Birds

Evolution and Classification

- Birds are Vertebrates of the Class Aves
- The evolution of warm-blooded, has enabled birds to survive in virtually every known environment

Origin and Early Evolution

- Evidence from fossils and from studies of comparative anatomy indicates that birds evolved from reptiles
- Their features and their fragile hollow bones do not preserve well.

Archaeopteryx

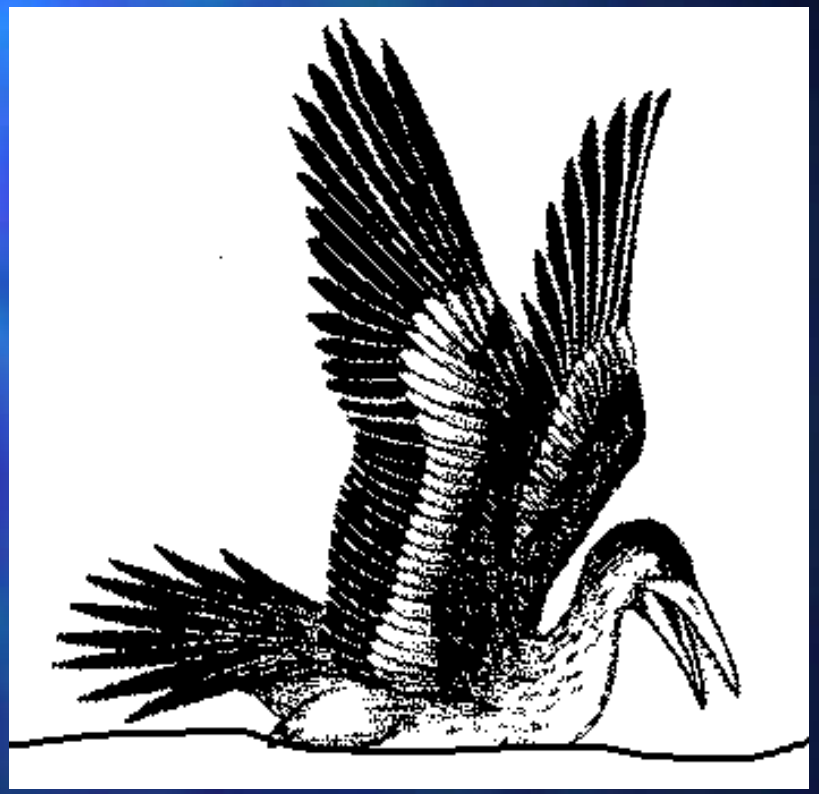
- The fossil genus Archaeopteryx link between reptiles and birds, these mammals possessed characters of both reptiles and birds.
- Like reptiles it had a large skull with teeth, bones that weren't hollow, claws on its forelimbs, and a long tail.
- Its strong legs and rounded wings indicated that it glided rather than flew

Archaeopteryx

- In contrast, the presence of feathers and of a furculum, the fused collarbones commonly called the wishbone, suggest that Archaeopteryx was birdlike
- After Archaeopteryx the next bird fossil dates from about 90 million years ago, in the Cretaceous period.

