

TRILOBITES AND THE CULTURE OF WONDER IN ANTEBELLUM AMERICA

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EMMA JO PRIESENDORF
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Emma Jo Priesendorf, Candidate for the Master of Arts Degree

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ABSTRACT

This thesis examines a “culture of wonder” in the United States from 1800-1850 through the exploration of invertebrate fossils, especially the trilobite, in historical sources. A short discussion of Charles Willson Peale’s Repository allows the reader to understand the culture of wonder at the beginning of the time period under review. Wonder, this paper argues, is a trope that can help uncover larger trends in American culture, including the democratization of knowledge and rejection of expertise, the establishment of American identity and success, and an emerging American fascination with collecting. Each of these trends are examined individually, using trilobites and other invertebrates as an illustrative tool in each case. These objects are a perfect case study because they were a potent manifestation of the idea of wonder: evidence of past marine life that could be found in the soil of American farms, they were a representation of divine creation and mystery. At the same time, they were collectible and accessible to everyday Americans. To illustrate the change in the culture of wonder over the time period in question, the analysis closes with a discussion of P.T. Barnum’s American Museum as a comparison to Peale’s establishment. Ultimately, the culture of wonder represents the impulse by antebellum Americans to find something special in and about America and the American way of life.

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Supervisory Committee

Matthew Osborn, Ph.D., Committee Chair
Department of History

Brian Frehner, Ph.D.
Department of History

William Ashworth, Ph.D.
Linda Hall Library

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CHAPTER 1

INTRODUCTION

In 1894, children’s author Mary Prudence Wells Smith released the seventh installment of the *Jolly Good Times* series. *Jolly Good Times To-Day* followed the adventures of a young Cincinnati girl named Amy Strong. One day, Amy finds a strange rock that resembles a seashell but feels quite heavy. She brings it to the attention of Dr. Hough, a friend of the Strongs and a natural history enthusiast. The rock is a fossil brachiopod, an extinct seashell-like animal, Hough informs the wide-eyed child. It is evidence of life that existed long, long ago in an ocean that covered what is now Ohio. Amy is delighted with this information, immediately vowing to create her own collection of curiosities. She begins promptly. Her father buys her a geological hammer, and she roams the neighborhood with her friends to look for new specimens. They find many corals and various shells, but the true prize eludes them: the trilobite.¹

An extinct marine arthropod, trilobite fossils are common enough to create widespread interest, varied enough to inspire fascination, and sufficiently rare to motivate long hours of collecting. Dr. Hough divulges to Amy that “the trilobite was the aristocrat of his time . . . he was the highest order of living creatures then, the nearest to a fish.”² Amy and her friends are supremely annoyed when a rival group of children find a trilobite in a nearby roadcut. Determining to visit the exact spot of the find, Amy utters a perfect summary of the seemingly timeless appeal of fossil collecting: “I should so love to find one myself, and think I was the first human being to see it, and that there it had lain, waiting for me, millions of years.”³

¹ Mary P. Wells Smith, *Jolly Good Times To-Day* (Boston: Roberts Brothers 1894), 217–20, <https://www.loc.gov/item/20019318/>.

² Smith, *Jolly Good Times To-Day*, 222.

³ Smith, *Jolly Good Times To-Day*, 223–24.

Especially because the novel's protagonists are children, *Jolly Good Times To-Day* offers an intriguing glimpse into cultural perceptions of fossils and the widespread participation in paleontology. The book challenges the notion of paleontology being the sole province of an elite, educated subset of the population. While scholarly journals and monographs were common ways of communicating new scientific discoveries and theories, those publications were not the means through which most Americans learned about fossils. Historian Margaret Welch writes that works intended for naturalists were often inaccessible to the general public. However, the ideas inside them trickled down into other types of literature, including children's books like *Jolly Good Times To-Day*. Welch contends that the diffusion of print culture was central to the popularity of natural history activities from 1825 to 1875. Textbooks and encyclopedias were often relatively inexpensive compared to scientific monographs and often served as an introduction into a natural history hobby. In periodicals such as newspapers and magazines, it was common practice for editors to copy large chunks of text from the latest natural history books to fill space.⁴ Over time, says Welch, "The discourse in general became so well known that even non-naturalists could employ it to express their encounters with the natural world."⁵ Through this process of dissemination, the research of natural historians reached the public, where it was filtered through each reader's experience, reinterpreted, and spread further.

In the nineteenth century, readily collectible invertebrate fossils frequently formed the basis of discussions about ancient life. These included crinoids, brachiopods, corals, bryozoans, and trilobites. But as Dr. Hough said, trilobites often starred in these dialogues as the most complex—and interesting—of all. They are also the only one that is obviously an animal, even to

⁴ Margaret Welch, *The Book of Nature: Natural History in the United States 1825-1875* (Boston: Northeastern University Press, 1998), 137–41.

⁵ Welch, 134.

a non-specialist. The three lobes, the discernible eyes, and the distinctive segments all suggest a comfortable, insect-like familiarity. Furthermore, trilobites were among the earliest fossil subjects to be researched extensively.⁶ Natural philosophers and nature enthusiasts were already writing books about the dozens of known trilobite species when the first dinosaur bones were just being discovered. By the late 1800s, trilobites had entered the public lexicon and were referenced off-handedly not only by naturalists but also by regular Americans.

