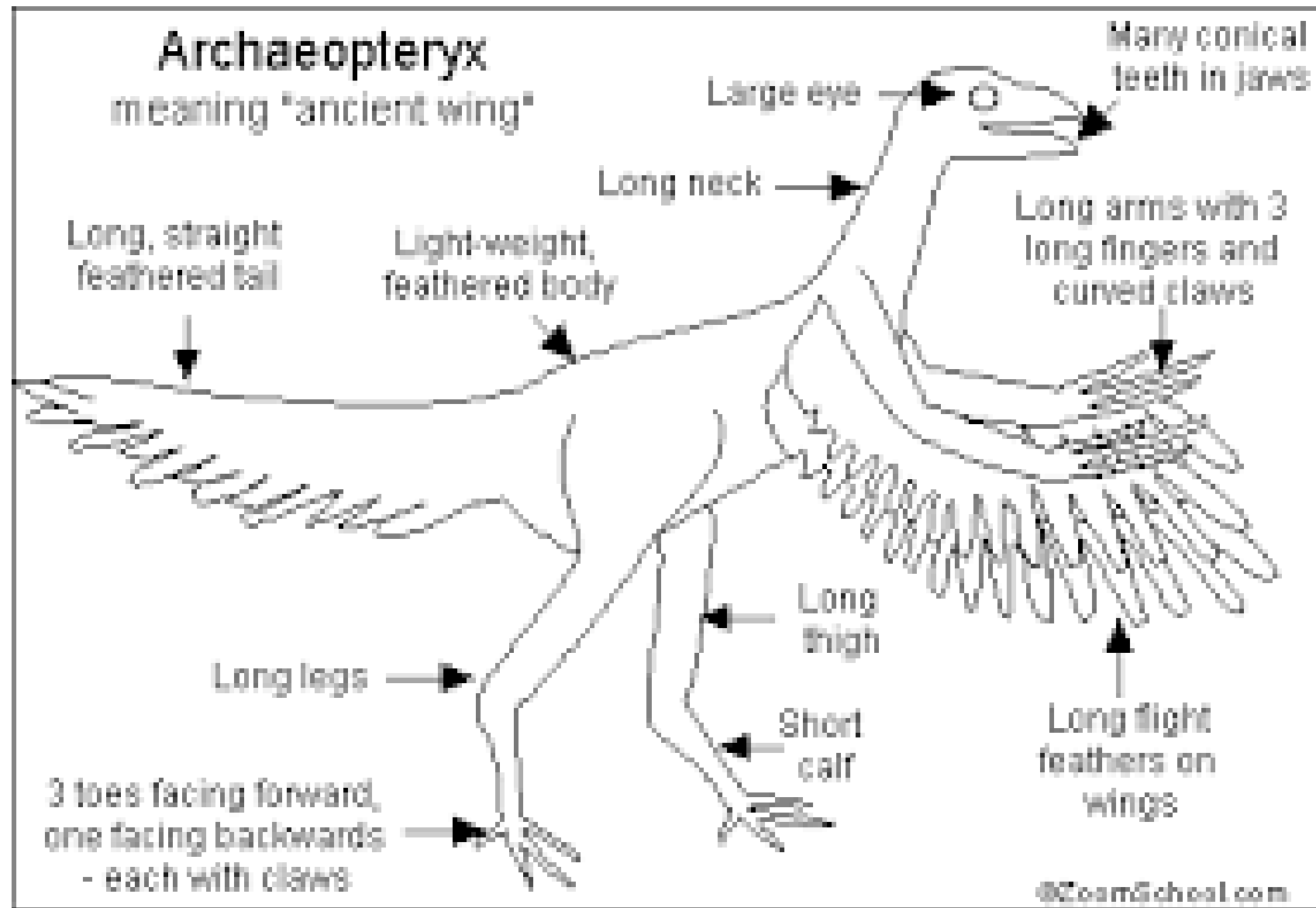




Archaeopteryx

A connecting link between reptiles and birds



Introduction

Archaeopteryx means the ancient wing. Archaeopteryx occupies a great position in avian phylogeny. After the discovery of fossil of Archaeopteryx, it is now confirmed that birds originated from reptiles. Fossil records show that Archaeopteryx provides an admixture of reptilian and avian character. So, the study of Archaeopteryx is significant for its evolutionary position.

