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Discussions among zoologists to search the probable answer emerged in the form of various theories.

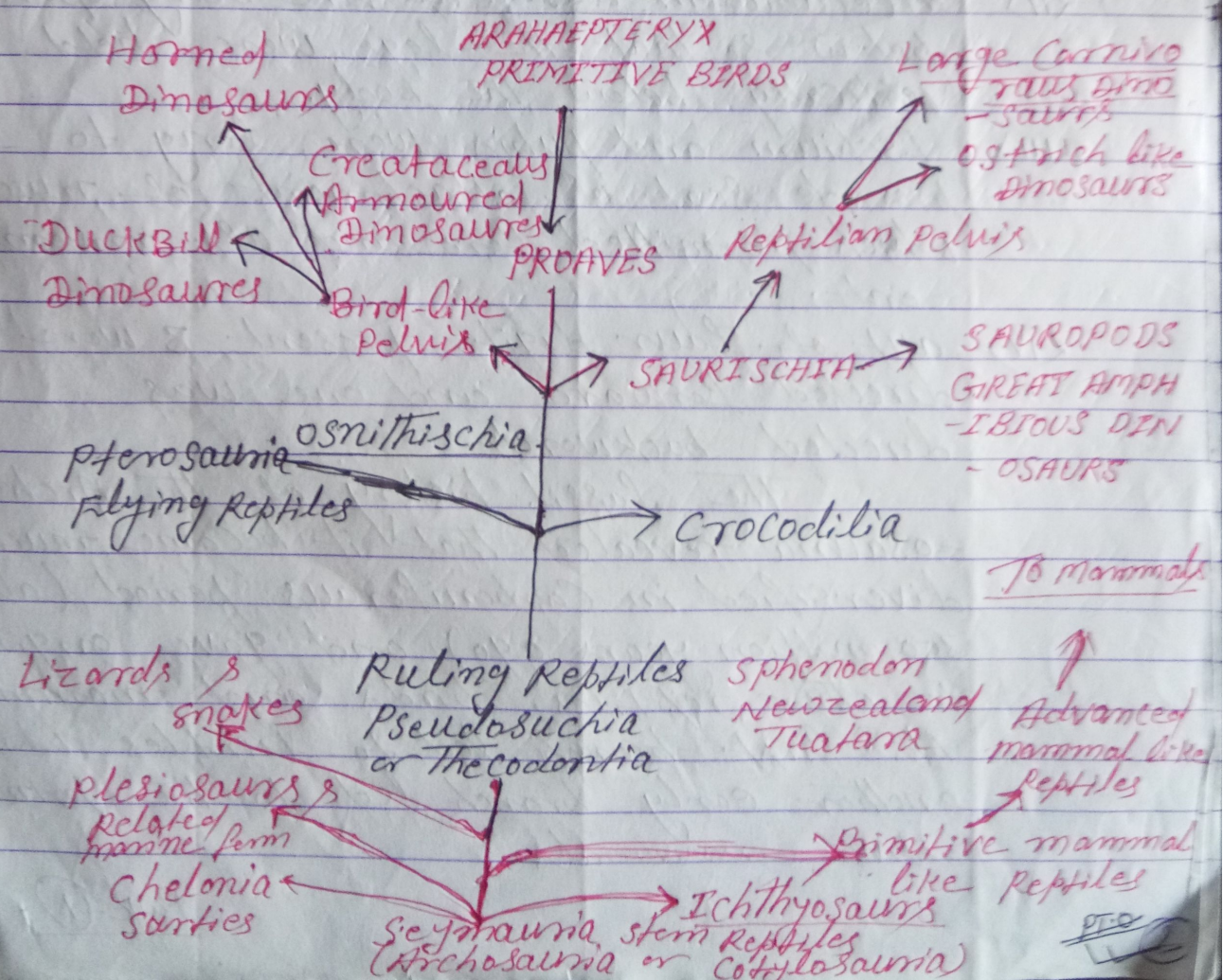
Probable ancestors of birds:

The palaeontological evidences have established that Archosaurian diapsida hold the key of avian ancestry. Archosauria or Cotylosauria exemplified by Seymouria, Euparkeria etc represented an important group of stem reptiles of Carboniferous. This group has several common characters shared by birds.

- (i) Hind limbs were much longer than the fore limbs.
- (ii) Acetabulum was cup like being open below so that the legs were held vertically below the body.
- (iii) Ischium and pubis were long to provide seat of attachment of muscles which permitted fore and aft movement.
- (iv) out of four digits present, 3 were directed forward and one was directed backward.

The fossil history of the Archosauria revealed that it became much diversified in Carboniferous period (about 300 million years ago) and gave origin to other reptiles, birds and mammals. Its first branch led to turtles while another early branch led to the primitive mammals.

Some early branches like Ichthyosauromorpha and Plesiosauroidea flourished only for a very short period and became totally extinct without giving rise to any living descendants. An important branch of the stem reptiles which remained on the main line of evolution was called Thecodontia or Pseudosuchia. The latter gave rise to the Crocodylia, the Saurischia, the Ornithischia, the flying pterosauria & birds (by unknown route). Out of these pterosauria, Saurischia and Ornithischia included some members resembling birds, hence potential probable avian ancestors may be traced among these groups.



Pterosaurs or pterodactyles were light
bodied, membrane winged flying reptiles.
But resemblances were due to adapta-
-tions in response to similar conditions
of life, Hence the view that birds
originated from this group is not accep-
-ted today.

The Saurischian possessed triradiate
pelvis. The ostrich-dinosaur was biped-
-al reptiles and walked on three toes.
The bones were hollow and the skull
was heavily built with a beak like
structure. The number of teeth were
greatly reduced.

The ornithischian or bird like -
dinosaur were also bipedal forms and
possessed essentially avian pelvis. A
pre-dentary bone was present in the
mandible to support the horny beak.
The beak was either edentulous or the
teeth were restricted to the hinder
part of the beak. The digits of fore
limbs were reduced to three and
were possibly modified for grasping.
on the basis of these characters it
was presumed that birds originated from
some bipedal dinosaur. But main objection
to this view is that all the flying birds
including Archaeopteryx have a V-
shaped wish bone or furcula which
is absent in all suggested ancestors.
Hence presently it is believed that
birds originated independently along
a separate evolutionary line from the
Thecodont stem. A Danish scientist

Gerard Heilmann, proposed a hypothetical connecting link to bridge the gap between the first birds and their Theropod ancestors which he named *proaves*.

The presence of flightless and flying birds also provided opportunities to think differently concerning their origin.

P.R. Lowe and some others believe in diphyletic origin of birds. They maintain that the flightless and flying birds of today have descended from different flightless ancestors.

The more commonly accepted view today maintains that birds have monophyletic origin i.e. all birds have evolved from a single ancestor, perhaps close to *Archaeopteryx*. According to this view, the flightless birds have evolved by loss of flight from flying ancestors.