

Actinaria; this is generally most inappropriately expressed by the term "retractile tentacles." It would be decidedly more rational to make the anatomical reason, and not the physiological appearance, of systematic value. We shall therefore talk of Actinaria without sphincter, and of Actinaria with weak and with strong sphincter, and further distinguish in the latter case whether the muscle is endodermal or mesodermal.

The systematic value of the circular muscle does not end here, as it furnishes a character not to be undervalued, for determining the species. The extraordinary variations of the circular muscle are shown by a glance at Plates VI. and VII.; in the endodermal forms the shape and mode of branching of the muscular folds vary, in the mesodermal the shape and grouping of the bundles formed by the fibres, and also their position in the more superficial or deeper layers of the wall. I lay stress upon this point, as the circular muscle can be examined in the preserved animals even when their state of preservation is not very favourable, and because, moreover, a small piece of the wall, which can be cut away without essential damage to the whole animal, is sufficient for such an investigation.

Muscles, especially longitudinal muscles, are rarely present on the ectodermal side of the wall, whilst, on the other hand, it is not unusual to find "marginal spherules" and different forms of papillæ. The marginal spherules ("bourses marginales," Hollard, Ann. d. Sci. Nat., Zool., ser .iii., t. xv. p. 257) follow immediately outside the tentacles, and are evaginations of the mural membrane, just as the tentacles are evaginations of the oral disk. All the layers of the body participate in the evagination, though the ectoderm alone undergoes modification of its structure, being extraordinarily rich in nematocysts.

The papillæ, to which such importance was attached in earlier investigations of the Actiniæ, are formations of very subordinate value; they are caused by mere local growth of the supporting plate, and are not distinguished by a single special property of the covering epithelium (Pl. VIII. fig. 4). Hence the observer often found himself on the horns of a dilemma when he had to decide whether papillæ were present or not. A smooth surface may become papillose in consequence of contraction, and, on the other hand, small papillæ may disappear when, as often happens, the Actinia becomes distended like a drum. It would, therefore, be better in future only to make the papillose or smooth nature of the membrane of value in distinguishing species, or at most of genera, and to disregard it in the formation of larger divisions.

The comportment of the epidermis appears to me much more important. The majority of the Actiniæ have a smooth surface, on which particles of mucus become secreted when the animal is irritated; histological investigation then shows an active ciliated epithelium composed of extremely long, thin cylindrical cells. Besides this, two varying modifications of the integument have already been specially observed. In the one case, in *Cerianthus*, the epithelium is covered externally by a tough membrane, consisting of mucus, nematocysts, and scattered foreign bodies, which can be stripped off, but which