HHMI Video

- <https://youtu.be/z4nuWLd2ivc>

History

History :- ① Wagner (1861) first discovered Archaeopteryx in Solnhofen lithographic state in Bavaria, Germany.

Von Meyer (1863) named it as Archaeopteryx lithographica.

② Dines (1977) discovered 2nd species ⁱⁿ Solnhofen limestone as Archaeopteryx.

③ 3rd species was discovered in 1956 from Lageraltheimer, Laardt quarry.

④ Ostrom (1973, '74) discovered the 4th species which has been kept and mislabelled in Taylor Museum of Holland as Pterosaurs since 1855.

⑤ Wullenkofer discovered the 5th sp. from Eischstätt named as Archaeopteryx.

⑥ Wullenkofer (1988) discovered the 6th sp.

Time of origin

Time of origin:-

Ostrom (1974) suggested that Archaeopteryx originated in Jurassic period (about 160 million years ago). Walker (1977) believed that Archaeopteryx originated in late Triassic period.

Reptilian and Avian features of Archaeopteryx

ANATOMICAL PECULARITIES:-

Archaeopteryx consist of both reptilian and avian features, hence it is regarded as TRANSITIONAL LINK between two phylogenetic status.

Reptilian features

E-content prepared by Dr. Roli Shukla Ray, Assistant Professor of Zoology,
Durgapur Government College

Point	Features	Remark
Skull	<ol style="list-style-type: none">1. Diapsid skull2. Single occipital condyle	Like reptiles
Teeth	Homodont and thecodont dentition	Like thecodont dinosaur
Vertebra	<ol style="list-style-type: none">1. Few cervical vertebrae2. Long tail with 20-21 caudal vertebrae3. 6 sacral vertebra	Like reptiles
Ribs	Presence of abdominal ribs	Like reptiles
Sternum	Flat and cartilagenous	Like reptiles
Limbs	Tibia and fibula are of same length Forelimbs with three clawed digits and hindlimbs with four clawed toes	Like reptiles Like Theropod dinosaur

Reptilian features

E-content prepared by Dr. Roli Shukla Ray, Assistant Professor of Zoology,
Durgapur Government College

Point	Features	Remark
Girdle	Scapula slender Pubis and ischium rod like, parallel and backwardly directed	Like reptiles Like ornithischian reptiles
Locomotion	Bipedal locomotion	Like bipedal dinosaurs
Bones	None of the bones are hollow	Like reptiles
Brain	1. Elongated cerebral hemisphere 2. Small cerebellum	Like lizards

Avian features

E-content prepared by Dr. Roli Shukla Ray, Assistant Professor of Zoology,
Durgapur Government College

Point	Features	Remark
Skull	Large orbit	Like modern birds
Exoskeleton	<ol style="list-style-type: none">1. Presence of remiges and retrices2. Scales on limbs3. Presence of claw	Like birds
Girdle	<ol style="list-style-type: none">1. Scapula slightly curved and sword like2. Presence of pubic symphysis	Like birds Like ostrich
Limb bones	<ol style="list-style-type: none">1. Forelimbs are modifies into wings2. Tarsus and metatarsus fused3. Hallux opposable and backwardly directed for perching	Like birds
Locomotion	<ol style="list-style-type: none">1. Gliding flight2. Bipedal locomotion	Like modern birds
Brain	<ol style="list-style-type: none">1. Elongated cerebral hemisphere	Like primitive bird

