21a. Distribution limited to temperate eastern and central North Pacific (Fig. 451) . . . . . **Northern elephant seal *(Mirounga angustirostris)*** **p. 284**

21b. Distribution circumpolar in polar to temperate waters of the Southern Hemisphere (Fig. 452). . . . . **Southern elephant seal *(Mirounga leonina)*** **p. 286**

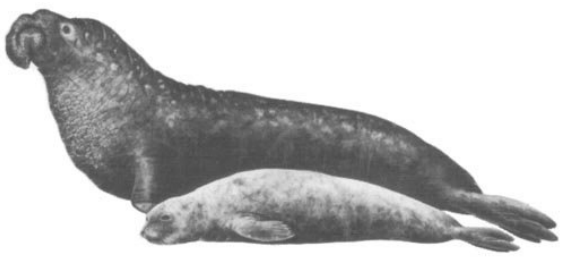

Fig. 451 *Mirounga angustirostris*

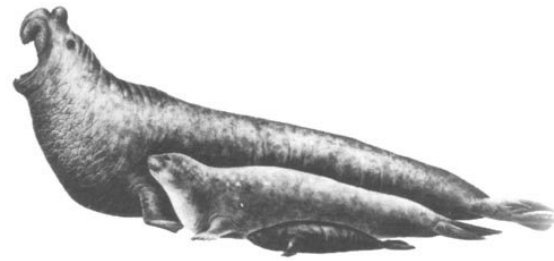

Fig. 452 *Mirounga leonina*

22a. Distribution limited to Southern Hemisphere . . . . . **(“Antarctic seal”)** → **23**

22b. Distribution limited to Northern Hemisphere. . . . . → **26**

23a. Head and muzzle short and wide; foreflippers about one-fifth or less of standard length; post-canine teeth relatively simple (Fig. 453) . . . . . → **24**

23b. Head and muzzle long and narrow; foreflippers long, at least one-fourth standard length; post-canines ornate and multi-cusped (Fig, 454) . . . . . → **25**

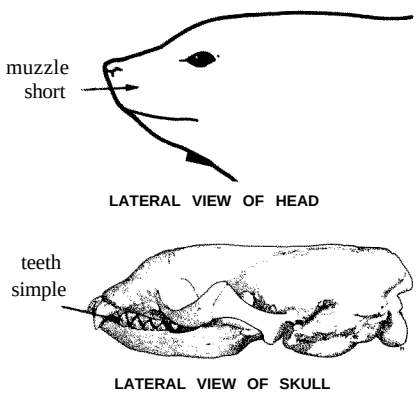

Fig. 453

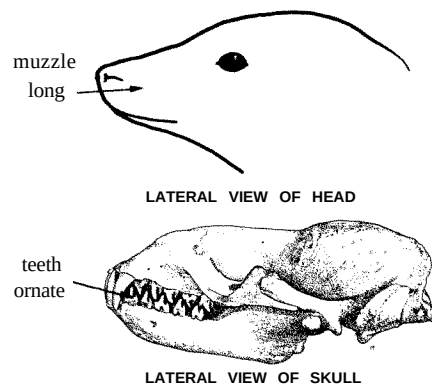

Fig. 454

24a. Adults very long (2.5 to 3 m) and massive, with a relatively small head; numerous blotches of light and dark, particularly on sides and belly (Fig. 455) . . . . . **Weddell seal *(Leptonychotes weddellii)*** **p. 294**

24b. Adults 2 to 2.5 m; long streaks of colour on face, neck, chest, and extending onto the sides; head more normal in size, neck appears thick and enlarged (Fig. 456) . . . . . **Ross seal *(Ommataphoca rossii)*** **p. 290**

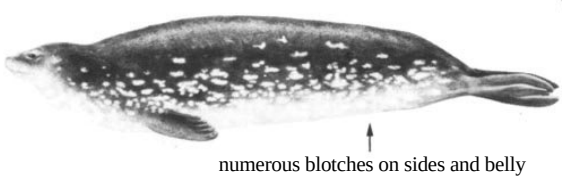

Fig. 455 *Leptonychotes weddellii*

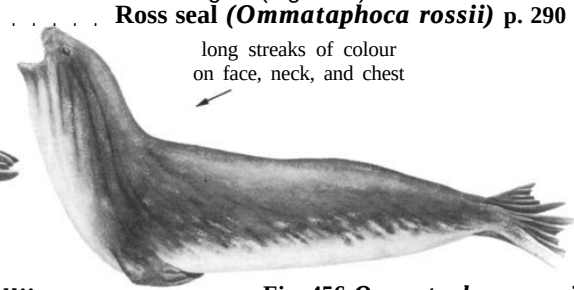

Fig. 456 *Ommataphoca rossii*

25a Head and jaws massive and reptilean in appearance; body long (to 3 m), and serpent-like, thickest at shoulders; foreflippers very long, almost one-third standard length; foreflipper claws very small (Fig. 457) . . . . . **Leopard seal *(Hydrurga leptonyx)* p. 292**

