Thunder Beasts, Hellbenders and Tiny Horses: A Safari Through the Cypress Hills Formation of Saskatchewan

Main Speaker: Dr. Emily Bamforth, Royal Saskatchewan Museum, T. rex Discovery Centre, Eastend, Saskatchewan

Location: Webinar On-line Presentation

Date: Friday May 14th, 2021, 7:30 pm MST

ABSTRACT

Vertebrate paleontology in Saskatchewan today is inextricably linked to charismatic dinosaurs like Triceratops and T. rex (the provincial fossil emblem), and to the province’s impressive array of endemic marine reptiles. However, it was not Mesozoic mania that first drew paleontologists to the province in the Twentieth century. It was the Cenozoic mammals.

The oldest diverse fossil mammal assemblages in Saskatchewan are found in the Late Cretaceous; the small - and sometimes not-so-small - furry critters that shared their landscape with T. rex and Triceratops. The province is also well known for its early Paleocene mammals, sometimes found just centimeters above the K-Pg Boundary. Many of these survivors of the dinosaur mass extinction gave rise to linages from which modern North American mammal faunas stem. These taxa are known primarily from tiny teeth and/or jaws, as mammal teeth preserve better and are easier to identify than post-crania. It is generally not until the Eocene that some mammals and their fossil remains get big, heralding in the age of Cenozoic giants.

Some of the earliest discoveries of vertebrate fossils in western Canada were of Paleogene (Paleocene - Miocene) mammals in the Cypress Hills region of western Saskatchewan, from what is now known as the Cypress Hills Formation (CHF). The first record of a CHF fossil assemblage was made by R. G. McConnell in 1883, less than a decade after George M. Dawson reported Canada’s first dinosaur fossils in Saskatchewan. It is now recognized that the CHF contains fossils from a time period not represented anywhere else in Canada, but which are a northern extension of fossil mammal-bearing units in the Great Plains of America.

Since the discovery of dense microvertebrate mammal sites in the CHF, collections of from this formation have grown almost exponentially. In Canada, hundreds of thousands of fossils from the CHF are housed at the Royal Saskatchewan Museum (Regina and Eastend, SK), Royal Ontario Museum (Toronto, ON), Canadian Museum of Nature (Ottawa, ON), and other institutions across the country. The formation is now known to contain a mix of extant mammal groups including artiodactyls (even-toed ungulates), rodents, marsupials, lagomorphs (rabbits and their allies), early primates, camelids and early candidids. It also contains an array of now extinct groups like multituberculates, mesonychids and the bizarre condylarths.

Arguably, the CHF taxa that have generated the most public attention are the perissodactyls, or odd-toed ungulates. These included rhinos, the small leaf-eating early horses Hyracotherium (Eohippus) and Mesohippus, and the elephant-sized brontothere (Latin for ‘thunder beast’) Megacerops. In addition to the
mammals, fossils of other vertebrates including snakes, lizards, turtles, crocodiles, birds, amphibians (including a metre-long hellbender salamander) and a diversity of fish are also well represented in the CHF.

Despite the vast collections fossils from the formation, the CHF was for decades thought to be comprised of a single biostratigraphic unit from the early Oligocene. We now know that the formation spans a time period from the mid-Eocene, though the Oligocene, and into the earliest Miocene. The formation encompasses a major floral and faunal turnover event across the Eocene-Oligocene (E-OG) boundary, which is suggested to be related to climate cooling. As the climate cooled, the forests began to disappear and were replaced by grasslands. It was during the E-OG event that many browsing mammals (e.g. brontotheres) went extinct and grazing mammals (e.g. horses) became more prevalent. No other geological formation in Canada, and few others in North America, offer such a unique opportunity to study this continuous sequence of evolutionary and ecological transitions.

BIography

Dr. Emily Bamforth is a vertebrate paleontologist with the Royal Saskatchewan Museum (RSM), working out of the RSM’s T. rex Discovery Centre in Eastend, SK. Dr. Bamforth’s research in Eastend focuses mainly on palaeoecology, involving the study of fossil plants and animals, as well as sedimentology and paleoclimatology, to understand ancient ecosystems. Dr. Bamforth received a BSc in evolutionary biology from the University of Alberta in 2005, with an undergraduate thesis on 38 million-year-old fossil snake hibernacula from Wyoming. She went on to do a MSc in Precambrian Invertebrate Paleontology at Queens University with Dr. Guy Narbonne, exploring Ediacaran taphonomy and paleoecology at Mistaken Point in Newfoundland. In 2008, she began her PhD at McGill University under the supervision of Dr. Hans Larsson, exploring pre-extinction biodiversity trends immediately prior to the K-Pg extinction in Saskatchewan. She received her doctorate in 2014, the same year she began working for the Royal Saskatchewan Museum. Dr. Bamforth has published numerous papers and conference abstracts of Ediacaran and Cretaceous paleontology. She is the recipient of several academic, teaching and community engagement awards, including the Regina YWCA’s 2019 Women of Distinction Award for Science.

INFORMATION

This event is presented jointly by the Alberta Palaeontological Society, the Department of Earth and Environmental Sciences at Mount Royal University, and the Palaeontology Division of the Canadian Society of Petroleum Geologists. For details or to present a talk in the future, please contact CSPG Palaeontology Division Chair Jon Noad at jonnoad@hotmail.com or APS Coordinator Harold Whittaker at 403-286-0349 or contact programs1@albertapaleo.org. Visit the APS website for confirmation of event times and upcoming speakers: http://www.albertapaleo.org.