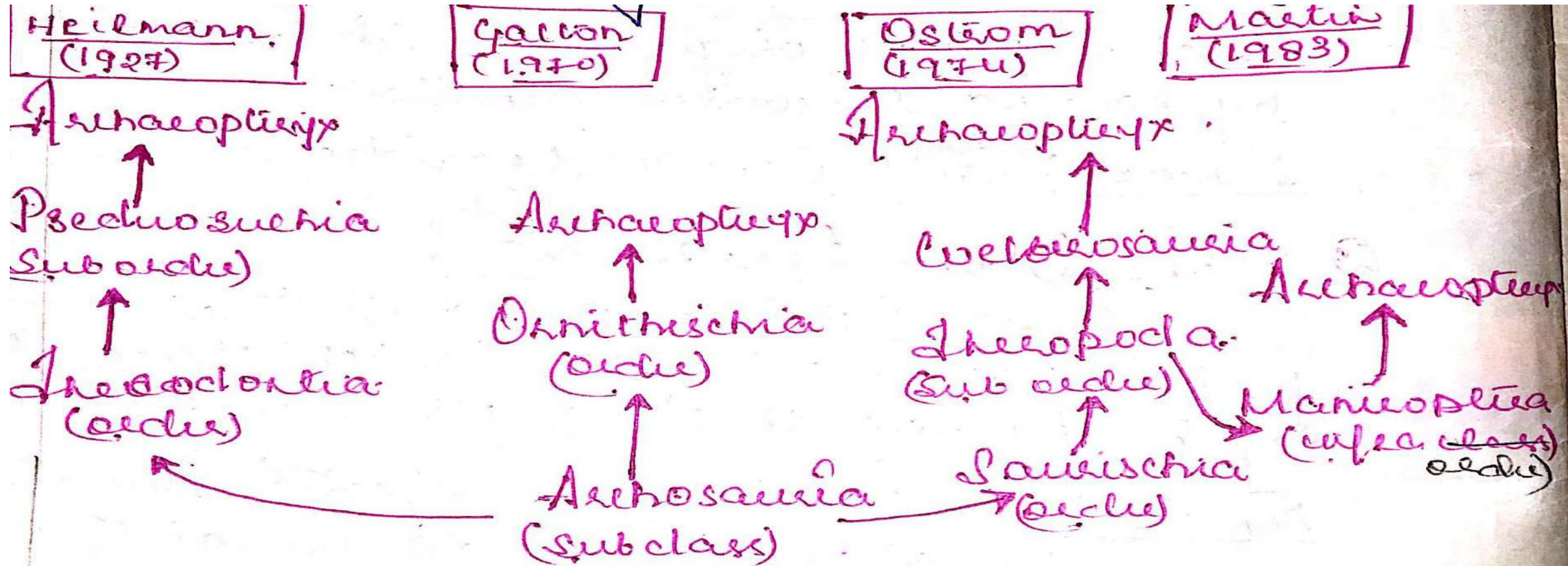
Stock of Origin

Young (1981) suggested that sub-order Theropoda and small bipedal Theropod of infra-order Coelurosauria may be the probable ancestor of because of their bipedal locomotion, smaller fore-limbs than hind limbs.

Martin (1983) suggested that infra-order Maniroptera of Theropoda may be the possible ancestor on the basis of reduction of pre-frontal bones, similarity in feet structure and arrangement of caudal vertebrae.

Mc. Parland et al (1990) supported the Saurischian origin of Archaeopteryx.

Stock of Origin



Different views of probable origin
of Archaeopteryx

Conclusion

Discussion

Discovery of Archaeopteryx gave a first break through in avian origin. Before Archaeopteryx the reptile-like birds (Hesperornis and Ichthyornis) were regarded as the primitive birds.

Archaeopteryx shows combination of both reptilian and avian characters hence the taxonomical position differs from modern birds. Tyde and Beuger (1976) classified it as

Class! Aves.

Subclass! Archaeornithes

Order! Archaeopterygiformes

From evolutionary point of view Archaeopteryx is regarded as transitional link between reptiles and birds.