A Preliminary Report on the Eye of the Mole (Scalops aquaticus machrinus).

By James Rollin Slonaker.

It is a general belief with many people that the mole does not have eyes. This is possibly due to the fact that the eyes are not readily seen and that an animal living habitually in the ground would have little or no use for organs of sight. But this, like many other common ideas, is wrong, for the mole has not only a well-defined eye, but one which is readily observed on parting the fur at the right place. It is seen as a dark area covered by the skin and true eyelids. The latter, however, are rudimentary and the cleft between them so small that it is practically never open enough to admit light. (Fig. 1.)

From this fact alone one could safely conclude that the power of sight in the mole is no more than to distinguish between light and darkness. But when the eye itself is examined this conclusion is well substantiated.

Comparing the mole eye with a normal mammalian eye it is found to be quite degenerate. The stages of degeneration seem to be in the following manner:

The eye decreases materially in size. This reduction diminishes the size of the aqueous and vitreous chambers until in some eyes they are wholly wanting. This allows the retina to collapse, causing the inner layers to become more or less jumbled together. Each of the layers may, however, be made out as is shown in Figs. 2 and 3.

The lens is much modified in size and shape in different eyes. Owing to the great diversity of pressure exerted by the shrinking eye the lens takes a variety of forms which may be decidedly different in eyes taken from the same animal. This is shown in Figs. 2 and 3, representing the right and left eye respectively, from the same animal. On magnifying the lens the cells are seen to resemble cartilage more than typical lens cells. (Figs. 4 and 5.) The histological degeneracy of the lens has thus gone much farther than one would at first suspect.

Ritter[1] and Rabl[2], in describing the development of the mole lens say

[1] C. Ritter, Die Linse des Maulwurfs. Arch. f. Micr. Anat. u. Entwl., Bd. 53, Heft III, p. 397.

[2] Carl Rabl, Ueber den Bau und die Entwicklung der Linse. Zeitschr. f. Wis. Zool., Bd. 67, Heft 1, 1899, p. 63.

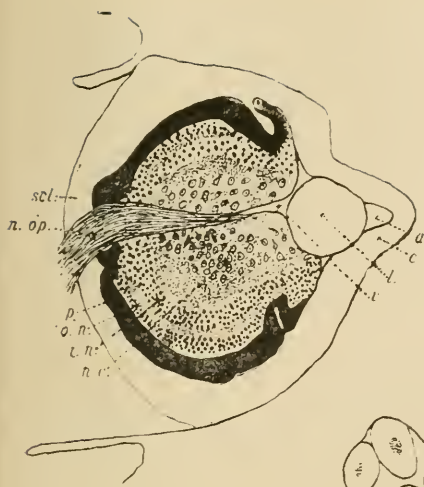

Fig. 3

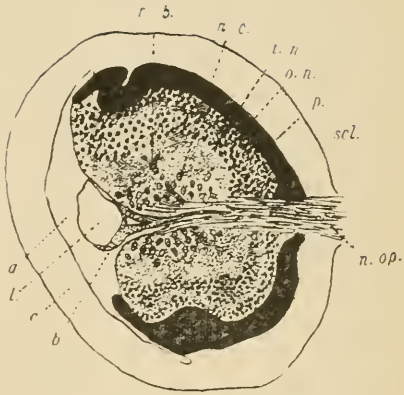

Fig. 2.

