conform to the modern LBG. Instead, dinosaur diversity was highest at temperate paleolatitudes throughout the 160 million year span of dinosaurian evolutionary history, and may have been driven by the amount of available land area among latitudinal belts. Thus, the ubiquity of the paleotemperate peak indicates that there is no evidence that fluctuations in climate exerted a strong influence, or that the tropics acted as a cradle to dinosaur diversity at any point in their evolutionary history: the earliest known representatives of most clades are from temperate paleolatitudes. Late Cretaceous sauropods and ornithischians exhibit disparate LBGs, providing clear evidence of geographical partitioning among major clades of herbivorous dinosaurs. This partitioning may result from the advanced stages of continental fragmentation and/or differing responses to increasing latitudinal climatic zonation. The apparent conformity of post-Eocene birds to the 'standard' LBG contrasts dramatically with Mesozoic dinosaurs. Our results suggest that the modern day LBG on land was only established 30 million years ago, following a significant post-Eocene recalibration, potentially related to a reduction in extratropical speciation rates as a consequence of increased seasonality across the Eocene/Oligocene boundary.

Technical Session X (Friday, November 4, 8:30 am)

EVIDENCE FOR SCANSORIALITY IN THE FORELIMB OF NORTH AMERICAN PALEOCENE INSECTIVORES (MAMMALIA, EULIPOTYPHLA)

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Eulipotyphla is a monophyletic clade of insectivorous mammals (shrews, moles, hedgehogs, selenodons) that generally exhibit terrestrial or fossorial behaviors, but little is known about positional behaviors of early eulipotyphlans. While their teeth are known back to the early Paleocene, postcrania are only rarely found. Here we describe the forelimb of two taxa with dentally associated skeletons that were recovered from freshwater limestone of the late Paleocene Willwood Formation, Bighorn Basin, Wyoming: *Leptacodon rosei* (Soricomorpha?, Nyctitheriidae) and *Adunator* n. sp. (Erinaceomorpha, incertae sedis). Their morphology is very similar, likely reflecting shared ancestry and similar forelimb capabilities. The proximal humerus has a rounded head, low tuberosities and distinct muscle attachment sites for rotators of the shoulder that suggest considerable mobility at the glenohumeral joint. The elbow joint appears to have been habitually flexed, based on the shallow olecranon and deep radial fossae on the distal humerus, and on the short, cranially curving olecranon process of the ulna. Considerable supination was possible at the elbow joint between the nearly spherical humeral capitulum, the deeply concave, rounded central fossa of the proximal radius, and the flat, craniolaterally facing radial notch on the ulna. These characteristics of the forelimb indicate arboreal capabilities and suggest that early members of Soricomorpha and Erinaceomorpha were scansorial, unlike the terrestrial *Macrocranion* or *Pholidocercus*, Eocene erinaceomorphs for which whole skeletons are known. The distal humeri greatly resemble those of plesiadapiforms in morphology and proportion, particularly in having an entepicondyle that is about half the width of the articular surface and a similar trochlear shape that is wider than long. Both humeri have unique similarities to euarchontans including a robust, medially protruding lesser tuberosity and a nearly spherical capitulum. These similarities may represent convergence on arboreal capabilities or the retention of a primitive morphology that allowed considerable forelimb mobility inherited from a boreoeutherian ancestor.

Poster Session IV (Saturday, November 5)

DIGGING MORPHOLOGY AND THE INTERACTION BETWEEN SOIL AND CLIMATE DETERMINE POCKET GOPHER (*THOMOMYS*) DISTRIBUTION ACROSS TIME AND SPACE

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The allopatric distribution of northern Californian pocket gophers (*Thomomys* spp.) is hypothesized to be a result of competitive exclusion. Replacement of subgenus *Thomomys* with subgenus *Megascapheus* occurred gradually during the Pleistocene-Holocene transition, suggesting a role for abiotic factors in their niches. A principle component analysis (PCA) of linear and geometric morphometric data from 80 adult female forelimbs and 450 crania show that these groups separate by tooth and/or claw-digging traits. We propose that morphological differences contribute to the competitive dominance of one species over another given the local environmental inputs on soil condition in their range, and suggest that climate has impacted soils through the past 20,000 years, favoring *Megascapheus*. GIS analysis of specimen localities mapped on NRCS physical soil maps and PRISM climate data helps explain boundaries between gopher taxa. Soil clay, bulk density, and shrink-swell capacity separate species with digging strategy differences. While clay and bulk density stay constant over 1000s of years, low precipitation and high temperatures can produce shrink-swell behavior in reactive soils within days. The strong yet underappreciated interaction between soil and moisture on the distribution of this major vertebrate group is rarely considered when projecting species responses to climatic change. Understanding how the environment impacts gopher digging efficacy could pinpoint the key climatic changes most likely to have influenced past populations of gophers as well as predict future distributions in this region.

