

WHALES AND THEIR NEIGHBOURS.



A STUDENT, on being asked by his examiner if he could give any information regarding the fishes, is said to have replied that "he knew them all, from the limpet to the whale." Whilst most persons would object to the idea of the limpet being included in the class of fishes, there are not a few who might possibly agree with the student in his ideas of classification as regards the whale. Very frequently the latter animal is named a "fish." It swims about in the sea, and is in fact wholly aquatic in its habits. It is, moreover, fish-like in shape and appearance. It possesses a tail-fin and other fins, or fin-like structures, seen in fishes. And with this list of characters before the mental vision, it is hardly to be wondered at that popular zoology should have classified the whales with fishes, or that many persons, even in this enlightened age, will express some surprise on being told that the modern leviathan, so far from being a fish, is in reality a very close relation of their own. To begin with, fishes are cold-blooded animals—that is, their blood is a degree or two warmer than the water in which they swim. They breathe by gills—structures adapted for separating the oxygen gas from the water with which it is entangled—and are thus truly aquatic animals, being unable, as a general rule, to exist out of their native element. Their bodies, as every one knows, are covered with scales, and their fins are supported on stiff filaments known as fin-rays; and if our examination of the fish extended to its internal structure, we should find that its heart was a comparatively simple organ, consisting of two compartments, or chambers; whilst other anatomical characters, which need not be specially detailed in the present instance, would come to be associated with fishes as typical features of their class. Lastly, the young are hatched from eggs, and, save in a very few cases, of which the sticklebacks, sea-horses, and their neighbours present examples, the parent-fishes show no concern for the welfare of their progeny, which are left to themselves in the matter of development and growth.

Turning to the whales, on the other hand, we may speedily discover wide and apparent differences between them and their fish-neighbours. Thus whales are warm-blooded, their temperature rising very con-

siderably above that of the surrounding water. They breathe, as does man, by lungs, and require therefore to ascend periodically to the surface of the water to inhale atmospheric air. The covering of their bodies consists typically of hairs, and not of scales, although this body-covering is but sparsely, or not at all, developed in the whales. They may possess fins, but these fins are not supported by fin-rays such as are found in fishes; and the tail-fin in whales is placed horizontally, or across the body, and not vertically as in fishes. In their internal anatomy they present features of perfect agreement with man and all mammals or quadrupeds. They have a four-chambered heart, this being the highest type of heart that we meet with in the animal series; and in respect of their brain-structure and of other characters, the whales present a close resemblance to the quadrupeds. Lastly, the young of the whales are born alive, and are nourished with milk, the strong attachment existing between, and the affection of the whale-parent for her offspring being a matter of common knowledge, familiar to all who have read accounts of whaling-expeditions. The whales, to conclude, present us simply with a modification of the quadruped-class adapted for a life in water, and in this respect are approached by the seals and walruses, although these latter animals exhibit a nearer approach to ordinary quadrupeds than the whales.

Having thus cleared the ground, as it were, for a brief study of the whales, we may next glance at the various kinds of these animals which are comprised within the limits of their order. This order, or division, is named *Cetacea*, and hence the term "Cetacean" is used to indicate any animal that is truly "like a whale." The whalebone whales, sperm whales, and their allies represent, of course, the most typical members of the group; but there are other animals, familiar to most of us, which, whilst departing somewhat from the strict type of these whales, yet evince all the characters of Cetaceans. Such are the familiar dolphins of mythological fame, whose unwieldy gambols serve to amuse the tropical voyager, and to remind him of the exploits of a troop of schoolboys liberated from pedagogic supervision. To the dolphins, may be added the grampus and porpoise, both dread enemies of the fisherman's interests, from the havoc they commit amongst shoals of fishes; and most extraordinary of all the Cetaceans, perhaps, is the Narwhal, or sea-unicorn, from the upper jaw of which grows a long spirally twisted ivory pole, measuring from eight to ten feet in length, and representing the large or extreme development of a certain tooth, the exact nature of which it is very difficult to determine. The ivory pole of the narwhal represents certainly the longest, and probably in other respects the most remarkable tooth in the animal world. The remaining members of the whale group include two animals which cannot by any stretch of ideas be described as well-known forms. One of these creatures inhabits the

mouth of the Ganges, whence it is named the Gangetic Dolphin. Like the Gavial or Gangetic Crocodile, this latter form possesses a very long snout, whilst its nostrils are represented by a mere slit. The remaining animal is equally curious in its habits. It is named the Inia, and is found inhabiting the rivers of Bolivia. It is often met with in the upper reaches of these rivers, at a distance of 2,000 miles or more from the sea, and may thus be regarded as a typical fresh-water Cetacean.

