

A single lower molar from the Birchwood locality represents the first known material of a new, larger species of *Saxonella* (Primates: Saxonellidae). At present, no specimens referable to *Saxonella* have yet been recorded from more southerly localities in the western United States. Evidence for new Tiffanian species of *Eudaemonema* and *Bisonalveus* has been collected over the past several years from localities in Alberta. *Eudaemonema* (Dermoptera: Plagiomenidae) has been represented in the past by a single species, *E. cuspidata*, recovered from Montana and Wyoming strata of late Torrejonian (T63) and earliest Tiffanian (T11) age. A new species extends the geographic and temporal ranges of this genus. A new species of *Bisonalveus* (Pantolestia: Pantolestidae) is the smallest known species in most linear measurements, and extends the geographic range of the genus northwards.

As with other unique discoveries from Albertan localities, the discovery of these new species has paleogeographical and paleoecological implications. Their presence in Alberta is consistent with the suggestion that quarries in the Paskapoo Formation of Alberta record a terrestrial ecosystem significantly different from quarries further south in the western United States.

LATE QUATERNARY FAUNAS, FLORAS AND CULTURES IN FLORIDA KARST

WEBB, S. David, Florida Museum, Univ. of Florida, Gainesville, FL 32611.

The karst lowlands of north-central Florida provide a rich record of late Quaternary environments as reflected in faunal, floral and cultural remains preserved in fine-grained organic sediments. In the past 12 years the Aucilla River Prehistory Project has developed special techniques and equipment for locating and excavating submerged sections up to five feet thick. Although the sediments are now exposed in fluvial settings, they were deposited in sinkhole ponds during times of rising sealevels. Some 60 carbon dates from 10 major sites indicate that most of these sections accumulated either about 30 kyr ago (oxygen isotope stage 3) or from about 12 to 9 kyr (stage 2) at rates of a few mm per yr.

Most strata produce abundant pollen representing regional vegetation, and many also sample wood, nuts and seeds from proximate vegetation. A savanna landscape shifted to a denser mesic forest. A third set of vegetation samples represent *Mammot digesta*, including at least a dozen species of dicots. Associated vertebrates consist primarily of freshwater aquatic fishes, frogs and turtles; some of the coarser sediments (e.g. fine sand) sample terrestrial species, notably late Pleistocene megafauna. Molluscan remains occur in most strata and are densely concentrated in some. Stable isotopic signatures of vertebrates and molluscs will be integrated with other data. Impacts of late Pleistocene people are represented by diverse cultural remains including lithics, bone, ivory and wood. Some fifty examples of ivory shafts indicate a substantial level of proboscidean killing and/or butchering.

This array of sites provides an excellent opportunity to compare changing environments about 30 kyrs ago, when there is no evidence of human presence, with those from the latest Pleistocene, when human presence was increasingly evident. For example, diets and isotopic signatures of *Mammot americanum* will be compared between stage 3 and stage 2, when the species becomes extinct.

USING COMPUTERIZED TOMOGRAPHY TO INVESTIGATE SAUROPOD CERVICAL MORPHOLOGY

WEDEL, M.J., Okla. Mus. Nat. Hist., Dept. Zoology, Univ. Okla., Norman, OK, 73019; SANDERS, R.K., University Hospital, Dept. Radiological Sciences, Oklahoma City, OK, 73190.

The Oklahoma Museum of Natural History collections contain a large amount of sauropod material from the Morrison Formation (Late Jurassic) of the Oklahoma panhandle. Included in this material is an assortment of cervical vertebrae whose neural spines and cervical ribs were lost prior to or during collection. These centra were originally referred to *Apatosaurus* cf. *excelsus*. With the cooperation of the University Hospital in Oklahoma City, we used computerized tomography (CT) to image these vertebrae. The centra exhibit considerable variation in the size, shape, and symmetry of their internal pneumatic cavities, and in the degree to which the cavities are connected to each other and to external fossae. On the basis of these features, the vertebrae can be separated into three morphological categories. The variation between these three categories is consistent with generic level separation. The presence of *Camarasaurus* and *Diplodocus* remains from the same horizon suggests that, in the absence of external morphological characters commonly used for identification, cervical centra from these taxa were lumped with the more abundant material referred to *Apatosaurus*. We propose that, by allowing non-invasive access to otherwise hidden characters, CT imaging can be used to identify isolated and poorly preserved sauropod vertebrae on the basis of internal morphology alone. In addition, taxonomically significant variations in the internal anatomy of sauropod vertebrae could provide a new suite of characters for evaluating sauropod phylogeny.

