

tional keel of the sternum. It appears that this hypocleidium is formed by the interclavicle, a bone that is incorporated into the sternum in Ornithurine birds. If this is true, then the furcula of enantiornithurine birds is functionally and structurally different from that of Ornithurine birds and their common ancestor would probably lack a furcula.

PALEOBIOGEOGRAPHICAL INTERRELATIONSHIPS OF LATE JURASSIC DRYOLESTIDA (MAMMALIA) FROM PORTUGAL

MARTIN, Thomas, Institut für Paläontologie, Freie Universität Berlin, Malteserstrasse 74-100, Berlin, D-12249, Germany; BONAPARTE, José, F. Conicet, Museo Argentino de Ciencias Naturales, Avda. Ángel Gallardo 470, Buenos Aires, 1405, ARGENTINA.

In the early Kimmeridgian Guimarota coal mine near Leiria in west-central Portugal pre-tribosphenic therians are represented by Dryolestidae, Henkelotheriidae, and the recently discovered Arguimuridae, Dryolestidae and Henkelotheriidae from Guimarota are closely related to dryolestids from the late Kimmeridgian Morrison formation. The genus *Dryolestes* occurs in both localities, and *Henkelotherium* from Guimarota is a close relative of *Tathiodon* from the Morrison formation, indicating a continuous environment in late Jurassic. Apparently, the isolation of Iberia from surrounding land areas by Jurassic seas and the endemic evolution of its terrestrial fauna was not as strong as assumed previously.

The mammal fauna from early Cretaceous fluvio-lacustrine sands and marls of Porto Pinheiro about 70 km SSW of Leiria is clearly more advanced than that of Guimarota. The progressive dryolestid *Laolestes* (= "*Melanodon*") with a strongly enlarged stylocone at the upper molars is present which occurs also in the Purbeckian of southern England and in the Morrison formation. In the upper molars of late Cretaceous *Leonardus cuspidatus* from the Los Alamitos formation in Patagonia the stylocone is extremely enlarged and isolated from the paracrista, a tendency which is already clearly evident in *Laolestes andresi* sp. nov. from Porto Pinheiro. This might indicate a faunal interrelationship between southwestern Europe/northern Africa and South America in early Cretaceous.

AN ARTICULATED SKULL AND NECK OF SAUROPODA (DINOSAURIA: SAURISCHIA) FROM THE UPPER CRETACEOUS OF CENTRAL PATAGONIA, ARGENTINA

MARTINEZ, Rubén, Lab. de Paleover. C. C. 360. (9000) Comodoro Rivadavia, ARGENTINA.

A well preserved and articulated skull and neck of a new sauropod has been found in the Bajo Barreal Fm., Upper Cretaceous of Chubut, Central Patagonia. The skull is a flattened structure with 15 maxillary and premaxillary thick teeth and 11 teeth in the dentary. There is only one nasal opening with signs of a nasal arch as in *Brachiosaurus*. There are traces of a prenasal depression in the snout.

The patagonian form shares with *Nemegtosaurus* and *Diplodocus* occipital condyle ventrally directed and, with the former, mandibular symphysis of the dentary perpendicular to the long axis of the lower jaw. Moreover it shares with *Nemegtosaurus* and *Brachiosaurus* sharp inclination of the wear facets of the teeth and with *Diplodocus* lacrima vertically oriented, but it retains with *Camarasaurus* and *Brachiosaurus* teeth along maxilla and dentary, each one in contact with two teeth of the opposite mandible, wide and dorsally visible supratemporal fenestrae, jugal does not participate of the margin of the preorbital fenestra, elevated coronoid process of the surangular, posterior face of the quadrate shallowly excavated and curved symphyseal ramus of the dentary.

There are 3 rods along both sides of the neck. Two of the rods are alike with 1 cm diameter, smooth surface and brown color, but the third rod has 0,3 mm diameter, rugose surface and black color. These ossified tendons shows a dense concentration of haversian systems.

The new sauropod is considered a primitive form related with the titanosauriformes.

USING THE ESEM TO ASSESS THE QUALITY OF EPOXY CASTS FOR FIDELITY TO THE ORIGINAL SPECIMEN

MASON, Jane, Museum of Paleontology, Univ. of California, Berkeley, CA, 94720; STEFEN, Clara, Museum of Paleontology, Univ. of California, Berkeley, CA, 94720.

Can research quality casts be made from quickly setting mold-making compounds? Epoxy casts made from molds of RTV (Room Temperature Vulcanizing) silicone, used under laboratory conditions, and vinyl polysiloxane, used for making quick molds while visiting a museum collection, were compared using the ESEM (Environmental Scanning Electron Microscope) to evaluate reproductive fidelity to the original specimens. Differences in the replication of wear artifacts (e.g., scratches and pits), including their size and occurrence, as well as overall dimensions, were assessed.

Comparisons were made among original specimens and casts made from different compounds over the lifetime of the molds. It was demonstrated that there is significant degradation with increasing age of the molds, but that casts made soon after molding produce results acceptable for certain research applications.

