

f11 Early large ungulates < five toed >

The first mammals to achieve large size were ungulates.

In the exuberance of Paleogene evolution, one line of hornless rhinoceroses, extinct by the end of the Lower Miocene, produced the *largest land mammals* ever (17 feet high at the shoulder) that spread though Asia (Mongolia, Baluchistan, and southern Russia). One genus, *Indricotherium*, (built somewhat like a heavy giraffe), Brenhard Kummel described as “so big that a procession of soldiers in ranks of six could easily pass under its belly as under a triumphal arch.”¹ Other rhinoceroses, that became extinct, had evolved to live as do hippopotamuses.

Primitive ungulates that became extinct by the end of the Eocene were all five toed animals. Condylarths and amblypods are Paleocene orders of these extinct animals. They walked plantigrade (flatfooted) and each toe ended in a small hoof. Condylarths remained light boned. Amblypods were stocky. Species of the genus *Coryphyodon* (resembled a hippopotamus) had saberlike canine teeth (possibly for defense) and species of the genus *Uintatherium* (rhinoceros sized) were the largest land animals of the Eocene. By contrast, rhinoceroses then were gracile small animals.² □

(Topic f10 cont.) (beach) beds. Possibly they lived like pinnipeds (seals, walruses). *Indocetus* ingested seawater—its fossils have only been found in marine beds.¹³ Early Eocene cetaceans possess a characteristic exclusive to order Artiodactyla: a postcranial double-pulleys astragalus (in shape like the sheep ankle bones that the Romans used to play at knucklebones).¹⁴ So, near the beginning of the Age of Mammals cetaceans were with the form of large wolves but greatly different being in the clade that does not include those carnivores but includes today the herbivore hoofed animals (artiodactyls) with an even number of toes, which include cows, sheep, goats, pigs, deer, and hippopotamuses, and now we know also cetaceans, which include whales, dolphins, and porpoises.¹⁵

Reprise

The ungulates that would evolve into whales once roamed the continents with carnivore pretensions. But for them hoof lost out to claw and they gave up their terrestrial lifestyle for one under the waves. Ancient whales *pari passu* diminished their legs and pelvises and developed the characteristic fluked tail that propels the leviathan when it flexes its back up and down. The oldest transitional land-cetacean forms are 55 million years old (beginning of the Eocene). Living whales have no visible hindlimbs, but some have internal finger-size bones that are vestiges of hips and legs. □

Footnote f12.1 Order Sirenia: Manatees (seacows) and dugongs

Modern sirenians are completely aquatic. These marine, aquatic plant-grazing herbivores frequent warm-water coastal lagoons and estuaries. Being mammals they need to surface about every five minutes although they can remain submerged up to thirty minutes when sleeping. Manatees in Floridian waters have the status of Endangered Species. Half of all known deaths are caused by people and most are due to collision with speeding watercraft with a life-occurrence rate in adult manatees, according to Edmud Gerstein in 2002, of about 5 hits.¹

Since 1990, at Seven Rivers, Jamaica, abundant remains of sirenians have been collected from sediments (siltstones and sandstones) of a lagoonal (or estuarine or deltaic) depositional environment early middle Eocene in age. From these, Daryl P. Domning described in 2001 how obligatorily aquatic life (flipperlike forelimbs and no hindlimbs) evolved from Eocene sirenian land-dwellers (with four well-developed legs, and strong backbone to pelvis connection that could support the weight of the body out of water). However, these earliest quadrupedal seacows already had adaptations (retracted nasal opening, and thick chest bones for ballast) for spending time in the water.²