rate rose. Furthermore, throughout all their experiments the basal metabolic rate varied with the general condition of the patient. When the rates were lowest the glucose utilization was best and acidosis was either controlled or decreased. When the basal metabolic rate rose sugar tolerance was diminished and acidosis increased.

ABSTRACTS OF COMMUNICATIONS, PEKING BRANCH

First meeting.

Peking, China, December 4, 1922

104 (2064)

Some experimental observations on the retina of the gecko.

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The association of visual purple or rhodopsin with the visual function of the rods in dim or twilight vision as maintained in the duplicity theory of von Kries (Nagel,[1] Helmholtz,[2] Parsons,[3] and Hartridge[4]) is generally regarded as well substantiated.

As to the genesis of this pigment, numerous ideas have been advanced, although it is generally held that it is a product of the epithelial pigment cell (Garten[5] and Kolmer[6]).

In the present work on the gecko retina, which is cone-free,

[1] Nagel, W., Handbuch der Physiologie des Menchen, Bd. 3, 1905.

[2] Helmholtz, H. von, Handbuch der physiologischen Optik, Bd. 2, 1911.

[3] Parsons, J. H., An Introduction to the Study of Colour Vision, 1915.

[4] Hartridge, H., "Vision," pp. 486-588, Starling's Human Physiology, 1920.

[5] Garten, S., Graefe-Saemisch Handbuch der gesammten Augenheilkunde, 1907, Bd. 3, Kap. 12, 130 pp.

[6] Kolmer, W., *Pflüger's Archiv.*, 1909, cxxix, 35.

certain observations have been made which suggest that the outer segment of the rod may be more directly concerned in the production of this pigment.

When the retina is preserved in modified Held's fixative (v. Kolmer, op. cit.) and stained with iron haematoxylin and erythrosin, numerous droplets, which stain with a varying intensity from gray to black, are seen on and between the outer segments of the rods. In addition, a characteristic lamellar arrangement of deeply staining granular material in the outer segment of the rod is very evident. When stained sections of eyes which have been kept in darkness for twenty-four hours are studied microscopically, the droplets are found to be very numerous and the deeply stained granular material in the rod outer segment is greatly reduced in amount or is not to be seen at all. On the other hand, identically prepared sections of eyes that have been exposed to light for six hours not only show a great reduction in the number of droplets, but the granular striations in the rods are very compact and deeply stained. Intergrades between the two extreme conditions are also to be found and, within the same retina, whether light or dark adapted, there is a stiking correlation between the number of droplets present and the amount of granular material within the rod outer segment.

Kolmer described the presence of these droplets in the retinæ of various vertebrates. In the frog retina kept in darkness, he found these droplets to be larger and more numerous than in the illuminated retina, and after illumination with direct sunlight, they were not to be seen at all. These droplets are ascribed by Kolmer to be secretion products of the retinal epithelial cells and he makes no mention of a relationship existing between the number of droplets and the amount of granular material in the rod outer segment. His failure to find them in the pure cone retinæ of lizards and snakes, strengthened his assumption that they are concerned in rod vision and perhaps with the appearance of visual purple.

From the study of these droplets in the gecko retina, two significant points are brought out. The number of droplets outside the rod seems to be inversely proportional to the amount of granular striated material within the rod outer segment. Their genesis from the rod, therefore, seems to be less questionable than an origin from the pigment epithelial cells. Further, since

they are found to be more numerous in the dark-adapted retina than in the light-adapted one, the extent of their presence is more or less in correspondence with the conditions responsible for the regeneration and the bleaching of visual purple.

When sections of light-adapted eyes of field mice are compared with sections of dark-adapted ones, the droplets occur in considerably reduced numbers in the sections of the light eye as compared with those in the dark eye; and the histological comparison corresponds closely with that found in the gecko eye under the same conditions. However, a comparative study of light and dark-adapted eyes of Eremias (a diurnal lizard possessing cones only) shows a total absence of these droplets under both conditions.

The exclusive presence of these droplets in rod retinæ, as well as the difference which exists between eyes kept in darkness and those exposed to light, is highly suggestive that they are concerned with the appearance and disappearance of visual purple under the two respective conditions, although it would be premature to say definitely that they represent a histological picture of this pigment.

A more complete account of these experiments and of additional ones will be forthcoming.

The intermediate host of schistosoma japonicum in China.

105 (2065)

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The snail which acts as the intermediate host of *Schistosoma japonicum* in Japan has been known since 1913 to be *Blanfordia nosophora.* No intermediate host for the parasite has heretofore been described for China. We selected the endemic region about Soochow, in Kiangsu Province, for our search. Our method