Trilobites make regular appearances in nineteenth-century literature, such as Jules Verne's 1874 classic *Journey to the Centre of the Earth*.⁷ They also show up in the *Prose Works of Ralph Waldo Emerson* in an essay on nature.⁸ They began to creep into the language in the form of common expressions; to call someone a trilobite in the late nineteenth century might have meant that they were old or antiquated. There are numerous references to trilobites in poems, as well. An 1898 poem by Bret Harte, "A Geological Madrigal," expresses the narrator's romantic love for a woman by proclaiming he has "found out a gift" for her—fossil collecting localities, of course:

Oh, come, and—in technical speech—
We'll walk this Devonian shore,
Or on some Silurian beach

⁶ See James Hall, George B. Simpson, and John Mason Clarke, *Palaeontology of New York* (Albany: Printed by C. Van Benthuyzen, 1847); Roderick Impey Murchison, *The Silurian System: Founded on Geological Researches in the Counties of Salop, Hereford, Radnor, Montgomery, Caermarthen, Brecon, Pembroke, Monmouth, Gloucester, Worcester, and Stafford; with Descriptions of the Coal-Fields and Overlying Formations* (London: John Murray, 1839); Hermann Burmeister, Thomas Bell, and Edward Forbes, *The Organization of Trilobites: Deduced from Their Living Affinities; with a Systematic Review of the Species Hitherto Described / by Hermann Burmeister* (London: Ray Society, 1846); Jacob Green, *A Monograph of the Trilobites of North America: With Coloured Models of the Species*. (Philadelphia: JBrano, 1832); William Buckland, *Geology and Mineralogy Considered with Reference to Natural Theology / by the Rev. William Buckland ...*, Bridgewater Treatises on the Power, Wisdom, and Goodness of God, as Manifested in the Creation Treatise VI (London: WPickering, 1836).

⁷ Jules Verne, *A Journey to the Centre of the Earth* (New York: Scribner, Armstrong & Company, 1874), 108.

⁸ Ralph Waldo Emerson, *Prose Works of Ralph Waldo Emerson* (Boston: J.R. Osgood and Company, 1875), 510.

We'll wander, my love, evermore.
I will show thee the sinuous track
By the slow-moving Annelid made,
Or the Trilobite, that, farther back,
In the old Potsdam sandstone was laid...⁹

Harte's employment of geological and paleontological terms throughout the poem is well-informed. His comment on the Potsdam sandstone's trilobites is especially notable because it is such a remarkably specific reference to be placed into poetry. The Potsdam sandstone is in New York, but it was not the most well-known fossil locality, even within that state. Furthermore, naturalists had discovered the trilobites of the Potsdam less than a decade before the poem's publication.¹⁰ This is a relatively short period for a scientific discovery to have seeped into lay public discourse in this way, and yet there it is, hidden in a poem that is itself hidden in a book of non-geological poems. The references to fossils and geologic periods in a book intended for nonscientific readers indicates that there was widespread awareness of these topics in the last years of the nineteenth century.

Novels are another particularly rich source of trilobite references during this time period. In one 1893 novel, a young man spent time on his honeymoon searching for fossils with his new bride, Sophia, at her request. He made a real effort, but he did have "an unfortunate tendency . . . to confuse a trilobite with a graptolite, a blunder for which Sophia had no tolerance."¹¹ This reference is one of several examples, including *Jolly Good Times To-Day*, in which a female character is the one most interested in paleontological endeavors. This willingness to include women illustrates that nineteenth-century authors saw fossil collecting as an activity that was

⁹ Bret Harte, *The Poetical Works of Bret Harte* (Boston, New York: Houghton, Mifflin and Company, 1898), 279, <https://www.loc.gov/item/98001738/>.

¹⁰ Patricia A. Lemieux, "A Trilobite Fauna from the Potsdam Formation (Cambrian; New York) and Its Contribution to Stratigraphy" (Geological Society of America Northeastern Section - 43rd Annual Meeting, Buffalo, NY, 2008), https://gsa.confex.com/gsa/2008NE/finalprogram/abstract_135566.htm.

¹¹ F. Anstey, *Tourmalin's Time Cheques* (New York: D. Appleton and Company, 1893), 78.

open to anyone. Like astronomy and botany, paleontology was both an important knowledge-making endeavor as well as an appropriate pastime for children and learned ladies.

Usually, novelists who mentioned trilobites did so only in passing—all the more interesting because this suggests that the readers were presumed to be already familiar with them. Occasionally, an author mentioned a specific kind of trilobite, implying a far deeper knowledge than one might expect from a general audience. For example, in a novel called *Elsie Venner: A Romance of Destiny*, Oliver Wendell Holmes mentions “Trenton” trilobites and suggests that they do not appear to change over long stretches of geologic time. He presumably means trilobites of the Trenton group of the Rust formation in New York’s Walcott-Rust quarry, but since he does not even attempt to explain this, he appears to have believed his audience would catch the reference.¹²

At the same time these literature references appeared, in certain American cities—most notably Cincinnati—there were exceptionally active groups of amateur fossil collectors. Some of these untrained fossil enthusiasts even published books and discovered new species.¹³ In 1889, native Ohioan Samuel Almond Miller, a founding supporter of the Cincinnati Society of Natural History and the editor of its journal,¹⁴ published a comprehensive book called *North American Geology and Palaeontology for the Use of Amateurs, Students, and Scientists*. The title alone demonstrates the author’s confidence that non-scientists would be the primary users of the book.

¹² Oliver Wendell Holmes, *Elsie Venner: A Romance of Destiny* (Boston, New York: Houghton, Mifflin and Company, 1889), 295.

¹³ The terms “amateur” and “professional” in this period of science history can be loaded. For more, see Robert E. Kohler, *Landscapes and Labscapes: Exploring the Lab-Field Border in Biology* (University of Chicago Press, 2002); Jeremy Vetter, *Field Life: Science in the American West During the Railroad Era*, *Intersections: Histories of Environment, Science, and Technology in the Anthropocene* (Baltimore, Maryland: Project Muse, 2016).

