

summer to the winter of the great year before alluded to\* — the migratory movement will be directed constantly from the poles towards the equator; and for this reason the species inhabiting parallel latitudes, in the northern and southern hemispheres, must become widely different. For I assume on grounds before explained, that the original stock of each species is introduced into one spot of the earth only, and, consequently, no species can be at once indigenous in the arctic and antarctic circles.

But when, on the contrary, a series of changes in the physical geography of the globe, or any other supposed cause, occasions an elevation of the general temperature, — when there is a passage from the winter to one of the vernal or summer seasons of the great cycle of climate, — then the order of the migratory movement is inverted. The different species of animals and plants direct their course from the equator towards the poles; and the northern and southern hemispheres may become peopled to a great degree by identical species. Such is not the actual state of the inhabited earth, as I have already shown in my sketch of the geographical distribution of its living productions; and this fact adds an additional proof to the geological evidence, derived from independent sources, that the general temperature has been cooling down during the epochs which immediately preceded our own.

I do not mean to speculate on the entire transposition of a group of animals and plants from tropical to polar latitudes, or the reverse, as a probable or even possible event; for although we may believe the mean annual temperature of one zone to be transferable to another, we know that the same climate cannot be so transferred. Whatever be the general temperature of the earth's surface, comparative equability of heat will characterize the tropical regions; while great periodical variations will belong to the temperate, and still more to the polar latitudes. These, and many other peculiarities connected with heat and light, depend on fixed astronomical causes, such as the motion of the earth and its position in relation to the sun, and not on those fluctuations of its surface, which may influence the general temperature.

Among many obstacles to such extensive transference of habitations we must not forget the immense lapse of time required, according to the hypothesis before suggested, to bring about a considerable change in climate. During a period so vast, the other causes of extirpation, before enumerated, would exert so powerful an influence as to prevent all, save a very few hardy species, from passing from equatorial to polar regions, or from the tropics to the pole.†

But the power of accommodation to new circumstances is great in certain species, and might enable many to pass from one zone to another, if the mean annual heat of the atmosphere and the ocean were greatly altered. To the marine tribes, especially, such a passage would be possible; for they are less impeded in their migra-

\* See above, chap. vii.

† See above chaps. vi. vii. and viii.