ther studies of all these forms are now being made.

The Eye of the Common Mole: James Rollin Slonaker.

The eye of the mole lies imbedded in the muscle beneath the skin, where it appears as an inconspicuous dark spot. It is situated well forward on the side of the snout.

The eye is degenerate and is no longer capable of functioning in distinct vision. The most noticeable changes which have occurred are:

1. The great reduction in the size of the eye.

2. The much crowded condition of the retina as a result of the decrease in size of the eye as a whole.

3. The noticeable reduction in the size, or the complete absence of the aqueous and vitreous chambers.

4. The varied modification of the shape and size of the lens. Also the peculiar cell structure of the lens.

All the structures of the normal mammalian eye are present in some form or other.

Two stages have been studied: (1) At birth, (2) the condition found in the adult. Very little difference is seen in these two stages excepting an increase in size.

The eye muscles and the optic nerve are easily traced back to the skull. At birth the nerve presents in its course from the eye to the skull a peculiar arrangement. The course is marked by numerous cells and few or no fibers. At the eye there is a rapid change from this cell condition to the fiber condition of the nerve tract. The fibers have not apparently grown much beyond the limits of the eye. In the adult the fibers can be traced to the skull.

The eye cleft may be seen in cross sections. It is very small and of practically the same diameter in both horizontal and vertical sections through it. It meets the eye at such an angle that it is impossible for rays of light, should any enter, to pass through the eye along the axis of vision.

All the elements of the normal retina are present, but, owing to the much crowded condition, the ganglion cell layer is much increased in thickness.

The lens, which is found in a great variety of shapes and sizes, is composed of peculiar cartilage-like cells with well-defined nuclei. It is therefore incapable of functioning as a normal lens.

It is very doubtful therefore whether the eye of the mole functions in any sense. At the best it can do no more than distinguish between light and darkness.

The Breeding Habits of Certain Fishes: Jacob Reighard.

1. Experimental evidence was offered that the nests of *Amia* are built by the male fish alone. Access to an area of the natural breeding ground was barred by a fyke net, in which fish that attempted to reach the breeding ground were caught and kept living. The males were removed from the net and placed in the natural enclosure behind it; the females were confined in a crate. Twenty-three nests were built by the males and of these only five ever contained eggs. These eggs were apparently all laid by one or two females that had gained access to the enclosure. The remaining eighteen nests were never used and were finally abandoned.

2. It was pointed out that the colors of the male *Amia* are protective in the breeding season. The fins are all colored green in harmony with the surrounding vegetation. The reticulation of the sides is in close imitation of the shadows cast by the interlaced and floating parts of water plants. The tail spot is strikingly like certain refraction images cast on the bottom

by irregularities of the surface of the water. Such images are small black spots, orange or yellow bordered.

3. It was pointed out that in the male of *Eupomotis gibbosus* the colors are much brighter than in the female. The vermicular markings on the cheeks of the male are more brilliant than those of the female; the opercular ear-flap is larger and bordered with scarlet and blue; the ventrals of the male are black, while those of the female are yellow; the dorsal and caudal of the male are much more brilliantly blue than those of the female. In approaching the female, in order to induce her to enter his nest to spawn, the male elevates or puffs out the gill covers so as to display their brilliant markings. At the same time the opercular ear-flaps are erected and the black ventral fins spread out. When in this attitude the male faces the female and it is when seen from the front that his display of color is most brilliant. He assumes a similar attitude when threatening other males. He was never seen to assume this attitude except under the circumstances described, so that the display of color resulting from the attitude must be regarded as a means of expressing the emotions.

The Early History of the Lateral Line and Auditory Anlages in Amia: CORA J. BECKWITH. Presented by Jacob Reighard.

No common anlage of the auditory pit and lateral line system, such as has been described in Teleosts by Wilson, was found in *Amia*. The auditory pit was found to arise much earlier than the lateral line system and in the usual way. It is at first imbedded in an elongated mass of mesectoblast proliferated from the neural crest. This mass of mesectoblast, with enclosed auditory pit, bears a considerable resemblance to the common anlage of auditory pit and lateral line system referred to above. It subsequently extends into the adjacent gill arches, where its further history was not followed. The lateral line system makes its appearance at a later stage in the form of several independent ridge-like thickenings of the ectoblast which subsequently fuse. It is at no time connected with the anlage of the auditory pit.

The Vascular System of the Common Squid, Loligo pealii: L. W. WILLIAMS.

The knowledge of the histology of the vascular system of decapod mollusks is very incomplete, especially in reference to the extent of the capillary system. In addition to the capillaries, lacunæ have been believed to intervene between the arteries and veins. The extent of the capillary system was determined by injecting the vascular system with Berlin blue, and the lining of the vessels was studied by means of silver impregnations. Both the arterial and branchial hearts seem to lack an endothelium. The branchial heart consists of striated muscle and apparently secretory polygonal cells. The intrinsic muscle of the peristaltically contractile arteries resembles connective tissue. The arteries and veins are connected in all parts of the squid by capillaries. All the vessels are lined by an endothelium. The veins are connected with small end-sinuses which enclose the terminal branches of the arterioles and receive numerous capillaries, some of which arise from the perforating arteriole. The so-called lacunæ which partially enclose the pharynx and eyes are sinuses, since they have endothelial walls and since they intervene between veins, not between veins and arteries.

The wide distribution of the capillary vessels, the presence of an endothelium around every blood-containing cavity except possibly the heart, and the absence