¹⁴ William Miller III, *Trace Fossils: Concepts, Problems, Prospects* (Elsevier, 2011), 26–27.

In over 800 pages, Miller explained which kinds of fossils could be found in each location, and included picture drawings of invertebrate fossils, helpful for identification. His book was exceptionally well received. Emphasizing the guide's utility above all, geologist Kenneth Caster has called it "probably the most used volume on American paleontology ever compiled, and it certainly was the most ambitious private publication in the discipline."¹⁵ This notable book was published privately because S. A. Miller was not affiliated with a university or museum.

Technically, he was an amateur, in the sense that he had no formal paleontological training and did not make his living with geology. Miller was a member of the Cincinnati "School" of Paleontology, a group of publishing amateurs who were well-known all over the United States for their excellent work on trilobites, echinoderms, corals, and other invertebrates of the upper Ordovician period (450-500 million years ago).¹⁶ Some of these men remained in their jobs as lawyers, doctors, and teachers, keeping their fossil-studying hobby as just that. For instance, S.A. Miller accomplished the publication of his remarkable book while he maintained his official career in local politics.¹⁷ Other members of the Cincinnati school went on to study and have careers in paleontology: Charles Schuchert held only a sixth grade education, yet he became a professor of invertebrate paleontology at Yale, influencing generations of credentialed paleontologists.¹⁸ When considered alongside the trilobite references in literature, the Cincinnati

¹⁵ Kenneth Caster, "The Cincinnati 'School' of Paleontology," *Earth Sciences History* 1, no. 1 (January 1, 1982): 25.

¹⁶ This term was coined in Caster, "The Cincinnati 'School' of Paleontology."

¹⁷ Miller III, *Trace Fossils*, 27.

¹⁸ Danita S. Brandt and Richard Arnold Davis, "Trilobites, Cincinnati, and the 'Cincinnati School of Paleontology,'" ed. Donald G. Mikulic, Ed Landing, and Joanne Kluessendorf, *New York State Museum Bulletin, Fabulous Fossils: 300 Years of Worldwide Research on Trilobites*, 507 (2007): 38.

School paints a picture of a late nineteenth-century public that was surprisingly engaged with scientific discourse.

Why were trilobites cropping up in everything from poetry to children’s literature in the late 1800s? Why were so-called “laymen” becoming involved in collecting and writing about invertebrate fossils? At first glance, trilobites do not seem to evoke anything in particular that would appeal to the American psyche. They are small and unassuming. It has been argued that dinosaurs, by contrast, were prehistoric creatures that represented much for Americans. Historian Lukas Rieppel has recently suggested a relationship between fossil dinosaurs and the American capitalist identity. The massive bones, unearthed by paleontologists on expeditions in the 1870s financed by major museums and industry tycoons, symbolized power and supremacy when the United States was becoming a major economic player on the world stage. Rieppel convincingly argues that these major fossil discoveries came to be associated with the extractive economy, environmental exploitation, and the idea that westward expansion would be met with rewards for scientists and capitalists alike. Furthermore, dinosaurs fit the narrative that Europeans had been wrong about the American continent’s degenerative qualities. Although naturalists discovered the first dinosaurs in England, the specimens found in America were larger, more abundant, and often in better states of preservation.¹⁹ Dinosaurs were, in many ways, the perfect find at the perfect time in America. But whereas a gigantic *Tyrannosaurus Rex* can stand in as a symbol for the nation’s economic superiority, what of trilobites? What did they mean for Americans?

Antebellum American sources reveal details of what this paper will refer to as a “culture of wonder” in the new republic. Understanding what that means requires recognizing that “wonder” is a word with multiple meanings and a long history. Lorraine Daston and Katharine

¹⁹ Lukas Rieppel, *Assembling the Dinosaur: Fossil Hunters, Tycoons, and the Making of a Spectacle* (Cambridge, Massachusetts: Harvard University Press, 2019), 6–7.

Park wrote about wonder extensively in their influential 1998 monograph *Wonders and the Order of Nature: 1150-1750*, and although the time period examined is different, much of what they described regarding the definition of wonder applies here as well. The word wonder was used regularly, they explain, to express a number of ideas. First, wonders were physical curiosities: they were rare objects that provoked surprise and “marked the outermost limits of the natural.”²⁰ Elite men often put these kinds of objects into curiosity cabinets, and those who were inclined to study them were able to learn about the natural world. Second, a wonder could be a remarkable marvel in some faraway location. This kind of wonder, which features prominently in travel narratives, can be an object, landscape, or experience. Third, wonder was an emotion. It was the actual “experience of the novel or unexpected, and ignorance of cause.”²¹ It is the wonder described by René Descartes as “a sudden surprise of the soul which makes it tend to consider attentively those objects which seem to it rare and extraordinary.”²² Some took this emotion to be an invitation to study, investigate, and understand. Others took it as an invitation to revere the divine, which is why another common use of the word was related to religious phenomena and the wonders of God’s creation. These wonders were meant to inspire spiritual awe. Beautiful landscapes, remarkable objects, and even man-made marvels all prompted this use of the word.

During the Enlightenment and through the eighteenth century, European elites began to turn away from wonder, particularly its associations with the supernatural. Many scoffed at old

²⁰ Lorraine Daston and Katharine Park, *Wonders and the Order of Nature 1150-1750* (New York: Zone Books, 1998), 13.

²¹ Daston and Park, 23.

