

WHALES, MOST REMARKABLE MAMMALS THAT EVER LIVED

By D. DWIGHT DAVIS
CURATOR OF VERTEBRATE ANATOMY

Whales are the most gigantic animals that ever lived on earth. A blue whale 100 feet long and weighing 150 tons is larger than the largest of the dinosaurs. Beside it a ten-ton elephant is a pigmy.

Partly because of their tremendous size, partly too because of the difficulties of observing them, and, finally, because man

otters, or beavers, for example—spend a good deal of time in the water, but none is so completely tied to an aquatic life as are the whales. Only the manatees and dugongs approach the whales in their dependence on water, but they never venture beyond the shallow coastal waters and are less specialized.

Adapting a hairy, four-footed, air-breathing mammal to a perpetual life on the high

Like other mammals, whales nourish their young with milk. To do this successfully they have developed a remarkable system of injecting milk into the mouth of the young. Even special physiological adjustments to drinking salt water were necessary in an animal that never comes into contact with fresh water.

Of course a whale has no gills and would drown promptly if deprived of air. The devices for insuring a constant supply of air—and for insuring that water cannot get into the lungs—are remarkable. In all whales there is only one nostril. Instead of being on the tip of the snout, where water could enter as the whale lies on the water surface, it opens on top of the head, as the so-called "blowhole." The larynx, or "voice box," is thrust directly into the back of the nose, so that it is impossible for a whale to get food or water into its "Sunday throat."

A series of models explaining some of these remarkable modifications was recently installed in the Whale Hall (Hall N-1). The models were prepared by Artist-Preparator Joseph B. Krstolich under the direction of the author. A companion exhibit covering the biology of whales is in preparation.

BLUE MUSHROOMS

By JULIAN A. STEYERMARK
ASSOCIATE CURATOR OF THE HERBARIUM

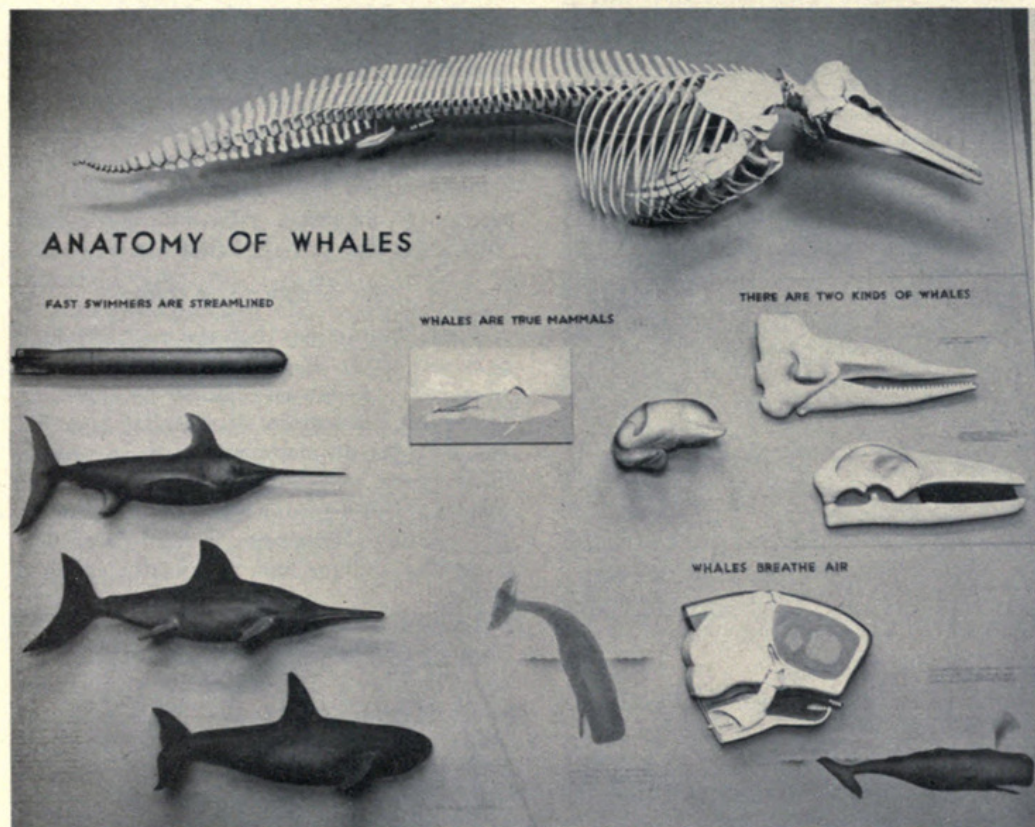
Sometimes the experiences that befall a botanist are amusing as well as interesting and scientifically profitable. For instance, during the summer of 1949, while on a collecting trip in the southern part of Missouri, I was botanizing the slopes of a deep canyon known as Grand Gulch, when I spotted a dark blue object on the ground and discovered to my surprise that it was a mushroom.

Back in Chicago, I immediately turned the specimen over to Dr. Francis Drouet, Curator of the Cryptogamic Herbarium, with the request that he try to name it for me, assuring him that I had never observed a mushroom of such unusual color. He at once recognized it as a mushroom known botanically as *Lactarius indigo*, and showed me an illustration of it.

ONE FROM GUATEMALA

Then Dr. Drouet showed me to my great surprise and bewilderment the only specimen of this species in our herbarium, which I had collected in 1942 in Guatemala, Central America, on the volcano of Santa Clara. The label of this Guatemalan collection showed that I had recorded the bluish color of this specimen realizing its unusual character.

This brought up the question of how common blue is as a color in mushrooms and other fungi. Talking with Dr. Drouet
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WHALE 'STREAMLINING' ILLUSTRATED IN NEW EXHIBIT

A model of a torpedo on the left shows how man has adopted nature's methods to decrease water resistance to a minimum.

has long engaged in hunting them, whales have always attracted interest. In the vast expanse of the ocean even a whale is a tiny object, poorly seen because, like an iceberg, most of its bulk is hidden beneath the surface. Even today a beached whale causes a flurry of local excitement and is likely to be pictured in newspapers throughout the country.

The "beaching" of a whale is the key to the whole story. The largest whales can be as big as they are only because their enormous bulk is supported by water. A creature of such proportions would be helpless on land; the muscles required to move such weight would themselves be so great that the monster would have to be even larger, requiring still greater bones and muscles, and so on ad infinitum. Engineers have a simple formula to prove that it can't be done.

Whales are mammals, no matter how fishy they may look. Other mammals—seals,

seas was something of an evolutionary problem, and the astonishing contrivances by which this was accomplished have excited the wonder of biologists from earliest times. Whales are the most highly modified of all known mammals, living or extinct.

Merely cataloguing some of the problems whales had to solve gives an idea of the adjustments that were required in their evolution. They are warm-blooded like other mammals. But water conducts heat 27 times as rapidly as air, and the thick layer of fatty blubber is the whales' answer to this insulation problem. Water is 227 times as dense as air, and an animal moving through water even at the relatively slow speed of a whale must be as well streamlined as the fastest jet plane. For the same reason, a man-made torpedo is well streamlined, although it travels through the water at a top speed of only 30 to 40 miles per hour. The hind legs are missing in all whales, but hip bones remain as a functionless vestige.



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