

An Archosaurian Adventure: Integrating the Evolutionary History and Paleoecological Context of the Dinosaurs

Dinosaur Odyssey: Fossil Threads in the Web of Life, by Scott D. Sampson. Berkeley: University of California Press, 2009. Pp. xix + 332. H/b \$29.95

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There are many creatures that capture our imagination and spark our interest in the evolutionary history of life, but few are as compelling as the great rulers of the Mesozoic, the dinosaurs. Many books are available to the avid student of these extinct icons of evolution, ranging from the encyclopedic (Currie and Padian 1997) to the specific (Carpenter 2000), but few tell the story of the ecological stage upon which the dinosaurs danced as well as Scott D. Sampson.

Dinosaur Odyssey: Fossil Threads in the Web of Life

Like many good storytellers, Sampson has firsthand knowledge of his subject. He starts with a personal account of an expedition to the island of Madagascar (chapter 1). Throughout the narrative, Sampson weaves a delicate tapestry that includes observations of modern ecology, diversity, and environment and links those threads to the distant past. In this manner, the reader is taken through a world of intricate relationships demonstrating the importance and function of the often-overlooked players of the dinosaurian stage. All of the players, whether microbe or *Monolophosaurus*, are given their time in the spotlight, providing a contextual framework that makes the dinosaur odyssey all the more fascinating.

Imagine three stories, one of climate, geography, and evolution, a second composed of hidden faunal players and other ecological components (think poop, soil, worms, insects, and bacteria), and the last featuring the stars of the

show: dinosaurs. The three storylines are integral to one another, and the book is written so that each successive story incorporates components of previous chapters. In more ways than one, the interwoven organization of Sampson's book mirrors the natural world it attempts to portray.

The first third of the book (chapters 1–6) takes a broad approach to understanding biological complexities and contingencies throughout Earth's dynamic history. The reader is taken on a journey that explores paleoclimate, tectonics, global nutrient cycling, and the importance of the trophic pyramid in paleoecology. Along the journey, the functional role of primary producers who convert sunlight into an effective ecological currency is further investigated, along with characteristics that define what a dinosaur is (and isn't!). Sampson smoothly discusses evolutionary theory through several guided examples that relate ecology and dinosaurs to the fundamental concepts of natural selection.

The middle third of the book (chapters 7–11) begins to truly delve into the details surrounding the environment, anatomy, and physiology of several major groups of dinosaurs and their supporting ecological cast. In this section, Sampson further weaves together various strands of the natural world, such as the flow of energy from plants to herbivores to carnivores and back through a myriad of interactions and processes. This portion of the book also includes a wonderful discussion of dinosaur behavior and biology, including feeding mechanics, metabolism and growth, hunting, and reproduction.

By this point, the reader has toured multiple ecological facets of the prehistoric world, from plants harnessing the sun's energy to higher up the trophic ladder, through the digestive tract of a carnivorous dinosaur and out the other end, only to be recycled once more. The last third of the book (chapters 12–15) pulls all of these strands together until the reader sees a completed picture of the rulers of

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the Mesozoic: from dinosaur origins through their extinction (see also Dingus and Rowe 1998). It is in these chapters that the history of the dinosaur odyssey finally unfolds within the environmental and ecological context of the Triassic (Fraser and Henderson 2006), Jurassic (Foster 2007), and Cretaceous periods.

Although the book covers complex subjects, Sampson's writing is clear and easy to read; throughout the book the reader will encounter bolded words that highlight useful technical terms (e.g., p. 43, "First are the lizard-hipped dinosaurs, or SAURISCHIA, including..."). It would be an excellent source for the secondary and post-secondary classroom. To promote further investigation, convenient references are provided for each chapter. Culturally, we find dinosaurs to be an awe-inspiring group of animals that continue to capture our imagination. Scott Sampson's *Dinosaur Odyssey* not only discusses the biology and anatomy of these fascinating creatures, but also ignites our imagination

as he submerges us into the complex, interconnected nature of our world and helps us understand how the ecosystem functions as a whole. This is an excellent read for an introduction to dinosaurs and a brilliant tool for teaching ecological first principles.

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