femur, tibia and fibula are imaged in circularly polarized light, thus facilitating the identification of regional patterns of CFO, as revealed by variation along a 256 gray scale. Taxa examined include strepsirhine and haplorhine primates, as well as chiropteran, dermopteran, and tupaiid specimens. The taxonomic sample is designed to encompass a range of evolutionary relationships, and to provide comparisons among species with varying positional behaviors and life histories (and therefore potentially varied tissue type distributions). Section thickness and lighting parameters are standardized for all sections, allowing for the quantitative comparison of gray values. Gray level histograms and average pixel gray-scale values are derived for whole sections, as well as for sectors within sections. Results reveal variation in CFO in both primary and secondary tissues across sections, among skeletal elements, and among taxa. For example, CFO patterns differ between humeri and femora, and preliminary assessments indicate that these relate to differential use of the limbs in locomotion. As part of an ongoing study of bone microstructural variation and its ecological correlates, this study of extant taxa will provide the foundation for studies of CFO and other microstructural attributes in fossil mammals.

TWO PREVIOUSLY UNREPORTED SAUROPOD DINOSAURS FROM THE UPPER JURASSIC MORRISON FORMATION OF OKLAHOMA

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Between 1935 and 1942, J. Willis Stovall directed the excavation of thousands of dinosaurs bones from quarries in the Morrison Formation of the Oklahoma panhandle, near the town of Kenton. Sauropods previously reported in this material are *Apatosaurus*, *Camarasaurus*, and *Diplodocus*. *Apatosaurus* material from the Kenton quarries has traditionally been regarded as *A. excelsus*, following Stovall s referral of the material to *Brontosaurus excelsus*. To date, no characters have been cited that support the referral of this material to either *A. excelsus* or *A. louisae*. OMNH 01368 is a disarticulated cervical rib of a large sauropod from Kenton Pit 1. The specimen lacks an anterior projection and is therefore referrable to *A. louisae*, a species previously unrecognized from Oklahoma. This and other specimens from the quarry pertain to one or more individuals at least 35% larger than CM 3018, the holotype of *A. louisae*. Furthermore, the capitular and tubercular synchondroses of OMNH 01368 are unfused, indicating that the animal was not skeletally mature, and that the range of body size at maturity in *Apatosaurus* was very large.

OMNH 01138, also from Kenton Pit 1, is a sauropod metacarpal II that was previously catalogued as *Camarasaurus*. The specimen is proportionally and absolutely longer than any metacarpals that can be reliably referred to *Camarasaurus*. It is more similar in morphology and proportions to the elongate metacarpals of *Brachiosaurus*, a second sauropod taxon that has not been previously reported from Oklahoma. The vertebrate fossils from the Kenton quarries have never received a thorough analysis and description, and represent an underutilized record of morphological and taxic diversity.

TECTONO-TAPHONOMIC EXPRESSION OF CAMPANIAN-MAASTRICHTIAN BASIN ADJUSTMENTS IN THE BIGHORN BASIN, NORTHWESTERN WYOMING: DEAD DINOSAURS HAVE TRANSPORTATION TALES TO TELL

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The nature and distribution of taphonomic modes of dinosaur fossils occurring in the Campanian-Maastrichtian stratal succession of Elk Basin, Wyoming, can provide information about transportation, deposition, and diagenetic processes within the basin, some possibly due to regional tectonic adjustment. Tectono-taphonomic signatures suggest potential Bighorn Basin and Western Interior Seaway response to allostratigraphic events such as the Laramide Orogeny. tectono-taphonomic evidence of the Laramide Orogeny is suggested in the lower portions of marginal marine to non-marine, and sometimes, volcaniclastic sediments of the Meeteetse Formation, as well as in non-marine to marginal marine sheet sandstone units of the Lance Formation. Lance Formation sheet sandstone units located in Elk Basin, Wyoming are in general sedimentologically graded beds that fine upwards. The top of the second Lance Formation sheet sandstone in Elk Basin, Wyoming preferentially contains desiccation features and occurrences of articulated dinosaurs, along with dinosaur, small vertebrate, and invertebrate ichnofossils. Disarticulated dinosaur bone occurs preferentially in the bases of the first and third volcaniclastically influenced sandstone units in the Meeteetse Formation. Small channel (less than one meter in diameter) conglomerate lag deposits containing disarticulated dinosaur bone clasts are found in the lowest Meeteetse Formation sandstone. Disarticulated vertebrate bone contained within lag deposits and other units deposited hydraulically can suggest transport mechanisms that moved bone away from the initial site of carcass deposition. Tectono-taphonomic deposits suggest carcass reworking as well as potentially a hydraulic response to basin adjustments to changes in base-level, resulting in the reworking of sediments and faunal inclusions.

NEW INSIGHTS ON THE ANATOMY OF *POSTOSUCHUS KIRKPATRICKI* (ARCHOSAURIA: CRUROTARSI)

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Postosuchus kirkpatricki is currently one of the most completely known rauisuchids. Many features of the osteology of *Postosuchus* have been clarified recently by a new specimen from North Carolina, a headless, articulated skeleton from New Mexico, and specimens from other collections along with a reexamination of the type and paratype skeletons. This study has contributed to a redescription of the animal by the author and has clarified many of the issues associated with it, including the relationship of *Postosuchus* to other crurotarsans.

