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above the water surface in a swan-like manner is rejected due to unbalanced buoyancy forces acting on the body. The oblate bodies of *Cryptocleidus* and *Liopleurodon* provided effective passive mechanisms for righting the body if perturbed by waves at the surface, but the almost circular cross-section of the *Thalassomedon* body was ineffective in self-righting. Impractically large amounts of gastroliths were needed to initiate sinking. With the lungs 50% inflated,10kg of stones were still required in a 218kg *Cryptocleidus* to produce negative buoyancy, and the idea that gastroliths were for control of buoyancy and equilibrium is rejected. However, gastroliths equal to 1% of body weight in a *Thalassomedon* model were effective at damping out buoyant oscillations of the neck when at the surface.

Poster Session A

A NEW PELOBATID ANURAN FROM THE EOCENE ELKO FORMATION OF NEVADA

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A new, small pelobatid anuran is represented by a small collection of fairly well-preserved and for the most part articulated to closely associated fossils recovered from the middle Eocene Elko Formation near Elko, Nevada. The Elko Formation is divided into three informal members, lower, middle, and upper, and was deposited primarily under warm, temperate conditions in a fluviolacustrine system of a broad, shallow basin extending over a large area of present-day northeastern Nevada. The fossils were preserved in a sandy limestone unit near the base of the middle member, which lies about 100 m above a unit yielding a radiometric date of 46.1 Ma.

A phylogenetic analysis suggests that the new pelobatid is the most primitive pelobatid currently known and differs from all other pelobatids in the following autapomorphies: 1) alary process of premaxilla is broad-based and forms a laterally-deflected, straight blade whose transverse axis in an articulated skull would be oriented in a near parasaggital plane; 2) pars acromialis of scapula is triangular with an anteriorly directed apex positioned at the level of the dorsal rim of the glenoid fossa; and 3) urostyle length exceeds that of the vertebral column.

The new pelobatid is the oldest known member of its family that exhibits burrowing specializations in its skeleton. Thus, like extant pelobatids, it very likely could avoid high daytime temperatures and periods of dryness by constructing a burrow in which it aestivated. The ability of early Tertiary pelobatids to presumably avoid drought by aestivating in burrows is thought to be a preadaptation for hibernation in burrows to survive subfreezing temperatures resulting from global cooling that began in the Middle Eocene.

Poster Session A

THE PIRAPOZINHO SITE—A TAPHOFACIES STUDY

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The Pirapozinho site (Sao Paulo, Brazil) is informally known as Tartaruguito due to the spectacular preservation and abundance of turtle fossils. The analyzed litologic facies present cyclic alternations of mudstone and sandstone layers. The basal one (clay sediment) presents several fragments including fish and reptile material (Class III B—fragmented isolated bones). In the subsequent sandstone layers, which are intercalated with some mudstone, and eventually some clay pellets, are several articulated bones representing different classes of degrees of articulation (I—articulated skeletal material, II—partially articulated skeletal material and IIIA—disarticulated complete bones). In the uppermost layer, it is observed a large fragmented turtle bone material, probably a result of a slight reworking of the material, due to a canal erosion (Class III B—fragmented isolated bones).

Based on some geological studies and on the great concentration of the testudine material, that supposedly indicates that individuals were once agglomerated around a body of water, till their death, some authors indicate a semi-arid condition to the region. Nevertheless, some turtle materials present an internal stratification and a disarticulated internal condition, and others remained totally articulated, as proved by a tomographic exam. The crocodylia material, that was probably carried into the river by fluctuation and deposited at the local, was preserved articulated. The presence of a clay layer, small pellets of clay and the small cross bedding sedimentary structures indicate that wet periods were also occurring.

Sedimentary and tomographic analyses of the internal structures of different turtle material indicate that there exists a time-averaging process, the fossil assemblage representing more than one episode. A climatic transition phase, from a humid to a semi-arid condition, is speculated to the Pirapozinho site (Presidente Prudente Formation), dated as Campanian-Maastrichtian. The typical semi-arid condition would only have been established at the Bauru Basin during the end of the Cretaceous period (Maastrichtian), as it is observed in Marilia Formation.

Poster Session A

MITIGATION OF NATURAL AND HUMAN-INDUCED CHANGES TO NEW MEXICO'S MOST IMPORTANT JURASSIC BONEBED

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The Bureau of Land Management (BLM) recently stabilized and protected an important Late Jurassic bone bed. New Mexico Museum of Natural History (NMMNH) locality L-3282, informally known as the 'Peterson Quarry', was discovered on BLM land during uranium prospecting expeditions to Jurassic and Cretaceous outcrops west of Albuquerque. The quarry represents New Mexico's most important Jurassic locality. When discovered, dinosaur bones were eroding out of a channel sandstone in the Brushy Basin Member of the Upper Jurassic Morrison formation. In 1989, excavation by NMMNH volunteers began under a BLM permit and continues today. Over the last 16 years, excavations have produced over 72 jackets and hundreds of sauropod and theropod bones and teeth. Proximity to Albuquerque makes the quarry an ideal outdoor laboratory to showcase field activity associated with collection of large fossil bones.

