

tained, its limits better defined, when we know all its representatives; but I am satisfied that any natural genus may be at least pointed out, however numerous its species may be, from the examination of any single one of them. Moreover, the number of genera, both in the animal and vegetable kingdom, which contain but a single species, is so great that it is a matter of necessity in all these cases to ascertain their generic characteristics from that one species. Again, such species require to be characterized with as much precision, and their specific characters to be described with as much minuteness, as if a host of them, but not yet known, existed besides. It is a very objectionable practice among zoölogists and botanists, to remain satisfied in such cases with characterizing the genus, and perhaps to believe, what some writers have actually stated distinctly, that in such cases generic and specific characters are identical.

Such being the natural relations and the subordination of types, classes, orders, families, genera, and species, I believe, nevertheless, that neither types, nor classes, (orders of course not at all,) nor families, nor genera, nor species have the same standing when compared among themselves. But this does not in the least interfere with the prominent features of orders, for the relative standing of types, or classes, or families, or genera, or species does not depend upon the degrees of complication of their structures as that of orders does, but upon other features, as I will now show. The four great types or branches of the animal kingdom, characterized as they are by four different plans of structure, will each stand higher or lower, as the plan itself bears a higher or lower character, and that this may be the case we need only compare Vertebrata and Radiata.¹ The different classes of one type will stand higher or lower, as the ways in which and the means with which, the plan of the type to which they belong is carried out, are of a higher or lower nature. Orders in any or all classes are of course higher or lower according to the degree of perfection of their representatives, or according to the complication or simplicity of their structure. Families may stand higher or lower as the peculiarities of their form are determined by modifications of more or less important systems of organs. Genera may stand higher or lower as the structural peculiarities of the parts constituting the generic characteristics exhibit a higher or lower grade of development. Species, lastly, may stand one above the other, in the same genus, according to the character of their relations to the surrounding world, or that of their representatives to one another. These remarks must make it plain that the respective rank of groups of the same kind among themselves must be determined by the superior or inferior grade of those features upon

¹ I must leave out the details of such comparisons, as a mere mention of the point suffices to suggest them;

moreover, any text-book of comparative anatomy may furnish the complete evidence to that effect.