The Life History of the Early Camel *Poebrotherium* as Inferred From Osteohistology

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The White River Formation of Wyoming houses an incredibly rich fossil record from the late Eocene through early Oligocene. It preserves a period of climatic shifts and tectonic activity that imposed environmental pressures on the fauna that lived there. An outgroup member of Camelinae, *Poebrotherium,* the diminutive North American camel, serves as a particularly useful species to better understand the environmental pressures experienced by mammals during this time. *Poebrotherium*'s herbivorous diet was reliant on available vegetation, making it susceptible to any changes in the local environment. Any fluctuations in diet would therefore be reflected in its bone microstructure, thus giving *Poebrotherium*'s biology the potential to reveal how climate, geography, and life history played a role in the evolution of Camelidae. This can be accomplished through paleohistology. The primary histological results of *Poebrotherium* show that juvenile members of the species exemplified a high growth rate based on the presence of fibrolamellar bone and abundant vasculature continuing throughout the mid-cortex. Regular lines of arrested growth (LAGs) are present throughout the cortex of *Poebrotherium* indicating seasonal cessation of growth that mirrors cyclical environmental changes. The rapid growth apparent in juvenile-to-adolescent bone slows considerably towards the periosteum as evident by the increased contribution of lamellar bone and decrease in vasculature. The periosteal surface completely lacks vasculature, indicating that the humerus has reached skeletal maturity. Overall, these findings show that *Poebrotherium*'s rapid growth into sub-adulthood was impacted by seasonality, potentially linked to the subtropical to semi-arid/temperate climatic shift that occurred during this time. Further, the presence of LAGs shows that it took multiple seasons for these animals to reach skeletal maturity. Lastly, this study suggests that the ancestral rapid growth rates for Camelidae might have allowed for extant camels to reach the large sizes seen today.