Birds That Never Came Back

Paleontology

The annual southward flight of all but the hardiest of birds at the close of summer may be taken as a kind of epitome of a greater drama that is written across the geological records in the rocks of America. For what happens on a small scale every year apparently occurred on a grand scale a long time ago, when the Arctic came south not for a few months' visit but for a stay of nearly half a million years—the long glacial winter which men of science call the pleistocene.

Nearly four million years of summer had preceded this vast southward march of seemingly endless snowstorms that piled into mile-thick ice. Four million years of mild climate, of paradise for birds, of no need for long migrations, during which they could deploy and evolve into feathered forms which the world had never seen before and which it will never see again.

Many of them were doubtless beautiful; the larger of them, whose fossils have naturally survived more frequently than those of the delicate-boned little species, were strange and terrible.

These bigger birds had their day, but when the long winter of the ice age loomed they could not migrate, and so they ceased to be. Only their bones now remain to puzzle scientists and make museum visitors gasp in wonder.

One of the most ancient of these fantastic avian nightmares has received the name of *Hesperornis,* which Englishes into "bird of the west."

Hesperornis swam and dived in the shallow seas that covered large areas of the interior of North America back in the Cretaceous period, from 55,000,000 to 120,000,000 years ago. He had wings but he could not fly. He had legs and feet but he could not walk. He had teeth like a fish and he was almost as much at home in the water as a porpoise.

Yet *Hesperornis* was a true bird and not merely an experimental attempt of nature to fasten wings on a reptile, such as is represented by the well-known *Archæopteryx* of the Old World with its lizard's tail and teeth.

This curious creature stands very close to the foot of the historical ladder of bird life in North America. It is represented today by several practically complete skeletons in

AN IDYLL of the Upper Jurassic: The Courtship of the Archæornis

which five species can be recognized.

"These birds," says Dr. Alexander Wetmore, assistant secretary of the Smithsonian Institution, "seem to have fed on fish which they captured by diving. They were so adapted for aquatic life that they had entirely lost the power of flight. The legs projected at right angles from the body so that it is doubtful if the bird could stand on them at all. Hesperornis, it appears, presented the most highly specialized development for aquatic life of any bird yet known. It traveled through the water by propulsion of its tremendously powerful feet, which are of such form and have such size in relation to the remainder of the skeleton that it is probable that at need the bird could develop the speed and agility in turning around of the modern shark or porpoise."

One other toothed bird existed in North America in the Cretaceous period, but compared to the nightmare-like *Hesperornis* it presents quite a commonplace picture. This was Ichthyornis, a genus in which seven species have been recognized from the fossil remains.

Ichthyornis was only about as large as a common pigeon. "The neck," says Dr. Wetmore, "was long and the head was large and strong, with long jaws implanted with many small, sharply pointed, recurved teeth set in sockets. The wings were large, long and strong, the breast-bone heavily keeled and the legs and feet comparatively weak. *Ichthyornis* was developed pre-eminently for flying. It flew by feathers and not by means of a skin membrane, as do bats."

An odd feature of Ichthyornis was the fact that the vertebræ have the form found in fish and some amphibians, and which is duplicated in no other birds, living or dead.

Throughout the Cretaceous period the birds were clinging close to their reptilian ancestry but with the dawn of the next geological period, the Tertiary, there is a sudden change. The teeth have disappeared. The fossil forms found are more like modern types, so that many of them have been placed in existing families of the feathered creatures of earth.

Approximately 25 species have been described from the eocene, the first time division of the Tertiary period, but some, Dr. Wetmore says, have been named from very inadequate material and may not be birds at all.

Most notable of the new birds found in North America at this time was the *Diatryma Steini.* A nearly complete skeleton of this bird has been recovered in Wyoming. It was nearly seven feet high. It has strong legs, a heavy head, a great arched bill and very small wings. It probably was a flightless land creature. It has been placed near the rails and cranes, although the relationship is not very close.

At about the same time—possibly a little later—there existed in eastern Patagonia another huge winged creature, *Phororhacos.* It was larger than an ostrich. It had a remarkably heavy skull, as large as the skull of a horse, to which the legs, huge as they were, bore no adequate proportion. *Phororhacos* has been described as like "a great, thick-legged ostrich with the head of a still greater hawk," and very likely he would not have been a pleasant fellow to encounter unarmed.

It was during the latter part of the Tertiary period, the miocene and pliocene eras, that the modern forms had their origin. Then the great tree-top choirs came into being. This, in fact, may have been the golden age of the feathered creatures.

Says Dr. Wetmore: "It seems probable that (*Turn to next page*)

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the bird life of the miocene and pliocene was even more varied and wonderful than that of today and that a larger number of species may have existed. Climatic conditions in that time had not developed such sharply marked zones as in the recent period. Though the temperature was not oppressively warm it was moderate and fairly uniform at points much farther north than under modern conditions.

