

During the Cretaceous age Birds and Mammals became the predominating animals. Of birds there are many varieties among which was a species of the Diver which was about five and one-half feet high. This was a great chalk making period, as is indicated by its name, the chalk being formed under salt water. This fact is a great aid in tracing the shape of the continent.

At the close of this period the continent was divided into two parts by a narrow and shallow body of water which reached from the Gulf of Mexico to the Arctic Ocean, covering in the United States what is now Montana, Wyoming, Colorado, Texas and portions of bordering states. The waters of the Gulf, also, reached nearly to the mouth of the Ohio River, the present lower half of the Mississippi Valley having been formed by the detritus which the river has deposited along its banks.

The comparatively large amount of water probably did much toward modifying the climate, for it is found that even so late as the Tertiary age which followed, the climate was mild enough as far north as the shores of the Arctic Ocean, to admit of the life of such animals as the Tiger, Elephant and many others which live only in a warm climate. The remains of palm trees are found as far north as the Upper Missouri. Among the Mammals were the first species of the horse tribe known in America.

There is evidence that during the Tertiary period the Rocky Mountains were raised nearly to their present height, for Cretaceous deposits are found at an elevation of 11,000 feet. At the beginning of the next period, the continent had much the appearance as at present, for the elevation of the land caused the body of water dividing the land to recede nearly to the present limits of the Gulf of Mexico, and the outline of the continent varied but little from that at present.

Perhaps the most interesting period in the history of North America, is the last one, or Quaternary. The first part of this age is called the Glacial, or drift, from the large amount of loose unstratified matter that was distributed over the northern part of North America at this time, and is one much discussed by the geologist of to-day. Over the New England states, the southern part of the Dominion of Canada, the northern part of the Middle States, and west as far as the limits of Minnesota and Iowa, the surface is strewn with boulders, sand, and gravel which must have been

brought from some other locality. Some believe that the land was submerged and this material deposited by floating icebergs, but the most acceptable theory is that known as the Glacial. This supposes that the land was above the sea, and especially in the northern part, at a higher elevation than now, and that all that country where drift occurs was overrun by glaciers. Proof of some such phenomena is given by the drift, parallel scratches, or grooves, in the rocks, and the smooth polished surface of boulders and stones in many places. These great fields of ice moving southernward from the Dominion of Canada did great work in the deepening of valleys and the excavation of lake basins. It is thought that the lakes of New York, Lake Champlain and Lake George, some of the Great Lakes, and the lakes in Minnesota did not exist until after this period.

The great cold of this period was probably due to increased elevation, and consequently came on very slowly. Many of the Tertiary animals, however, were exterminated, and others were driven southward.

Following this age of elevation came one of depression, during which a large portion of the continent was under water. The question of where this water came from has not been satisfactorily answered, but many believe it to be due to the rapid melting of the glaciers. In the region of the Great Lakes there was a great body of fresh water, reaching as far as the southern border of Illinois and Indiana, with an outlet to the Mississippi. At this time the Mississippi was from fifty to seventy-five miles wide, though not so long as at present. Water covered the whole area of the Great Basin.

Then followed another era of elevation. The water in the northern Mississippi Valley was gathered into the Great Lakes, and all that is now left of that in the Great Basin is found in Great Salt Lake, and the lakes in Nevada. Florida was raised above sea level, and the great Valley of California, as the Coast Range began to rise, and cut off from the ocean forming a shallow inland sea. As the sea was filled by streams from the mountains, its waters cut a channel to the ocean. This channel was probably the Golden Gate. The bed of this sea was gradually raised until dry land appeared.

In the Quaternary age mammalian life reached its culmination. Remains of the Elephant are found all through the United States and in Mexico. Fossils of the Mastodon, an enormous