

Serolis gracilis, in which species the eye seems to be disappearing (see p. 24), it is relatively larger but not so conspicuous, owing to the fact that little or no pigment is present; these external points of difference between the eyes of the deep-sea and shallow-water species are accompanied by very striking differences in their minute structure. Since, however, the shallow-water species agree more closely with other Arthropoda in the structure of the eye, it will be more convenient to commence with them before describing in greater detail the deep-sea species.

Among the shallow-water species I have investigated the minute structure of the eye in the following:—*Serolis schythei*, *Serolis paradoxa*, *Serolis latifrons*, and *Serolis cornuta*. In all there is a fundamental similarity, but there are certain differences in detail.

In *Serolis schythei* the eye (Pl. IX. fig. 2) is faceted externally, and a transverse section shows that each facet forms a doubly convex lens, the posterior convexity being more marked than the anterior. Corresponding to each lens is a vitreous body (*v*) of an oval conical form, and composed, as in other Isopods, of two halves joined in the middle line; as a general rule the vitreous bodies have the even regular form displayed in the figure, but some are uneven, one half being larger than the other; surrounding the vitreous body are the remains of the two cells which gave rise to them, and above, between the vitreous body and the cornea, are two nuclei ("nuclei of Semper") which belong to these cells. The whole "vitrella"¹ is enclosed in a sheath of deep black pigment cells.

Below the vitrella is the retinula, which consists of only four cells; this is an unusually small number; from Grenacher's work upon the Arthropod eye already quoted, it appears that five or seven cells is the usual number, and in some cases the retinula contains a greater number of cells; *Gammarus locusta* would seem to be the only known Crustacean besides *Serolis* in which the retinula is composed of so few as four elements. Each of the retinula cells is club-shaped when viewed in front (fig. 2); seen laterally they are hatchet-shaped (figs. 18, 19); at about the middle of the cell is an oval swelling where the nucleus is situated; the nucleus is oval in form, the long axis corresponding to the long axis of the cell, and is contained in a cavity; in the interior of each nucleus is a small highly refracting nucleolus. The retinula cells are clothed externally with a coating of pigment, which is more especially developed at the upper swollen extremity and gradually decreases in amount towards the lower end; this pigment appears to be contained in long branched connective tissue cells. The retinal cells themselves, however, do contain intrinsic pigment in addition to this adventitious sheath, as is shown by transverse sections. Fig. 20 represents a series of sections through a single retinula at various points which are indicated in the description of plates; from these sections it may be seen that the retinal cells contain abundant pigment granules within their own

¹ The nomenclature used in this description is taken from Grenacher's *Untersuchungen über das Sehorgan der Arthropoden*, Göttingen, 1879; and from a *Memoir on the Eyes of Limulus and Scorpio* by Prof. Lankester and Mr. A. G. Bourne (*Quart. Journ. Micr. Sci.*, N. S., vol. xxiii. p. 177, 1883).