New insectivorous mammals from the John Day Fossil Beds, Oregon

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ABSTRACT:
John Day Fossil Beds National Monument in eastern Oregon preserves an amazing and colourful sequence of interbedded volcanic and volcaniclastic rocks, with dramatic stratigraphy including flood basalts. The fossils preserved there range from the middle Eocene rainforest faunas and floras of the Clarno Formation Nut Beds (44 Ma) and the Hancock Mammal Quarry (40 Ma), the Bridge Creek Flora (33 Ma) and the Turtle Cove Unit of the John Day Formation (29 Ma), the Mascall Assemblage (15 Ma) and the Rattlesnake Assemblage (7 Ma).
Recent work in the Turtle Cove Unit has yielded remains of two enigmatic insectivorous mammals, *Cryptoryctes* and *Micropternodus*.
Cryptoryctes has only been known so far from the humerus (or upper arm bone), which is very specialized and appears to adapted for an unusual form of digging. It has been found in Eocene rocks in Montana and Saskatchewan, and into the early Oligocene in North Dakota. Recent work has found a humerus in the Turtle Cove Unit that is very similar, and it is, for the first time, associated with a skull. This specimen is dated about 30 million years, younger than any of the other known specimens, and is the first time this genus has been found in the Pacific Northwest. CT scans of the skull show that it has unusual dental specializations and is probably closely related to *Micropternodus*.
Micropternodus is found in the late Eocene through earliest Miocene of North America, and has been reported from the John Day Formation based on a very fragmentary skull. A recent specimen of a much more complete skull gives more complete information on the shape of the skull, and CT scans reveal the ear morphology of *Micropternodus*. The ear of Micropternodus has adaptations that suggest it was specialized for low frequency hearing and is similar to subterranean insectivores such as moles and golden moles.

Biography:

Bio: I grew up in Toronto and found my first fossil in my backyard at age 6, visited the ROM and decided to become a paleontologist. I did my B. Sc. at the University of Toronto in Palaeontology, then my PhD at University of California Berkeley, where I was associated with the University of California Museum of Paleontology. I completed postdoctoral research at Brown University and UCLA. Following those, I was a curator of Geology at the Illinois State Museum until 2006 when I became a professor at the University of Calgary. My research focusses on the evolution of hoofed mammals over

the last 55 million years. I teach courses in vertebrate zoology, paleontology, and anatomy.