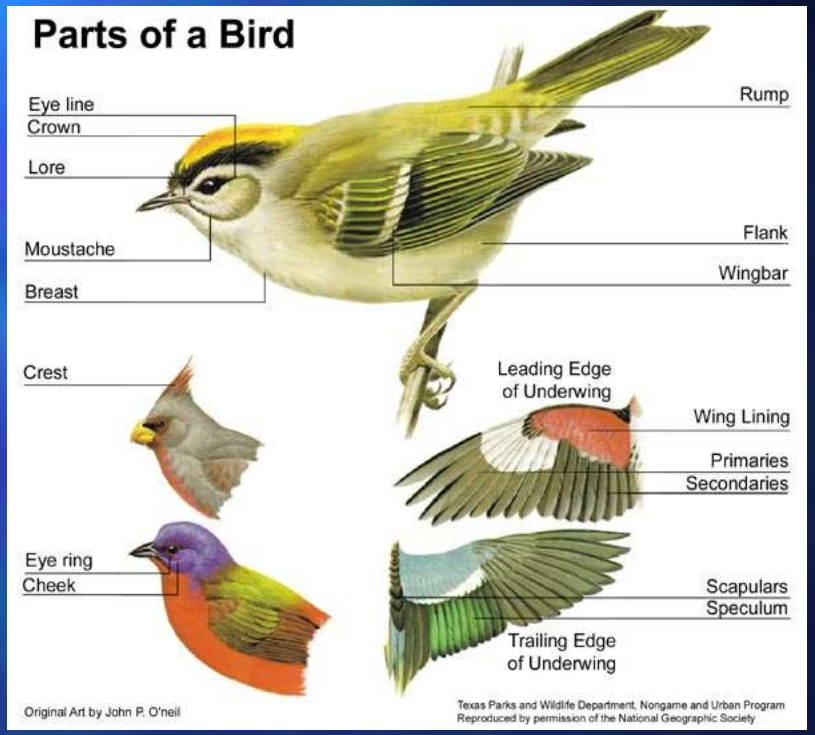
Hesperornis

- Hesperornis, a large, flightless, driving bird, probably resembled the modern loon but had reptilian teeth.
- A smaller ternlike bird called Ichthyornis had large wings, indicating that it may have been a strong flier.
- The development of sustained flight may have been enabled birds to colonize new areas during the Cretaceous.



Classification

- Most taxonomist classify the nearly 9,000 species of Class Aves into 27 orders
- To classify birds into orders and families taxonomists most often use morphological evidence from beaks, feet, plumage, bone structure, and musculature.



Characteristics of Birds

- The following characteristics distinguish birds from other Vertebrates:
- Body covered with feathers
- Bones are thin and hollow
- The forelimb function on wings I used for flight not grasping
- The two hind limbs, with clawed toes support body
- A toothless, horny break in present
- Body temperatures is generated and regulated internally
- The 4-chambered heart has a single right aortic arch
- Amniote eggs are encased in hard, calcium-containing shells.
- Most species eggs are incubated in a nest.

External Characteristics

- Soft, fluffy down feathers cover body of nestling birds and provide and insulating undercoat for adults.
- Contour feathers give adult birds their streamlined shaped and provide coloration and additional insulation
- Flight feathers are specialized contour feathers on the wings and tails
- Hairlike Filoplumes, or pinfeathers, and dust filtering bristles near nostrils

Feathers Continued

- Feathers develop from thing pits in the skin called follicles
- At maturity each vane has many branches called barbules that are equipped with microscopic hooks.
- In the process called preen gland located at the base of the tail.
- The major molt, during which the birds replaces its flight feathers, occurs in the late summer between breeding and migration.

Beaks and feet

- Hawks and eagles have powerful break and clawed talons that help them capture and then rip their prey.
- Swifts have a tiny breaks that opens wide like a catcher's mitt to share insects in midair.
- The feet of flightless birds, on the other hand are modified for walking and running

Skeletons and Muscles

- Combine lightness and strength
- Bones are thin and Hallow
- The fused bones of the trunk and hip vertebras and the pectoral and pelvic girdles
- Fused bones form a sturdy frame that anchors the powerful breast muscles during flight and supports the muscles when a bird is walking or at rest.

Skeleton

- The sternum supports the large breast muscles
- The humerus, ulna, and radius, along with the pectoral girdle and the sternum, support the wing.
- The pygostyle, the terminal vertebra of the spine, support the tail feathers, which also play an important role.

Endothermy

- Generate and regulate body heat internally
- Enables birds to inhabit both cold and hot climate
- Body temperature ranges from 40- 46 degrees Celsius.
- To help conserve body heat, birds fluff out there feathers to insulation.

Digestive and Excretory system

- Food passes from the mouth cavity straight to the esophagus.
- Enlargement of the esophagus called the crop stores and moistens food.
- In the first chamber, The proventriculus, gastric fluids begin breaking down the food.
- Then passes through the gizzard, a muscular organ that kneads and crushes the food