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Steller's Sea Cow in Pleistocene Interglacial Beach Deposits on Amchitka, Aleutian Islands

ABSTRACT

The first discovery of Steller's Sea Cow (*Hydrodamalis*) in place in Pleistocene deposits has been made in interglacial beach sand and gravel 35 m above present sea level on Amchitka, Aleutian Islands. Uranium series dating of the bone indicates that it is about 135,000 yrs old.

INTRODUCTION

The German naturalist G. W. Steller, who participated in the second voyage of the Danish explorer Vitus Bering, reported in 1751 the existence of a giant arctic sirenian, Steller's Sea Cow [*Hydrodamalis gigas* (Zimmermann, 1780)], that he had discovered in 1741 on the coast of Bering Island, one of the Komandorskiye Islands in the southwestern Bering Sea east of Kamchatka. With this discovery, the first steps toward the prompt extinction of the species began. Bering's crew, shipwrecked for almost a year on the island, found the huge, sluggish beasts easy to catch and good to eat. Within a few years Russian sailors made the island a victualing stop, killing sea cows for food for their voyages to the east; and by 1768, only 27 yrs after discovery of the species, the last Steller's Sea Cow had been slaughtered (Sauer, 1802; von Baer, 1840; Brandt, 1849; Stejneger, 1883).

GEOGRAPHIC RANGE

Evidence for a former geographic range of Steller's Sea Cow beyond the Komandorskiye Islands is slight and has been the subject of controversy. Reports that the animal frequented the coast of Kamchatka have been discounted by the argument that carcasses could have floated to Kamchatka from the Komandorskiye Islands (Middendorff, 1847-1875).

Grekov (1958) quoted a Russian trader's report of 1764 as possible evidence of the presence in historic time of the sea cow in the Near Islands (western part of the Aleutian chain); he cited another merchant's account of 1763 that reported sea cows at Shelag'skiy Nos (Cape Shelag'skiy) on the Arctic Ocean coast of eastern Siberia. Even as late as 1962 a sighting of Steller's Sea Cow was reported by the crew of a Russian whaler near Cape Navarin, Siberia (Berzyn and others, 1963). However, this identification has been questioned (Heptner, 1965).

GEOLOGIC RANGE

This species was believed, for two and a quarter centuries, to have lived only in post-Pleistocene time. Then, Jones (1967) reported that a badly eroded cranial fragment of *Hydrodamalis* had been brought up in a trawl from the bottom of Monterey Bay, California and had yielded a C^{14} radiometric age of $18,940 \pm 1,100$ years B.P. Comparison of this fragment with specimens in the U.S. National Museum confirmed Jones's identification. The Monterey specimen falls in the lower part of the size range of a series of modern skulls from Bering Island.

Shikama and Domning (1970) reported a rib of *Hydrodamalis* from the late Pliocene of the island of Honshu, Japan. They also mentioned that two specimens of a new species of *Hydrodamalis* had been discovered in the Pliocene of California, and that this species was morphologically intermediate between *Metaxytherium jordani* Kellogg of the late Miocene and *Hydrodamalis gigas*.

The only other sirenianlike genus ever reported from the Bering Sea-Aleutian area is the desmostyloid *Cornwallius*. In 1954, Lewis (p. 289, in Byers, 1959) identified teeth and

bones of a skeleton of *Cornwallius*, a lower Miocene genus, from the north side of Unalaska Island near Dutch Harbor.

AMCHITKA DISCOVERY

A discovery of Pleistocene *Hydrodamalis* was made by Gard in 1969 from interglacial beach sand and gravel 35 m above present sea level at the head of South Bight on Amchitka in the Aleutian Islands. Lewis first examined several fragments and reported (July 20, 1970, written commun.) identification as *Hydrodamalis* Retzius, 1794 (vertebral, rib, and limb bone fragments with characteristic pachyostosis and dorsoventrally depressed vertebral centra). A voluminous report by Desautels and others (1969–1970) on the archeology of Amchitka recorded many sea mammal bones and fragments from old Aleut middens, but included no *Hydrodamalis*. Six sites (R. Desautels, April 19, 1971, written commun.), revealing occupation over a 2,500-yr time span, were investigated. Jean S. Aigner (April 15, 1971, written commun.) reported that there are no known examples of *Hydrodamalis* from any Aleut middens and that a large number of middens have been sampled, some as old as 4,000 yrs. Specimens of this genus are very rare and, as the essential publications were not available to Lewis, he sent Gard's specimens to Whitmore at the U.S. National Museum, where one of the few skeletons in the world is preserved together with other osteological material, most of which was collected by Leonhard Stejneger on Bering Island in 1882 and 1883.

The *Hydrodamalis* bones collected by Gard on Amchitka are the centra of the fifth, sixth, and seventh cervical vertebrae and of the first thoracic vertebra; the distal half of the right humerus and the proximal end of the right ulna, both with open epiphyseal sutures and with the articulating ends of the bones missing; the ends of two ribs; and some unidentifiable fragments. Gard returned to Amchitka with Whitmore in May 1971 and collected more bones of the same individual: the horizontal rami of both mandibles, nearly complete left scapula, a badly decomposed left humerus, and both left and right radius and the rest of the right ulna. In addition, a single rib was collected about 50 ft below the rest of the bones from the base of this deposit. The associated bones are those of a young individual, as is shown by the open condition of the epiphyseal

area of the long bones; no ossification had yet taken place, so that the ends of the bones were lost. The Amchitka animal was very large compared to modern specimens collected by Stejneger on Bering Island and preserved in the U.S. National Museum. Measurements of the bones will be published in a detailed study being prepared by Whitmore.

In addition to *Hydrodamalis*, the gravel deposit yielded a partial skull of the Steller Sea Lion, *Eumetopias jubata* Schreber, and the distal half of the radius of a large whale.

AGE OF THE DEPOSIT

The fossiliferous interglacial beach deposit at South Bight (Powers and others, 1960) is unique in the Rat and Delarof Island groups of the central Aleutian Islands and probably in the entire Aleutian chain. Twenty-five to thirty meters of sand and gravel beds, which are mostly unfaulted, unconformably overlie a sequence of tilted and faulted lower Pleistocene fresh-water silt and marine sand beds.

A piece of sea-cow bone and two pecten shells from the beach deposit were submitted for uranium series dating. The Th^{230} and Pa^{231} dates of the two shell samples were not concordant (about 130,000 \pm 15,000 and 66,000 \pm 12,000 yrs, respectively); however, the Th^{230} and Pa^{231} dates of the bone are considered concordant (135,000 \pm 12,000 and >122,000 yrs, respectively). These dates, together with the presence of unweathered till overlying the beach deposit, indicate that *Hydrodamalis* existed in the north Pacific at least as far back as Sangamon time (Gard and Szabo, 1971).

The South Bight deposit is associated with a conspicuous 52-m marine terrace which is well developed on much of eastern Amchitka. In addition to *Hydrodamalis* and other marine mammals, numerous invertebrates have been collected from the upper part of the beach deposit by the U.S. Geological Survey during geologic investigations made on behalf of the Atomic Energy Commission.

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