Sunday September 15th, 10:00am talk

New Records of Marine Reptiles from the Late Cretaceous of Minnesota

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Abstract

Broad exposures of fossiliferous deposits from the Cretaceous Western Interior Seaway span across much of the Great Plains. However, the upper Midwest has very limited exposure. As a result of decades of iron mining in the Mesabi Range of northern Minnesota, Cretaceous-aged sediment was deposited at the surface as mining spoil. Numerous fossils have been recovered from these sizable deposits, pertaining to the Coleraine Formation (Cenomanian). Most fossils are shelled invertebrates, but a handful of bones begin to paint a larger picture of the ancient ecosystem. These are cataloged at the Science Museum of Minnesota (SMM) and the Minnesota Discovery Center.

Vertebrae, teeth, and potential limb bones recovered from the Hill Annex State Park in Calumet, Minnesota, reveal the presence of elasmosaurid marine reptiles. Isolated vertebrae from the cervical and dorsal regions measure 6.0–7.0 cm (centrum length), and exhibit fully fused neurocentral sutures, which suggest they were fairly mature individuals. Comparison to a nearly complete sub-adult *Elasmosaurus* exhibits much larger centra for these regions (9.9–10.7 cm). These suggest a much smaller relative was present in the northeastern shores of the ancient seaway, where water was much shallower than the Great Plains. Isolated teeth and potential limb bones likewise reflect relatively small body size.

Remains of sea turtles have also been recovered from the same area. Multiple fragments of costal bones from the carapace exhibit the shallow pitting characteristic of soft-shelled toxochelyid turtles. Toxochelyids have been previously reported in the seaway, but from more open-water deposits. A partial limb bone, however, seems most consistent with the left humerus of *Protostega*, suggesting the presence of at least two forms of sea turtle in Minnesota.

Numerous teeth of crocodylomorphs have been recovered as well. These often exhibit well-developed carinae as well as subtle fluting on both lingual and buccal surfaces. The teeth are notably recurved and form an acute apex. These teeth likely belong to the same taxon as an

anterior snout recovered in 1967, *Terminonaris robusta*. This specimen (SMM P68.56.1) was initially designated as the holotype of the species *Teleorhinus mesabiensis*, but was synonymized in 2001.

Fieldwork continues each summer at the Hill Annex State Park and surrounding areas of northern Minnesota. In time, more complete material will likely be recovered to help identify which reptilian species were present in the warm coastal environment of Minnesota during the Late Cretaceous.