Poster Session III (Friday, November 4)

OCCURRENCE OF THE MARINE TURTLE *THALASSEMYS* IN THE KIMMERIDGIAN OF OKER, GERMANY

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A partial chelonian was collected from the Langenberg Formation quarry of Oker (near Goslar, Lower Saxony, Germany). The amniotes from this formation include other chelonians (possible Plesiochelyidae), the sauropod *Europasaurus holgeri*, theropods (Velociraptorinae), crocodylomorphs *(*Atoposauridae, *Theriosuchus pusillus, Goniopholis simus, Machimosaurus hugii, Steneosaurus brevirostris)* and pterosaurs (Dsungapteridae, ?Ornithocheiroidea, ?Ctenochasmatidae).

The reported specimen, DFMMh/FV 296, includes a skull part (articulated quadrate, squamosal, basisphenoid, and pterygoid), a disarticulated 40 cm long partial carapace, plastron, and one cervical vertebra.

The carapace bears fontanelles, trapezoidal suprapygal with straight edges, small last neurals (about half the size of previous neurals), scute sulci bear a well-defined step near the neurals, a plicated longitudinal pattern in the proximal end of the costals originating on the posterior side of the scute sulci and dissipating posteriorly, wide central opening in the plastron, xiphiplastra with little or no contact between each other, and both the hyo- and hypoplastron have digit-form buttress projections.

The specimen has a central plastra fontanelle, which is regarded as a feature of the clade including *Solnhofia*, *Santanachelys*, and *Thalassemys*. DFMMh/FV 296 differs from *Solnhofia* by the trapezoidal shape of the first suprapygal. Within this clade, a suprapygal with straight edges and xiphiplastron participation in the central fontanelle is autapomorphic for the *Thalassemys* genus. A large central fontanelle with hyo and hypoplastron polygonal medial margins (i.e., segments with well-defined angles, rather than being gently curved), reduced contact between xiphiplastra and reduced size of the two last neural plates is shared between *T. hugii* and the Oker specimen. DFMMh/FV 296 differs from this species due to the presence of plastral projections. The different shape of the plastron (no polygonal-like margins or hyo- and hypoplastron projections) suggests that *T. moseri* might be reclassified into a different genus. Therefore, we can assign this specimen to *Thalassemys* sp.

Poster Session II (Thursday, November 3)

ONTOGENETIC CHANGES IN THE SKULL ELEMENTS OF THE LATE JURASSIC DWARF SAUROPOD *EUROPASAURUS HOLGERI*

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Juvenile sauropods are very rare in the fossil record. No extensive ontogenetic growth series exists for sauropod skulls, and consequently, the morphological changes in ontogeny are not well understood. This study explores such changes in the most complete collection of disarticulated skull bones of a single sauropod taxon, the dwarf basal macronarian *Europasaurus holgeri* from the Kimmeridgian of northern Germany. The skull material includes different individuals of various ontogenetic stages. Because size alone is not a good indicator to determine ontogenetic stage, we used size-independent characters to stage the bone elements. Since the original description of *Europasaurus*, new skull material has been found and has allowed us to create an updated skull reconstruction of an adult individual. The updated reconstruction features smaller external nares and a larger orbit as compared to the original reconstruction. Important ontogenetic changes are the decreasing ventral exposure of the jugal, which is extensive in the juvenile, and the increasingly erect nasal process of the premaxilla. This, the large orbit, and other skull parts are paedomorphic characters resulting from dwarfing. The ventral exposure of the jugal and the inclined premaxillary nasal process in the juvenile *Europasaurus* represents the retention of plesiomorphic characters seen in basal sauropodomorphs (e.g. *Plateosaurus* and *Massospondylus*) and basal sauropod dinosaurs (e.g. *Shunosaurus*). Apart from three partial braincases, only isolated skull bones have been found. This pattern, the lack of fusion of the skull bones, is regarded as another paedomorphic character. By studying the skull bones in detail, we also found that the material represents two morphs of different size classes that also belong to different ontogenetic stages. One such distinctive feature is the dimorphism of the orbital margin of the frontals.

Poster Session IV (Saturday, November 5)

POPULATIONS, PLASTICITY AND PHENOTYPE: THE PROBLEMS OF CONTINUOUS VARIATION AND MISSING LINKS IN IGUANODONTIAN DINOSAURS

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There has been a resurgence of interest in basal iguanodontian dinosaurs as a consequence of the discovery of an unexpectedly diverse Cedar Mountain Formation fauna. This has led to renewed interest in historical genera such as *Camptosaurus* and *Iguanodon*, and the creation of new taxa from material formerly referred to these genera. There has also been a notable