

## CHANGING PERCEPTIONS OF ANCIENT LIFESTYLES

Prior to 1960, paleontologists used fossil remains to assemble ancient lineages based on gross anatomical features. Now, they can derive information about the lifestyles of extinct animals from markings of blood vessels, muscles, and tendons present on fossils. In the 1970s, Robert T. Bakker began challenging previous perceptions of dinosaurs as lumbering giants and overgrown lizards. Bakker contended that that view of dinosaurs is difficult to reconcile with fossils, indicating that many dinosaurs were bipedal, or at least held their bodies well off the ground. Reptiles achieved many locomotor advancements long before similar advancements ever appeared in mammals. Unlike modern reptiles, dinosaurs had highly vascular bones, a condition typical of endothermic animals. Many believe it unlikely that very large, strictly ectothermic animals could warm up rapidly enough to maintain high activity levels. Bakker proposed that many, if not all, dinosaurs were endothermic.

Other scientists discount ideas that dinosaurs were endothermic. They maintain that dinosaurs may have been able to maintain active lifestyles, not in spite of their large size, but because of it. As

ectotherms increase in size, they resemble endotherms. Large body mass results in slower warming, but it also results in slower heat loss. Further, the climate during the Mesozoic era was considerably warmer than it is now. Even though dinosaurs may have been ectotherms, they could have had stable body temperatures and an active lifestyle. Opponents of the endothermy hypothesis point out that some ectotherms have highly vascular bones. They also note that large endotherms usually have obvious cooling devices (e.g., the ears of an elephant), and these were not found on most large dinosaurs.

There are no clear winners in this debate. The dinosaurs may not have had a single thermoregulatory strategy. The largest dinosaurs could have been ectothermic. Although not swift and agile, they would still have been able to maintain a relatively constant body temperature in a stable, warm climate; find food; and avoid predators. On the other hand, maintenance of speed and agility in smaller dinosaurs that lived in cool climates may have required endothermy.