on phenomenology, is that the strong interactions are treated on equal footing with the weak and electromagnetic interactions. There are very few experimental tests of the standard model that can escape strong-interaction effects, since the real world is made of mesons and baryons, not quarks. This book includes many of the approximate methods that are used to cope with the strong interactions, and these sections constitute a valuable resource in themselves.

The theoretical development and experimental verification of the standard model have dominated high-energy physics for almost 20 years. The history is thrilling and illustrates wonderfully the deep interdependence of experiment and theory and how each supports and advances the other in this field. However, that story has been told in many excellent books, and it is exciting now to move away from the historical approach and start to confront the detailed predictions of the model. It is in a deep and detailed understanding of the phenomenology of the standard model that we can hope to find the first glimmer of the new physics that awaits us beyond its horizons.

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Life of an Evolutionist

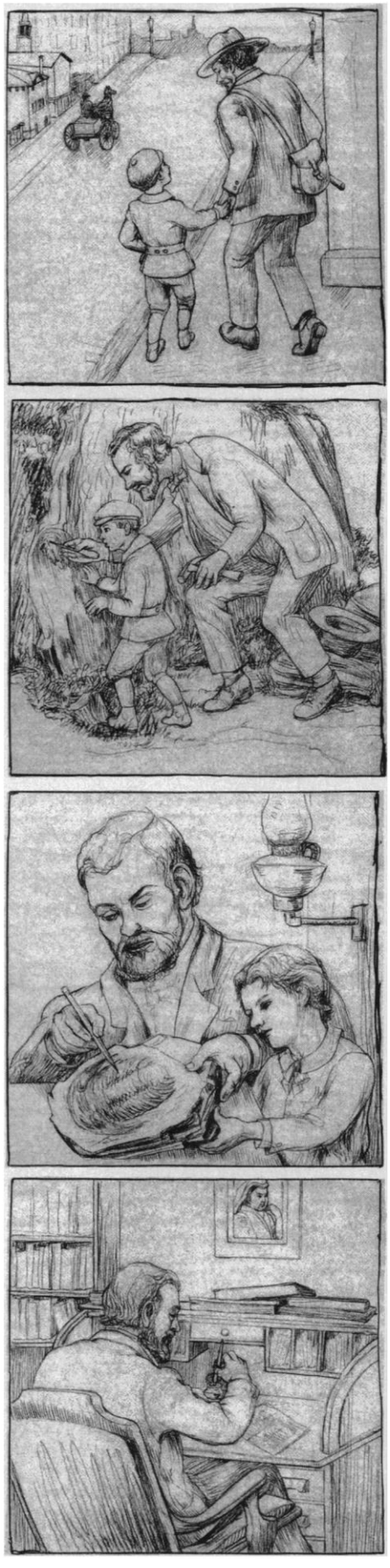
William Diller Matthew, Paleontologist. The Splendid Drama Observed. EDWIN H. COLBERT. Columbia University Press, New York, 1992. xvi, 275 pp. + plates. $45.

William Diller Matthew (1871–1930) represents the transition between two eras in American vertebrate paleontology: that of the pre-modern evolutionary synthesis, typified by Henry Fairfield Osborn (1857–1935), who was Matthew's teacher at Columbia University and subsequently his superior at the American Museum of Natural History, and that of the modern evolutionary synthesis, exemplified by George Gaylord Simpson (1902–1984), who was strongly influenced by Matthew early in his career and later succeeded him at the American Museum. This, the first full biographical study of Matthew, is written by his son-in-law, Edwin Colbert (b. 1905), himself a distinguished vertebrate paleontologist and former American Museum colleague of both Osborn's and Simpson's.

