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DINOSAURS-THE ENCYCLOPEDIA; SUPPLEMENT 3, 2003; by Donald Glut, McFarland & Company, Jefferson (North Carolina), and London; 726p. (\$95.00 library binding) ISBN 0-7864-1166-X.

Dinosaurs-The Encyclopedia Supplement 3 (herein S3) is truly another remarkable accomplishment in this continuing series concerning the ever-changing world

of non-avian dinosaurs. Once again Donald Glut has managed to pull together the latest global information, from a wide variety of sources, and present it in a matter-of-fact way. This supplement is divided into five main sections: I- *Introduction*; II -*Dinosaurian Systematics*; III-*Dinosaurian Genera*; IV-*Nomen Nudum* and V. *Excluded Genera*. These are followed by: A List of Abbreviations, Appendix: Dinosaur Tracks and Eggs, Glossary, Bibliography and an Index.

The *Introduction* (Section I) follows the format of previous supplements beginning with the "Mesozoic Era," followed by "New Discoveries, Ideas and Studies," "No consensus Yet— Ectothermy or Endothermy," "Dinosaurs and Birds" and lastly "Dinosaur Extinctions." The "Mesozoic Era" subsection is very brief and presents the three geologic periods of the Mesozoic Era in reverse stratigraphic order (from youngest to oldest) rather than the other (proper) way around. Discussions in this subsection center on the timing of the origin of dinosaurs (based on skeletal and ichnite evidence) and the recent vicariance hypothesis that support congruence of continental fragmentation and paleobiogeography of dinosaurs. I'm afraid the significance of this very short section, if any, is lost on the reader.

The meat of the *Introduction* lies within the subsection concerning "New Discoveries, Ideas and Studies." Here, Glut presents a synthesis on the latest happenings in the field of dinosaurian paleontology. There is so much information here that it streams forth in a never-ending manner. However, note that many of the data presented are derived from un-refereed, non-peer reviewed abstracts. Although Glut warns the reader up front about the nature of abstracts, they continue to provide much of the content of this particular subsection. A summary of the pioneering working by Larry Witmer on the correct position of the external nostrils in dinosaurs is arguably the most notable advance in our understanding of the biology of the dinosaurs. This subsection is further divided into: saurischians (theropods, sauropodomorphs, sauropods); ornithischians (stegosaurus, ankylosaurus); ornithopods (primitive ornithopods, iguanodontians [which include the hadrosaurids]); and marginocephalians (pachycephalosaurs, ceratopsians). Aside from this gross arrangement, there doesn't seem to be continuity within each of these subtopics.

Not much new is added to the "Ectothermy versus Endothermy" debate and dissent concerning the theropod origin of birds ("Dinosaurs and Birds") continues. The recent work of American Museum of Natural History ornithologist, Richard O. Prum, on the unequivocal fact of theropod-bird relationship is contrasted with the equally dogmatic views of the nay-sayers, like Alan Feduccia, who continue to deny the overwhelming evidence to the contrary. Papers concerning the phylogenetic relationships of the feathered "dinobirds" (*Caudipteryx*, *Protarchaeopteryx*, *Sinornithosaurus*, *Sinosauropteryx*) are presented together with contentious interpretation of oviraptorosaurs as birds based on the recent (2002) study by Maryanska, Osmólska and Wolson.

Finally, the subsection on dinosaur extinction, a subject near and dear to my heart, highlights some flawed studies that contend that there is no perceptible decrease in the decline of dinosaurs near the K-T boundary. The question has never been the number of specimens, rather the number of genera and species

that became extinct at the K-T boundary. The pattern of decline in the number of taxa during the Campanian and Maastrichtian is well documented and unequivocal. The "popularity" of the asteroid impact theory is noted, but since when is good science advanced by popular consensus?

In *Dinosaurian Systematics* (Section II), Glut presents dinosaur genera within the framework of higher (monophyletic) taxa. Although it is a mostly up-to-date account, some facts escaped Glut's attention, for instance, such as the removal of the enigmatic *Yaverlandia* from the Pachycephalosauria. That aside, the section for the most part is acceptable, although it will continue to change with future studies that concern new taxa and new phylogenetic analyses.

Dinosaurian Genera (section III) is, once again, the "meat-and-potatoes" of the volume. Arranged alphabetically, genera (and their species) that are either new, and/or have received recent attention, are the principle focus. Worth noting is the new replacement name *Megapnosaurus* (meaning "large dead lizard") for specimens previously referred to the "coelophysoid" *Syntarsus*, a name that belongs to a beetle (which has priority) and which was named over 100 years ago! Another interesting dinosaur is the dromaeosaur *Microraptor gui*, the media-proclaimed "4-wing" theropod (if you count its tail, it is arguably 5!) and all the new Chinese "dinobirds" (*Sinornithosaurus*, *Sinosauropteryx*, etc.).

Section IV, *Nomina Nuda*, is a separate new section. These "naked names" formerly were included with the Excluded Genera (Section V), which also now has its own section, in a combined section. Separation of these two sections underscores the differences between the two categories. Both sections include only a handful of genera.

The "Appendix: Dinosaur tracks and eggs" documents the ever-increasing popular world of dinosaur ichnites (principally tracks and eggs; coprolites and other ichnites are not considered). In the footprint subsection, Glut lists the dinosaur ichnogenera with only a brief characterization of each (which in the opinion of this reviewer is probably more than they deserve). Fortunately, Glut prefaces the section with a brief discussion regarding the nature and limitations and correctly notes "they do *not* name dinosaurs; nor, in the vast majority of cases, can these traces be linked with absolute or near certainty to any particular dinosaurian genus known from body fossil remains." The dinosaur egg subsection has a brief introduction followed by a listing of egg/eggshell names (oogenera). Little in the way of commentary is given on any of the oogenera.

An informative Glossary, and extensive Bibliography, and Index, round out the volume.

The quality of figures and photographs in *S3* follow that of its predecessors (*D:TE*, *S1* and *S2*). While many photos are good there are still a number that are substandard, some are out-of-focus, while others are just uninformative. As with earlier volumes, reproductions of line drawings, taken from the primary literature, are very informative whereas others are less so. Nevertheless, as I have indicated in my reviews of the preceding volumes (see *Priscum*, vols. 10[2] and 11[1]), the primary strength of these encyclopedias continues to be the figures and photos of original material.

Supplement 3, like its predecessor volumes, is a "must have" for any one working on, or who is truly interested in, dinosaurs. The amount of up-to-date

information compressed into this series it truly staggering. It is another indispensable reference work in the Glut series, and it is with great anticipation that I await the publication of Supplement 4. The standard in Dinosaur encyclopedias has been set.

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