²² René Descartes, *The Passions of the Soul*, trans. Stephen H. Voss, 1642nd ed. (Indianapolis: Hackett, 1989).

explanations for the wondrous as they “reabeled their unicorn horns as narwhal tusks.”²³ Daston and Park make much of this move toward the anti-marvelous, but they argue that the impetus was more theological than scientific. Naturalists and clergymen, perhaps unwittingly, worked together to ban wonders right alongside miracles and demons. Just as “demons . . . counterfeited God’s signs and wonders in order to misappropriate the wonder due to God,” some intellectuals worried that “too great an admiration for nature’s wonders would lead to the same idolatrous outcome.”²⁴ As the sources in this paper reveal, by the eighteenth century, these concerns still existed, but on the American continent, a new culture of wonder emerged in spite of them.

Trilobites, it turns out, are a convenient vehicle for exploring the many facets of the marvelous in America: they were an easily accessible but potent form of wonder. Primary sources reveal the extent to which Americans in the nineteenth century valued finding and speculating about unique objects, including fossils. On a deeper level, examining these sources allows for a better look at how Americans understood their relationship to the divine and to each other. “Wonder” is here examined as a trope that can help uncover larger trends in American culture, including the democratization of knowledge and rejection of expertise, the establishment of American identity and success, and an emerging American fascination with collecting. This uniquely American set of beliefs and values are evident when exploring them through the lens of invertebrate fossils, and the “culture of wonder” stitches them together.

There are three major trends to explore related to wonder and paleontology in early nineteenth-century America. First, small invertebrate fossils, collected by people of all social classes and written about extensively in newspapers, contributed to the *democratization of*

²³ Daston and Park, 331.

²⁴ Daston and Park, 361.

wonder by opening the door to the average person to participate in the knowledge-making process. By collecting and sharing invertebrate fossils, regular Americans could take part in the pursuit of knowledge about the earth, whether professionals invited them to or not.

Second, Trilobites also helped create an image of uniquely *American wonder* and establish the ancient history foundations of the country and relative superiority of American nature over that of Europe. One of the ways they did that was by uncovering the wonder inspired by their natural history, including trilobites. Many historians have noted that American nature helped make the case for American exceptionalism. While Europeans had cathedrals to highlight their relationship to God and the accomplishments of their societies, Americans did not. Instead, they had Niagara Falls. A later generation discovered the Grand Canyon and the wonders of Yellowstone and Yosemite. Commentators interested in establishing a national identity suspected that the New World's unexplored land could unlock some of the long-unanswered questions in natural history, including the age of the Earth and whether a creative intelligence designed it. Unearthing answers to these ancient questions in the American frontier would strengthen America's national legitimacy.

Finally, Americans developed a fascination with *collecting wonder*—in several New York cities along the Erie Canal and Cincinnati, anyone could crawl around looking for trilobites. The persistent—and the lucky—were able to walk away with treasures for their own collections. Those who could not find their own could still buy specimens from others or visit museums and cabinets to see these little wonders for themselves. Trilobites shed light on the history of collecting and popular participation in academic science. The collecting sciences have been largely ignored by historians, perhaps because of a prevailing notion that collecting is “mere fact gathering: a routine preliminary to the real scientific business of manipulating and

analysing facts and constructing theories.”²⁵ The popularization of science was also traditionally seen as a trickle-down effect of elites passing information to everyday people. This, at least, has changed significantly in the last thirty years of scholarship: most science historians now recognize the legitimacy of public knowledge and its influence upon elite scientific endeavors.²⁶ Still, the historiography of science popularization in America is rather more scant than British material on the same topic. Katherine Pandora has described this gulf, as well as the existing research, concluding that “the dynamics of scientific knowledge within the American vernacular remain underresearched and undertheorized.”²⁷ In the nineteenth century, trilobites prove to be a rich area for exploring the American side of science popularization.

Recently, Andrew Lewis and other historians such as Londa Schiebinger, Sarah Gronim, and Susan Scott Parrish, have shown how nonelites, including women and people of color, participated in knowledge-making practices in colonial America and the early republic.²⁸ This was in part because collecting specimens—as opposed to theorizing about them—was often seen by elites as a low-brow activity. By collecting small invertebrates like trilobites, brachiopods,

²⁵ Robert E. Kohler, “Finders, Keepers: Collecting Sciences and Collecting Practice,” *History of Science* 45, no. 4 (December 1, 2007): 428, <https://doi.org/10.1177/007327530704500403>.

²⁶ For the historiographical turning point, see Roger Cooter and Stephen Pumfrey, “Separate Spheres and Public Places: Reflections on the History of Science Popularization and Science in Popular Culture,” *History of Science* 32, no. 3 (September 1994): 237–67; Stephen Hilgartner, “The Dominant View of Popularization: Conceptual Problems, Political Uses,” *Social Studies of Science* 20 (1990): 519–39. For a modern historiographical analysis, see Andreas W. Daum, “Varieties of Popular Science and the Transformations of Public Knowledge: Some Historical Reflections,” *Isis* 100 (2009): 319–32.

²⁷ Katherine Pandora, “Popular Science in National and Transnational Perspective: Suggestions from the American Context,” *Isis* 100, no. 2 (2009): 347.