The quarry location in an arroyo bottom created a challenge for ongoing excavation. Portions of quarry have been subject to flood events. This interaction with occasional surface water affected the preservation of material collected. In the mid 1990s, overburden was removed by backhoe and excavation continued away from the arroyo bottom. Bone preservation has improved as excavation extended outside of the recent channel. Rock debris removed from the wash with a small backhoe was used to form a berm that can deflect periodic flow events away from the quarry. Cleaning out the wash re-established the grade to allow through flow and prevent ponding.

Public demand for landscape rock in Albuquerque had created a human induced threat to the quarry. Recent illegal landscape rock collection along the old jeep trail leading to the quarry called for immediate response. A gate and short fencing project blocked access to unauthorized vehicles. Construction of a pedestrian walk through allows hikers access to the short scenic hike to the quarry. By taking these measures, the quarry will remain open and accessible for excavation, future study and opportunity for outdoor learning activities for years to come.

Saturday 4:00

REVISED HORN RECONSTRUCTIONS FOR EXTINCT RHINOCEROTID TAXA: SEPARATING THE CONTRIBUTIONS OF DERMIS AND EPIDERMIS TO HORN RUGOSITIES

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Recent work on the skin of extant rhinoceros has led to the development of a mechanistic model for the osteological correlates of rhinoceros horn attachment, which relates grossly visible bony features of the "horn rugosities" to specific characters of the dermis that provide attachment for the epidermal horn. The projecting texture of rugosity that characterizes most of the nasal and frontal horn rugosities is formed by metaplastic ossification of the reticular dermis and the investing fascia of the dermis, respectively. Similar textures of rugosity on the facial bones of extant taxa such as *Hippopotamus* and *Potamochoerus* that lack epidermal horns indicate that projecting rugosity is in itself only associated with the presence of a thickened and well-organized dermis, and is not necessarily indicative of a horn. Instead, the presence of an epidermal horn is associated with specific larger-scale patterns of rugosity and vascularity. Large nasal horns such as those found in *Ceratotherium* and *Diceros* are associated with a peripheral zone of projecting rugosity around the nasals. The center of the nasal rugosity is often grossly smooth, but is perforated by numerous branches from the lateral nasal arteries, which traverse from within a novel nasal sinus to the surface of the nasal bone. Frontal horns are associated with two adjoining fields of tangentially-oriented rugosity. Absence of epidermal horns, as in female *Rhinoceros sondaicus*, is associated with absence of rugosity. The facial integument of several extinct rhinos, notably *Diceratherium*, *Menoceras*, and *Acerorhinus*, has been reconstructed using these osteological correlates. These findings have bearing on the evolutionary role of the integument in agonistic behaviors, species recognition, sexual display, etc.

Poster Session B

ANATOMY AND PHYLOGENETIC POSITION OF THE PALEOCENE CROCODYLIAN *AKANTHOSUCHUS LANGSTONI*

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Akanthosuchus langstoni is a poorly known crocodylian represented by a few postcranial elements and approximately 200 unusually ornamented osteoderms. The paucity of available material pertaining to *A. langstoni* has hindered interpretations of its lifestyle and phylogenetic affinities, because such interpretations for fossil crocodylians have been traditionally based on morphology of the skull instead of the evolutionarily conservative postcranial skeleton. Here, we use available morphological data to assess the phylogenetic relationships of *A. langstoni*, and present new information on the morphology of crocodylian osteoderms.

The range of intraorganismal variability in crocodylian osteoderm morphology is extensive, and multiple distinct morphotypes can be identified in individuals of several extant and extinct species. Thin sections of *A. langstoni* osteoderms demonstrate the presence of three histologically distinct regions, arranged in layers from superficial to deep. Growth marks in sections of the holotype osteoderms reveal that the individual was at least eight years old, and that its small size might be attributable to it not being fully mature.

Cladistic analyses indicate that *A. langstoni* is unequivocally nested within Alligatoroidea, and may be more closely allied with alligatorines than with caimanines. The hypothesis that *A. langstoni* represents the postcrania of the Paleocene crocodylians *"Navajosuchus"* or *Ceratosuchus* is unsupported. Although *A. langstoni* may be regarded as a "wildcard" taxon that causes a decrease in phylogenetic resolution, its higher-level relationships can be ascer-