a nearly exclusive $\text{C}_4$ diet, with low seasonal variation (1 per mil). $\delta^{13}C$ values change inversely with $\delta^{18}O$ values over the annual cycle for all individuals sampled. Decreasing carbon isotopic composition of tooth enamel could indicate a shift in dietary content from the wet to the dry season or a seasonal shift in $\delta^{13}C$ vegetation itself. Stable isotope studies on modern species provide fundamental insights for reconstructing the ecology of extinct mammals and discovering the influence of seasonal changes on Cenozoic mammalian lineages and faunas.

Poster Session I (Wednesday, October 17, 4:15 - 6:15 pm)

**A NEW RHOMALEOSAURID PLEOSAUR FROM THE SINEMURIAN (LOWER JURASSIC) OF LYMNE REGIS, ENGLAND**

SMITH, Adam S., British Geological Survey, Nottingham, United Kingdom; ARAÜO, Ricardo, Southern Methodist University, Dallas, TX, United States

An excellently preserved partial skeleton of a rhomaleosaurid plesosaur (Sauropterygia: Plesiosauria) from the Sinemurian (Lower Jurassic) of Lyme Regis, England, consists of a complete cranium, mandible, and articulated cervical vertebral column. The material is taxonomically distinct and its occurrence is noteworthy because plesiosaurs are rare from this stratigraphic horizon. The new taxon is diagnosed by a single autapomorphy: a pronounced pit on the posterior margin of the dorsal ramus of the squamosal. It also possesses the following unique combination of characters: premaxillary rostrum short (length and width subequal), five teeth in the premaxilla, premaxilla-maxilla sutures parallel anterior to the external nares, frontals contact on the midline, prefrontal-frontal suture convex and gently curved medially, mandibular symphseal region spatulate and short (length and width subequal), robust rod-like axis neural spine with a circular transverse cross section, and cervical neural spines with a laterally expanded apex. The taxon shares some characters with older (Hettangian) rhomaleosaurids (e.g. *Rhomaleosaurus* megalospondylus), and other characters with younger (Toarcian) rhomaleosaurids (e.g. *Rhomaleosaurus sensitivus stricto* and *Meyerasaurus*), and it is therefore morphologically and proportionally intermediate between these two groups.

Poster Session III (Friday, October 19, 4:15 - 6:15 pm)

**A RECONSIDERATION OF THE STATUS OF THE UPPER JURASSIC PTERODACTYLOID PTEROSAUR MESADACTYLL ORNITHOPTEROS FROM THE MORRISON FORMATION OF COLORADO**

SMITH, David K., Northland Pioneer College, Show Low, AZ, United States; HARRIS, Jerry D., Dixie State College, Saint George, UT, United States

Pterosaurian fossils from the Upper Jurassic Morrison Formation remain fragmentary and poorly known. In the 1980s, a small synsacrum from Dry Mesa Dinosaur Quarry, Mesa County, Colorado, was proposed for the holotype of the new pterodactyloid pterosaur species *Mesadactylus ornithopterus*. A number of disarticulated cranial and postcranial elements subsequently have been referred to the same taxon.

Although the referred postcranial material is certainly pterodactyloid, the synsacrum would constitute an extremely unusual element for a pterosaur. It consists of a series of fused sacral vertebrae with prominent, distally fused neural spines that dramatically decrease in height posteriorly. The vertebrae also become minute posteriorly, indicating that this animal could subsequently have been referred to the same taxon. Principal components analysis (PCA) was conducted to compare EFT M3s to those of *E. recki* and *L. atlantica* described in the literature. Variables used in the PCA were those not substantially affected by tooth incompleteness: height, width, enamel thickness, and average lamellar thickness (a measurable reflection of lamellar frequency). The first principal component sorted individuals by species and showed that the newly recovered M3 was more similar to *L. atlantica* than to *E. recki*, but species assessment based on PCA was unreliable because the distinction between species was unclear on the first or any axis. Qualitative criteria may be more useful for identifying species based on molars; for example, *E. recki* exhibits irregular enamel folding, usually not present on *L. atlantica* and not present on EFT molars. Overall, there is little reason to revise taxonomic assignment of EFT specimens or to refer the new molar to *E. recki*. However, if not for geographic differences and based on molar criteria, *E. recki* and *L. atlantica* might be described as members of the same genus.

