be intermediate in size between previously described species, ~15-30% larger than *Hilarcotherium castanedaii*, *Xenastrapotherium christi*, and *Xenastrapotherium kraglievichi*, but ~15-20% smaller than *Granastrapotherium snorki*, *Hilarcotherium miyou*, and *Uruguaytherium beaulieu*. The Quebrada Honda material likely represents a new species, but its generic affinities are presently unclear. Despite the temporal overlap between Quebrada Honda and La Venta, they have virtually no species or even genera in common, a pattern reinforced by the astrapothere material described here. However, the presence of an uruguaytheriine astrapothere at Quebrada Honda suggests some paleoenvironmental similarities with La Venta and other Middle Miocene sites (e.g., Fitzcarrald and Tumbes, Peru; Alto Juruá, Brazil) where their remains have been reported, such as a warm, lowland setting with permanent bodies of water.

Romer Prize Session (Thursday, October 31, 2024, 8:00 AM)

Southern giants: locomotory and sensory adaptations of diprotodontid marsupials from the late Cenozoic of Australia and New Guinea

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Giant mammals exert a major influence on terrestrial ecosystems due to their size and the ways in which they use and modify landscapes. Although many large species became extinct over the past 100,000 years, iconic survivors include elephants, rhinoceroses, hippopotamuses and tapirs. On the Australian continent, the extinct marsupial diprotodontids have often been cast as the functional and ecological equivalents of such placentals, but the validity of these claims remains poorly tested, a situation exacerbated by 186 years of taxonomic confusion. Through comparisons of over 2,200 3D digitised bones, I re-appraised the taxonomy of late Cenozoic diprotodontids and investigated their locomotory adaptations and vision. Analysis of visual systems was conducted through measurements of orbit orientation, and geometric reconstructions of eye volume and placement using the surrounding contours of the orbit. Of the Pleistocene species, I consider five (*Diprotodon optatum*, *Nototherium mitchelli*, *Zygomaturus trilobus*, *Hulitherium tomasettii* and *Maokopia ronaldi*) to be taxonomically valid. Each had a distinct geographical distribution; with only *D. optatum* consistently occurring sympatrically with other species. All five are present in fossil deposits dated to within the last 100,000 years. Comparisons of limb-bone morphology demonstrate that all Pleistocene species exhibit unique adaptations to plantigrade graviportal locomotion. The function and weight-bearing role of the digits are vastly reduced/absent compared with that of the carpals/tarsals. Furthermore, the pisiform is modified into a secondary heel for efficient long-distance walking. The mid-Pliocene appearance of these adaptations coincided with expansion of open habitats. Advanced specialisation in the limbs of *N. mitchelli* is demonstrated in the form of a passive locking mechanism in the elbow, facilitated by the medial ulnar collateral ligament. Further unique specialisations are observed in the eye orbit region of *M. ronaldi*. It displays demonstrably larger, more convergent eyes than any other diprotodontid. This is likely reflective of a nocturnal niche in the subalpine tundra of New Guinea. These discoveries highlight the ecomorphological distinctness of diprotodontids among giant mammals; they were as unique to the Australian continent as the kangaroo or echidna. Ongoing research on diprotodontid anatomy and ecology is

expected to shed light on the impacts of their loss from Australian ecosystems.

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Regular Poster Session 2 (Thursday, October 31, 2024, 4:30 - 6:30 PM)

Dental wear facets in Pachycephalosauridae are more similar than previously thought

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Previous workers have documented a variety of facet configurations in pachycephalosaurid taxa, from the apically located planar facets devoid of cutting edges on maxillary teeth of *Prenocephale* (MgD-I/104) to the lingual maxillary facets of *Homalocephale* (MPC-D 100/1201) that are so extensive they form a confluent occlusal plane across the entire maxillary dentition. To test these interpretations, we examined facet configuration and type (attrition/abrasion) in a variety of pachycephalosaurid taxa.

Wear on maxillary crowns of *Pachycephalosaurus* (TCMI 2004.17.1) exhibits four configurations: a large mesiolingual attrition facet; large mesiolingual and a smaller distolingual attrition facet; a third abrasion facet apicolingually positioned between these attrition facets; or a large attrition facet that broadly covers the lingual surface of the crown. *Stegoceras* (UALVP 02) shares with *Pachycephalosaurus* large mesiolingual or paired mesiolingual and distolingual attrition facets, but not the other two configurations. Dentary crowns of cf. *Sphaerotholus* (NMMNH P-30068) exhibit either single or double attritional facets like those of *Stegoceras* where the larger facet is located distolabially and the smaller mesiolabially.

Facets in *Homalocephale* resemble similarly placed facets in *Pachycephalosaurus* but do not form a confluent surface, being slightly offset among crowns. Additionally, the aberrant apical facets in *Prenocephale* are an affectation of weathering, with much of the apical-most enamel and dentine missing and fragmented to give the false appearance of faceting. Remnants of true attritional facets are preserved on three left maxillary teeth in *Prenocephale*. Although poor preservation has diminished their extent, the position of these facets implies that they covered the mesiolingual crown more extensively, akin to the large mesiolingual maxillary facets of *Pachycephalosaurus* and *Stegoceras*.

Goyocephale (MPC-D 100/1501) was not examined by us, but previously published figures of this specimen show large mesiolingual to lingual maxillary facets that resemble those in *Pachycephalosaurus* and *Homalocephale*. The figured dentary teeth imply the presence of double facets like those of *Stegoceras* and cf. *Sphaerotholus*.

We interpret the similarity of facets among pachycephalosaurids to indicate a more congruent pattern of mastication among taxa, with previous interpretations of widely varying wear indicative of highly disparate diets having lost support.

Technical Session 17: Theropoda II (Saturday, November 2, 2024, 8:00 AM)

A new double clutch of *Prismatoolithus* eggs from the Cretaceous Two Medicine Formation of Montana and nesting site fidelity in non-avian dinosaurs

Varricchio, David J.[1], Allen, Harrison J.[2], Scannella, John[3]