25b. Head and jaws long, but tapering, with a somewhat flattened muzzle: body moderately robust, more filled out; foreflippers long, but only to about one-fourth standard length; foreflipper claws more normal in size (Fig. 458). **Crabeater seal (*Lobodon carcinophagus)* p. 288**

Fig. 457 *Hydrurga leptonyx*

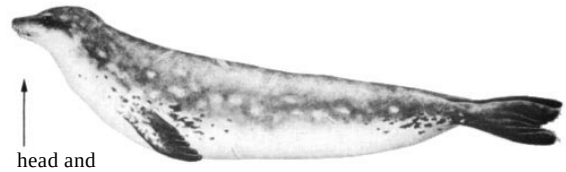

Fig. 458 *Lobodon carcinophagus*

26a. Distribution limited to either Lake Baikal or the Caspian Sea, far from oceanic areas . . . . → **27**

26b. Distribution oceanic or in lakes or rivers near oceanic areas . . . . . → **28**

27a. Distribution limited to Lake Baikal (Fig. 459). . . . . **Baikal seal (Phoca *sibiricu)* p. 264**

27b. Distribution limited to the Caspian Sea (Fig. 460) . . . . . **Caspian seal *(Phoca caspica)* p. 266**

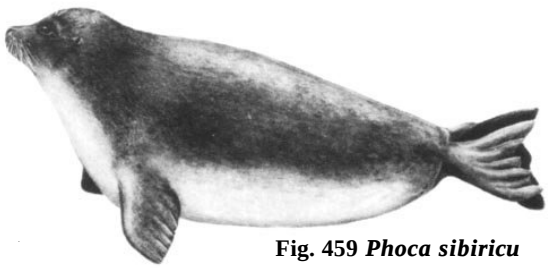

Fig. 459 *Phoca sibiricu*

Fig. 460 *Phocu caspica*

26a. Pelage markings consist of bands or broad swaths of light or dark colour . . . . . → **29**

28b. Pelage markings consist of spots, rings, or blotches . . . . . → **30**

29a. Body orange-brown to black; fighter colour bands encircling each foreflipper, around neck, and around abdomen; distribution limited to Bering Sea, Sea of Okhotsk, and adjacent Arctic Ocean (Fig. 461) . . . . . **Ribbon Seal *(Phocu fasciata)* p. 270**

29b. Body generally silvery white, with some animals sooty grey and others with scattered blotches; body marked with a broad swath of black on each side, meeting (generally) over the shoulders to roughly form a V pattern (Some harp seals never develop the harp pattern and remain blotched as adults. These blotched animals can be separated from grey seals, based on their smaller size, clearly demarcated and shorter muzzle, and closer-set nostrils; and from hooded seals, based on their longer, but thinner, head and muzzle and lack of a hood pattern on the head.) (Fig. 462) . . . . . **Harp seal *(Phocu groenlandica)* p. 268**

Fig. 461 *Phoca fasciata*

Fig. 462 *Phoca groenlandica*

30a. Pelage markings consist of irregular, small to large, dark brown to black or sometimes tan blotches; distribution limited to North Atlantic and adjacent Arctic areas . . . . . → **31**

30b. Pelage markings consist primarily of round to oval smaller spots or rings around spots, or a combination of the above. . . . . → **32**

31a. Head broad and short with short muzzle on females, and large fleshy nasal bladder (with overhanging nostrils) on males; head dark in both sexes from merged blotches, creating hooded appearance (Fig. 463) . . . . . **Hooded seal *(Cystophora cristata)* p. 276**

31b. Head and muzzle very long and somewhat narrow; in silhouette, nose is rounded outwards (convex) in males and straight to slightly rounded in females; adult males dark brown to grey-black with lighter (tan) blotches (Fig. 464) . **Grey seal *(Halichoerus grypus)* p. 272**

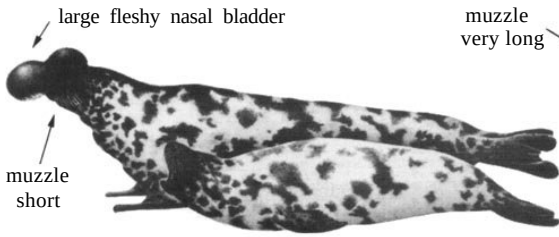

Fig. 463 ***Cystophora cristata***

Fig. 464 ***Halichoerus grypus***

32a. Pelage pattern consists mostly of small round to oval spots with few or no rings (Fig. 465) . . . . . **Ringed seal *(Phoca hispida)* p. 262**

