## CHAP. II.

we find easily, that while in some (the Polypi) the body exhibits a large cavity, divided by radiating partitions into a number of chambers, into which hangs a sac, (the digestive cavity,) open below, so as to pour freely the digested food into the main cavity, whence it is circulated to and fro in all the chambers, by the agency of vibrating cilia; in others, (the Acalephs,) the body is plain and full not to be compared to a hollow sac, traversed only in its thickness by radiating tubes, which arise from a central cavity, (the digestive cavity,) without a free communication with one another for their whole length, etc., etc., while in others still, (the Echinoderms,) there is a tough or rigid envelope to the body, inclosing a large cavity in which are contained a variety of distinct systems of organs, etc.

Without giving here a full description of these classes, I only wish to show, that what truly characterizes them, is not the complication of their structure, (for Hydroid Medusse are hardly more complicated in their structure than Polyps,) but the manner in which the plan of Radiata is carried out, the ways in which life is maintained in these animals, the means applied to this end; in one word, the combinations of their structural elements. But the moment we would discern what are the orders of these classes, these considerations no longer suffice; their structure has to be viewed in a different light; it is now the complication of these apparatus which may guide us. Actinarians and Halcyonarians among Polypi, as orders, differ, the first by having a larger and usually indefinite number of simple tentacles, an equally large number of internal partitions, etc., while in Halcyonarians the eight tentacles are lobed and complicated, and all the parts are combined in pairs, in definite numbers, etc., differences which establish a distinct standing between them in their class, assigning the latter a higher rank than the former.

It follows, then, from the preceding remarks, that classes are to be distinguished by the manner in which the plan of their type is executed, by the ways and means by which this is done, or, in other words, by the combinations of their structural elements, that is to say, by the combinations of the different systems of organs building up the body of their representatives. We need not consider here the various forms under which the structure is embodied, nor the ultimate details, nor the last finish which this structure may exhibit, as a moment's reflection will convince any one that neither form nor structural details can ever be characteristic of classes.

There is another point to which I would call attention, respecting the characteristics of classes. These great divisions, so important in the study of the animal kingdom, that a knowledge of their essential features is rightly considered as the primary object of all investigations in comparative anatomy, are generally represented as exhibiting each some essential modification of the type to which they