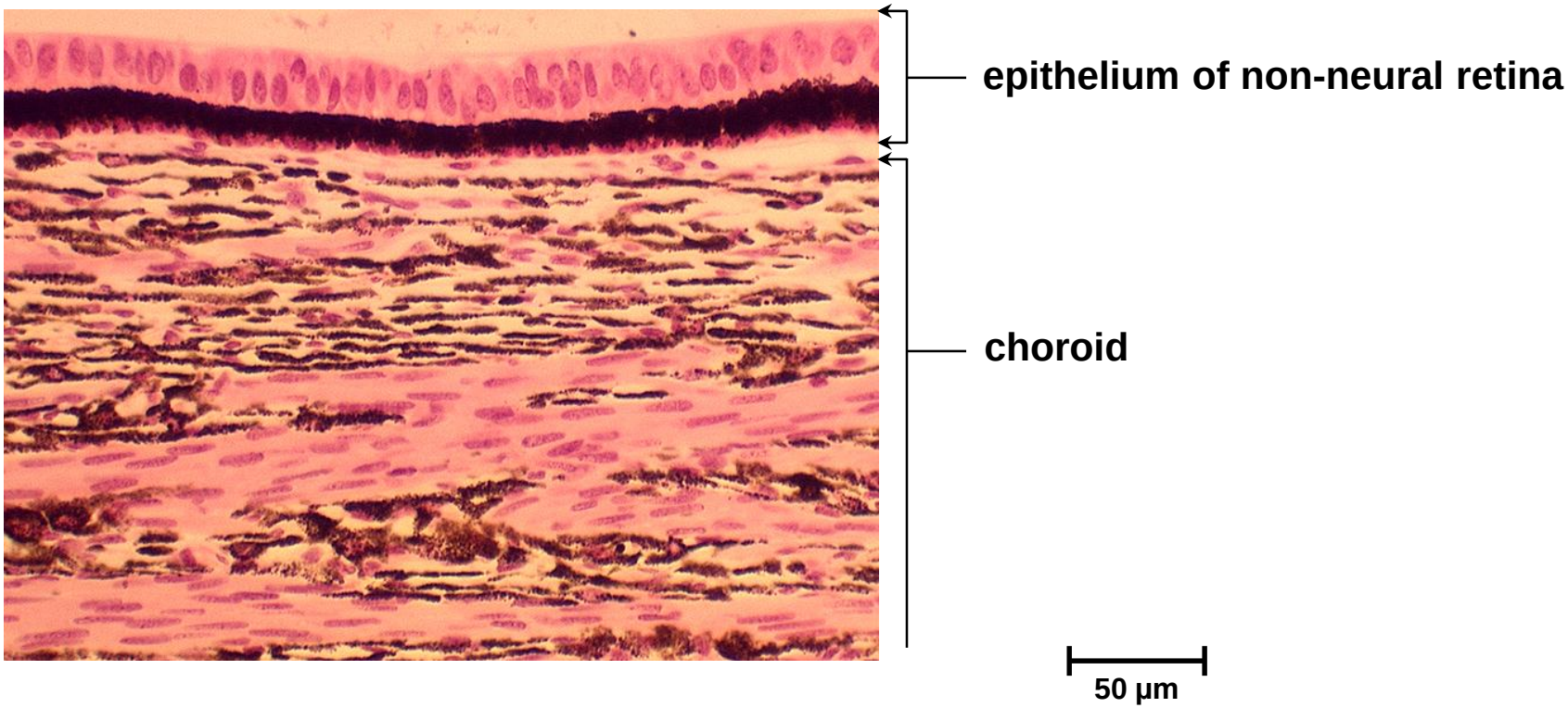


non-neural retina | **edge of neural retina** | **close to edge of neural retina** | **neural retina**

