

PHYSICAL CHARACTERISTICS OF CANADA.

At this time the entire northern hemisphere was probably peopled by an essentially similar population developing along approximately parallel lines through a more or less free interchange of individuals. These conditions, however, were interrupted by the breaking down of the land connecting the continental areas and the occurrence of the glacial epochs¹, when solid ice covered a large part of the northern hemisphere in North America south to below the Great Lakes. Probably this resulted, over the whole of Canada, in conditions closely approximated to those at present found in Greenland, and a temperate climate did not occur short of the Gulf States. Though these arctic conditions prevailed gradually they none the less inevitably blotted out the original population of the subtropical north.

The species that were of too inflexible a nature to adapt themselves to new conditions, or forsake their ancestral habitats, became extinct and perished entirely; some more adaptable, while they retreated before the face of the oncoming ice, became hardier and capable of living in temperate or sub-arctic climates, and others more easily moved were driven far south, perhaps into South America, where in competition with forms already resident they either triumphed at their expense or succumbed, as the case might be. The survivors under new and various influences evolved into numerous new forms and differentiations more or less distinct from the original stock. These conditions prevailed for what can be historically regarded as great periods of time in the process of which an originally continuous and fairly homogeneous world population became a number of isolated units, differentiating along independent and often divergent lines. Some forms in each hemisphere disappeared, specializations of old ones arose, and the bases of the peculiarly characteristic Faunas of the two great continental areas were laid.

On the gradual retreat of the great ice barrier to inter-continental communication at the beginning of the present geological era, many descendants of the species that had been driven south gradually returned, following as closely upon the edges of the withdrawing ice as their natures and requirements permitted. Some were satisfied with their acquired southern homes or were more able to retain them in competition with their neighbours; they remained and probably became the ancestors of our present typically southern genera; but others seized with avidity upon the opportunity to occupy the gradually opening countries to the north, where competition was relaxed, and each succeeding spring advanced as far into them as climatic conditions permitted or competitive necessity demanded. Thus the north again became repopulated, but not with similar forms in both continents. On the contrary, each was supplied with forms made widely dissimilar through their enforced disconnected residence and divergent development.

¹Though here treated for convenience and clearness as but one single occurrence, it should be borne in mind that the glacial epochs were composed of a number of advances and retreats, more or less complete, of the ice cap with various intervals between. This, however, does not seriously alter the zoological results here stated.