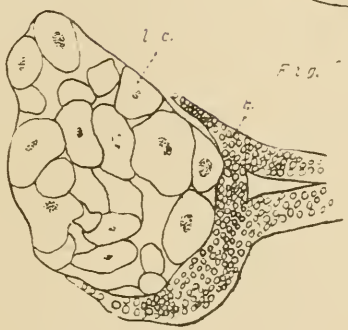

Fig. 5

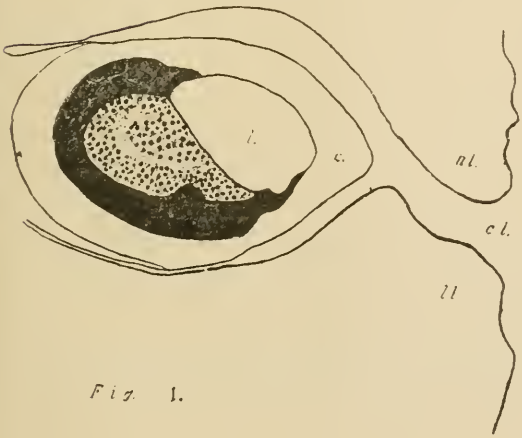

Fig. 1.

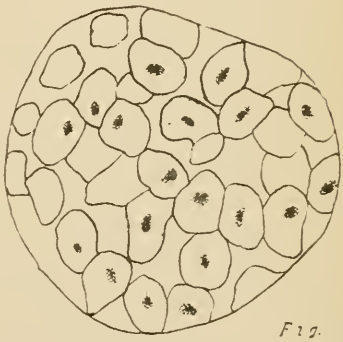

Fig. 4.

that it is similar to the mammalian type in its early stages, but the later stages are arrested, and in the adult the typical lens cells have degenerated to a form as above described.

The finer histological structures and relations of the different cells will be presented in a later paper.

The function of such an eye as this may be reasonably conceived when we consider the composition and shape of the lens, the almost closed lids and the closely crowded condition of the retina. The power of sight would doubtless extend little if any beyond the ability of distinguishing between light and darkness.

EXPLANATION OF FIGURES.

All the figures are semi-diagrammatic camera drawings of sections from the mole eye.

ABBREVIATIONS.

a. Aqueous chamber.
b. Blood vessel.
c. Cornea.
cl. Cleft between eyelids.
i. n. Inner nuclear layer.
o. n. Outer nuclear layer.
n. c. Nuclear or ganglion cell layer.
l. Lens.
ll. Lower eyelid.
ul. Upper eyelid.
r. b. Retinal blood vessel.
p. Pigment layer.
v. Vitreous chamber.
scl. Sclerotic coat.
n. op. Optic nerve.
l. c. Lens cells.

Fig. 1.—Vertical section through eye and lids showing the cleft between the lids. The section did not pass through the center of the eye. x48.

Fig. 2.—Vertical section passing through center of nerve and lens. The thickness of the different layers is correctly represented, but the cells are diagrammatic. x48.

Fig. 3.—Horizontal section through the left eye from the same animal as Fig. 2. The cornea is folded, due to the hardening fluid. x48.

Fig. 4.—Enlarged view of lens from the same eye as Fig. 3. The peculiar cartilage-like cells are shown. x270.

Fig. 5.—Enlarged view of lens from the same eye as Fig. 2. x270.

Notes on Indiana Birds.

By Amos W. Butler.

The following notes are given here in order that they may be placed on record. In them are included such records of special interest as have been brought to my attention since the publication of my report on "The Birds of Indiana," at the beginning of 1897. In them, it will be observed, are added two species to the list of birds of this State. These are the Caspian Tern and Bachman's Warbler. There are also some interesting notes on the appearance of the Wild Pigeon.

AYTHYA VALLISNERIA (Wils.).

Canvas-back Duck.—A male and female were killed in the marsh at English Lake, Indiana, November 4, 1899. Never known to have been taken there in the fall before.

A single one was seen at the same place November 24, 1899. (Ruthven Deane.)

CLANGULA HYEMALIS (LINN.).

Old Squaw Duck.—February 12, 1899, a flock of thirteen Old Squaws alighted in the water where ice was being cut at English Lake, and all were killed. (Ruthven Deane.)

October 29, 1889, a specimen was taken at Calumet Heights, Indiana. This is a very early record.

LOXIA CURVIROSTRA MINOR (BREHM).

American Crossbill.—Dr. Stanley Coulter reports at least two dozen on Purdue University Campus November 3, 1898.