100 µm

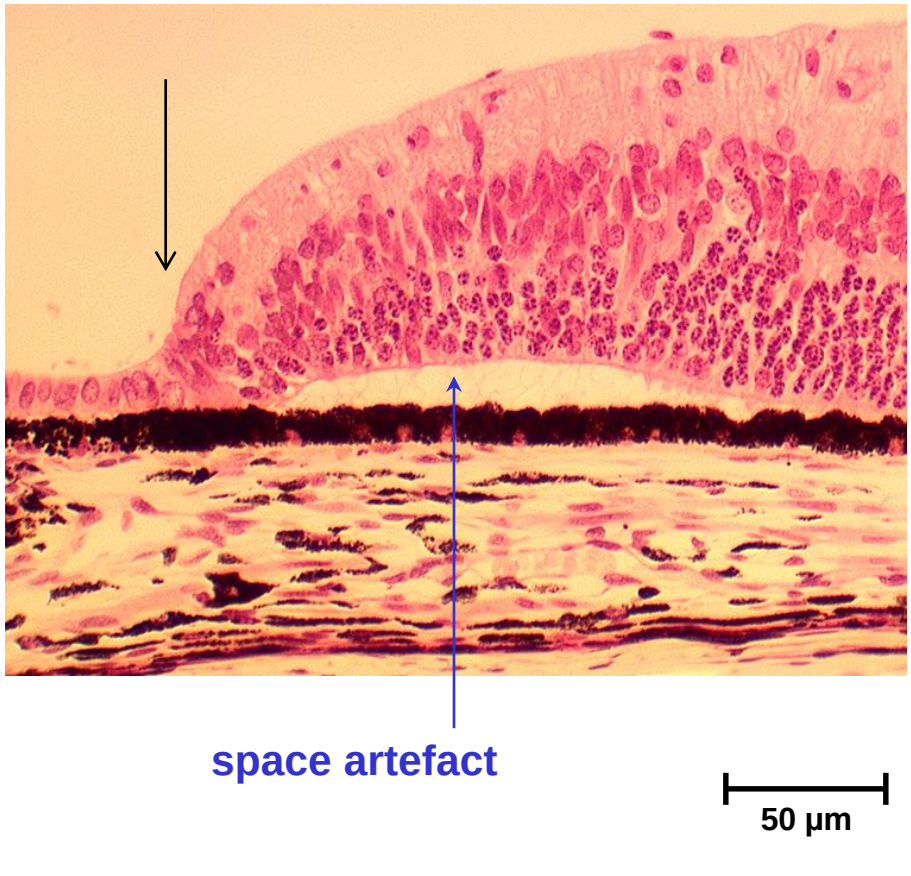
Retina

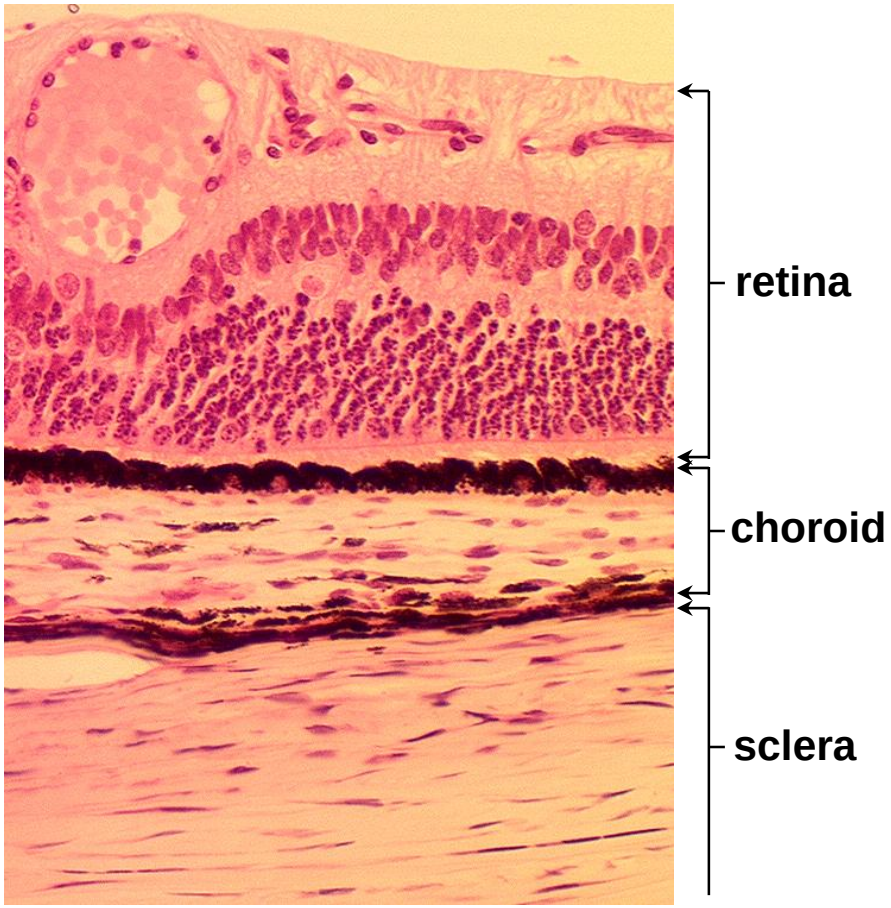
This non neural portion of the retina approaching the iris consists of two layers of non-light sensitive epithelium.
This epithelium is continuous with that covering the ciliary body and iris.



