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Location of the earliest changes in experimental xerophthalmia of rats.¹

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It is generally assumed that the lesions in experimental xerophthalmia due to dietary deficiency have their origin in the cornea which, in the advanced stage of the condition, becomes markedly affected. A recent study of the eyes of a series of rats on a diet deficient in fat-soluble A has led us to the conclusion that it is the eyelid rather than the cornea that is primarily affected.

The following is a summary of the study. Six young rats, weighing from 45 to 50 grams, were placed on a diet consisting of casein, mineral salts, starch, lard, and yeast. After from 45 to 60 days, the first evidences of eye changes developed—watery lacrimation with a serosanguineous conjunctival secretion, becoming after a short time somewhat viscid. The rats were killed at this stage and the eyes, with the lids attached, were embedded and sectioned. In all cases early focal lesions were found in the epithelial lining of the lids. The changes consisted of localized foci of degeneration of the epidermis with cellular infiltration which, in some cases, extended into the subepidermal tissue. In all these early cases the cornea was found uninvolved, that is, there were no degenerative changes which could be recognized by ordinary stains, and no cellular or vascular reaction.

These findings suggest that the eye changes resulting from deficiency in fat-soluble A vitamine, which in the advanced stage is characterized by a widespread keratitis, do not begin in the cornea but have their origin in the lids. In this respect the sequence of events is the same as that in some of the severer types of acute and chronic conjunctivitis which are frequently complicated by corneal injury, with infection and ulceration of this structure.

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