

Examrace

Competitive Exams: Evolution Time Scale: Mammals

Get unlimited access to the best preparation resource for UGC : Get [detailed illustrated notes covering entire syllabus](#): point-by-point for high retention.

The Remains of Early Mammals

The remains of these interesting early mammals, restricted, as they generally are, to jaws and teeth and a few other bones that cannot in themselves be too confidently distinguished from those of certain reptiles, may seem insufficient to enable us to form a picture of their living forms. In this, however, we receive a singular and fortunate assistance. Some of them are found living in nature to-day, and their distinctly reptilian features would, even if no fossil remains were in existence, convince us of the evolution of the mammals.

The southern continent on which we suppose the mammals to have originated had its eastern termination in Australia. New Zealand seems to have been detached early in the Mesozoic, and was never reached by the mammals. Tasmania was still part of the Australian continent. To this extreme east of the southern continent the early mammals spread, and then, during either the Jurassic or the Cretaceous, the sea completed its inroad, and severed Australia permanently from the rest of the earth. The obvious result of this was to shelter the primitive life of Australia from invasion by higher types, especially from the great carnivorous mammals which would presently develop. Australia became, in other words, a "protected area," in which primitive types of life were preserved from destruction, and were at the same time sheltered from those stimulating agencies which compelled the rest of the world to advance. "Advance Australia" is the fitting motto of the present human inhabitants of that promising country; but the standard of progress has been set up in a land which had remained during millions of years the Chinese Empire of the living world. Australia is a fragment of the Middle Ages of the earth, a province fenced round by nature at least three million years ago and preserving, amongst its many invaluable types of life, representatives of that primitive mammal population which we are seeking to understand.

It is now well known that the Duckbill or Platypus (*Ornithorhynchus*) and the Spiny Anteater (*Echidna*) of Australia and Tasmania--with one representative of the latter in New Guinea, which seems to have been still connected--are semi-reptilian survivors of the first animals to suckle their young. Like the reptiles they lay tough-coated eggs and have a single outlet for the excreta, and they have a reptilian arrangement of the bones of the shoulder-girdle; like the mammals, they have a coat of hair and a four-chambered heart, and they suckle the young. Even in their mammalian features they are, as the careful research of Australian zoologists has shown, of a transitional type. They are warm-blooded, but their temperature is much lower than that of other mammals, and varies appreciably with the temperature of their surroundings. * Their apparatus for suckling the young is primitive. There are no teats, and the milk is forced by the mother through simple channels upon the breast, from which it is

licked by the young. The Anteater develops her eggs in a pouch. They illustrate a very early stage in the development of a mammal from a reptile; and one is almost tempted to see in their timorous burrowing habits a reminiscence of the impotence of the early mammals after their premature appearance in the Triassic.

The Next Level of Mammal Life

The next level of mammal life, the highest level that it attains in Australia (apart from recent invasions), is the Marsupial. The pouched animals (kangaroo, wallaby, etc.) are the princes of pre-human life in Australia, and represent the highest point that life had reached when that continent was cut off from the rest of the world. A few words on the real significance of the pouch, from which they derive their name, will suffice to explain their position in the story of evolution.

Among the reptiles the task of the mother ends, as a rule, with the laying of the egg. One or two modern reptiles hatch the eggs, or show some concern for them, but the characteristic of the reptile is to discharge its eggs upon the warm earth and trouble no further about its young. It is a reminiscence of the warm primitive earth. The bird and mammal, born of the cooling of the earth, exhibit the beginning of that link between mother and offspring which will prove so important an element in the higher and later life of the globe. The bird assists the development of the eggs with the heat of her own body, and feeds the young. The mammal develops the young within the body, and then feeds them at the breast.

But there is a gradual advance in this process. The Duckbill lays its eggs just like the reptile, but provides a warm nest for them at the bottom of its burrow. The Anteater develops a temporary pouch in its body, when it lays an egg, and hatches the egg in it. The Marsupial retains the egg in its womb until the young is advanced in development, then transfers the young to the pouch, and forces milk into its mouth from its breasts. The real reason for this is that the Marsupial falls far short of the higher mammals in the structure of the womb, and cannot fully develop its young therein. It has no placenta, or arrangement by which the blood-vessels of the mother are brought into connection with the blood-vessels of the foetus, in order to supply it with food until it is fully developed. The Marsupial, in fact, only rises above the reptile in hatching the egg within its own body, and then suckling the young at the breast.

These primitive mammals help us to reconstruct the mammal life of the Mesozoic Epoch. The bones that we have are variously described in geological manuals as the remains of Monotremes, Marsupials, and Insectivores. Many of them, if not most, were no doubt insect-eating animals, but there is no ground for supposing that what are technically known as Insectivores (moles and shrews) existed in the Mesozoic. On the other hand, the lower jaw of the Marsupial is characterised by a peculiar hooklike process, and this is commonly found in Mesozoic jaws. This circumstance, and the witness of Australia, permit us, perhaps, to regard the Jurassic mammals as predominantly marsupial. It is more difficult to identify Monotreme remains, but the fact that Monotremes have survived to this day in Australia, and the resemblance of some of the Mesozoic teeth to those found for a time in the young Duckbill

justify us in assuming that a part of the Mesozoic mammals correspond to the modern Monotremes. Not single specimen of any higher, or placental, mammal has yet been found in the whole Mesozoic Era.

Developed by: [Mindsprite Solutions](#)