Retina

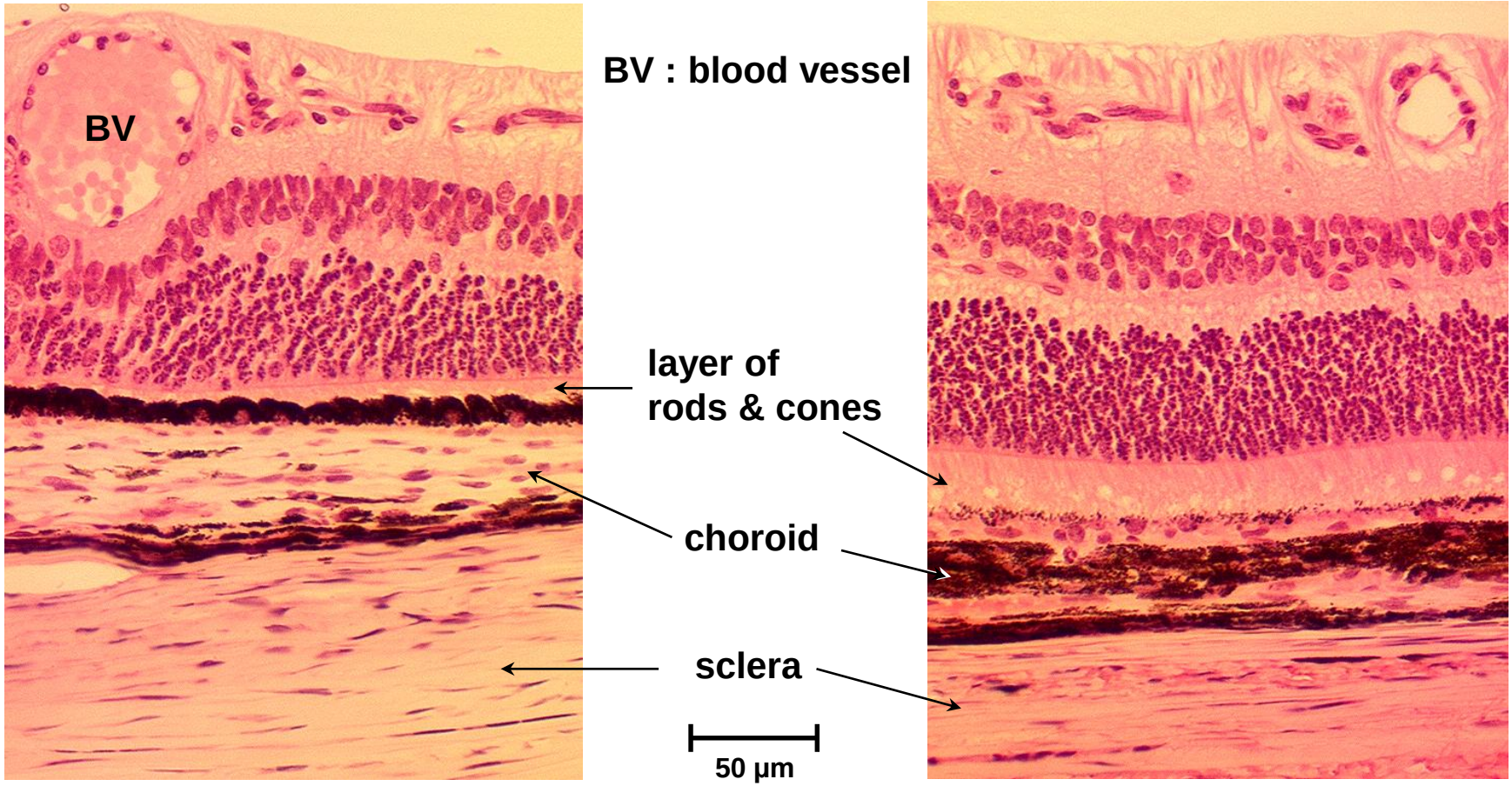
This area shows the sudden increase in thickness of the retina as it becomes the neural retina.
The junction is called the ora ciliaris retinae (arrowed).





Retina

A comparison of the neural retina close to the periphery (left) and at its full thickness (right).
Larger blood vessels may be seen in the nerve ganglion cell layer towards the edge of the retina.
The individual layers are more easily recognised (right).
Note the much thicker layer of rods and cones.



Retina

Examine the neural retina in more detail
Observe a full depth portion of this area and identify the different zones.

1. Inner limiting membrane.
2. Nerve fibre layer.
3. Ganglion cell layer.
4. Inner plexiform layer.
5. Inner nuclear layer.
6. Outer plexiform layer.
7. Outer nuclear layer.
8. Outer limiting membrane.
9. Layer of rods and cones.
10. Pigmented epithelium.
11. Choroid layer.
12. Scleral layer.