There also exist, however, certain animals which, as Polonius would say, are so "very like a whale" in all their features, that even by naturalists they were formerly included in the Cetacean group. Such are the Sea-cows, or Manatees, and Dugongs, animals attaining a length of from eight to twelve feet, and which inhabit the Atlantic coasts of Africa and North America, and also occur on the shores of the Indian Ocean. They have been named *Sirenia*, from the fact that when they support themselves in a semi-erect posture in the water they present to the eye, and no less to the weird imagination of voyagers, a striking likeness to the fabled sirens and mermaids. Like the whales, they have a horizontal tail-fin, but they certainly differ in habits and in many points of structure from the former animals, and are hence classified by modern zoologists as near neighbours of the whales, and not as true Cetaceans.

Such is a brief *resumé* of the whale-family and its nearest connections. A family history may in this instance appropriately preface an account of some of the more prominent individual peculiarities of certain members of the group, and we may commence such an account with the recital of the chief features of interest to be found in the well-known Greenland or whalebone whales. These animals form the chief objects of interest to the Greenland whalers, and, as implied by the last-mentioned designation, afford that useful substance known as whalebone, or "baleen." Common as this substance undoubtedly is, it may be questioned whether any persons who have not an intimate acquaintance with comparative anatomy know exactly what it represents in the living animal. The term "whalebone" would lead us to believe that it forms some portion of the animal's skeleton, but this is very far indeed from the truth. Whalebone, in fact, represents an enormous development of the gum of the whale, and exists in the living animal in the form of two rows of plates, which, like a great double fringe, hang or depend from its palate. From 150 to 200 of these plates exist in the mouth of a whale, and the largest plates may measure from eight to ten or twelve feet in length. The inner edges of these whalebone-plates exhibit a fringed or frayed-out appearance, and the whole apparatus is adapted to serve as a kind of gigantic sieve or strainer. Thus when the whale fills the mouth with water, large numbers of small or minute animals, allied to jelly-fishes and the like, are engulfed and drawn into the capacious mouth-cavity. The water is allowed to escape by the sides of the mouth, but its solid animal-contents are strained off

and entangled by the whalebone fringes, and when a sufficient quantity of food has been captured in this way, the morsel is duly swallowed. Thus it is somewhat curious to reflect that the largest of animals are supported by some of the smallest beings, and the case before us serves as a practical parallel to the fable of the lion and the mouse. The sperm whales possess no whalebone-plates, and there are a few whales, exemplified by the rorquals, &c., in which the baleen-plates are of very small size.

Beneath the skin in the whales there exists a thick layer of fat, constituting the "blubber," and serving to maintain an equable temperature of body in whatever seas the whale may chance to swim. This blubber affords the "oil" of the whaler, and in addition to its function of acting as a warm coating, it fulfils the purpose, from its lightness, of rendering the body of the whale more buoyant, and on the well-known principle that fat people float well, serves to render the great body less cumbersome.

Whales have no hinder limbs, and possess the merest rudiments of haunch-bones. The horizontal tail-fin is adapted for acting as a huge lever in enabling the animal to dive, but it is useless, from its position, as an organ of locomotion; hence the "flippers," or swimming-paddles, formed of the modified front limbs, constitute the organs of movement of these animals. The whales, however, swim very swiftly, the spectacle of a whale careering along the surface of the water being one worthy of remembrance. At frequent intervals the whale is seen to "blow" or to "spout"—these terms being applied to indicate the ejection of water, or what looks like that fluid, from the nostrils. In the whalebone whales the nostrils are situated on the top of the head, and are named "blow-holes." On the supposition that the water ejected from these apertures consisted of that which, as already remarked, is continually being drawn into the mouth, the "blowing" of these animals appeared to be susceptible of ready explanation. But it was ultimately seen that there was no plain anatomical justification for the idea that water could pass so readily and constantly from the mouth to the nose, while a much more feasible explanation of the "blowing" of these animals can readily be found. Thus the water which is taken into the mouth appears to be strained off, as we have seen, by the whalebone-plates, and escapes simply by the sides of the mouth-cavity. When, on the other hand, the whale "blows," the animal rises to the surface, the act of "blowing" being in reality the effort of expiration, or "breathing out" the heated air of the lungs, preparatory to taking in a fresh breath of air. As the whale begins to blow just before approaching the surface of the water, the effort must result in the water which lies above the head being carried up into the air in the form of a column or jet; whilst the heated air from the lungs is expelled when the animal has reached the surface, and being condensed by sudden exposure to the outer cold, appears in the form of the fine spray or vapour which is last exhaled.