

Mother love

Leonard Krishtalka

Digging Dinosaurs. By John R. Horner and James Gorman. *Workman Publishing, New York: 1988. Pp.210. \$17.95.*

A HUNDRED years ago in the American West, a 'bone pilgrim' was a cowboy who collected dead animal bones and sent them east for processing into artificial manure. Roaming the West at the same time was a second, lesser known, breed of bone pilgrim, one who collected fossil animal bones and sent them east for processing into scientific manuscripts. Jacob Wortman, Charles Sternberg, William Reed, John Bell Hatcher and others were bone pilgrims of this sort for Pittsburgh's Carnegie Museum, New York's American Museum of Natural History, Yale's Peabody Museum and Princeton University. Today they would be called 'field palaeontologists'.

John Horner, curator of palaeontology at the Museum of the Rockies in Bozeman, Montana, would have made a fine bone pilgrim in the Old West because he is one of the finest field palaeontologists in the New West. In August 1978 Horner, then a preparator of fossils at Princeton, and his friend Bob Makela, a high-school science teacher in Montana, followed the owners of a local rock shop up a windswept knob of red and green mudstone on the plains near Choteau, Montana. Back at the rock shop lay bits of a thigh bone, a rib and a jaw of a baby hadrosaur (a duck-billed dinosaur) that the owners had found on the surface.

Horner and Makela combed the knob, and in the scree found the remains of two more baby hadrosaurs. The bones were concentrated in a bowl-shaped mass of green mudstone, a nest scooped out by the hadrosaur mother 80 million years ago. The dinosaur was a new genus, later named *Maiasaura*, 'good mother lizard'. Horner and his colleagues spent the next six years in Montana exhuming the ancient life of *Maiasaura* from the knob and surrounding rock — 14 nests, 42 eggs, three nesting grounds, 31 babies and a gigantic herd of 10,000 individuals. The excavations also uncovered the extraordinary record — 25 skeletons, 14 clutches of eggs and 19 eggs with embryonic skeletons — of a second dinosaur, a new genus of hypsilophodontid.

In a field beset by hyperbole, it is fair to say that Horner's discoveries are unparalleled. Two square miles of late Cretaceous rocks reveal geological moments when female maiasaurs and hypsilophodontids gathered in birdlike flocks on communal nesting grounds and laid their eggs. On hatching, the young maiasaurs (which were apparently altricial) stayed in their

AWFUL CHANGES

MAN FOUND ONLY IN A FOSSIL STATE — REAPPEARANCE OF ICHTHYOSAURI.



A Lecture — "You will at once perceive," continued Professor Ichthyosaurus, "that the skull before us belonged to some of the lower order of animals; the teeth are very insignificant, the power of the jaws trifling, and altogether it seems wonderful how the creatures could have procured food."

The cartoon, from Francis T. Buckland's *Curiosities of Natural History* (1859), is reproduced in *Dinosaur Plots and Other Intrigues in Natural History* by Leonard Krishtalka, published by William Morrow, which will be reviewed in *Nature's Spring Books* issue next week.

nests and were fed and cared for by their good mother lizard; the hypsilophodontid hatchlings, comparatively more mature, left the nests immediately after birth. Both species, like birds, grew quickly and were warmblooded. The maiasaurs, like modern wildebeest, travelled in herds several thousand strong.

Digging Dinosaurs, which is co-written with James Gorman, is Horner's personal account of this revolutionary dinosaur diorama and the good fortune, perseverance and palaeontological detective work behind its discovery and reconstruction. Horner is folksy. He toasts the co-evolutionary ties of bonehunters and beer, using the tab of a Rainier beer can for scale in an illustration of baby maiasaur bones. Not much has changed in a hundred years of bonehunting: the field pictures are no longer black and white, the field crews no longer wear black suits and bow-ties in the quarry, and mule teams no longer haul out the dinosaur blocks. But that is about all. What has changed is the picture we have of the dinosaurs themselves, no longer cloddish and dimwitted, but hot, nimble, social and caring.

The book captures the romance, realism and scientific implications of Horner's field work and astonishing discoveries. The friendly, unassuming tone is tailored

for a general audience; those hungry for the straight, academic treatment of the evidence can refer to his papers in the scientific journals. Once in a while Horner's folksy science is, as they say in the West, bodaciously wrong — life evolved at least 3.5 not 2 billion years ago (pp. 38–39), and Darwin never called natural selection 'survival of the fittest' (p.66), Herbert Spencer did. Some critics have already demanded more evidence for maternal care among maiasaurs. Others question Horner's proposition that volcanic gassing and catastrophic flooding turned a herd of 10,000 of them into a graveyard of dismembered, shattered skeletons.

But these are the rough and tumble issues in *Digging Dinosaurs*. When it comes to dinosaurs, the palaeontologist's mind until recently was a prisoner of conventional attitudes that kept the beasts stiff and cold. As Horner says, "paleontology can grow sleepy and accumulate dust like museum cellars" were it not for challenges to the prevailing wisdom. Those challenges have wrought a dinosaur renaissance during the past two decades, a new manifesto for the Mesozoic. □

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