

to determine the number and the relations of the spheromeres, for in *Tiaropsis*¹ the eyes are not in the medial prolongation of the radiating chymiferous tubes, though they occupy that position in *Coryne* (*Sarsia*) *mirabilis* and many other *Acalephs*. Again, in *Polyclonia* (Pl. XIII. *Figs.* 2, 3, and 4), there are no eyes in the prolongation of the rays in which the sexual pouches are situated, though there is an eye in the medial prolongation of each ray occupied by a sexual pouch in *Aurelia* and *Cyanea* (Pl. IV. and VII). On the other hand, the corners of the mouth always coincide with one radiating chymiferous channel; and in most *Hydroids* there are no other chymiferous tubes besides those which thus correspond to the main avenues of the mouth, while the sexual organs follow these channels in bands, on each of their sides, and in all *Echinoderms* we find the sexual organs occupying an interambulacral position. The question, therefore, turns upon this point: Are the spheromeres of *Radiates* necessarily identical, or may heterogeneous spheromeres alternate with one another? or, in other words: Does the body of an *Aurelia* consist of eight spheromeres, four of which are connected with the oral appendages and four with the sexual pouches, and that of an *Echinus* of ten, five of which are ambulacral and five interambulacral? or, are the interambulacral zones only a special expansion of the sides of the ambulacra, and not by themselves distinct zones in the body of *Radiates*? If we take a comprehensive view of the whole type of *Radiates*, there seems to me no difficulty in the solution of these questions. In *Crinoids* and *Starfishes* the prominent rays of the body are essentially ambulacral in their structure and homologies, and if in *Echinoids* the interambulacra assume an apparent independence, it is solely owing to the widening of the little plates extending along the ambulacral plates of the *Starfishes*, and the consequent swelling of the whole body into a more spheroidal form; but even here the so-called interambulacra are only the flanks of the ambulacral zones, and owe their prominence more to the circumscription and separate development of the plates of which they consist than to any intrinsic importance, since nothing of the kind exists in the *Holothurians*. And if we extend the comparison to *Polyps*, we see this conclusion fully sustained by the fact, that the radiating partitions, which separate the radiating chambers, bear the same relations to these chambers and their peripheric tentacles, as the interambulacra of the *Echinoderms* bear to the ambulacra; or, in other words, we become satisfied that the radiating chambers are homologous to the ambulacral system, and the radiating partitions homologous to the interambulacra. Now in *Polyps*, as well as in *Echinoderms*, the sexual organs alternate with the ambulacra, that is to say, in *Polyps* they are attached in a double row

¹ See my Contributions to the Nat. Hist. of the *Acalephæ* of North America, Part. I. Pl. VI. VOL. IV.

Figs. 1, 3, 4, and 5, in Mem. Amer. Acad. vol. 4, and the chapter on *Tiaropsis* in this volume.