

the most natural series known in the animal kingdom, every member of which exhibits a distinct grade<sup>1</sup> in the scale?

After we have freed ourselves from the mistaken impression that there may be some genetic connection between physical forces and organized beings, there remains a vast field of investigation to ascertain the true relations between both, to their full extent, and within their natural limits.<sup>2</sup> A mere reference to the mode of breathing of different types of animals, and to their organs of locomotion, which are more particularly concerned in these relations, will remind every naturalist of how great importance in classification is the structure of these parts, and how much better they might be understood in this point of view, were the different structures of these organs more extensively studied in their direct reference to the world in which animals live. If this had been done, we should no longer call by the same common name of legs and wings organs so different as the locomotive appendages of the insects and those of the birds? We should no longer call lungs the breathing cavity of snails, as well as the air pipes of mammalia, birds, and reptiles? A great reform is indeed needed in this part of our science, and no study can prepare us better for it than the investigation of the mutual dependence of the structure of animals, and the conditions in which they live.

### SECTION III.

#### REPETITION OF IDENTICAL TYPES UNDER THE MOST DIVERSIFIED CIRCUMSTANCES.

As much as the diversity of animals and plants living under identical physical conditions, shows the independence of organized beings from the medium in which they dwell, so far as their origin is concerned, so independent do they appear again from the same influences when we consider the fact that identical types occur everywhere upon earth under the most diversified circumstances. If we sum up all these various influences and conditions of existence under the common appellation of cosmic influences, or of physical causes, or of climate in the widest sense of the word, and then look around us for the extreme differences in that respect upon the whole surface of the globe, we find still the most similar, nay identical types (and I allude here, under the expression of type, to the most diversified acceptations of the word) living normally under their action. There is no structural difference between the herrings of the Arctic, or those of the Temperate zone, or those of the Tropics,

<sup>1</sup> See, below, Sect. 12.

<sup>2</sup> See, below, Sect. 16.