

standing at various angles with the direction of their movements, and, what is still more perplexing, the actinal and abactinal poles of the axis are now turned one way and now the opposite way. This variability of the motions of the *Acalephs* renders it exceedingly difficult to describe their natural attitudes in a manner which shall not conflict with their organic structure. When at rest, *Ctenophoræ* assume three different attitudes, peculiar to three different types of the order: *Bolina* and allied genera stand in a vertical position, with the actinal pole of their main axis downward; *Pleurobrachia* and allied genera stand also in a vertical position, but the actinal pole of their main axis is turned upward; *Idya* and allied genera, on the contrary, assume a nearly horizontal position, their main axis slightly slanting, the actinal pole being lower in the water than the abactinal pole. When moving onward, in whatever direction the motion may take place, whether it be straight forward, or upward or downward, or in a circuitous course, these different types of *Ctenophoræ* retain the same general relation of their main axis to the surrounding medium, that is, the actinal and the abactinal poles are in the direction of the motion, the abactinal pole moving forward in *Bolina*, while in *Pleurobrachia* the actinal pole is turned forward and in *Idyia* obliquely backward. Besides moving in these ways by the more energetic action of the whole spherosome, the *Ctenophoræ* may change their position by the activity of the locomotive flappers, when the main axis may assume any direction, according to the greater or less energy, or the total inactivity, of some of the rows of these locomotive flappers, or of parts of one and the same row. In this way a slow rotatory motion may also be produced, during which the main axis may, or may not, change its direction.

It is plain from these statements, that unless a nomenclature entirely irrespective of the various positions of these animals be adopted to describe their structure and their movements, the strongest conflicts between the structural relations

*Echinoderms* differs only from that of the *Acalephs* by its hardness, that the chymiferous tubes of the *Acalephs* are homologous to the aquiferous system of the *Echinoderms*, the marginal tentacles of the *Acalephs* homologous to the ambulacral suckers of the *Echinoderms*, etc.; and once upon that track it will be easy to embrace in these comparisons all the organic systems of all *Radiates*, from the simplest *Polyp* to the most highly organized *Echinoderm*. As to the *Ctenophoræ* in particular, I have already shown (pp. 99-124) that they do not form a class by themselves, but belong to the class

of *Acalephs*, and that they constitute one order, standing highest in that class. I cannot agree with *Leuckart* and *Gegenbaur*, who consider them as a distinct class; nor does *Gegenbaur's* expression appear to me correct, when he describes the digestive cavity of the *Ctenophoræ* as extending in the longitudinal axis of the body, if what I have stated of the morphology of *Acalephs* in general is true: for I hold that the main axis of all the *Radiates* ought to be considered as the vertical axis, around which the spheromeres are symmetrically and radiatingly arranged.