

my doubtful suggestion of its occurrence in *Pachymatisma johnstonia* has not been confirmed.

The epithelium, whether ectodermal or endodermal, scarcely ever retains in spirit specimens the outlines of its component cells, which are solely indicated by small, circular nuclei, surrounded by fine granules, and more or less regularly distributed through a thin superficial membrane, which represents the confluent cell-walls. In rare and exceptional instances, however, the outlines of the cells are preserved, as in a specimen of *Craniella cranium* from Kors Fjord, and in several of the Challenger sponges. Living specimens of *Pachymatisma johnstonia*, treated with gold chloride and formic acid, yield very clearly expressed epithelium, lining the canals of the cortex. Strange to say it is without definite cell-outlines, but the contained protoplasm, however, is very admirably displayed, as a superficially extended film produced into innumerable fine sometimes branching threads (Pl. XXXIV. fig. 22), reminding one altogether of ink splashes. An unstained oval space in the middle represents the nucleus, which in transverse section is seen characteristically bulging out the cell-wall beyond the general surface. The thread-like processes of adjacent cells seldom appear to unite, but terminate abruptly. This structure reminds one of that represented by von Lendenfeld as occurring in *Dendrilla rosea*,<sup>1</sup> but in this sponge the processes of the plasma are longer, broader, and less numerous than in *Pachymatisma johnstonia*. Von Lendenfeld observes that the pinacocytes of the inner epithelium of the skin are somewhat smaller than those of the outer layer, where they measure 0.01 to 0.015 mm. in diameter. In *Pachymatisma johnstonia* a marked difference in size occurs in the pinacocytes of the different intercortical canals, but these canals appear to be all of the same nature. In some the protoplasmic portion measures (including the thread-like processes) 0.02 mm. in diameter, in others as much as 0.036 mm.

No trace of a flagellum or cilium has been observed in connection with the pinacocytes of any Tetractinellid.

*Choanocytes*.—The collared flagellated cells or choanocytes of the endoderm present in the least highly organised species of the genus *Tetilla*, and in *Placina*, F. E. Schulze, the same characters as have already been made known in the case of other sponges by James Clark, Carter, Haeckel, Schulze, and other investigators. In the remaining Tetractinellida, *i.e.*, the vast majority of the group, a curious modification of this structure occurs. The body of the choanocyte is produced into a long cylindrical or conical process, which is tubular for the greater part of its course, only the basal part being solid, and thus representing the collum; the distal three-quarters appertaining to the collar. Distally the collar curves outwards and becomes concrescent with the similar collars of the surrounding choanocytes. From the concrescence of the collars there results a delicate film or membrane, which forms a second lining to the wall of

<sup>1</sup> *Zeitschr. f. wiss. Zool.*, Bd. xxxviii. pl. xii. fig. 22.