

THE SHIFTING OF THE MAMMALIAN FAUNAS, AS SHOWN BY THE PLEISTOCENE REMAINS OF ILLINOIS*

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A study of the fauna of any region, extending over a short period of time, will show certain changes in the animal population that are due entirely to natural causes; since conditions change, food animals become reduced in numbers through drouths or extended winters, and the correlated animals must move and re-adjust their numbers. Many of these shifts in the population appear to be without cause and are due simply to the wandering spirit, while others are correlated closely with actual changes in conditions. A study of a region for a long period of time will show marked changes and a great reduction or a complete dropping of the large groups. Sometimes descendants are left in the original home; sometimes survivors are to be found in regions far distant from the original home; sometimes entire groups disappear and leave no traces behind them but their bones in the rocks.

When man enters a region, rapid changes are likely to take place in a very short time. He first hunts and traps until certain animals are reduced or exterminated. The hunter is followed by the rancher who fences large areas, or leaves it open and grazes it, and as a consequence eliminates certain types of the fauna. The next man to follow is the farmer or agriculturist who fences and cultivates the land, cuts off the forests, drains the lakes and swamps, and changes the water courses. As cities grow up, the water courses are contaminated with their waste until they cannot support life, and another portion of the fauna disappears. A survey of Illinois for the last hundred years will show just such a shift, with the larger animals and many of the smaller ones driven out or reduced by the activities of man. The bison, deer, bear, beaver, and even the wolves have left us, although the wolf will remain longer than almost any

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other medium sized animal. On the western plains the coyote breeds and raises a family almost within the limits of towns of fifteen thousand. Smaller forms, such as mink, muskrats, and foxes, now find few localities where they can live in anything like their natural conditions.

A study of the life of a longer period will show changes in which man has had no part and has been no factor. It is of this period that this paper gives a sketch. If we go back into Tertiary times we find the Americas populated with a strange assemblage, a small part of which foreshadows the life of the present day. Ancestral horses, camels, the rhinoceroses, tapirs, and many other interesting forms were working out their evolution in different parts of the country. The horse went through his evolution from the five to the one toe, sending migrants to Europe at some stage of his development, which was a fortunate thing for us, since our magnificent horse fauna died out long before America was discovered by Columbus, and we have been forced to replenish our horses from those same European migrants of an earlier day. It is difficult to imagine the reason for the extinction of this horse group, for they lived here in abundance and in many forms that were suited to live under many different conditions. It has been suggested that we place the blame for their extermination on some of the protozoan parasites that continue their work even to the present day. The American horses were of all sizes and types. Forms as large as the draft horses of the present day, and ponies of many types were scattered over the plains of the latter part of the Tertiary.

The camels, a pure American product, also went through their evolution on the plains of the middle west and western America. They adjusted their bones to the running adaptation with joined metacarpals to form the cannon bone. A large fauna, varying from delicate deer-like types to the great giraffe camel of a later day, scattered their bones in profusion over the land in which they lived. The camels of the present day are the end form of this great population. A migration to Europe is represented by the camels now found in the east, while a

southern migration is represented by the llamas and guanacos of South America.

The rhinoceros came into existence in America and developed into many interesting types here, such as the short legged *Teleoceras*, the large *Metamynodon*, the horselike, running *Hyracodon* and the commoner *Caenopus*. Migrants from this primitive stock gave Europe and the adjoining continents the present day rhinoceros, found now only in southern Asia and Africa. All that we have left are the large masses of bones to be found in the fossil fields of the west. This exchange of animals with the other side was by no means a one sided affair, for we received in return some of our most picturesque types, such as the bear, elephant, moose, elk, caribou, deer, musk ox, mountain sheep and mountain goat.

Woods (1910) in a paper published by the Natural History Survey says that an elk was killed in the state about 1830 and that the bisons were common about 1800. A deer was seen near Homer about 1880. These are the last of the large mammals to remain wild in the state.

If we drop back to Pleistocene times, we shall find a very different fauna living in this state and region. The animals of this period are the ones to be considered in this sketch of the old fauna. The following paragraphs will take up some of the mammals that have lived in or near to this region. Probably all of them could be counted as ancient residents.

The Edentates were represented by three large forms, all migrants from the old stock of South America. *Megalonyx* was to be found from coast to coast, *Myodon* was very generally distributed, while the southern species just reached the borders of the state. The only related form now living in the United States is the armadillo of Texas.

No camel has been reported from this region, as they were to be found in the west.

The Bovidae were numerous and some forms continued down to comparatively recent date. The bisons left the state about 1800. In time prior to this two other bisons were to be found here, *Bison latifrons* and *Bison antiquus*. These last two were from an older stock that was

replaced by the modern bison. Two musk ox are recorded from the state, a very old one, *Symbos cavifrons*, and the modern *Ovibos moschatus* that probably followed the ice from his northern home.

A peccary was fairly common here in the form of *Platogonus compressus*. His relative, the peccary of the south, now lives in parts of Texas and south of the Rio Grande.

The tapir was of an old type, *Tapirus haysii*. The tapir fauna of the present day is to be found only in Central and South America and in Southern Asia.

Of the large horse group only two have been found in this region, *Equus complicatus* and *Equus fraternus*. They died out with the rest of the horses and left their bones in the state.

The elephants, of African origin, came over early in the Tertiary and scattered over the Americas. Three of this magnificent group lived in this region, *Elephas primigenius* or the mammoth, *Elephas columbi*, a much larger type, and the swamp loving *Mastodon* of the wet, wooded regions, *Mastodon americanus*. At the present time the elephant is to be found only in Africa and Asia.

All of the larger members of the deer group were to be found in this region, the elk, moose, the caribou, and the smaller *Odocoileus virginianus*. Although all of these forms are still to be found, they are far removed from this central region.

The bear left sometime before 1800, and has been driven gradually to more uncivilized parts where he is not in such close contact with man.

One very interesting mammal, *Castoroides*, a large beaver-like animal, lived here as the original deforesting agent. As large as a small black bear in size, his onslaught on the trees must have been terrific. If the modern beaver can cut a cottonwood four feet in diameter, what must have been the size of the trees that this fellow would cut? This form was quite widely scattered over the country.

This picture of the shifting of the faunas delights the students of geographical distribution and enlivens the labors of the palaeontologist and the student of compar-

ative anatomy, but unfortunately, such movements will never occur again, for the larger mammals are located probably where they are to meet their doom, for those unprotected by man are on their way to extinction. The highest mammal, man, now covers the face of the earth and any other mammal must give way to make more room for him. It is pitiful to see the last stand of the buffalo on his protected ranges where man keeps a rigid watch over him to protect him from other men. The free running antelope finds himself running between great stretches of barbed wire, where once nothing but the horizon bounded his domain. The elk must depend upon the bounty of man for his winter food, since his winter ranges with their supply of hay have been utilized by the rancher for his herds. The African game is going the way of the buffalo in America. The enormous herds of roving mammals have been thinned to the danger point, and will disappear shortly unless they are protected in certain restricted and suitable ranges, where they can be kept for the future generations to see and enjoy.

BIBLIOGRAPHY.

- Baker, F. C., (1920). The Life of the Pleistocene or Glacial period.
Osborn, H. F., (1910). The age of Mammals. 1913.
Scott, W. B., History of the land mammals of the Western Hemisphere.
Woods, F. E., (1910). A Study of the mammals of Champaign County, Illinois.
Bulletin of the Illinois State Laboratory of Natural History, Vol. VIII, Art. V.