

*Eighth Law. The older the rock the more unlike the existing fauna and flora are the fossil animals and plants.*

If we compare the plants and shells of the tertiary with those now living, a casual observer would see but little difference. But let the successive groups in the lower rocks be brought into comparison, and the naturalist would be obliged to form new genera and orders for their reception. Still more rapidly do the forms of the higher animals and plants deviate from existing types as we descend.

There are some exceptions to this statement; for some forms are wonderfully persistent. Take, for example, the ammonite and nautilus; how much like the living nautilus! So the terebratulidæ, living and extinct, are closely related. So in the tertiary, although the *Dinotherium*, the *Palæotherium*, the *Zeuglodon*, etc., are quite unlike living forms, yet in the same formation certain small mammifers can hardly be distinguished from those living.

*Ninth Law. The fossil faunas and floras were, for the most part, of a tropical character, whatever be the present climate where they are found.*

Even the tertiary plants and animals agree, for the most part, with those of intertropical regions better than those of temperate regions; and it was essentially the same even in post-tertiary days, when Europe and the United States were filled with elephants, rhinoceroses, lions, tigers, hyenas, etc., though the hair and wool of the Siberian fossil elephant indicate a colder region than the intertropical; but unless warmer than that at present along the shores of the Arctic Ocean, so many of these huge animals could not have subsisted as are found buried there.

As we go deeper into the rocks the evidences of a former tropical, or even ultra tropical climate, multiply. The coal formation especially, which has been traced beyond Melville Island in N. latitude 75°, is decidedly and strikingly tropical everywhere. The old fossil corals found over equally wide arctic regions—at Melville Island, for instance—tell the same story. And so do the numerous and sometimes gigantic chambered shells so widely diffused.

Some facts seem to indicate an occasional alternation of a colder with the tropical climate, at an earlier date than drift, when we know that in northern regions there was a glacial period. Similar temporary reductions of the temperature may have taken place earlier. But these cases do not invalidate the general law of the prevalence of a tropical climate.

Even in the Pleistocene Period, "Grand, indeed," says an English naturalist, "was the fauna of the British Islands. Tigers as large again as the biggest Asiatic species, lurked in the ancient thickets; elephants of nearly twice the bulk of the largest individuals that now exist in Africa or Ceylon roamed in herds; at least two species of rhinoceros forced their way through the primeval forest, and the lakes and rivers were tenanted by hippopotami as bulky and with as great tusks as those of Africa." To these he might have added the great cave bear and cave hyena, two species of huge oxen, and an elk ten feet and four inches high.

*Tenth Law. In the distribution of species in the ancient faunas and floras, they had a much greater range than at present, while in the newer rocks their limits differed but little from existing zoological and botanical provinces.*

In the palæozoic strata animals and plants have a striking resemblance over almost the whole globe. As we ascend, diversity increases when we