Example of essay on the evolution of whales from land to sea

Environment, Animals

After reading the three articles that are featured in the following pages, it is evident that whales originated from a species of terrestrial mammals and that during the process of evolution that began in early Eocene it has lost some of the features of terrestrial mammals and grow features that made it fully adopt to an aquatic habitat.

Thewissen, J. G. M. and Lisa Cooper, John George, Sunil Bajpai. " From Land to Water: the Origin of Whales, Dolphins, and Porpoises." Evolution: Education and Outreach 2. 135 (2009). Springer International Publishing, http://link. springer. com/article/10. 1007/s12052-009-0135-2/fulltext. html.

Thewissen et al's article traces the ancestry of the cetaceans – a species of marine mammals that include the whales, dolphins and porpoises and which have originated about 50 million years earlier during the Eocene epoch. The article argues that cetaceans transitioned from land to sea mammals. To prove their point, the authors cited many features found in land mammals that are also found in cetaceans, which have, through the course of the evolutionary process, disappeared although traces are retained particularly by their fetuses. For example, cetacean fetuses display whiskers and cetacean embryos have hind limbs although these later disappear as the late stages of embryo life. The authors believed these proved the connection of whales to fully terrestrial mammals, such as wolves.

Although this article merely summarized what had already been studied by other scientists, it is significantly helpful because it has highlighted the findings that led to the claim that whales have evolved from wolves. The article detailed the earliest ancestor of cetaceans and followed the evolutionary path from its earliest form to the modern cetacean form. This

study has clarified that the earliest cetacean form had wolf-like creatures, which could mean that it could have also been an ascendant of the wolves. The summarization of all findings about this evolution has clarified this evolution.

Gingerich, Philip. “ Evolution of Whales from Land to Sea.” Proceedings of the American Philosophical Society 156. 3 (2011): 309-323.

This article was written by Professor Gingerich – a paleontology professor who was part of an American-French archaeological expedition in Pakistan in search of Eocene land mammals in the 1970s. It was this team that discovered the braincase of a wolf-like mammal, but had a middle ear resembling that of a whale. In this article, Gingerich wanted to focus on the evolution of whales to document the discoveries and findings, so far, of scientists on the period between the time the whales existed in their terrestrial mammal forms and their modern existence as sea mammals. Gingerich recalled that the discovery of the mammal, which they named as pakicetus, led him and his team to theorize that whales evolved from terrestrial mammals, such as pakicetus, and that this evolution was gradual and took place in the early Eocene as their terrestrial ancestor began spending their time in the shallow waters of the Indian sea to feed on planktivorous fishes. Later discoveries also made in Pakistan in the 1970s ended the debate whether whales were related to artiodactyls as the discovery of “ double-pulley” astralagus validated the claim of molecular biologists that whales are genetically related to the artiodactyls. Gingerich summarized the entire evolution process of whales as originating from artiodactyl, evolving to the pakicetus, then to the maiacetus, to the

archaeocete, and finally to modern cetacean.

Gingerich's article is significant for its simplicity and conciseness making understanding of the evolution of whales from fully terrestrial to fully aquatic easy. In addition, he attempted to cover the entire spectrum of the evolution path of cetaceans, with a goal to touch on the intermediary period between terrestrial existence and aquatic life.

Houssaye Alexandra and Paul Tafforeau, Christian de Muizon, Philip Gingerich. " Transition of Eocene Whales from Land to Sea: Evidence from Bone Microstructure." PLoS ONE 10. 2 (2015): 1-28.

In this article, the authors examined the microanatomical features of the bones of cetaceans that lived in various points of history. The purpose of this comparative examination is to detail the progressive changes of cetacean features that underpinned their transition from fully terrestrial mammals to fully aquatic features. The primitive cetaceans that were studied and compared were the Remingtonocetidae, which lived in the early middle Eocene period, the Protocetidae of the Middle Eocene period and the Basilosauridae of the Middle to Late Eocene period. By showing the changes in the microanatomical features of these primitive cetaceans, the authors were able to show the progressive evolution of cetaceans from terrestrial to aquatic mammals. The microanatomical features that were particularly looked into were the long bones, such as the femur and the humerus, the vertebrae and the ribs.

This article is very important because it is illustrative of the changes that the cetaceans went through to be able to fully function in a water environment from a land environment. By studying the various bones of the body of

terrestrial mammals that lived from the early Eocene period to the late Eocene period, the researchers succeeded in illustrating the gradual changes that happened in the bodies of cetacean terrestrial ancestors preparing them for a fully aquatic habitat.

Works Cited

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