Born and raised in St. John, New Brunswick, Matthew obtained his Ph.D. at the Columbia School of Mines with the intention of becoming a "hard-rock" geologist. While at Columbia, however, he took several courses from Osborn, and each impressed the other; upon completing his Ph.D. Matthew was appointed to a full-time staff position at the American Museum. Before long he was juggling the demands of long field seasons away from wife and family, of excavating, describing, and interpreting an ever-increasing supply of mammalian teeth and jaws, skulls, and other bones, and of organizing materials for exhibition halls—all under the direction of the overbearing Osborn. As Matthew gained professional experience and self-confidence, he found himself more and more at odds with Osborn's evolutionary theorizing as well as with contemporary interpretations of the sedimentary environments in which many of the fossils of the American West were deposited. In a series of classic monographs Matthew expounded on the principles of stratigraphic correlation, the nature of ancient environments, evolutionary histories and trends, and concepts of biogeography.

After 30 long years of service, often approaching servitude, at the American Museum, Matthew accepted the chairmanship of the department of paleontology at Berkeley, where he now was completely his own man, intellectually and administratively. Unfortunately, his tenure at the University of California was short-lived, for within a few years, several months short of his 60th birthday, he died of kidney disease.

With access to the archives of the American Museum and more especially to family records, letters, and anecdotes, Colbert provides an engaging and informative account of Matthew's professional and personal life. Besides giving us an intimate family portrait, he brings to life the various personalities of early 20th-century vertebrate paleontology, including not only Osborn but also Matthew's other American Museum colleagues such as William King Gregory, Roy Chapman Andrews, Barnum Brown, Walter Granger, and the all-important preparators and field hands like Albert ("Bill") Thomson.



"A reconstruction of the discovery of the giant trilobite, *Paradoxides regina*." Top to bottom: "George Frederic Matthew sets out with his son Will for some fossil hunting in the outskirts of Saint John; Will discovers the fossil, much to the delight of the two fossil hunters; The rock containing the fossil has been excavated, and is brought home and admired by father and son; George Frederic Matthew writes a description of the fossil, published some years later in the *Transactions of the Royal Society of Canada*. He proudly named the fossil *regina*, in honor of Queen Victoria." [From *William Diller Matthew, Paleontologist*; drawings by Margaret Matthew Colbert]

W. D. Matthew's camp on Porcupine Creek, South Dakota, 1906. "The sheet iron stove with its long stovepipe along with the wall tent, chuck wagon, and horses reveal a past perhaps forgotten or unappreciated by many present-day fossil hunters." [From *William Diller Matthew, Paleontologist*]

The biography's scientific strengths are Colbert's clear précis of Matthew's key paleontological monographs and papers, particularly those on the character and evolutionary significance of various Cenozoic mammalian fossils and the interpretation of the temporal ordering, paleoenvironments, and paleogeography of the fossil sequences, and his rendering of the local color surrounding Matthew's many field expeditions to the American West. The biography's weaknesses spring from an insufficiency of analysis of how and why Matthew came to differ so strongly from Osborn, among others, in his views about mammalian evolution and of how he anticipated much of what Simpson was later to contribute to the evolutionary synthesis. A more explicit discussion of the origin and development of Matthew's paleobiological conclusions would have been most valuable, especially given how well placed Colbert is to provide such an analysis. Fortunately, however, this shortcoming can be mitigated by reference to Ronald Rainger's recent biography of Osborn (*An Agenda for Antiquity*, University of Alabama Press, 1991), which has an excellent chapter on Matthew's original ideas in biostratigraphy and correlation, paleobiogeography, and evolution and how they fit within contemporary vertebrate paleontology.

The systematic development of Matthew's evolutionary thinking from an Osbornian evolution internally driven by aristogenesis to one environmentally mediated by natural selection leads one to wonder whether, had he lived just a few years longer, he would have preempted Simpson in bringing paleontology back into the mainstream of 20th-century biology. Although not explicit on this point himself, Simpson did acknowledge years later that he "was trained by Matthew at least as much as by [his] major professor, [Yale's Richard Swann] Lull." This biography deserves the attention of those interested in the more recent history of vertebrate paleontology as well as its eventual seating at the "high table" of modern evolutionary theory.

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