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THE FIRST FOSSIL HUNTERS
PALEONTOLOGY IN GREEK AND ROMAN TIMES

Reviewed by Norman MacLeod

Adrienne Mayor
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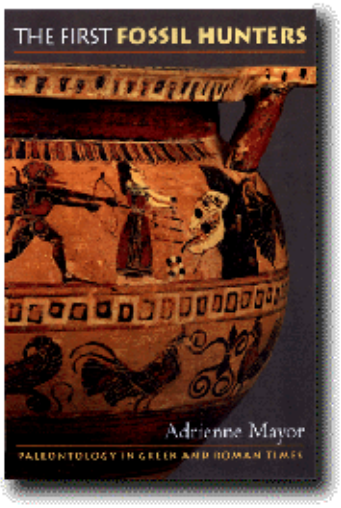
In the canonical treatise of paleontology's history as a science, Martin Rudwick (1976) argued that the study of fossils began on 28 July 1565 with the publication of Conrad Gesner's book **On Fossil Objects, Chiefly Stones and Gems, their Shapes and Appearances.** According to Rudwick, previous authors missed the link between the morphologies displayed by some fossils and those of living organisms because classical and Renaissance (then modern) philosophers—chiefly Aristotle and various neoplatonists—offered alternative metaphysics that, in light of Renaissance scientific knowledge, seemed more comprehensible. The Aristotelian theory involved the growth of fossil objects in rocks in situ as a response to the actions of an organic essence or 'seed' while the Neoplatonic theory suggested that such objects represented the actions of metaphorical forces that transcended nature's superficial boundaries.

In The **First Fossil Hunters: Paleontology in Greek and Roman Times,** Adrienne Mayor challenges this view of paleontological history by contending that not only were classical Greeks and Romans familiar with fossils as the remains of living beings, but that they strove mightily to come to terms with this fact. Indeed, so mightily that much of the classical western cultural canon can be regarded as being—at least partially —the result of their efforts to assimilate the existence of fossil bones scattered throughout sedimentary deposits across the classical world.

Let me say from the outset that this is a bold claim that is sure to be controversial within archaeological and antiquarian circles. Ms. Mayor is a classical folklorist who specialises in the investigation of the origins of Greek and Roman myths and whose recent work has also ranged to the investigations of the cultural uses of tattoos. As a paleontologist, though, I must admit I found many of her arguments compelling. That such deposits and fossils occur is not in question; they are still there for anyone to see. That such keen observers of the natural world as the Greeks and Romans must have noticed and been interested in these curiosities seems eminently reasonable. The mystery lies in the apparent lack of scholarly writings by classical philosophers on fossils to match such works as Aristotle's **Parts of Animals.** Mayor argues that such works exist throughout Greek and Roman literature and art, but that classicists, through lack of training in paleontology, have misinterpreted the references. Similarly, paleontologists, through lack of familiarity with the details of classical literature and art, have missed the information that would have allowed them to make the necessary connections.



Mayor begins her book with perhaps her best example of a paleontological discovery being represented in classical art and literature; the story of the griffin. The griffin legend is neither Greek nor Roman in origin, but comes from Scythian nomads

who, about 675 BC, told the Greek traveller Aristeas of a vast wilderness to the east where gold deposits were guarded by fierce lion-like creatures with hooked eagle-like beaks. Aristeas worked these gryps (= hooked) or griffins into a story (probably also related by the nomads) in which men on horseback battled the griffins for possession of the gold fields or, in later accounts, to protect their nesting areas and young from the gold miners. Soon after this story—and others like it—appeared, the griffin motif began to be incorporated into classical art and architecture alongside such familiar mythical creatures as dragons, Cyclops, and various giant heroes.

In one of the best non-fictional detective stories I've read recently, Mayor follows a trail of clues east from the Black Sea to the gold fields of the Hindu Kush, Altari Mountains, and Gobi Desert where the archetypal griffin is revealed to be none other than **Protoceratops** (Fig. 1). The entire legend is there. The beak, the wings (supported by the bony frill at the rear of the skull), the size, the nests, the young, the association with gold deposits; even down to a distinctive color contrast between the fossils (white) and sedimentary matrix (red) that would ensure any traveller happening by couldn't help but notice the fossils.