²⁸ Andrew J. Lewis, *A Democracy of Facts: Natural History in the Early Republic*, First edition, Early American Studies (Philadelphia: University of Pennsylvania Press, 2011); Londa L. Schiebinger, *Plants and Empire: Colonial Bioprospecting in the Atlantic World* (Cambridge, MA: Harvard University Press, 2009); Sara Stidstone Gronim, *Everyday Nature: Knowledge of the Natural World in Colonial New York* (New Brunswick, N.J.: Rutgers University Press, 2007); Susan Scott Parrish, *American Curiosity: Cultures of Natural History in the Colonial British Atlantic World* (Chapel Hill: The University of North Carolina Press, for the Omohundro Institute of Early American History and Culture, Williamsburg, Virginia, 2006).

and snails, regular people could develop their own humble collections of curiosities, claiming a bit of wonder for themselves. Importantly, they did not have to purchase anything, know the right people, or have any social capital whatsoever in order to obtain these wonders. They needed only to be in the right geographical area and in possession of a keen eye. This paper adds to this conversation about knowledge-making practices in early America: invertebrate fossils are a window into the broader culture. They allow historians to evaluate elite white men, women, children, slaves, and canal workers on the same playing field. These small creatures demonstrate that people of all walks of life were interested participants in scientific endeavors, not only to collect specimens but to speculate on their philosophical meaning.

Because the history of wonder is so closely related to cabinets of curiosity, this exploration of wonder will begin and end with a museum. These two museums—Charles Willson Peale’s Repository for Natural Curiosities and P.T. Barnum’s American Museum—represent the change in the culture of wonder from 1800 to 1850. Peale’s Repository represents the beginning of an emphasis on public education and mass accessibility of natural history, but its contents were still mediated by Peale. Knowledge was still something that needed to be passed to the people from an educated and well-meaning patron. Barnum, contrastingly, did not present himself as a mediator between his audience and the truth, preferring to allow the people to make up their own minds about the wonders he presented to them. The difference between these two men is indicative of not only changing tastes in entertainment, but also changing American values and attitudes about wonder over the first half of the nineteenth century.

Charles Willson Peale was already a well-respected Philadelphia painter in 1786, when he posted an announcement about his latest endeavor in the *Philadelphia Packet*. “Mr. Peale,” the notice read, “ever desirous to please and entertain the Public, will make part of his House a

Repository for Natural Curiosities—The Public he hopes will thereby be gratified in the sight of many of the Wonderful Works of Nature which are now closeted but seldom seen.” Making it clear that his personal focus was shifting, Peale’s announcement also noted that “all the portraits are now removed into the former Exhibition Room.”²⁹ The emphasis on the public was intentional. As part of a generation of newly-minted Americans that included Thomas Jefferson, Peale was a believer in the Revolution’s Enlightenment ideals. The virtue of the electorate in the new republic was of crucial importance, and Peale saw his museum as an opportunity to improve Pennsylvania’s citizens’ character and education. His business practices reflected these values: historians have noted that “unlike the state-run museums and collections in Europe, the specimens and artifacts were not hidden in drawers or storerooms, accessible only to the learned and privileged.” Peale even published guides to help visitors learn about his collection.³⁰

Over the next several years, in an attempt to draw more visitors and subscribers to his museum, Peale became more extensively and personally involved in procuring items to exhibit.³¹ Ever unsatisfied with the state of his museum and its utility to the public, Peale shared his vision for an expanded building in a letter to William Findley in 1800:

“Rooms that will hold of large & small quadrupeds rather more than 200, of Birds 2000; besides amphibious animals, Fishes, Insects, minerals, & other fossils – Shells & other marine productions – These if possible should be arranged in one suite, to shew a gradual link in the natural connecting chain. and the light ought [to] be from the north, as the best to preserve their colors, Rooms for Utensils, models, Arms & cloathing of Various Nations.”³²

²⁹ *Pennsylvania Packet*, July 18, 1786: 3.

³⁰ Sidney Hart and David C. Ward, “The Waning of an Enlightenment Ideal: Charles Willson Peale’s Philadelphia Museum, 1790-1820,” *Journal of the Early Republic* 8, no. 4 (n.d.): 396–97.

³¹ *Pennsylvania Packet*, July 9, 1790: 3.

³² Charles Wilson Peale to William Findley, February 18, 1800. Cited in Lillian B. Miller, ed., *The Selected Papers of Charles Willson Peale and His Family*, vol. 2 (New Haven: Yale University Press, 1988): 279.

Peale followed up on his ambitions for a grander museum collection. The following year, he organized a large scientific expedition to extract two nearly-complete mastodon skeletons in New York. The artwork he painted a few years later illustrates the scale of the work: a team of at least two dozen men are in a large pit, either digging in mud or attempting to remove water. One man near the center triumphantly holds up a large bone he has apparently just pulled from the depths of the watery quagmire. Peale directs the work as dozens of onlookers—including his family—watch the proceedings. Several children are among the assembled crowd, obviously excited by the exhumation of such a wonder as a giant skeleton. Peale and his entourage took the bones back to the museum and assembled them. Peale used models as replacements for the few absent bones and displayed signage that acknowledged which bones were real and which were reproductions.³³

Peale attempted to garner federal funding for his museum many times, often appealing in writing to his friend Thomas Jefferson, who usually wrote back with regrets that he could not offer much help. “No person on earth can entertain a higher idea than I do of the value of your collection . . . and I very much wish it could be made public property, but as to the question whether I think that the U.S. would encourage or provide for the establishment of your Museum here? I must not suffer my partiality to it to excite false expectations in you, which might eventually be disappointed.”³⁴ Peale’s discovery and exhumation of the mastodon in New York was of particular interest to Jefferson, who had a fondness for the creatures and thought they

³³ Hart and Ward, “The Waning of an Enlightenment Ideal: Charles Willson Peale’s Philadelphia Museum, 1790-1820,” 407.

