

That's Some Letter Opener You've Got There!

by Moki Kokoris

It is said that Herman Melville, American novelist, poet, and author of *Moby-Dick*, humorously classified the narwhal's tusk as a letter opener. This conspicuous incisor tooth has been called many things: a fang, a horn, a lance, a swizzle-stick, and even a dowsing rod for fertile females. And it is this solitary tooth, when seen separate from the body of its elusive cetacean bearer, that inspired the creation of legends such as those of the unicorn, and still continues to mystify the imagination.

The word "narwhal" is a derivation of an Old Norse word that means "corpse man" (nahvalr), which refers to the animal's greyish, mottled pigmentation, with discolorations resembling livor mortis like that of a drowned sailor. This name is further supported by the fact that the narwhal whale can lie belly-up for several minutes without much movement. The scientific name, *Monodon monoceros*, is derived from the Greek: "one-tooth one-horn". The Inuit name, qilalugaq qernartaq, translates to: "the one that points to the sky", describing the narwhal's unique behavior of pointing the tusk straight upward out of the water.

Much about this creature remains unknown, and because it is difficult to study in its dark, extreme arctic natural environment, misconceptions about it prevail. Jules Verne, in his book "20,000 Leagues Under the Sea," unfoundedly described the animal as a slaughterer of other whales, and said it even attacked boats with its "ivory sword".

Historians believe that the Vikings brought narwhal tusks back from their sea journeys, and that traders peddled the tusks as unicorn horns, an antidote to poison. Because no one had ever seen a unicorn except in illustrations, wealthy citizens fell for the ploy. Since it is mentioned in the Bible, to question the unicorn's existence



"Tusking" narwhal

was considered heresy, thereby perpetuating the elaborate medieval bestiary myths of single-horned, cloven-hoofed horses and virgin maidens. In his notebook, Leonardo da Vinci wrote: "The unicorn, through its intemperance and not knowing how to control itself, for the love it bears to fair maidens, forgets its ferocity and wildness; and laying aside all fear it will go up to a seated damsel and go to sleep in her lap, and thus the hunters take it."

In a perhaps insensitive-to-mythology effort to dispel some of these erroneous and fantastic tales, scientifically based data about these creatures as it is being collected, is beginning to reveal some fascinating facts. Starting with the basics, the narwhal is an active marine mammal of the whale family, found primarily in the Atlantic region of the Arctic Ocean, rarely south of 65°N latitude. Highest concentrations inhabit the Canadian Arctic, Baffin Bay,

Davis Strait and northern Hudson Bay, but some groups have been seen in the Greenland Sea, extending to Svalbard and even as far as Severnaya Zemlya off the coast of Russia.

Inuit people hunt the narwhal for their long tusks, and dine on the top layer of skin and blubber, called muktuk or maktaaq, for vitamin-C, a scarce commodity in the Arctic. Indigenous tribes use the tusks as sled-runners, tent poles and harpoons. The narwhal's meat feeds sled dogs and is often frozen as winter rations. Eating these marine mammals, however, has unfortunately become dangerous for the Inuit peoples because levels of PCBs and mercury in animals around the northern ice cap have been found to be very high. The whale's diet is primarily cod and halibut, and also includes squid and shrimp, but it is not known for certain when and how they feed.

As mentioned earlier, the pelt color of the adult narwhal is mostly mottled grey and white. Infant narwhals are solid grey or greyish brown, while old individuals can be almost white.

However, it is its distinctive tusk that is this creature's most incredible feature, and many details about it are still unknown. Typically, it is the male narwhal that possesses the impressive two to three meter incisor tooth, which grows from the left side of the upper jaw directly through the upper lip. It is always a left-handed corkscrew helix, yet tusk length, girth, morphology, wear and coloration vary depending on the individual whale and its age. The corresponding right tooth remains embedded in the skull and measures roughly one third of a meter long. Occasionally, the



Cinematographer Adam Ravetch in the Arctic (© ADAM RAVETCH)

PHOTO BY GLENN WILLIAMS, NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY

right tooth grows into a tusk, but instead of developing symmetrically, it, too, spirals to the left.

Male tusks have a wide variation in ridge structure, often appearing wavelike when viewed in profile, characteristics that promote algae growth, which often makes them look green. Although only 15% of females develop tusks, theirs are shorter, straighter, and smoother, and as a result, collect less algae on the surface, thus appearing whiter. The tusks are flexible, able to bend about a foot in any direction without breaking. They can grow to more than three meters, which is rather remarkable considering that the male's body length is approximately five meters at maturity.

