

investigations to the structure of special classes, either considering them by themselves or comparing them with allied types. Others still, look upon structure chiefly with a view of ascertaining the functions of the organs, and may trace these functions either through the whole series of animals or within the limits of some particular group. The danger of this kind of researches lies in the tendency, forced upon the investigator at almost every step of his inquiry, to take the functions as a safe guide in the appreciation of the true structural character of the organs. On the other hand, the student of microscopic anatomy traces chiefly the elementary parts of all the organic structures; but while he reveals to us a world unseen by the ordinary powers of our senses, he is apt to overlook the more comprehensive relations of all these parts in their extensive combinations. The same may be said of the embryologists. They confine their studies too exclusively to the investigation of the earlier periods in the development of animals, and leave generally unnoticed that state of growth during which the new being, having acquired an unmistakable resemblance to its parent, has still to go through a series of transformations before it is itself capable of reproducing its kind. Moreover, during these changes most animals have very different forms, and display sometimes so striking a resemblance to full-grown animals of other types, that these analogies ought to be traced more closely than is usually done. Finally, palæontologists have of late become so thoroughly satisfied that the animals of past ages are entirely different from those now living, that they too frequently proceed to describe extinct species without due comparisons with the living ones; and even represent fossil remains as distinct species, without first determining how far species may be distinguished by the parts they have on hand. It is now, indeed, one of the most pressing desiderata for the palæontologists to ascertain what are the parts in different classes of animals which may be sufficient to identify a fossil genus, and what is further required to determine the species. When I see how many fossil fishes have been described within the last fifteen years as distinct from those now in existence, without allusion to any comparisons with the skeletons of their living representatives, I think it may well be asked whether it was done with a full consciousness of the limitation which the similarity of the skeleton of species of the same genus forces upon the attempts of the palæontologists.

The study of organized beings, considered from these different points of view, has necessarily led to the division of our science into a number of very distinct branches, now mostly cultivated as specialities by different individuals; and yet all these different branches of Natural History are only the systematized results, as it were, of one-sided considerations. A complete history of an animal should embrace the whole in a proper coördination. Their separation is only the natural consequence of the difficulties inherent in the investigations, and of the necessity of