Poster Session IV (Saturday, November 5)

TRICERATOPS AND TOROSAURUS SYNONYMY: AN EVALUATION OF TWO LARGE SPECIMENS FROM BRIGHAM YOUNG UNIVERSITY

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Due to the recent controversy surrounding the synonymizing of *Torosaurus* and *Triceratops*, two skulls from the Brigham Young University Museum of Paleontology have been evaluated. BYU 12183 initially appeared to maintain typical *Triceratops* morphology, and did not possess mature *"Torosaurus"* features despite its exceptionally large size. However, examination of the original specimen shows extensive restoration bias, obscuring the original morphology. A second large, un-restored *Triceratops* frill (BYU 19974) possesses dorso-ventrally compressed epiparietals and episquamosals, a sign of ontogenetic maturity. Significant thinning of the parietal occurs in areas that correspond to the parietal fenestrae observed in "*Torosaurus."* These features indicate that it is an ontogenetically transitional form between *Triceratops* and *"Torosaurus."*

Technical Session VII (Thursday, November 3, 3:45 pm)

PALEOBIOLOGICAL IMPLICATIONS OF THE EARLY EOCENE RODENT *TUSCAHOMYS* BASED ON AN EXTRAORDINARY NEW FAUNAL ASSEMBLAGE FROM THE GREAT DIVIDE BASIN, WYOMING, USA

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The cylindrodontid rodent *Tuscahomys* is a dominant component of earliest Wasatchian faunas from the United States, where its range is known to have extended from Mississippi to Wyoming. Earliest Wasatchian faunas containing *Tuscahomys* play a pivotal role in documenting how North American ecosystems responded to the dramatic, yet short-lived episode of global warming known as the Paleocene-Eocene thermal maximum (or PETM). Here, we report an extraordinary new sample of *Tuscahomys* currently consisting of 400 identifiable specimens representing at least 63 individuals from the newly designated Smiley Draw local fauna (l.f.) in the Great Divide Basin, Wyoming. To our knowledge, this is the largest sample of a rodent species ever collected from an early Cenozoic locality in North America, and possibly worldwide. The Smiley Draw l.f. correlates with the lower part of the Wa-4 faunal zone on the basis of the biostratigraphic record of the primate *Tetonius*. Although the new assemblage of *Tuscahomys* is substantially younger than those previously documented from Mississippi and the Bighorn Basin, it maintains a similar pattern of faunal association. Along with *Tuscahomys*, the most common mammals in the Smiley Draw l.f. are *Haplomylus* and *Meniscotherium*. The Smiley Draw l.f. therefore mimics the unusual faunal association that characterizes the earliest Wasatchian Wa-M faunal zone in the Bighorn Basin. Based on the extraordinary abundance of *Tuscahomys* and its association with *Meniscotherium*, a taxon that is well known for its patchy spatiotemporal distribution, the Smiley Draw l.f. apparently samples an ecosystem that was characterized by some of the same unusual conditions that prevailed during the PETM in the Bighorn Basin. *Tuscahomys* appears suddenly in the North American fossil record at the base of the PETM, alongside a suite of other immigrant taxa including Perissodactyla, Artiodactyla, Primates, Hyaenodontidae and Hapalodectidae. The affinities of Cylindrodontidae are debated, but new data from *Tuscahomys* suggest that Cylindrodontidae dispersed into North America at the base of the PETM rather than evolving *in situ* from Clarkforkian paramyid ancestors.

Technical Session IX (Friday, November 4, 8:15 am)

DEATH, DECAY AND DISARTICULATION: RECONSTRUCTING TAPHONOMIC HISTORIES OF TRIASSIC MARINE REPTILES FROM MONTE SAN GIORGIO, SWITZERLAND

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Three marine reptile taxa from Monte San Giorgio, Switzerland, were used to develop and test a new method of evaluating taphonomy: the morphologically similar pachypleurosaurids *Serpianosaurus* and *Neusticosaurus* and the protorosaur *Tanystropheus*. Although the *Neusticosaurus* originate from a younger horizon, individuals of all three taxa are preserved in similar successions of alternating black shale and dolomite, representing normal background sedimentation and event beds respectively. Skeletal taphonomy was assessed for nine anatomical units (the head, neck, dorsal, tail, ribs and four limbs) scored independently for two characters (articulation and completeness). All taxa vary in their state of preservation, however the patterns of articulation and completeness indicate individuals reached the sediment-water interface shortly after death and while still largely intact. Episodic deposition of event beds buried individuals at various stages of decay. Where decay reached increasingly advanced states, carcasses became progressively affected by weak bottom currents, resulting in removal of skeletal elements. Removal is most pronounced in *Serpianosaurus* and limited in *Neusticosaurus* indicating subtle differences in the environmental conditions of the basinal setting across two successive units. Interpretations of *Tanystropheus* as having a fully or partly terrestrial lifestyle in near-coastal settings are not supported. Disarticulation is often entire, however completeness remains relatively high, which could not be achieved during the extended interval of transport necessary to reach the marginal intra-platform basin, into which individuals were deposited.