Despite, or perhaps because of their diet and habitat, narwhal can live to be more than 100 years old. To protect themselves from the extreme frigid waters, the narwhal's body fat content, like that of belugas and bowhead whales, is about 50%. They possess collapsible rib cages which allow them to dive as far



Dr. Martin Nweeia examines narwhal tusk morphology, asymmetry and form at the Zoological Museum, University of Copenhagen in 2005.

cticular, Adam Ravetch – an award-winning cinematographer with a speciality in underwater photography – is taking this task to an extreme in his latest endeavors. During a “by invitation only” lecture at the Explorers Club in New York City in March 2009, Ravetch presented some of his initial narwhal footage. It is filming at its finest and most engaging because not only can we see these animals from above the surface, but Mr. Ravetch also swims alongside them, sometimes beneath the ice itself.

Ravetch and his wife, Sarah Robertson-

Ravetch, are the co-directors of the film “Arctic Tale”, which is a theatrical wildlife epic that represents more than a decade of the couple's work in the Arctic. Adam Ravetch's incredible sequence of a starving polar bear attacking a walrus herd can also be seen in the DisneyNature/BBC production “Earth”.

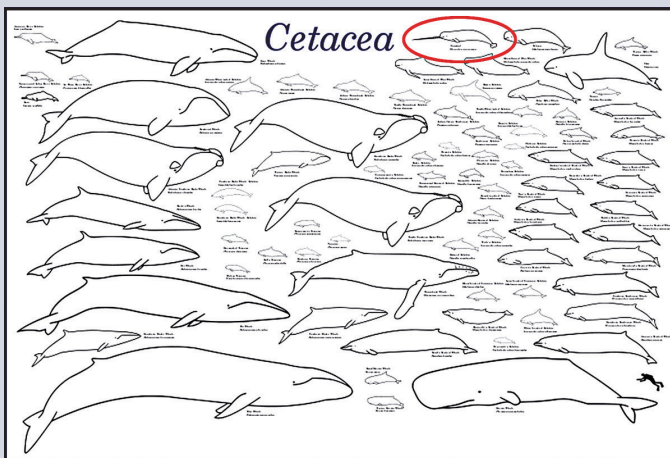
In development, and currently seeking further sponsorships, is Ravetch's “Extreme Beings” project. This will be a collaborative effort of Arctic Bear Productions and The Arctic Exploration Fund, the latter being a public nonprofit organization created and dedicated to capturing new behaviors on film as the Arctic's top marine predators adapt to a new and warming environment.

As stated on its website: “Sometimes accompanying cutting-edge Arctic scientists, and sometimes acting independently, Arctic Exploration Fund will take calculated risks

to photographically pursue the most fascinating mysteries left in the North in one of the most hostile regions on Earth. In doing so, AEF will produce documents that will be accessible to the public (via television, internet, lectures, and big screen presentations), lend insight to compelling scientific questions, and create a photographic time capsule that compiles the amazing adaptations and drama of animals reacting to an era of climate change for generations to view.”

Indeed this is a very relevant undertaking. Taking into account how tightly the narwhal is wedded to its pack ice environment, even minimal changes in sea ice can have a huge impact on its migration patterns and survival. One scientist labeled the narwhal “the marine mammal least likely to survive melting ice floes.” The more we learn about them, the better we will be able to understand these enigmatic unicorns of the Arctic.

But... the next time you are sitting in the dentist's chair, feel fortunate that you have no teeth that are 9 or 10 feet long. In this case, yes, size definitely matters! □



as 1,800 meters (more than a mile deep), and according to a recent study, they swim upside down much of the time at those depths.

Harvard School of Dental Medicine researcher, Dr. Martin Nweeia, who is the principal investigator and founder of the Narwhal Tooth Expeditions and Research Investigation, reports that the tusk has hydrodynamic-sensing capabilities and acts as a sensor. Nweeia's team postulates that the narwhal tusk acts as a membrane with an extremely sensitive surface, with 10 million nerve connections from its core to the outer surface, enabling the animal to detect changes in water temperature, pressure, and salinity. It may even be able to determine barometric pressure when it is above the water's surface.

All of these aspects and questions make this creature of the Far North a worthy subject for further study. One explorer in par-



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