32b. Pelage pattern with few or no spots, not encircled by a lighter ring . . . . . → **33**

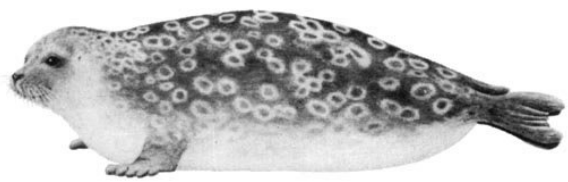

Fig. 465 ***Phoca hispida***

33a. Often no, occasionally a few, rings; spotting more even from top to bottom; face generally dark, like the back; distribution limited to North Pacific and adjacent Arctic areas (Fig. 466) . . . . . **Largha seal *(Phoca largha)* p. 260**

33b. Usually a moderate number of light rings around spots: more heavily spotted above than below: face generally light, unlike the back (Fig. 467) . . . **Harbour seal *(Phoca vitulina)* p. 258**

4.2 Key to Identification of Skulls of Pinniped Families

1a. Tympanic bullae inflated and rounded; supraorbital processes absent; nasals penetrating posteriorly deeply between frontals on midline (Fig. 466) . . . **(Phocoidea) Phocidae: True seals**

1b. Tympanic bullae flat, small, and angular; supraorbital processes present (Otariidae) or absent (Odobenidae); frontals penetrating anteriorly slightly to moderately between nasals on the midline (Fig. 469) . . . . . **(Otarioidea) → 2**

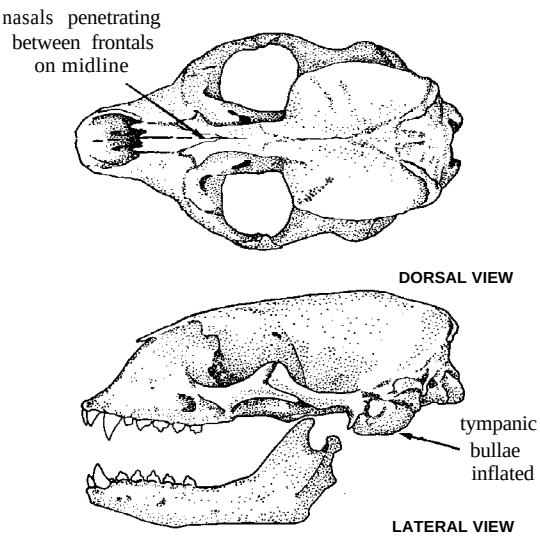

Fig. 468 Phocidae

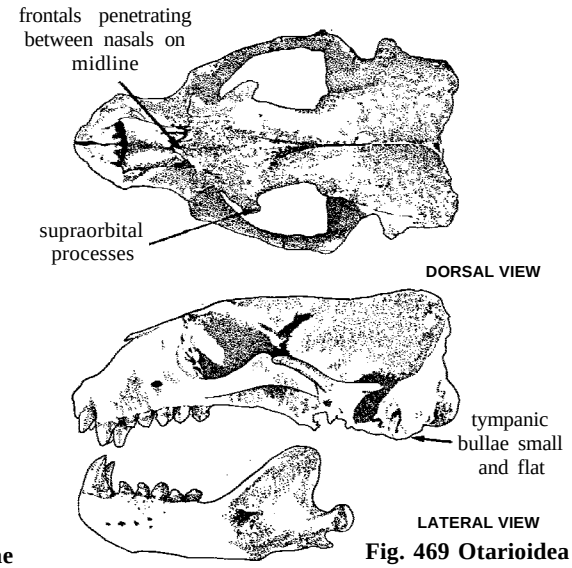

Fig. 469 Otarioidea

2a. Upper canines not enlarged into tusks; supraorbital processes present; 2 lower incisors on each side; transverse groove on first 2 upper incisors; 5 or 6 post-canines (Fig. 470) . . . . . **Otariidae: Eared seals**

2b. Upper canines massive, enlarged to form tusks; no supraorbital processes; no grooves on upper incisors; only 3 post-canines (Fig. 471). . . . . **Odobenidae: *Odobenus* (Walrus)**

