

field open for investigations in this most attractive branch of Zoölogy. So much, however, is already plain from what has been done in this department of our science, that the identity of structure among animals does not extend to all the four branches of the animal kingdom; that, on the contrary, every great type is constructed upon a distinct plan, so peculiar, indeed, that homologies cannot be extended from one type to the other, but are strictly limited within each of them. The more remote resemblance which may be traced between representatives of different types, is founded upon analogy,¹ and not upon affinity. While, for instance, the head of fishes exhibits the most striking homology with that of reptiles, birds, and mammalia, as a whole, as well as in all its parts, that of Articulata is only analogous to it and to its part. What is commonly called head in Insects is not a head like that of Vertebrata; it has not a distinct cavity for the brain, separated from that which communicates below the neck with the chest and abdomen; its solid envelope does not consist of parts of an internal skeleton, surrounded by flesh, but is formed of external rings, like those of the body, soldered together; it contains but one cavity, which includes the cephalic ganglion, as well as the organs of the mouth, and all the muscles of the head. The same may be said of the chest, the legs and wings, the abdomen, and all the parts they contain. The cephalic ganglion is not homologous to the brain, nor are the organs of senses homologous to those of Vertebrata, even though they perform the same functions. The alimentary canal is formed in a very different way in the embryos of the two types, as are also their respiratory organs, and it is as unnatural to identify them, as it would be still to consider gills and lungs as homologous among Vertebrata now embryology has taught us that in different stages of growth these two kinds of respiratory organs exist in all Vertebrata in very different organic connections one from the other.

What is true of the branch of Articulata when compared to that of Vertebrata, is equally true of the Mollusks and Radiata when compared with one another or with the two other types, as might easily be shown by a fuller illustration of the correspondence of their structure, within these limits. This inequality in the fundamental character of the structure of the four branches of the animal kingdom points to the necessity of a radical reform in the nomenclature of comparative anatomy.² Some naturalists, however, have already extended such comparisons respecting the structure of animals beyond the limits pointed out by nature, when they have attempted to show that all structures may be reduced to one norm, and

¹ See SWAINSON, (W.) *On the Geography and Classification of Animals*, London, 1835, 12mo., p. 129, where this point is ably discussed.

² See AGASSIZ, (L.) *On the Structure and Ho-*

mologies of Radiated Animals, with Reference to the Systematic Position of the Hydroid Polypi, Proc. of the Amer. Assoc. for the Adv. of Science for 1849, Boston, 1850, 1 vol. 8vo. p. 389.