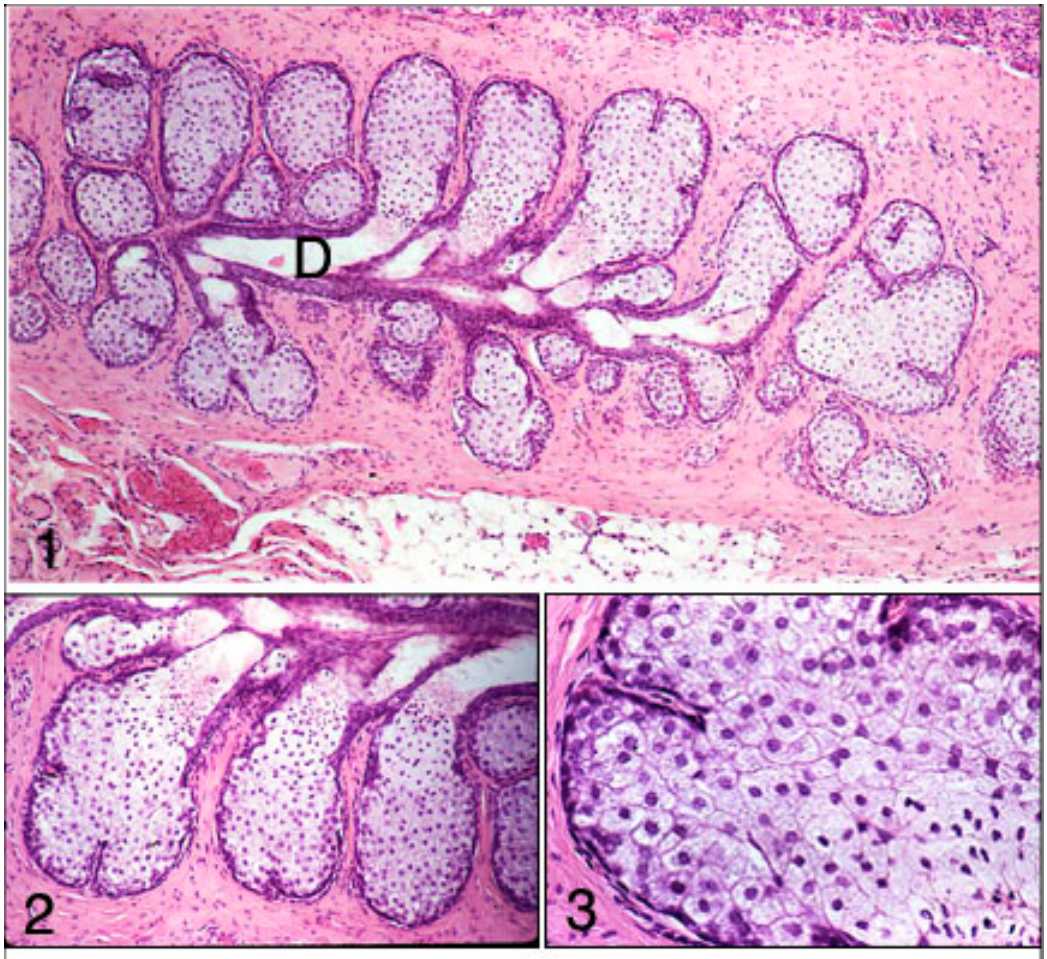
Eyelid



1. A tarsal (Meibomian) gland embedded in the dense connective tissue of the surrounding tarsal plate. Note the long central duct (D).
2. Three secretory alveoli of a tarsal (Meibomian) gland draining into the central duct. Note the latter is lined by stratified squamous epithelium.
3. Increased magnification of an alveolus from a tarsal (Meibomian) gland.

The eyelids protect the anterior aspects of the eyes. They consist of a connective tissue core covered externally by thin skin. The interior surface of each lid and the anterior surface of each eye (except for the cornea) are covered by a mucous membrane called the conjunctiva. The palpebral conjunctiva lines the interior of the lid; the bulbar conjunctiva covers the anterior surface of the eye. Both consist of a stratified columnar epithelium interspersed with goblet cells, resting on a dense connective tissue that is rich in elastic fibers and may contain numerous lymphocytes. The goblet cells provide mucus, which lubricates and prevents abrasion of the corneal epithelium. At the margin of the lid, the palpebral conjunctiva is continuous with the keratinized stratified epithelium of the skin.

The external surface of the eyelid consists of skin: an external layer of keratinized stratified squamous epithelium and an inner layer of loose connective tissue with many elastic fibers. Fine hairs are present, associated with many small sebaceous and sweat glands. Skeletal muscle from the orbicularis oculi and superior levator palpebrae muscles is present in the substance of the lid. The curved tarsal plate, composed of dense fibrous connective tissue, is a

major structure in the lid. It conforms to the shape of the eyeball and maintains the shape of the lid. Large sebaceous glands, the tarsal (Meibomian) glands, are embedded in the tarsal plate, arranged in a single row with their ducts opening at the margin of the lid. Each gland consists of a long central duct surrounded by numerous secretory alveoli. They elaborate a lipid secretion that lubricates the lid margins. The eyelashes are thick, short, curved hairs arranged in two or three irregular rows along the margin of the lid. Their follicles extend into the tarsal plate. Sebaceous glands associated with eyelashes are called the glands of Zeis; the modified apocrine sweat glands located between the follicles are called Moll's glands. Moll's glands secrete a variety of antimicrobial proteins (IgA, lysozyme, lactoferrin, and β-defensin-2), which play a role in the defense of the eye against infection.