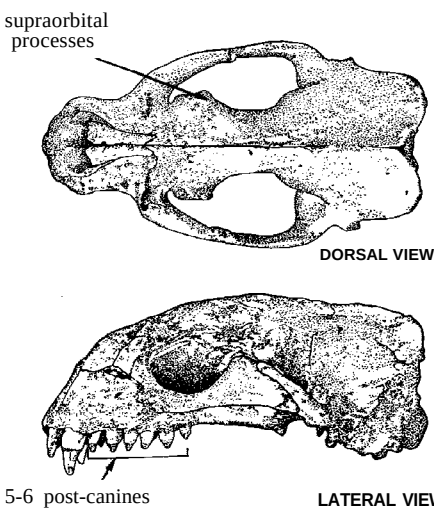

Fig. 470 Otariidae

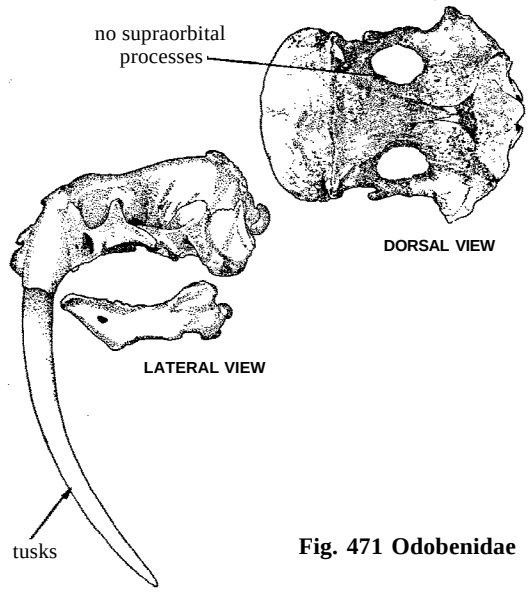

Fig. 471 Odobenidae

4.1.3 Guide to Families of Pinnipeds

OTARIIDAE

Eared seals (14 species in 7 genera) p. 228

All sea lions and fur seals have a polygynous mating system and pronounced sexual dimorphism. Characteristics of this family are: small external ear flaps (pinnae), smooth vibrissae, light skin, a dense double layer of fur with short underfur and longer guard hairs, partially hairless fore- and hindflippers, 4 teats in females, scrotal testes, and skulls with supraorbital processes and sagittal crests (the latter enlarged in adult males only). Eared seals swim with their large foreflippers and can rotate their hindflippers forward to walk and climb on all fours on land. While resting at sea most elevate flippers in various combinations out of the water.

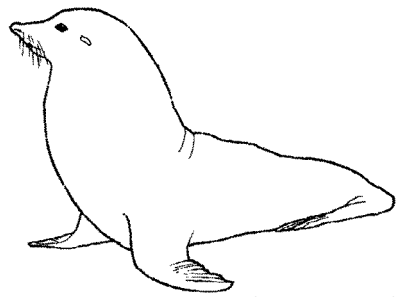

Fig. 472 Otariidae

ODOBENIDAE

Walrus (1 species in 1 genus) p. 256

Walruses are enormous animals that combine features of both otariids (moderately long foreflippers that can lift the body off the ground) and phocids (lack of ear pinnae). The neck is long and the hindflippers can rotate under the body and permit walking, although walruses are so bulky they cannot walk as easily as most otariids. The tail is sheathed in skin and not readily visible or free, as in other pinnipeds. The tusks, which are enlarged canines are a unique feature, and are important in fighting and assisting with hauling out. Walruses have numerous short smooth vibrissae on their thick fleshy mystacial ("moustache") pads. The testes of walruses are internal, not scrotal, and females have 4 retractable mammary teats. The skin is dark in younger animals and lightens with age. Walruses swim with phocid-like side-to-side strokes of the hindflippers, with assistance from the foreflippers.

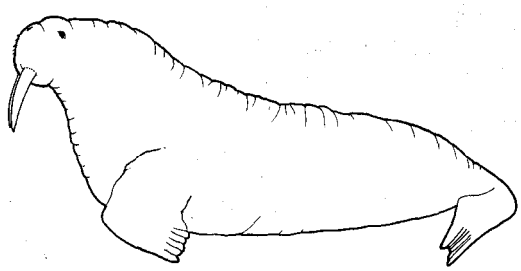

Fig. 473 Odobenidae

PHOCIDAE

True seals (19 species in 10 genera) p. 258

The true, or earless, seals include the largest of the pinnipeds, the elephant seals. Species within the group have variable degrees of sexual dimorphism (in some species, females are the larger sex). Phocids are characterized by the absence of external ear pinnae, a short muzzle, beaded vibrissae, dark skin, short fur, generally 2 teats in females, internal testes, furred fore- and hindflippers, and the absence of supraorbital processes or an enlarged sagittal crest on the skull. Propulsion in water is provided by figure-eight movements of the hindflippers, exept in leopard seals which primarily swim like otariids with foreflipper strokes. Movement on land is by inch-worming or “galumphing,” without much help from the relatively small foreflippers; movement on ice is accomplished by combinations of rapid pulling strokes with the foreflippers or sculling with hindflippers, and snake-like writhing of the body depending on the species and the situation.

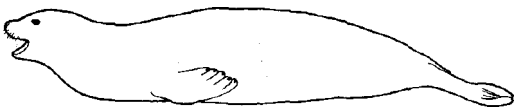

Fig. 474 Phocidae