"Forms that we now consider as sub-tropical then ranged north into northern Nebraska, and probably farther. The present number of species in tropical and sub-tropical sections of America is much greater than in the temperate zone. Ecuador has approximately the same area as California. The known bird life of Ecuador, at present numbers 1,508 forms, more than the whole of North America north of Mexico, while that of California at the end of 1924 included only 594 species and subspecies.

"By analogy you may support a rich and highly varied bird life for the miocene and pliocene periods in North America, a fauna that since has been in part exterminated and in part restricted to more southland latitudes. Further research may be expected to increase considerably the list of fossil forms from this section of geologic time."

Then came the ice. The great glaciers crawled down over blossoming sub-tropical swamps, bringing with them the cold and the storms and creating a vast desolation. They drove the birds before them through the long, dreary centuries. Many species became extinct. In pleistocene beds, Dr. Wetmore says, there are remains of 50 species which have no living representatives although they are closely approximated by some existing forms, and 105 species of birds which survived and are alive today.

The ice retreated and the birds came back. Once again the dewy tree-tops were musical with their voices but they did not have long, geologically speaking, to enjoy themselves. Their greatest enemy was at hand. Already strange ogre-like beasts were crouching on a river bank in Java or even gnawing rhinoceros bones in front of caves in central Germany. The retreat of the ice also marked the emergence of the greatest enemy bird life has ever known, Man.

Man, it is true, had no wings to follow the birds into the tree-tops and into the blue skies. But he invented deady flying things to pursue them—stones from slings, arrows from bows, and finally bullets from guns.

Following the increase of man over the earth, says Dr. Wetmore, "there has been a steady reduction and extermination among birds, a process that will continue in spite of protective regulation until most of the peculiar forms have disappeared and only the more adaptable ones remain."

Few chapters of the book of the rocks are more fragmentary or more difficult to decipher than that dealing with the birds. Concerning the mammals, the amphibians and the reptiles long, detailed and picturesque chapters are presented in the hieroglyphics of fossils. There are approximately 25,000 living bird families in the world. There are only about 700 fossils that have been found to tell the story of the birds of the past, and many of these are so fragmentary that it is stretching a point to consider them as representatives of birds at all.

Of all those that have lived in North America throughout time only 259 left any remains, so far as is known.

There must be a peculiar combination of circumstances in order to produce large beds of bird fossils. Such conditions doubtless obtained when the deposits in Fossil or Christmas Lake in Oregon were laid down. Here hundreds of bones of birds have been discovered.

In the pleistocene this probably was a small, alkaline lake, similar to some which still exist in that area. Now in the past few years hundreds of thousands of water fowls have been destroyed by a peculiar malady known as "duck-sickness" which has been especially prevalent in the deltas of streams flowing into Great Salt Lake, but is known also in the neighborhood of smaller alkaline lakes.

The water birds are affected by excessive concentrations of alkali in the waters in which they feed, and become paralyzed and die unless they can have immediate access to fresh water. The number of individuals killed in this way in the last twenty years, Dr. Wetmore says, runs into the millions. Christmas Lake probably killed them in the same way during pleistocene time.

Great numbers of fossil bird bones have also been recovered from the famous Rancho La Brea in the suburbs of Los Angeles. Here outpourings of asphalt from the depths of the earth have been exposed in such a way that animals were trapped and held in the sticky embrace of the substance until they died. Then the bones were preserved for centuries, many of them in perfect condition, in a bed of tar.

The Rancho La Brea deposits were laid down during the first interglacial period, it is believed, and they contain the remains of the largest creature that ever flew with wings, the giant *Teratornis Merriami,* exceeding in wing spread the modern condors. It is represented by an almost complete specimen.

Another species very abundant in these deposits is a bird supposed at one time to be a peacock, but now admitted to be a species of turkey.

Two-fifths of the forms found in the Rancho La Brea deposits are extinct, Dr. Wetmore says. Nearly 60 species have been identified and as yet the smaller forms, the perching birds in particular, have not been studied carefully.

Of the Christmas Lake deposits only one is held to be generally distinct from modern birds. Most of the genera might be expected in this area today, but there is one flamingo which exists now only in warm climates in the Northern Hemisphere. This, Dr. Wetmore says, does not necessarily indicate that Oregon was warmer than it is now when the deposits were laid down because a somewhat similar species ranges and nests through Patagonia, where the summer weather often is cold and inclement.

From New Jersey have come the remains of a genus known as *Paleotringa* which bears some slight resemblance to our modern snipes. Another type has been placed among the rails and still another with the ducks, geese and swans.

The skeletal remains of these species are very slight, however, and Dr. Wetmore questions the wisdom of grouping them with any modern families of birds which are familiar to Americans of the present day.

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The number of Americans in Mexico has decreased from about 75,000 in 1911 to about 20,000 at present.