BOOK REVIEW


Which superlative best describes *Tyrannosaurus rex* in the opening line of a book review? I have my old thesaurus in front of me, a holdover from my days as a moonlighting newspaper reporter in high school and college, but it is of little help. Nearly every adjective has been thrown at the ‘tyrant lizard king,’ the most famous and feared dinosaur in popular imagination. By now, over 100 years after Henry Fairfield Osborn christened *Tyrannosaurus rex*, any poetry I can muster is bound to be derivative. But what about scientific research on the ‘tyrant king’? Are there still exciting unanswered questions about this megapredator, or is tyrannosaur research doomed to the same fate as tyrannosaur hyperbole?

The current state of tyrannosaur research is the subject of a new book from Indiana University Press, *Tyrannosaurus rex*, *The Tyrant King*. One of the latest titles in IUP’s Life of the Past series, *The Tyrant King* is a compilation of chapters presented at a 2005 symposium at the Black Hills Institute of Geological Research in honor of *Tyrannosaurus*’ centennial birthday. With a glitzy cover and a snazzy new layout that deviates from past IUP books, *The Tyrant King* has been widely marketed not only to a scientific audience, but also to the general public as “a treasure trove of information about the most famous dinosaur of all.” Edited by Peter Larson and Kenneth Carpenter, this book includes 21 chapters written by a total of 30 authors. These chapters cover a wide range of information, from gross anatomy, stratigraphy, and taphonomy to novel computer models of *Tyrannosaurus* locomotion and historical reviews of tyrannosaur research and celebrity. As in most edited symposium volumes, these chapters run the gamut from good to poor, and are mostly a set of separate papers rather than a coherent narrative.

A handful of chapters are well-written contributions that present either novel research or timely reviews of interesting topics. Within the former category, Kent Stevens and colleagues describe the latest application of their DinoMorph software, a biomechanical computer program that animates dinosaurs and allows researchers to force all sorts of gymnastic routines on their digital animals. They conclude that *Tyrannosaurus* had a wide range of motion in its legs, could easily sit down and get back up, and may have used its arms to help prop itself up from a resting position. Hans Larsson provides a first look at palatal kinesis in *Tyrannosaurus* based on gross morphology, and outlines a hypothesis of limited palatal movement that can further be tested with biomechanical software. John Happ presents a long-awaited description of a unique *Triceratops* fossil with healed bite marks that match the teeth of *Tyrannosaurus*, which has obvious implications for various debates on the hunting behavior (or lack thereof) in the tyrant king. Ralph Molnar provides detailed jaw muscle reconstructions for *Tyrannosaurus* based on his now 36-year-old PhD thesis, a lesson in both the importance of detailed anatomical observation and perseverance! I have no doubt that these chapters could be published, with slight modification, in many peer-reviewed journals.

Much of the book is composed of review chapters that present little new information but synthesize current areas of research. Perhaps the most useful of these is the first chapter in the book, Neal Larson’s illustrated catalogue of every *Tyrannosaurus* specimen ever discovered, with information on the locality, completeness, and current repository for each fossil. I suspect this chapter, more than any other, will prevent this book from gathering dust on my shelf. A few other reviews stand out, including Mary Schweitzer and colleagues’ accessible review of medullary bone and its discovery in the remarkable *Tyrannosaurus* specimen MOR 1125, Kirk Johnson’s succinct outline of Hell Creek Formation stratigraphy and dating, and Thomas Holtz’s passionate but precise rebuttal to the curious hypothesis that *Tyrannosaurus* was merely a 40-foot-long scavenger of dead carcasses. Each of these could be turned into a peer-reviewed review paper quite easily. Don Glut’s review of *Tyrannosaurus*’ role in popular culture and Bruce Rothschild and Ralph Molnar’s summary of tyrannosaurid pathologies are also interesting, and Phil Manning’s ode to dinosaur footprints contains useful information but in places suffers from verbose passages and strangely informal language.

Unfortunately, much of the rest of the book is a puzzling jumble of marginally interesting chapters, ill-founded attempts at quantitative analysis, and truly bizarre diatribes that are out of place in a scientific publication. If I were serving as a referee I would critique many of these chapters at length, but for the sake of this review I will only focus on a few of the most problematic contributions.

Two chapters from Peter Larson leave much to be desired. First, Larson provides a review of variation and sexual dimorphism in *Tyrannosaurus*, an important subject that demands careful anatomical comparisons and rigorous statistical analysis. However, Larson provides neither. Although Larson gives a useful, clear, and succinct overview of dimorphism in living animals, I fear that his most important conclusions for *Tyrannosaurus*—that there may be two contemporary species of *Tyrannosaurus* and that *Nanotyrannus* is a separate taxon and not a juvenile *Tyrannosaurus*—are based more on wishful thinking than hard evidence. Larson presents pages of measurements and bivariate plots, but does not subject his data to multivariate analysis, which is necessary to find an overriding signal of multiple size or shape clusters among his specimens. Even more damning, there is no statistical analysis whatsoever: the measurements and plots are presented at face value and then heavily interpreted.

Larson’s second chapter is a cranial description of BHI 3033, the famous *Tyrannosaurus* specimen ‘Stan’ that is heralded as the ‘most significant’ skull known for any *Tyrannosaurus*. Indeed, the nearly complete and disarticulated nature of the skull makes BHI 3033 an ideal subject for a comprehensive monograph, as previous cranial descriptions (e.g., Molnar, 1991; Brochu, 2003) have focused on less complete, distorted skulls in which many details are obscured by articulated and crushed bones. However, Larson only provides eight pages of descriptive text, and the photos on the accompanying CD are of such poor resolution that they provide little information. Indeed, as someone actively involved in research on tyrannosaurid anatomy and systematics and constantly on the prowl for quality descriptive data, this chapter was the most disappointing to me.

A chapter by Greg Paul, although useful in many regards, reads like a sensational, unauthorized biography of *Tyrannosaurus*, which he describes in gushing detail as a sort ofprehistoric James Dean, which “grew rapidly and died remarkably young….(and