

picture which is at present offered to us by the distribution of animal and vegetable species.

There is yet another important circumstance to be mentioned here, which is likewise of great importance for a complete explanation of this varied geographical picture, and which throws light upon many very obscure facts, which, without its help, we should not be able to comprehend. I refer to the gradual *change of climate* which has taken place during the long course of the organic history of the earth. As we saw in our last chapter, at the beginning of organic life on the earth a much higher and more equal temperature must have generally prevailed than at present. The differences of zones, which in our time are so very striking, did not exist at all in those times. It is probable that for many millions of years but one climate prevailed over the whole earth, which very closely resembled, or even surpassed, the hottest tropical climate of the present day. The highest north which man has yet reached was then covered with palms and other tropical plants, the fossil remains of which are still found there. The temperature of this climate at a later period gradually decreased; but still the poles remained so warm that the whole surface of the earth could be inhabited by organisms. It was only at a comparatively very recent period of the earth's history, namely, at the beginning of the tertiary period, that there occurred, as it seems, the first perceptible cooling of the earth's crust at the poles, and through this the first differentiation or separation of the different zones of temperature or climatic zones. But the slow and gradual decrease of temperature continued to extend more and more within the tertiary period, until at last, at both poles of the earth, the first permanent ice-caps were formed.