From this—to my mind—stunning triumph of comparative folklore/anatomy/paleontology Mayor goes on to ask the obvious question. If classical people's attempts to explain **Protoceratops** fossils (which few actually saw) resulted in the griffin legend, what other myths or legends may have been based on the vertebrate fossils that occur in copious numbers throughout the Tethyan faunal realm? Mayor's answer is, perhaps many. In a short 250 pages she introduces the reader to Chinese dragons (a generic term for all dug-up bones, one major 'dragon works' visited in the 1920's contained **Hipparion** and **Cervocervus** fossils), Indian dragons (a distinction is drawn between horned mountain dragons [quite probably based on the giraffids **Sivatherium** and **Giraffokeryx**] and tusked lowland dragons [possibly based on elephant fossils] of the Siwalik Hills that reflect the different ages of those deposits), the legendary Neades (monstrous inhabitants of Samos who screamed so loudly that the Earth opened up and swallowed them [probably based on the mastodon fossils that occur on the island]), the flying reptiles of Egypt (possibly based on spinosaur fossils), and the monster of Joppa (slain during the rescue of Andromeda by Perseus and possibly based on a **Zeuglodon** whale fossil). In addition, many shrines to local Greek heroes (e.g., Orestes of Sparta, Theseus of Athens, Pleops of Olympia) turn out to have likely connections to large Cenozoic mammals the remains of which were often housed in elaborate municipal shrines—the first paleontological museums. All these, along with many more charming and thought-provoking delights, await the readers of this book.

Mayor's primary thesis is that there is much to be gained from a collaboration between archaeologists-ethnologists-folklorists and paleontologists and that these examples (many of which are admittedly speculative) are but the tip of the mytho-paleontological iceberg. On this ground I believe she makes her case admirably. Inevitably, though, there are also flaws of both commission and omission. Mayor's needlessly overbearing critique of Rudwick's single chapter on the origins of paleontology detracts from the overall positive tone of her work. After finishing **The First Fossil Hunters** I went back and re-read **The Meaning of Fossils,** but did not find Rudwick's treatment of classical paleontology as dismissive as Mayor implies. Rudwick simply chose begin his discussion with the first work on fossils that could reasonably be termed scientific in the modern sense. Moreover, Rudwick's discussion of Aristotelian essentialism is far more scholarly, accurate, and generous that Mayor's position that Aristotle spurned the consideration of fossils as natural objects simply because they were connected with the (then) popular mythos. Rudwick also concerned himself more with the interpretation of 'difficult' fossils for which there would have been no obvious modern analogue for classical naturalists instead of the 'easy' Cenozoic bivalves, gastropods, and many vertebrate fossils which he recognises were identified as the remains of once living creatures in antiquity. One would be well-advised to read Mayor's and Rudwick's books in sequence to obtain a more balanced picture than either book offers by itself.

I was also struck by a seeming lack of willingness on Mayor's part to use the knowledge she has gained from her studies to illuminate the role of fossils in our world. After all, one of the primary reasons for studying history is to gain a perspective from which one might better understand one's own time. If Mayor is right and much of classical mythology represents and attempt by Greek and Roman cultures to interpret the remains of creatures that no longer existed in their world, how immune are we—in a cultural sense—from the same needs? Some of this ground has been covered recently by W. J. T. Mitchell's **The Last Dinosaur Book** which proposes that dinosaurs fulfil a necessary cultural role far more pervasive and important than their

scientific study would suggest. To Mitchtell, dinosaurs are modern totems; cultural concepts we (need to) use in order to think about our world. **The First Fossil Hunters** suggests that ancient peoples used vertebrate fossils—including dinosaurs, but mostly Cenozoic mammals—in a similar way. Apparently the difference between classical scientists and their modern counterparts is that Aristotle and his contemporaries drew a distinction between living organisms (which can be studied directly) and fossils (which are known only from imperfect and fragmentary remains) and regarded speculations about the latter as falling outside their purview. While modern science deems fossils as appropriate objects of study, perhaps a vestige of the classical distinction survives in the labelling of paleontology a "historical science'. Regardless, as a 'historical scientist' I find the similarities and the differences implicit in this thesis deeply intriguing and hope it will be explored in more detail by someone very soon.

Mayor, along with Mitchell, has opened up an entirely new way of looking at fossils and appreciating their importance. Moreover, it represents an approach to the appreciation of paleontology that can be accessed by a much larger audience than has traditionally been available. Courses in paleontology usually begin with a dry-as-dust recitation of the fossilisation process as well as a taxonomy of different fossilisation types (e.g., casts, molds, body fossils, trace fossils). As we all know, that material is an immediate turn-off from which most students never recover. Instead, I suggest we start with a lecture drawn from Mayor's, Rudwick's, and Mitchell's books to explain to students (1) what an important role fossils have played in our culture, (2) how paleontology made the transition from cultural curiosity to a science, and (3) how at least one group of fossils (dinosaurs) continues to support a dialogue between the cultural and scientific roles of fossils. The "types-of-fossilisation" material can be a part of point two if you really think it must be included. [Note: I'd leave it for the first lab, "What's a Fossil?"]. If done correctly this approach should resonate with as many prospective paleo. students as possible and be remembered by all. Of course, you'll need to read Mayor's book to do this, but you need do that anyway. It's well written, well argued, and there's much that will appeal to all paleontologists, professional or amateur. Best of all, it may only be the beginning of a re-evaluation of our understanding of the meaning of fossils.

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