³⁴ Thomas Jefferson to Charles Willson Peale, January 16, 1802 in Horace W. Sellers, ed., “Letters of Thomas Jefferson to Charles Willson Peale, 1796-1825,” *The Pennsylvania Magazine of History and Biography* 28 (1904): 136–54.

might still be alive in the inner part of the continent. Still, he could never secure the funding for Peale to turn his museum into a national educational institution.³⁵

Shortly after he reconstructed the mastodons, Peale traveled with one of them to England for exhibition where, historian Ralph O'Connor contends, its physical presence “helped to focus and define the distant past” for Londoners.³⁶ Mastodons may indeed have helped regular people imagine an ancient world. But these gigantic animals on display were still, in many ways, distant. They were skeletons, for one—an obvious giveaway of the long-dead. Too, one can assume that Peale did not allow people to touch his precious specimens, so they remained behind ropes and rules. Furthermore, it was far out of the average person’s reach to even dream of funding a paleontological excavation that could extract such a creature. It is easy to believe that mastodons may have provoked wonder and excitement in children and adults alike, but while they helped visualize the past, there was another fossil quietly bringing it home. It could be carried in a pocket, tucked inside a jewelry box, or folded inside a pair of stockings. It could be discovered by a child at play, a woman on a picnic, or an enslaved person working land alongside a creek. It looked familiar, like an insect—as one 1825 observer noted, it might put “the beholder in mind of the *Centipede*”—sometimes with visible eyes that stared back at the viewer, unlike an impersonal skeleton.³⁷ The humble trilobite may have been a simpler life form, but its qualities of mass-accessibility suited the mood of the nineteenth-century democratic spirit

³⁵ Hart and Ward, “The Waning of an Enlightenment Ideal: Charles Willson Peale’s Philadelphia Museum, 1790-1820,” 412.

³⁶ Ralph O'Connor, *The Earth on Show: Fossils and the Poetics of Popular Science, 1802-1856* (Chicago: The University of Chicago Press, 2007), 34.

³⁷ The centipede comparison comes from “Minutes of Conversations at Dr. Mitchell’s. Additional Trilobites of North America, with Their Localities: From Specimens in the Mitchillian Museum,” *The Minerva*, January 22, 1825, Newspapers.com.

embraced by many Americans. Put simply, it represented a reachable and democratic form of wonder.

CHAPTER 2

THE DEMOCRATIZATION OF WONDER

The history of a culture of wonder—in Europe, at least—is well-established. During the seventeenth century, it became fashionable for wealthy elites to establish cabinets of curiosity, or *Wunderkammern*, to display their personal collections of exotic specimens, natural marvels, and technological treasures.¹ Historians have long seen these “wonder rooms” as the forerunners to modern museums. Perhaps the most famous Renaissance cabinet, that of Danish collector Ole Worm, can be seen as a part of that transition. A posthumous book, *Museum Wormianum*, published in 1655, showcased the specimens inside Worm’s famous room. It includes illustrations of exotic species (including a live Greck Auk which Worm reportedly kept as a pet), but also of cultural artifacts, fossils, and more ordinary objects such as turtle shells, animal skulls, and plants.² Worm’s room illustrates how, as cabinets evolved into early museums, they took on a more educational quality. By the late eighteenth century, *wunderkammern* began to take a backseat to research repositories such as that of the Royal Society of London. Since the scientific community was dominated by aristocrats, however, these collections remained the province of the wealthy.

In the new world, elites continued to curate cabinets in locked university rooms—as well as for their own collections. New York Governor DeWitt Clinton made requests in several of his letters to David Thomas, a natural history expert in one of the Erie Canal construction crews, for this very purpose. “I will refund any expense that may occur,” he writes. “If you have any spare

¹ For more on this long history, see Daston and Park, *Wonders and the Order of Nature 1150-1750*.

² Ole Worm, *Museum Wormianum* (Leiden, Netherlands: Jean Elzevir, 1655), <https://digital.sciencehistory.org/works/rv042t91s>.

minerals for my cabinet, I will accept of them with thanks.” The specimens he desired were for the express purpose of impressing his European correspondents, indicating that a private collection of natural history specimens signified membership in a trans-Atlantic community of learned gentlemen scientists.³ Gifting specimens to an important cabinet could also serve as a way of gaining status. During his time completing his survey report for the state, geologist Amos Eaton collected countless specimens, including fossils. He and his patron, Stephen Van Rensselaer III, purposefully distributed these items to noteworthy cabinets and moneyed private collectors in Europe and the United States so as to gain maximum social capital from them.⁴ Clearly, the practice of collecting, purchasing, gifting, and displaying valuable specimens as a show of prestige was alive and well in early America.

Changes were brewing in the new nation, however—gradually throughout the nineteenth century, access to wonder became less restricted and even gained a more democratic element. In the United States, scientific leadership was more loosely defined than in, for instance, Great Britain, where the Royal Society of London had been an established authority for nearly two-hundred years. An 1842 Wisconsin newspaper article described this American democratic culture: “when a new and startling theory is brought up, [people] do not wait for the wise men and the doctors to analyze and investigate it, before they can venture an opinion on its merits or demerits; but they take up the subject at once for themselves’ they reason it over in their own mind, and discuss it among their neighbors.”⁵ Historian Andrew Lewis has provided a

³ DeWitt Clinton to David Thomas, “David Thomas Papers,” 1821, folder 3-4, box 1, New York State Library; quoted in David I. Spanagel, *Dewitt Clinton and Amos Eaton: Geology and Power in Early New York* (Baltimore: Johns Hopkins University Press, 2014), 93.

⁴ Ethel M. McCallister, “Amos Eaton, Scientist and Educator” (Ph.D. dissertation, University of Pennsylvania, 1941), 273.

