

New Directions in the Study of Fossil Endocasts: a Symposium in Honor of Harry J. Jerison,
Thursday 8:15

**THE ENDOCRANIAL ANATOMY OF THE DOMED-SKULL CHALICOTHERE
TYLOCEPHALONYX UCMP 115867 WITH EMPHASIS ON THE PARANASAL
SINUSES AND TURBINATES**

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The domed-skull nature of the Split Rock Miocene chalicothere, *Tylocephalonyx* UCMP 115867, from Fremont County, Wyoming was speculated on by Munthe and Combs. Aided only by examination of the skull's external morphology and glimpses of the internal structures afforded by fractures in the specimen, they developed an extensive list of possible functions of the calvarial dome that typified domed skulled chalicotheres. We revisit this subject with the aid of computed tomography to describe the internal anatomy of the skull with particular attention to the paranasal sinuses and nasal turbinates. Based on our analysis of the skull's internal anatomy, we further refine the speculated possible functions of the dome. With CT, any well-preserved skull can be potentially evaluated with respect to the endocranial anatomy as well as the paranasal sinus anatomy. With the domed skull chalicothere *Tylocephalonyx*, the paranasal sinus anatomy is particularly relevant to the nature of the domed calvarial architecture of the skull in that, as we now know through our investigation, the dome is an extension of the frontal sinus into the parietal plates. Furthermore, the entire volume of the dome above the dural covering of the brain is in fact pneumatized. The endocranium is well preserved including gyral impressions and calcified dural remnants. As the internal matrix is undisturbed, there are also traces of differential infilling of the endocast possibly reflecting a taphonomic sequence of brain material mummification and later replacement. Distinct crystalline replacement of preserved turbinate molds reveals the surprisingly complex sinonasal turbinate anatomy.