

*Ectoderm.*—In the Hexactiniæ the ectoderm is divided by O. and R. Hertwig into three layers: (1) a comparatively thick epithelial layer; (2) a nervous layer, which is rendered granular by the action of most reagents; and (3) a thin muscular layer, applied to the outer surface of the mesogloea. The epithelial layer contains four kinds of cells, viz.:—Nematocysts, glandular cells, ciliated epithelial cells (Stützzellen), and sensory cells. The two latter types call for a word of explanation. The ciliated epithelial cells are narrow and band-like, with a dilation at each extremity, but the peripheral end is wider; they bear numerous cilia, and generally extend from the surface of the ectoderm to the muscular layer. The sensory cells are extremely fine and thread-like, with a dilation containing the nucleus about the middle or near the base of the cell. They bear at the apex a single delicate flagellum, and the base passes into numerous fine fibrillæ, which are connected with a nerve plexus. Ganglion cells with large nuclei are generally recognisable in the nervous layer. The sensory cells are distributed with a considerable degree of uniformity between the other cellular elements of the ectoderm, but owing to their extreme delicacy little information concerning them can be gathered from sections, and it is necessary to separate the sensory cells and ciliated “Stützzellen” by maceration, &c., before their outlines can be made out.

The ectoderm of *Antipathella subpinnata*, as might be expected, is not so complex as that of Hexactiniæ, but it appears probable that it has a similar general structure. The ectoderm of the tentacles is very thick, and its surface is raised into a large number of transverse oval ridges, which vary from  $85 \times 45 \mu$  to  $48 \times 22 \mu$  in diameter. In longitudinal sections of a tentacle these ridges appear as gentle crenations of the surface, which become lost towards the apex of the tentacle. Most prominent amongst the histological elements of the layer are a number of clusters of large hyaline cells, which extend from the surface to the base of the ectoderm (Pl. XIII. fig. 8, *g'*). These are probably gland cells, and may serve to secrete mucus. They remain quite transparent in sections stained with borax-carminé, and the outline of the individual cells is not well defined. Each cell has a small round nucleus near its base. Near the middle of each group three or four more deeply-stained lines may often be noticed at moderate intervals, which appear to commence at a little distance beneath the surface, and to reach nearly to the base. The middle of each line bears an oval thickening, which is also deeply stained. Bearing in mind the inter-relationship of the various types of cells in the ectoderm of Actiniaria, it appears probable that the deeply-stained lines with a median thickening represent thread-like nucleated sensory cells, which are interposed between the gland cells. In specimens stained with hæmatoxylin, the hyaline cells stain darker than the bundles of nematocysts, but no further structure is shown, the stain being apparently confined to the cell-wall and the nucleus. Each group appears to consist of rather slender elongate cells, having a dilation at the surface of the layer. Sometimes the distal portion of a cell is triangular in section. These hyaline gland cells are from 10 to 60  $\mu$  long, and vary