periosteal surface and is formed of simple vascular canals. Growth marks, in the form of lines of arrested growth, are poorly defined, such that assessing skeletal maturity and measuring growth is difficult. However, what is preserved indicates the individual was still growing and the lack of an external fundamental system indicates the individual had not reached skeletal maturity. The cortical bone preserves numerous Sharpey's fibres, particularly in the anterolateral quadrant of the section. Notosuchians are generally interpreted as primarily terrestrial. Analysis with BoneProfileR recovers parameter values (P = 0.591; S = 0.056) consistent with all crocodylians with a tubular bone and moderate compactness. Thus, terrestriality is not strongly reflected in the bone density profile. When compared to other notosuchians, *Sebecus icaeorhinus* appears to be more similar to slower growing taxa such as *Araripesuchus buitreraensis* and *Iberosuchus macrodon*. Although sample size is small, with *Iberosuchus macrodon* and *Sebecus icaeorhinus* the only histologically sampled notosuchians from the Cenozoic, it is possible that slow growth was key to the survival of the sebecoid notosuchian lineage through the K–Pg extinction.

Funding Sources Funding provided by Natural Environment Research Council (Grant/Award Number: NE/X014010/1) and The Royal Society.

Regular Poster Session II (Thursday, November 13, 2025, 4:30 - 6:30 PM)

Variation in metaconid morphology and the distribution of twinned metaconids in Perissodactyla, Cambaytheriidae, Anthracobunidae, South American native ungulates, and Desmostylia

Holbrook, Luke T.[1], Croft, Darin A.[2], Beatty, Brian L.[3], Wynd, Brenen[4]

[1]Biological Sciences, Rowan University, Glassboro, New Jersey, United States, [2]Anatomy, Case Western Reserve University, Cleveland, Ohio, United States, [3]Anatomy, NYIT College of Osteopathic Medicine, Old Westbury, New York, United States, [4]Southeastern Louisiana University, Hammond, Louisiana, United States

The lower molars of many early perissodactyls possess a peculiar morphology of the metaconid where there are two distinct cusps. Originally these features were considered to be the metaconid and the metastylid, and only later was it recognized that the metastylid was distinct from these two cusps. As a result, this pair of cusps has been referred to as twinned metaconids. Twinned metaconids were first noted in early perissodactyls, but they are also present in anthracobunids and cambaytheriids and provide evidence for uniting these taxa in Perissodactylamorpha, which might also include Desmostylia.

Evidence for close relationships of some South American native ungulates (SANUs) to perissodactyls has led to conflicting interpretations regarding the possible presence of twinned metaconids in SANUs. We review the morphology of lower molar metaconids in perissodactyls, cambaytheriids, anthracobunids, desmostylians, and SANUs in order to evaluate possible homologies among these taxa. SANUs display a variety of metaconid morphologies, including elongated metaconids in didolodontids and litopterns and bifurcated metaconids in some early notoungulates. In didolodontids, what appear to be twinned metaconids are as likely, if not more likely, to be a single metaconid with a closely appressed paraconid. An isolated dp4 attributed to a didolodontid does show what appear to be true twinned metaconids, but otherwise at present there is little to connect the various metaconid morphologies of SANUs to the twinned metaconids of perissodactylamorphans.

We also examine the possibility of twinned metaconids in desmostylians, which some studies have recovered as closely related to perissodactyls. The early desmostylian *Behemotops* does not exhibit twinned metaconids, but this condition might be present in later desmostylians. The evaluation of later desmostylians is hampered by uncertainties in cusp homologies, but the presence of additional cusps in desmostylian lower molars suggests that twinned metaconids might be present.

Regular Poster Session II (Thursday, November 13, 2025, 4:30 - 6:30 PM)

The comparative biomechanics and cranial hydrodynamics of Jurassic marine reptiles

Holmes, Lucy H.

Geography, Earth and Environmental Sciences, University of Birmingham, Leeds, W Yorkshire, United Kingdom

The Jurassic Period is renowned for its diverse selection of marine reptiles, such as plesiosaurians, ichthyosaurs and marine crocodylomorphs. These groups showcased a wide variety of feeding strategies. Research into Jurassic marine reptile phylogeny and anatomy has been conducted previously, however, their feeding biomechanics are understood to a much lesser extent. Understanding the biomechanics and hydrodynamics of these groups is imperative to our understanding of their hunting, feeding and swimming behaviors. It was hypothesized that species with a broader skull and larger mandibular muscles would have a smaller maximum gape, but a stronger bite force. However, this would be achieved at the cost of increased hydrodynamic drag, and therefore slower movement. This hypothesis was tested by investigating the biting biomechanics and hydrodynamics of twelve species of Jurassic marine reptiles, within five phylogenetic groups, and two extant crocodilian species for validation. First, 3D models of their skulls were created using Blender, then the jaw adductor muscle attachment sites were reconstructed. These reconstructions were then used to perform gape analysis using Blender and Python. Finally, the hydrodynamic performance of these species' heads using, mandible and skull surface area data, was calculated using ImageJ. Results indicate that cranially robust apex predators, such as *Pliosaurus* and *Dakosaurus*, contradictorily had comparatively larger maximum jaw gape angles, in conjunction with large mandibular muscle attachments, indicating high bite force. This does typically come at the expense of increased hydrodynamic drag, which is seemingly counteracted by post-cranial morphologies, and would have little impact on swimming and hunting effectiveness.

Regular Poster Session III (Friday, November 14, 2025, 4:30 - 6:30 PM)

Recovering lost contextual data from early excavations at the Rancho La Brea and McKittrick tar seeps, California, USA, and disambiguating imperfect data

Holroyd, Patricia A.

Museum of Paleontology, University of California-Berkeley, Berkeley, California, United States

Contextual data for early 20th century fossil collections is often vague and/or has been lost or misinterpreted during succeeding decades of study and reorganizations of collections. Recapturing, disambiguating, and standardizing the associated data is key to making these collections more useful for future researchers. A major challenge in ongoing research using Pleistocene to Holocene fossils collected by the University of California from 1906–1912 at Rancho La Brea and in the 1920s at the McKittrick tar seeps is determining where specimens may have been collected and relating the specimens to those for which radiocarbon dates have been obtained. Although distinct excavations, the two sites share an intermingled curatorial and research history. As this field work largely took place prior to the creation of the museum, there was neither a standardized way of capturing information nor an internal archive to house it. Individual specimens may have no contextual data, cryptic coordinate data recorded only on the bones, conflicting locality numbers, or duplicated specimen numbers. Drawing on records from our museum and correspondence distributed in four other archives, it has been possible to reconstruct an imperfect chronology of collection and subsequent preparation and curation that traces and identifies multiple points at which