

## f4 Modern carnivores, fissipeds, and creodonts < carnassials >

... why be sad? After all, I ate the anchovies, not the anchovies me.

—Franz Kafka (1883-1924), a committed vegetarian who felt ill for the lapse.<sup>1</sup>

Indians, like many others, ate dogs. So apparently did the Spanish—as did many whites who became desperate for food as they worked their way to the West—but they had a crueller use for dogs: They were ‘specifically bred and trained to hunt down and disembowel Indians,’ and the Spanish followed the ‘practice of bringing along on any campaign chained Indian slaves as food for the dogs.’ They were known as ‘war dogs,’ and they brought terror everywhere they went.<sup>2</sup>

I cannot persuade myself that a beneficent & omnipotent God would have designed ... that a cat should play with mice. —Darwin in a letter to Asa Gray, May 22, 1860.<sup>3</sup>

Carnivores have well developed canine (C1) teeth but this does not necessarily distinguish them from herbivores. What does are their specialized (modified premolar or molar) meat-shearing cheek teeth called *carnassials* (French *carnassier*, carnivorous). These specialized teeth in cats, dogs, and seals, indicate a common heritage (some carnivores evolved to lose their carnassials functionally in correlation with changes in diet and, even, all their teeth as is so for the giant baleen whale that sieves Arctic waters mostly for krill). In living carnivores the carnassials, if retained, are the last (only) premolar above (P<sup>1</sup>), and the first molar below (M<sub>1</sub>).

*Note:* The superscript (or subscript) indicates upper (or lower) jaw position.

In some ancestral carnivore types, carnassial teeth are not always evolved, or the pair of molars modified are M<sup>1</sup>M<sub>2</sub> (also written M1/M2) or M<sup>2</sup>M<sub>3</sub> (M2/M3).

*Note:* The numeral indicates tooth position counted from the front of the jaw going back.

In the development of the opposed shearing surfaces of these molars, the originally diagonal line of meeting between them tends to swing around to a fore-and-aft position, and the tooth form simplifies to become high, narrow, and elongated.<sup>4</sup>

Modern land-mammal carnivores (superfamily of cats, civets, hyenas, and superfamily of bears, dogs, wolves, foxes, raccoons, martins, weasels, and badgers—which include otters), pinnipeds (true seals, sea lions, fur seals, and walruses), and sea-mammal carnivores<sup>5</sup> (porpoises, dolphins, and whales—*see Topic f10*), are considered to have evolved from ancestral fissipeds (name refers, in the terrestrial members, to having toes separated to the base) and not from creodonts (Gk. *kreas*, flesh; *odont-*, tooth) as they retain the fissiped feature of carnassials in a more forward position than is found in creodont primitive carnivores.

Pinnipeds are carnivores of fish, shellfish, squid, and other marine creatures. Their hindlimbs are evolved to flippers (*L. pinnipedia*, fin-feet) and are enclosed within the body to the level of the ankle. Their forelegs help steer in water where they swim with vertical undulating motion—which movement on land is called “gallumphing.”

All pinnipeds must come ashore to breed, give birth, and nurse their young.<sup>6</sup>

Both fissipeds and creodonts evolved in response to the appearance of primitive herbivores.

All of the above evolved from insectivore ancestors.<sup>7</sup>