Technical Session XIII (Friday, November 4, 4:00 pm)

DENTAL MESOWEAR AND LONG-TERM PALEODIETARY TRENDS IN HORSES AND OTHER UNGULATES FROM THE EARLY MIOCENE-EARLY HOLOCENE OF FLORIDA

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Dental mesowear is a macroscopic measure of apical cusp morphology that serves as a proxy for the relative amounts of abrasive and attritive dental wear. Recent mesowear studies show that dietary abrasion in North American ungulates broadly tracks paleoenvironmental change. We recorded mesowear data for the entire Florida Museum of Natural History fossil ungulate collection and documented Floridian trends in dietary abrasion from the early Miocene-early Holocene, including Equidae, Rhinocerotidae, Protoceratidae, Camelidae, Palaeomerycidae, Antilocapridae, Moschidae, Gelocidae, Cervidae, and Bovidae. The mesowear trends were compared with those from other regions of North America, mostly from the Great Plains and western United States. Mesowear data from 1342 Florida horse specimens follow a trend consistent with that of horses from other regions, suggesting increasingly abrasive diets during later half of the Cenozoic. Prior to the Clarendonian NALMA, Florida horse diets show abrasion levels most consistent with extant browsers. Thereafter, horses show a more disparate array of mesowear patterns, indicating a mixture of high-abrasion and low-abrasion diets. Low abrasion diets became increasingly rare and by the Pleistocene, all equid diets show high levels of abrasion consistent with extant grazers. Pleistocene horses from Florida appear to have had more abrasive diets than Pleistocene horses from other regions. The significance of higher dietary abrasion to our understanding of Florida paleoenvironment is not yet clear but may indicate that horses consumed greater amounts of incidental sand, soil, or dust. Data from several thousands of other specimens representing other types of ungulates consistently indicate low abrasion diets prior to the Late Miocene. In the Late Miocene / Early Pliocene, camelids develop moderately more abrasive diets perhaps indicative of mixed feeding, though not as abrasive as contemporaneous horses. In Florida, the horse mesowear data show strong and predictable responses to broad paleoenvironmental changes, whereas the mesowear from other ungulates show perplexingly weaker and less predictable paleodietary trends.

Poster Session IV (Saturday, November 5)

TAPHONOMIC INFORMATION FROM LABORATORY EXCAVATION OF A NEW MICROVERTEBRATE LOCALITY IN THE OWL ROCK MEMBER OF THE CHINLE FORMATION, PETRIFIED FOREST NATIONAL PARK, ARIZONA

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The Upper Triassic Chinle Formation in the Petrified Forest National Park is well known for its fossil trees and for vertebrates representing a wide range of body sizes and ecological niches. The fossil record of the uppermost Owl Rock Member of the Chinle Formation, dated at ~208 Ma, is less well known than that of the lower members. The Owl Rock Member is exposed in the northern wilderness area of the Park and is approximately 130 m thick, consisting of mudstones, mud-clast conglomerates, pedogenic carbonates (caliches), gypsum layers and sandstones. A new locality in the upper part of the Owl Rock Member has yielded abundant microscopic vertebrate remains, which vary from delicate, pristine teeth and fish scales 0.5 - 5.0 mm in length to abraded teeth and bone fragments up to 10.0 mm in length. Some elements have black, manganese oxide halos in the surrounding clastic matrix that may indicate the presence of decomposing organic components after burial. Few if any of the delicate remains would survive dry or wet screening of the sediment; preparation consists of careful breaking and excavation of small matrix blocks under a microscope followed by stabilization of exposed teeth or bones with hardener (Butvar) after they are exposed. Recovery of meaningful taphonomic and paleoecological information from this deposit is only possible using this micro-excavation protocol. The conglomeratic matrix is a relatively well-sorted mix of rounded mud pellets, carbonate clasts, angular to rounded rock fragments, and medium to fine sand. This lithology is laterally continuous over hundreds of meters and may represent fluvially reworked dessicated pond deposits. The fauna from this locality includes fish (teeth and scales), small amphibian pectoral elements, a theropod, phytosaurs, and unknown archosauromorphs. The wide range of bone and tooth preservation states within a single sedimentary unit indicates multiple cycles of erosion, deposition, and input of vertebrate remains. The fauna thus represents a time-averaged sample of aquatic and terrestrial animals that inhabited a Late Triassic depositional system with seasonally variable (possibly ephemeral) fluvial and lacustrine environments.

Symposium 2 (Wednesday, November 2, 8:00 am)

TAXON-BASED PALEOECOLOGICAL RECONSTRUCTIONS: CAUTIONARY NOTES ON THE PULL OF THE RECENT

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Taxon-based paleoecological reconstructions remain common in the literature for Neogene faunas and floras. Those reconstructions ultimately are based upon known or inferred data derived from studies of extant taxa. The unexpressed operational assumptions that accompany those reconstructions are tied to the notion that ecological tolerances (sometimes interpreted as 'preferences') of an extant taxon are understood adequately and can be inferred for