⁵ Quoted in Donald Zochert, “Science and the Common Man in Ante-Bellum America,” *Isis* 65 (1974): 473.

fascinating illustration of this with his research on swallow submersion stories in the late eighteenth and early nineteenth centuries. During this time, a lively debate played out in newspapers and journals over the winter activities of swallows. Many Americans believed that, instead of migrating south, swallows burrowed themselves into the mud of lakes and ponds, hibernating for the winter. Newspapers published numerous apparently credible eyewitness testimonies to this yearly occurrence. Sometimes the wonderous stories were told firsthand, and sometimes they were related by a naturalist who had spoken to the observer and been convinced by the statement. The latter, which Lewis calls a conversion narrative, “reinforced the agenda of American natural history: theoretical expectations of American nature could not compete with the reality of lived experience.”⁶ The value of first-hand facts over the theories of experts continued to be a theme of American scientific discourse well into the nineteenth century.

The rise of trilobites in this culture of public scientific discourse and knowledge through most of the nineteenth century can be most easily traced through newspapers. Americans were avid newspaper-readers. Literacy rates among white adults in America was high compared to England, and “the extent of newspaper reading was often an occasion for surprised remarks by foreign visitors.”⁷ Newspapers were not simply the means by which average citizens heard the nation’s important news, however. There was a great deal of miscellany that made it into the columns, including scientific information. It was common practice for newspapers to reprint stories from other publications as filler material. A scientific discovery might be made in New

⁶ See Chapter 1 of Andrew J. Lewis, *A Democracy of Facts: Natural History in the Early Republic*, First edition, Early American Studies (Philadelphia: University of Pennsylvania Press, 2011). Quote is from page 29.

⁷ Pandora, “Popular Science in National and Transnational Perspective: Suggestions from the American Context,” 354.

York, and then citizens in Wisconsin could read about it in their local newspaper a few weeks or months later.⁸

Trilobites were clearly a part of this culture of widespread scientific literacy. In the 1830s and 1840s, it was not uncommon for them to be referenced in newspapers all over the country. In the first half of the 1830s, for example, several newspapers across the nation picked up a story about an alleged discovery of a living trilobite. Dr. James Eights, a naturalist from Albany, NY, claimed to have discovered the specimen on the shores of the South Shetland Islands. “It goes to establish a very important fact in Natural History, that the genus of Trilobites is yet existing contrary to all previous opinions,” one article proclaims.⁹ Another newspaper elaborated, “the eyes are exactly the same, being semilunar, placed on the summit of the head, and perfectly corresponding to the two eminences of the same form, at the same place as the trilobites.”¹⁰ Sometimes articles were simply educational in nature, giving brief versions of the earth’s history with a few details about the more interesting creatures, although these summaries could vary in their level of complexity. This 1841 article appealed to the common Vermont citizen with basic features of fossils they might find: “the eyes of the trilobite are so well preserved in rocks, as to show that they were composed of about 800 lenses, placed in the ends of tubes, arranged side by side. It was one of the first inhabitants of our globe, and is most common in graywack rocks.”¹¹ On the other hand, in 1832, a Nashville newspaper published excerpts from a rather complex

⁸ Zochert, “Science and the Common Man in Ante-Bellum America.”

⁹ *Lancaster Intelligencer and Journal*, August 9, 1833, Newspapers.com.

¹⁰ “Crustacea,” *New England Farmer*, November 25, 1835. The claim about the living “trilobites” was first reported in 1832, immediately before Jacob Green finished his monograph on trilobites. He took the claim seriously, reporting on page 92 that he had seen the specimens himself. The specimen was in fact an isopod. marinespecies.org/aphia.php?p=taxdetails&id=175147

¹¹ “Organic Remains,” *The Universalist Watchman*, November 27, 1841.

geological survey that, in part, used trilobites as index fossils to determine that the strata of Tennessee was not exactly the same as is found in England. Articles like these, and everything in between, helped contribute to an overall awareness of fossils, and helped make average Americans feel that they were educated enough to share their own observations and participate in the knowledge-making process themselves.

As Andrew Lewis has shown convincingly, even as state-supported scientific endeavors such as land surveys gained authority in the first half of the nineteenth century, regular Americans continued to practice their own form of natural history, the “democracy of facts” that he illustrated with the swallow submersion stories. Deviating from European tradition, early Americans of varied educational and social backgrounds collected data and shared it. These facts were then “pitted against one another in public forums such as newspapers and magazines” and democratically selected for acceptance as truth. Ostensibly, in this system the facts could speak for themselves without interference from philosophers, scientists, or theologians. Lewis does not address paleontological activities, but fossil collecting practices both confirm and add depth to his thesis. Americans valued trilobite and other fossil collecting activities particularly in the 1830s and 40s, in part because they were participating in the democratic natural history process that Lewis describes, and also because these treasures offered access to a culture of wonder that had previously belonged only to elites.

Americans already showed a distaste for expertise in the eighteenth century. One of Linnaeus’s students who came to America found that professional science was “looked upon as a mere trifle and the pastime of fools.”¹² Sara Gronim argues in her 2007 book *Everyday Nature: Knowledge of the Natural World in Colonial New York* that this lack of interest by everyday

¹² Gronim, *Everyday Nature*, 112–17.

colonial inhabitants in the practice of learned natural history did not mean that they were alienated from nature—on the contrary, it was “the fabric of their everyday lives”—but that they saw no reason for the natural world to be the territory of specialists.¹³ To them, it was obvious that knowledge of the natural world was gained through experience rather than books, which held only the theories and opinions of wealthy European men who did not work outside. Surveyors, midwives, and other specialists merely held knowledge that was “an accentuation of what everyone knew.” Americans were skeptical of science because it threatened a democratic worldview in which everyone, not just the elite, had access to knowledge.¹⁴

By the 1830s and 40s, many professional scientists and educated naturalists were attempting to establish their own authority, rather than appeal to the masses for their democratic participation. But other professionals embraced the culture, at least to a point. In 1832, Jacob Green published *A Monograph of the Trilobites of North America*, which did cement him as an authority on the topic of trilobites, but he openly invited the participation of others. Green went to great effort to borrow trilobite specimens from some of the top cabinets in the country and created molds from the originals. His book was then sold with casts of each species he described. As one article in a geology journal announced: “All the species will be illustrated, by exact models, in plaster of paris, instead of the usual drawings or representations on paper; so that every copy of the book will be accompanied by a set of the casts. Naturalists being thus furnished with *fac similies* of the objects described, will be enabled to correct, for themselves, any errors committed by the Author.”¹⁵ Although it is likely that working-class Americans would

¹³ Gronim, 3, 133.

