

The Emergence of Whales

Evolutionary Patterns in the
Origin of Cetacea

ADVANCES IN VERTEBRATE PALEOBIOLOGY

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Edited by J. G. M. Thewissen

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Preface

Zoologists have long known that whales, dolphins, and porpoises are mammals: In the fourth century B.C., Aristotle pointed out that whales breathe air, have hair, and nurse their young. Nevertheless, nonscientists throughout the centuries have been hard to convince that cetaceans are not fish. The attitude of whale hunter Ishmael in Herman Melville's *Moby Dick* was common when the novel was written (1851) and is still widely held among the public. Ishmael lists Linnaeus's reasons for considering whales as mammals: "their warm bilocular heart, their lungs, their movable eyelids, their hollow ears, penem intrantern femnam, mammis lactantem." He rejects these reasons on the basis of habitat: "sharks and shad, alewives and herring, against Linnaeus's express edict, were still found dividing the possession of the same seas with the Leviathan." Ishmael defines a whale as "a spouting fish with a horizontal tail."

This discrepancy about cetaceans between the scientist's views and those of the public is easy to understand, because the morphology and ecology of modern whales seem to belie their genealogy. This alone indicates that the transformation of a four-footed terrestrial mammal into a fully aquatic cetacean must have been one of the most remarkable events in evolutionary history.

Although ancient whales have been known for more than a century, it was not until the early 1980s that fragmentary remains of the earliest of whales were recovered. In the 1990s the earliest whales became well-known skeletally and it became possible to track the acquisition of aquatic adaptations and the changing morphologies in cetacean evolution.

Research in whale origins is now in an explosive phase, with a cascade of discoveries adding to our understanding of the evolutionary pattern and a suite of new techniques being applied to address new questions. The objective of this volume is to provide a snapshot of this explosion. The volume paints the scene with a broad brush, as I have not forced the individual chapters to be consistent in details of interpretation, simply because individual authors have different views, and all of these are reasonable based on available evidence. Taken together, though, these chapters clearly indicate that cetacean origins is a field that is dynamic, multidisciplinary, and that the end of the explosive phase is not in sight. I hope that this volume provides an accessible summary of ongoing discoveries and that it identifies areas where future research will prove most fruitful.

J. G. M. Thewissen
Rootstown, Ohio

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