

### Dissection of the Sheep Eye

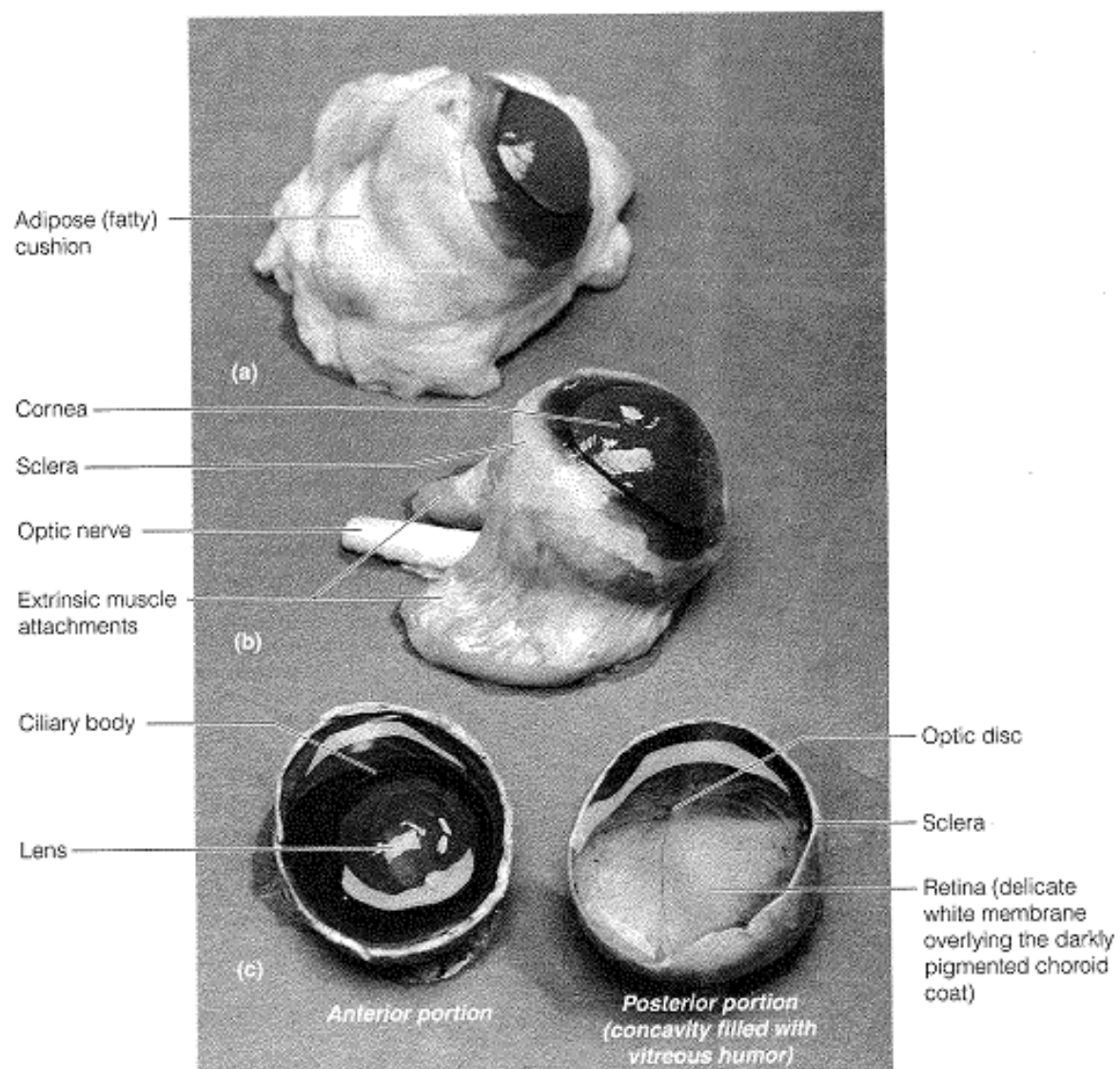
The size and structures of the sheep eye compare favorably with that of the human eye. This, coupled with their availability, makes them ideal for studying the anatomical structures of the eye.

**Materials:** sheep eyeball, dissecting instruments, dissecting pan, goggles, surgical gloves

**Procedure:**

1. Note the **fat (adipose tissue)** on the surface, of the eye. This cushions the eye from shock in its bony orbit.
2. Identify the following external structures:
  - a. The **sclera**, the tough, external, white coat.
  - b. The **conjunctiva**, reflected over the anterior surface of the eye and attached to the eyeball a short distance from the edge of the cornea.
  - c. The **cornea**, the anterior, transparent (opaque in your specimen, due to action of the preservative), portion of the sclera.
  - d. The **optic nerve**, located on the posterior surface. The nerve has the appearance of a solid white core and is approximately 3 mm thick.
3. Carefully dissect away the connective tissue (fat, etc.) from the posterior surface of the eyeball to free the six extrinsic eye muscles. These resemble flattened straps. Identify the **Lateral and Medial rectus, the Superior and Inferior rectus, and the Inferior and Superior oblique**.
4. Hold the eye so that the cornea is in an inferior position.
5. Making an incision into the eyeball about  $\frac{1}{2}$  cm from the edge of the cornea, cut completely around the eye (parallel to the cornea). **Wear goggles** to protect your eyes from the fluid that may spray out of the sheep eye.
6. If the incision was made properly, it should now be possible to carefully separate the **vitreous humor** (vitreous body) from the **crystalline lens**, and to keep the vitreous humor in the posterior portion of the eyeball, the lens in the anterior third of the eye.
7. Examine the interior of the anterior part of the eye.
  - a. Observe the **ciliary body**, the black structure which has the appearance of narrow, radial folds.
  - b. Locate the **suspensory ligaments**, the very delicate fibers connecting the ciliary body to the lens. They hold the lens in position.

- c. Free the lens from the ciliary body and remove it. Remnants of the suspensory ligaments can be seen attached to the lens.
  - d. The **iris** is now visible anterior to the former position of the lens. This also appears black. Try to distinguish between the circular and radial fibers comprising the iris.
  - e. Hold the lens up to the light. Does any light pass through? The lens in your specimen may be opaque due to the action of the preservative.
8. Examine the external surface of the anterior third of the eye. It is now relatively easy to distinguish the iris, pupil, and cornea.
9. Examine the posterior two-thirds of the eye and observe the following structures:
- a. The **vitreous humor** (in life, this substance is perfectly clear). Remove it from the eyeball.
  - b. The **retina**, the white inner coat that was covered by the vitreous humor. Determine the point at which the retina is attached dorsally.
  - c. The **choroid coat**. The retina covers this coat, and the two are easily separated. The iridescent appearance of the choroid is due to the presence of the tapetum, lucidum a special structure not present in the human eye. The function of the tapetum lucidum is to reflect some light back onto the retina. This reflecting device is found in vertebrates that live under conditions of low light intensity. This causes the animal's eyes to shine in the dark.
  - d. The sclera, the outer, white coat.
10. In the space below, draw a picture of the eye and label all of the parts.



**FIGURE 17.5 Anatomy of the cow eye.** (a) Cow eye (entire) removed from orbit (notice the large amount of fat cushioning the eyeball). (b) Cow eye (entire) with fat removed to show the extrinsic muscle attachments and optic nerve. (c) Cow eye cut along the coronal plane to reveal internal structures.