Examination of the material indicates that *Postosuchus* was at least facultatively bipedal, and possibly an obligate biped. Also, this study has shown that the pelvis of *Postosuchus* is different from that of *Chatterjeea*. A bifurcated infratemporal fenestra has also been confirmed. Endocasts and impressions of the brain have allowed for an understanding of the brain morphology of a rauisuchid for the first time, and indicate that the brain of *Postosuchus* was similar to modern crocodilians, but with a better developed hindbrain for balance and coordination.

MORPHOLOGIC DIVERSIFICATION OF CANIDAE AND FELIDAE IN NORTH AMERICA

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An innovative, quantitative approach, synthesizing novel and established methods for describing the dentition of carnivorans, is used to document the morphologic diversification of the Canidae and Felidae in North America. 18 discrete characters covering the four functional regions of the carnivore tooth row (incisors and canines, premolars, carnassials, and postcarnassial molars) categorize the dentition. This approach to morphological description minimizes the effect of phylogeny on the emerging patterns. Disparity (measured as average and maximum pairwise dissimilarity among genera), occupied morphological space, and the number of dental types (character state combinations), are used to examine the morphological diversification of these families.

I test two hypotheses: 1. Once an efficient system for consuming flesh evolved, the dental system remained unchanged; 2. Morphologic and taxonomic diversification are concordant in Canidae and Felidae. Preliminary results suggest that maximum disparity of dental types in Canidae occurred relatively early, with little change observed for the duration of the Cenozoic, supporting hypothesis one. This maximum coincided with the cat gap, a period during which catlike carnivores were absent in North America. Maximum average disparity occurred late in canid history, in the interval with fewest taxa. This implies that more extreme morphologies and fewer intermediates were present during this interval; there were fewer canids, but they were making a living in more disparate ways. The extinction of morphological intermediates in North American Canidae may be the result of the diversification, both taxonomic and morphologic, of felids and hyaenids during this time interval, which coincides with the maximum disparity and taxonomic richness for Felidae. Morphologic and taxonomic diversification are discordant in Canidae, contradicting hypothesis two, while in Felidae diversification is concordant, supporting hypothesis two.

CONTINUED EXCAVATION OF THE FIRST DINOSAUR COMMUNITY FROM CHIHUAHUA, MEXICO (*Presented at the Society of Vertebrate Paleontology annual meeting, Oct., 2001, Bozeman, MT*)

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Prospecting of Late Cretaceous Aguja Formation deposits in Canon de Santa Elena National Area of Protection in Chihuahua, Mexico continues to yield remains of a diverse coastal community which includes vertebrate, invertebrate and floral components. Numerous skeletal and plant remains cropping-out in fluvial deposits across a 1 km by 0.5 km area were mapped on a meter square grid system during field work conducted from May, 1999 to May, 2001, near the former community of Los Altares, just north of the Chihuahua-Coahuila border. Permits for collection and study were issued by the Mexican National Consejo de Paleontologia, and the Mexican National Institute of Ecology.

Dinosaur remains include maniraptoran, tyrannosaurid and ceratopsian (cf. *Chasmosaurus mariscalensis*) teeth and limb elements, with hadrosaur elements dominating the assemblage. Recent collection emphasis has focused on the excavation of a disarticulated hadrosaur (*Kritosaurus* sp.) skeleton from which most of the large limb elements and portions of the skull and vertebral column have been recovered. Taphonomic analysis of this specimen indicates that a preferential post-mortem orientation of long bones occurred prior to burial in anoxic muds.

Associated flora from fluvial sands lateral to the *Kritosaurus* skeleton include conifer (Araucariaceae) and palm (*Sabalites* sp.). These sands also yielded skeletal elements from gar, bowfin, turtles and goniopholid crocodiles. Nearby estuarine sandstones, both in lateral facies and near the base of the Aguja Formation, bear remains of ostreine oyster reefs and gastropods. Through acetic acid treatment these sandstones have also yielded teeth from the sharks *Scapanorhychus* sp., *Squalicorax* sp., and *Cretolamna* sp.; and batoids, including *Ptychotrygon agujaensis*, *Protoplatyrhina* sp., *Squatirhina* sp., and a hypolophid.

No other dinosaur specimens, except an unidentified ceratopsian element reportedly from the Late Cretaceous Ojinaga Formation, are known from the state of Chihuahua. This ceratopsian fragment more likely came from the San Carlos Formation. Mexico has only six localities outside of Chihuahua where dinosaur body fossils have been reported; four are Cretaceous in age and two are Jurassic.

DISCOVERY OF DINOSAUR REMAINS IN COASTAL DEPOSITS NEAR OJINAGA, MEXICO

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Preliminary site surveys and surface prospecting of Late Cretaceous San Carlos Formation outcrops near Ojinaga, in Chihuahua State, Mexico, have yielded numerous dinosaurian remains. Vertebrate specimens are found in Campanian-age deltaic mudstones. Deltaic deposits stratigraphically overlie estuarine mudstones bearing oyster reefs comprised of *Flemingostrea* sp.. Dinosaur remains belong to a tyrannosaurid, hadrosaurs and ceratopsians.