

Book Reviews

and/or nests, which indicates the eggs were laid *in situ* and not transported. Third, hardly any whole eggs contain embryos, and most of those that do are found in Montana. Fourth, hatchlings associated with nests are just as rare, and again these are found mostly in Montana.

The authors make claims for many more hatched eggs, but without any trace of hatchlings. They appeal either to broken egg shells in a nest, or to the bottom of an intact egg with the top pieces laying on the bottom part. However, this is an inference that may or may not be true for the broken eggshells. Crushed and broken eggs can easily be caused by the compaction of the sediments.

Where the bottom of the eggshell is still intact, the top could have been broken by a predator. Evidence of predators is found at many nest sites; for instance, the teeth and bones of theropods, and the remains of varanid lizards, crocodiles (chapter 9), mammals, and pterosaurs. The juvenile dinosaur remains of *Orodromeus makelai* lying around but not in the nests were missing the upper part of the skeleton, suggesting they were half eaten by predators (pp. 116, 117). Hatchlings would be expected to trample the bottom of their eggs (p. 139), and the eggs should dissolve easily after hatching (p. 8).

As with most dinosaur remains, rapid burial is required to preserve eggs. Several of the authors cite

evidence for burial by flooding or volcanic ash to preserve eggs.

The consensus of opinion on dinosaur metabolism is coming to the conclusion that dinosaur babies grew rapidly. Some of this is based on evolutionary inferences and some on bone structure. The incubation period for dinosaur eggs would be especially interesting to creationists, and this is estimated to be 50 to 60 days, but could vary from 10 to 100 days (chapter 6).

Eggs and babies are predominantly dated as Upper Cretaceous in the geological timescale. However, part of this conclusion is based on the manipulation of the fossils' dates. In at least three locations the dates of the strata were changed to Upper Cretaceous after eggs were found. In one instance an Eocene date was changed to Upper Cretaceous (p. 57). Is it any wonder that all dinosaurs supposedly died off by the end of the Cretaceous?

There is evidence that the dinosaur eggs are not really that old. Actual organic matter and proteins have been discovered with some eggs:

The discovery of proteins in dinosaur eggshell is rather remarkable because they are not very stable chemically . . . Even more remarkable than the discovery of eggshell protein is the report of organic material in eggshell (p. 3).

More data of interest are that at some locations egg clutches and nests

are found at different vertical levels, similar to dinosaur tracks. This can be interpreted in several ways by creationists. In at least one case, the different vertical levels are attributed to the relief of the ground (p. 222). Some eggs are pathological, especially the eggs with multiple layered shells, but this has not been evaluated in depth. In this book, healthy eggs were analysed. Possible signs of unusual egg laying conditions include sterile eggs, egg clutches too close together for the size of the dinosaur (p. 41), nests laid in conglomerate in Mongolia (chapter 7), and nests associated with the Deccan volcanics in India (chapter 13).

Although many geologists confidently believe that dinosaurs died out due to the Earth being bombarded by a meteorite or a comet, several authors in this book still consider dinosaur extinction an unsolved mystery. For instance, Zhao Zi-Kui states:

'The cause [of dinosaur extinction] poses a difficult question for which no ready answer is apparent (p. 197).'

REFERENCES

- Oard, M. J., 1994. Polar dinosaurs and the Genesis Flood. (Creation Research Society Quarterly, 32:47)
- Robinson, A., 1994. Flood geology explain the fossil record. CEN Tech. J., 10(1):32-41

QUOTABLE QUOTE: Ethical Consequences of Evolution

'Let me summarize my views on what modern evolutionary biology tells us loud and clear. . . There are no gods, no purposes, no goal-directed forces of any kind. There is no life after death. When I die, I am absolutely certain that I am going to be dead. That is the end for me. There is no ultimate foundation for ethics, no ultimate meaning to life, and no free will for humans, either.'

Provine, W. B., 1994. Origins Research, 16(1-2):9.
(Provine is Professor of Biological Sciences at Cornell University.)