

equally indiscriminate application of the results obtained, to characterizing classes. Those who have not made a proper distinction between the plan of a structure and the manner in which that plan is actually executed, have either overlooked the importance of the great fundamental divisions of the animal kingdom, or they have unduly multiplied the number of these primary divisions, basing their distinctions upon purely anatomical considerations, that is to say, not upon differences in the character of the general plan of structure, but upon the material development of that plan. Those, again, who have confounded the complication of the structure with the ways and means by which life is maintained through any given combination of systems of organs, have failed in establishing a proper difference between class and ordinal characters, and have again and again raised orders to the rank of classes. For we shall see presently, that natural orders must be based upon the different degrees of complication of structure, exhibited within the limits of the classes, while the classes themselves are characterized by the manner in which the plan of the type is carried out, that is to say, by the various combinations of the systems of organs constituting the body of the representatives of any of the great types of the animal kingdom; or perhaps, still more distinctly, the classes are characterized by the different ways in which life is maintained, and the different means employed in establishing these ways. An example will suffice to show that this distinction implies a marked difference between class and ordinal characters.

Let us compare the Polyps and Acalephs as two classes, without allowing ourselves to be troubled by the different limits assigned to them by different authors. Both are constructed upon the same plan, and belong, on that account, to the type of Radiata. In establishing this fact, we do not consider the actual structure of these animals, whether they have a nervous system or not, whether they have organs of senses or not, whether their muscles are striated or smooth, whether they have a solid frame or an entirely soft body, whether their alimentary cavity has only one opening or two opposite openings, whether it has glandular annexes or not, whether the digested food is distributed in the body one way or another, whether the undigested materials are rejected through the mouth or not, whether the sexes are distinct or not, whether they reproduce themselves only by eggs, or by budding also, whether they are simple or not: all we need know, in order to refer them to the branch of Radiata, is whether the plan of their structure exhibits a general radiated arrangement or not. But, when we would distinguish Polypi, Acalephs, and Echinoderms as classes, or rather, when we would ascertain what are the classes among Radiata, and how many there are, we must inquire into the manner in which this idea of radiation, which lies at the foundation of their plan of structure, is actually expressed in all the animals exhibiting such a plan, and