RHABDODON, AN UNUSUAL EUORNITHOPOD DINOSAUR FROM THE LATE CRETACEOUS OF WESTERN ROMANIA

WEISHAMPEL, D. B., Cell Biology and Anatomy, Johns Hopkins Univ., School of Medicine, Baltimore, MD, 21205; JIANU, C.-M., Muzeul Civilizatiei Dacice si Romane Deva, B-dul 1 Decembrie Nr. 39, Deva, 2700, ROMANIA; CSIKI, Z., Faculty of Geology and Geography, University of Bucharest, Bucharest, 70111, ROMANIA; NORMAN, D. B., Sedgwick Museum, Cambridge University, Cambridge, CB2 3EQ, UK.

Rhabdodon, originally described from the Sănpetru Formation of the Hateg Basin of Transylvania (western Romania) by Nopcsa in the first quarter of this century, is also an important member of nearly all other well-known Late Cretaceous terrestrial faunas from Europe. Because of this ubiquity as well as its relevance to euornithopod systematics and island biogeography, we have subjected this taxon to a numerical phylogenetic analysis. Using 13 taxa and 32 characters, the resulting cladogram is 51.25 steps long, with a consistency index of 0.63, a retention index of 0.82, and a recalculated consistency index of 0.51. *Rhabdodon* is positioned as a basal iguanodontian euornithopod in an unresolved polytomy with *Tenontosaurus*, *Muttaborrasaurus*, and *Euiguanodontia*. It also possesses a considerable array of autapomorphies, more than any other member of the Hateg fauna. The unresolved basal relationships of *Rhabdodon*, its high autapomorphy level, and implications for ghost lineages and biogeography will be discussed.

THE EVOLUTION OF THE MEDIAN EUSTACHIAN SYSTEM IN EARLY ARCHOSAURIFORMS

WELMAN, Johann, National Museum, P O Box 266, Bloemfontein, 9300, SOUTH AFRICA.

In the primitive archosauromorphs such as *Proterosuchus* and *Erythrosuchus*, the median eustachian system consists of paired tubes that enter between the basioccipital and basisphenoid-basiparasphenoid and connect prominent cavities in the floor of the endocranium with the pharynx. In some of the earliest dinosaurs such as *Plateosaurus*, *Massospondylus* and *Syntarsus* and the crocodylomorph *Sphenosuchus* in contrast, a much transformed archosaurian median eustachian system is present, similar to that of modern crocodiles.

The transformation from the early archosauromorph to the archosaur median eustachian system apparently happened by a gradual enlargement of the eustachian tubes in the phylogeny which separated the anterior and posterior parts of the braincase. A subsequent rearranged fusion of these parts resulted in the formation of the advanced archosaurian pattern.

The completely opened up condition of the eustachian tubes in the Upper Triassic *Euskelosaurus* seems to represent a transitional stage between the conditions of the more primitive archosauromorphs and some of the earliest archosaurs. Additional evidence for such an opening up and re-closing process in evolutionary history is provided by the complicated enclosed path of the palatine ramus of the facial nerve by the posterolateral process of the basiparasphenoid in more advanced dinosaurs.

THE FIRST CRANIAL MATERIAL OF *TAPOCYON*, AND ITS IMPACT ON THE PHYLOGENY OF BASAL CARNIVORA

WESLEY, G.D., Comm. Evol. Biol., Univ. Chicago, and Field Museum, 1027 E. 57th St., Chicago IL, 60637; FLYNN, J.J., Geol., Field Museum, Chicago IL, 60605.

Two new specimens of *Tapocyon* help resolve the poorly constrained placement of the genus within Carnivora / "Miacoidae." Previously known only from jaw fragments, the two new fossils preserve the entire skull and provide important character evidence from the basicranial region that helps clarify the phylogeny of basal Carnivora. A preliminary description indicates that the specimens represent two species of *Tapocyon*; the first specimen appears to be *T. occidentalis*, the genotypical species, while the second may prove to be new.

The "Miacoidae" (= Viverravidae + Miacidae) has alternatively been positioned either within or outside Carnivora. When placed within Carnivora, "miacoids" are split, with Viverravidae placed within the Feliformia and Miacidae within the Caniformia. In contrast, Viverravidae and Miacidae have also been positioned as successive outgroups to Carnivora. The new specimens shed light on these phylogenetic controversies because the basicranial region has figured prominently in carnivoran phylogeny. Preliminary character data suggests that *Tapocyon* is a miacid and that Miacidae is embedded within Caniformia. This contrasts the recent removal of *Tapocyon* from the Caniformia (Miacidae) to the Feliformia (Viverravidae). New data from these specimens yield important information on early carnivoran morphology and add to our knowledge of carnivoran phylogeny.

PALEOCENOLOGY AND BIOSTRATIGRAPHY OF GULF COAST EOCENE VERTEBRATE LOCALITIES

WESTGATE, James W., Department of Geology, Lamar Univ., Beaumont, TX 77710.

Bulk sample analysis has focused on paleoecologic and biostratigraphic data from Eocene vertebrate remains in marginal marine deposits on the Gulf Coastal Plain.