

HISTORY OF PALEONTOLOGY IN VIRGINIA:

1607–2007

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ABSTRACT

American paleontology was, in many respects, born in Virginia. The history of paleontological work in Virginia includes fossils from the Precambrian to Pleistocene, from protists to proboscideans. It clearly shows the evolution and the peak periods in the science over the last 400 years, and the activity of hundreds of researchers, including many of the leading American scientists of their times. This paper provides a chronological summary of this remarkable interval in the history of science. Three indexes are included that should help future students to locate the literature of Virginia paleontology. The first includes the References Cited in alphabetical order by author. The second lists all fossil references by fossil type. The third index lists all references in order of the geologic age of the studied taxa. Twenty-four text-figures demonstrate the techniques of fossil illustrations as they evolved from wood blocks to scanning electron microscopy. Forty-four plates illustrate representative fossils found in Virginia from the Paleozoic, Mesozoic, and Cenozoic.

A BRIEF HISTORY OF STUDIES ON FOSSILS

As early as 610 BCE, the Greek philosopher Anaximander examined marine fossils on land and deduced that the sea must have covered that area in the past. In the 4th century BCE, however, Aristotle had taken the science a giant step backward by teaching that fossils were spontaneously generated. In the 1500s CE the word *fossil* had come to mean anything dug out of the ground (Rudwick, 1976). This included not just specimens of petrified animals or plants, but also minerals, prehistoric tools, and other geological objects. Throughout the 1600s and 1700s, various workers examined the empirical evidence concerning fossils and struggled to make those observations consistent with religious beliefs. Some of these early workers were imprisoned for their views, such as French naturalist Bernard Palissy in the 1500s¹. One of them, Niels Stensen, correctly concluded that older beds and fossils were in lower strata and younger ones were in

higher (Cutler, 2003). Though not inspired by paleontology, the groundbreaking work of Carl von Linné established an orderly system of nomenclature was the landmark for the period (Linnaeus, *Systema Naturae*; 10th edition, 1758). Its principles were soon employed in zoological nomenclature, including fossils. Anatomist Georges Cuvier, while recognizing extinction—based on examination of fossil vertebrates—concluded that species do not evolve. Cuvier's contemporary Jean Baptiste de Lamarck described the evolutionary process as modifying species through transformation of simple organisms to more complex forms, and thought he could recognize these changes in fossils. Cuvier ridiculed Lamarck's ideas. (See Gayard-Valy, 1994 for a good summary of this formative period.)

English geologist and engineer William Smith was one of the first to use fossils for the practical application of providing relative dates for layers of sedimentary rocks (see Winchester, 2001; Torrens, 2016), and this revolutionized geology. French geologist Alcide d'Orbigny, in his *Prodrome de Paleontologie Stratigraphique* (1849–1852), further elaborated the concept

¹ See Table 1 for basic biographical information on most of the scientists mentioned in this paper.