Poster Session II (Thursday, October 18, 4:15 - 6:15 pm)

**DENTAL WEAR AND LAMELLAR FREQUENCY ANALYSIS TO CONSTRAIN THE IDENTITY OF THE NORTH AMERICAN MAMMOTH SPECIES**

SMITH, Gregory J., Penn State University, University Park, PA, United States; GRAHAM, Russell, Penn State University, University Park, PA, United States

A mammoth skeleton found at the Newton Site, a kettle lake 15 km southeast of Towanda, Pennsylvania, has been referred to *M. columbi* on the basis of its high, narrow skull. However, the specimen’s thin enamel (1.5 mm) and moderately high lamellar frequency (9 plates/decimeter) resemble some specimens of *M. primigenius*, as well. Maps from the Neotoma database show that a Columbian mammoth inhabiting the Towanda area would be a significant outlier from the general geographic range (western US and Gulf Coast area from Florida to Texas) for this species. This record would suggest that *M. columbi* inhabited a broader range of environments than previously presumed. However, if the specimen was in reality *M. primigenius*, its location, 50 km north of the Oleen drain border, would align well with the Woolly mammoth’s range.

To better ascertain the Newton mammoth’s identification, we examine herein the effects of dental wear on the morphology of mammoth teeth, especially enamel thickness and lamellar frequency. Sagittal sections of mammoth teeth reveal the tendency for enamel lophs to become more broadly spaced and enamel ridges to thicken towards the base of the crown. Thus, an older *M. primigenius* with extensively worn molars might display thicker enamel and a lower lamellar frequency, and might therefore appear to be a Columbian mammoth on the basis of dental morphology alone. Here, we conduct an analysis of numerous *M. columbi* and *M. primigenius* molars at various stages of dental wear to determine if this phenomenon has played a role in determining the species identification of the Newton mammoth.

Poster Session II (Thursday, October 18, 4:15 - 6:15 pm)

**REGIONAL PATTERNS OF MODERN SYMPATRY IN NORTH AMERICAN QUATERNARY MAMMAL FAUNAS**

SMITH, Michael R., Indiana University, Bloomington, IN, United States; POLLY, David, Indiana University, Bloomington, IN, United States

The temporal and regional responses of past faunas to Quaternary climate cycles provide important insights for how biotas respond to changing climates and environments. We used cluster analyses, digital range data for modern mammals, and digital climate data to determine whether faunal similarities from 27 Quaternary sites in North America was affected by site age, past climate, or biogeographic region. Cluster analysis using the Raup-Crick index was used to categorize sites based on the similarity of their mammalian faunas. Areas of maximum modern sympathy for the extant species at each site were comparatively identified using the modern geographic. Areas of sympathy were found by counting the number of modern species shared at each 50 km grid point in North America. The climate associated with the areas of maximum sympathy were located using the digital climate data for North America (1960-1990 average). Rectilinear climate envelopes were constructed for the projects with maximum sympathy using the minimum and maximum values for MAT and total annual precipitation from those points. Faunas clustered into four groups, which separate first on regional basin and secondarily on a climatic basis. The first cluster contained sites whose extant species were broadly sympatric in the area of the site, the second cluster contained sites whose extant species are today sympatric in the northeast of the Great Lakes, the third cluster with a mixture of species that are today sympatric in the great plains or greater midwest, and the fourth with species that are today sympatric in the inter-montane west. The extant component of the faunas were highly predictive of this pattern despite the wide variety of ages, paleoclimates, and proportions of extinct fauna at the sites. Local climate and/or other geographic range controllers were mixed in these continental scale patterns indicating a need for understanding faunal dynamics on a regional scale.