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## ORIGIN OF FLIGHT IN BIRDS

(1) Cursorial origin: — Nopcea believed that birds evolved from bipedal dinosaur like reptiles which used to run on the ground by the hind limbs. They flapped their fore limbs were stretched to maintain the balance. Hence fore limbs were enlarged and the scales lying on the margin of limbs became expanded to form feathers.

(2) Arboreal origin: — According to this theory pro-aves were arboreal which used to live on trees.

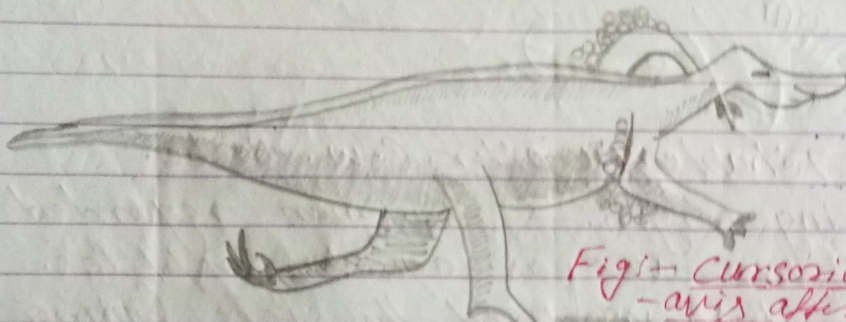


Fig - Cursorial bipedal pro-avis after Nopcea.

According to pair wing theory of Osborn only the fore limbs were used in climbing the trees and also during jumping from one tree to another. This caudal development of patagia b/w the limbs and the body.

According to four wing theory of Beebe, both fore limbs and hind limbs were used during parachuting or gliding from trees to the ground, and also from tree to tree. Later on, the tail feathers took up the duty of hind limbs which remained as legs.

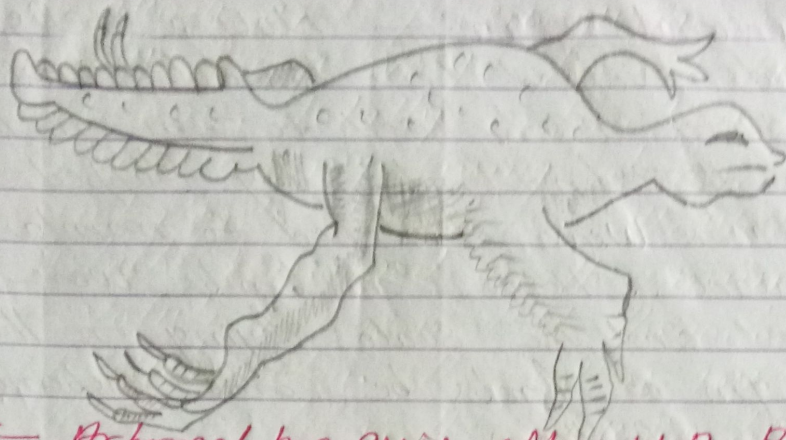


Fig:- Arboreal pro-avis after W.P. Pycraft.

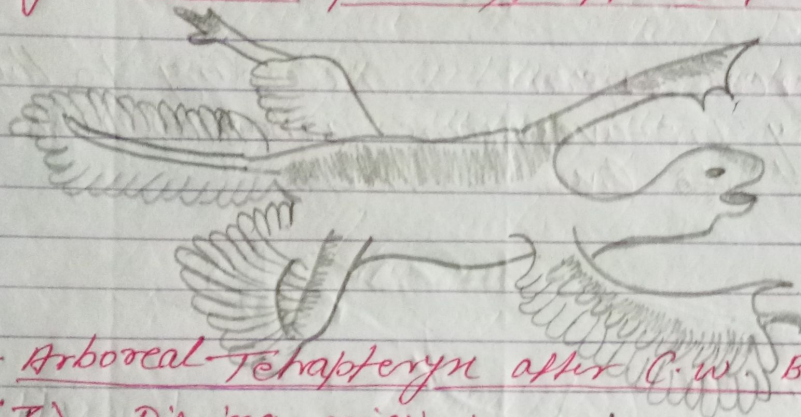


Fig:- Arboreal Pterosaur after C.W. Beebe.

(3) Diving origin:— New man regarded the pro-aves as aquatic reptiles. These pro-aves used the fore limbs together with their membranous and elongated scales or plumes to aid in diving for fishes.

Conclusion:— it can be safely ~~concluded~~ concluded that birds originated from a race of bipedal arboreal reptiles which were in habit to run, jump and glide on the branches of the tree. it happened during mesozoic era. This conclusion also supports gliding origin of flight.