THEROPOD DINOSAUR NEST FROM LOURINHA, PORTUGAL

MATEUS, Octavio^{1,2}, Philippe TAQUET^{1,3}, Miguel Telles ANTUNES^{1,2}, MATEUS, Horacio¹ & RIBEIRO, Vasco¹: (1) GEAL—Museum of Lourinhã, 2530 Lourinhã, PORTUGAL (2) Departamento de Ciências da Terra, Faculdade Ciências e Tecnologia, Quinta da Torre, 2825 Monte da Caparica, PORTUGAL (3) Laboratoire de paléontologie, URA 12 CNRS, Muséum national d'histoire naturelle, 8, rue Buffon, Paris 75005, FRANCE.

More than 100 well preserved dinosaur eggs have been discovered in the Upper Jurassic levels (Tithonian) of Lourinhã, Portugal. The eggshells dispersed in a big area with 11 meters in the highest diameter with a high concentration in the middle. A probable important part of the nest have been eroded. This high number could suggest that this species used a community nest because it is not probable that a single female could lay so many eggs in a short period of time. No especial nesting pattern is present and some of the eggs had over position to the other like a low pile of eggs. This nest arrangement is similar to the exhibited by ostrich egg-laying strategies.

Some eggs contained embryo bones of a theropod dinosaur (basal tetanuran). The eggshells are Dinosaurid-prismatic obliquiprismatic type. The eggshell thickness is between 0.6 and 0.9 millimetres, mammillary layer, prismatic shell units and oblique pore canals with 0.3 to 0.35mm large, distant one of each other with 2.5 to 3.5 mm in average and irregularly disperse. Five eggs with the microstructure similar to Crocodiloid, a jaw of *Kuehneodon* sp. (Mammalia: Multituberculata), a gastrolith, and an adult theropod teeth were also found within the eggs. Other five sites with dinosaur eggs were found in Lourinhã area.

EXPERIMENTAL FOSSIL AND GLASS BEAD COLLECTING BY THE HARVESTER ANT

MATTHIAS, A., MCKINNEY, J., & CARPENTER, K. Dept. of Earth Sciences, Denver Mus. Nat. Hist., 2001 Colorado Blvd., Denver, CO 80205.

It has long been known that the harvester ant recover and incorporate minute fossils into the construction of their mounds. Where these fossils come from has been a matter of speculation: are the fossils collected from the surface, brought up from the subsurface, or a combination of both? An experiment was conducted to determine where the fossils originated. Five 2–3 cm thick layers of a muddy-sand mixture were poured into a 60 x 60 cm aquarium. Yellow and orange 2 mm beads (400 each), were mixed into alternate layers, gar scale fossils dyed with methylene blue were mixed into a first layer, and pink beads were scattered on the surface. When the layers dried, harvester ants (*Pogonomyrmex occidentalis*) were introduced to the aquarium. The ants were fed and watered, and as they died, they were replenished from the original colony. The experiment was conducted from May through October, 1997. At the end of October the surviving ants were removed and the mound dismantled. During the experiment the ants excavated numerous tunnels in all the layers. Ant were found to moved beads and fossils to the surface and the first occurrences were recorded. The first orange bead appeared on the 3rd day, the first yellow bead on the 7th day, and the first fossil on the 10th day. At the conclusion of the experiment, we found the ants had incorporated fossils and beads into the mounds from the surface and subsurface layers. On average, the ants recovered 43% of 440 pieces out of any given layer. We also found the ants took the pink beads from the surface and stored them in tunnels in the third layer.

STATISTICALLY DESCRIBING THE AVIAN PELVIS: A SEPARATION OF LIFESTYLES AMONG WATERBIRDS

MATTISON, Rebecca G., Department of Biology, University of Massachusetts at Amherst, Amherst MA 00104.

Waterbirds can be sub-divided, by lifestyle, into three groups: surface swimmers, foot-propelled divers and wing-propelled divers. The same three groups can be described statistically by differences in hindlimb morphology that cross phylogenetic boundaries. Waterbirds can be subdivided into divers and surface swimmers using tibiotarsal measurements, and the divers can be further subdivided into foot-propelled and wing-propelled divers using tarsometatarsal measurements. Pre-acetabular to post-acetabular pelvic ratios are able to separate the divers into two groups, but the surface swimmers overlap both groups. Combining all of the data into a Discriminant Function Analysis statistically separates the birds into three distinct groups. Statistically and morphologically the surface swimmers are the functional "generalists" among the water birds. As birds specialize for diving and underwater swimming, leg positions and the accompanying skeletal-musculature morphologies modify in ways that directly reflect the way a bird swims, walks and flies. These modifications are the same ones that can be measured and analysed and show trends that do not track with phylogeny.

A NEW EOCENE VERTEBRATE FAUNA FROM SOUTH-EASTERN KAZAKHSTAN (AKTAU MOUNTAINS, DZHUNGARIAN ALATAU)

MAVRIN A.V., Kazakh Technical University, Mineral, and Crystallograph. Department, 480013 Almaty, KAZAKHSTAN and KORDIKOVA, E.G., Kapchagay Geol. Exped., 480008 Almaty, KAZAKHSTAN.

As a result of field work carried out in the framework of the long-termed Republic research program "Paleontology and stratigraphy of Aktau Mountains, Dzhun-