¹⁴ Gronim, 199–200.

¹⁵ “Synopsis of the Triobites of North America,” *Monthly American Journal of Geology & Natural Science* 1 (June 1, 1832): 558.

have been unable to afford such a book, Green's invitation is still a remarkably open one. He actively encouraged other naturalists to participate, judge, and respond to his work, and supplying each purchaser with a full set of casts allowed more people to have complete specimen cabinets from which to learn.

The American tendency to value wider participation than was traditionally acceptable extended to theoretical discussions. New discoveries of wonders in geology and paleontology raised new questions, and many were not content to allow theologians and famous learned men to determine the answers. Consider the story related to Professor Amos Eaton by one of his geology students, D. C. Smith. Eaton encouraged his students to write to him about their travels around the country, telling him about the plants, animals, and places they visited. Smith's letter in the summer of 1835 told of an uncomfortable carriage ride in which an argument erupted between two men he dubbed "Geology" and "Anti-Geology." Their disagreement was a theological one—neither party was anti-religious, but they were discussing whether or not geology confirmed the Bible's account of Earth's past. The argument became so heated that it eventually turned violent when Anti-Geology "knock[ed] the little fellow down, and injured him severely."¹⁶ What surprised D. C. Smith most about this interaction was that even Anti-Geology knew plenty about current geological theories, not least James Hutton's theory of Plutonism, which supposed that igneous rocks like granite were formed from molten magma. Spanagel concludes from the story that it seems lay people "really did care about the answers to the questions geologists were asking."¹⁷ Historian Andrew Lewis points out that one of the

¹⁶ David Spanagel, *DeWitt Clinton and Amos Eaton: Geology and Power in Early New York* (Baltimore: Johns Hopkins University Press, 2014), 205.

¹⁷ Spanagel, 206. Emma Priesendorf, "Historiographical Essay: Field Science in America," *Unpublished*, 2019.

difference between genteel naturalists and the less-educated was that “ordinary Americans asked and answered why phenomena in nature occurred, oftentimes with theological reasoning, adding religious import to nature study and nationalist gloss.”¹⁸ They insisted upon participation not only in collecting facts, but interpreting them as well.

Debates like the one D. C. Smith recounted illustrate that, to some in the nineteenth century, geology had begun to seem like a true threat to religious faith. In a letter to a friend, the essayist John Ruskin lamented that discoveries in nature were destroying his faith, exclaiming in a now-famous passage, “if only the Geologists would let me alone, I could do very well, but those dreadful Hammers! I hear the clink of them at the end of every cadence of the Bible verses.”¹⁹ Many geologists and enthusiasts were set to defend their passion. In a travel pamphlet for Trenton Falls in New York, Rev. John Sherman anticipates the objections of potential visitors to the falls by calculating how long it would have taken for the chasm at Trenton Falls to form using an erosional rate of one inch per year. He concludes happily that the effect could have been produced in 6,000 years.²⁰ Adding insurance to his argument, he goes on to say that the biblical six days of creation were merely figurative anyway. “Let then geologists go on and dive deep into the bowels of our earth,” Sherman challenges, confident that they will only discover that “an irreligious geologist ‘is mad.’”²¹

¹⁸ Lewis, *A Democracy of Facts*, 2.

¹⁹ John Ruskin, *The Works of John Ruskin* (G. Allen, 1909), 115.

²⁰ Sherman is here joining a much larger debate of catastrophism versus uniformitarianism. For more on this discussion, see M. J. S. Rudwick, *The Meaning of Fossils: Episodes in the History of Paleontology*, 2d rev. ed., History of Science Library (Macdonald & Co.) (New York: Science History Publications, 1976).

²¹ John Sherman, *A Description of Trenton Falls, Oneida County, NY* (New York: Wm. H. Colyer, No. 5 Hague-Street, 1844), 13–14.

It was not only canyons and mountains that were a source of anxiety to Christian souls—fossils could be particularly troubling. Jacob Green addresses the widespread anxieties that trilobites—ancient ocean-dwelling animals that are found inland all over the world—appear to contradict the biblical creation story. They revealed the tension that could be created by the discovery of “wonders.” Green remarks: “Every one knows that the sceptical [sic] naturalist has drawn from these vestiges of organic life, an argument contradictory to the Mosaic account of the history of the world.”²² As with other wonders, trilobites could be a prompt for curious people to further investigate the history of the world, but they could also be a source of unease. Green goes on to reassure his readers by proposing a few theories to explain away any discrepancies. His concern here is as much protectionist impulse towards the science of geology as it an anxiety about the souls of Americans. He, like many others, believed geology to be the most *useful* branch of natural history, despite its reputation as being hostile to biblical truth.

American practitioners of natural history like Jacob Green inherited a tradition from England that placed biblical questions at or near the center of scientific discussions. The famed *Bridgewater Treatises on the Power, Wisdom and Goodness of God as Manifested in the Creation* were eight books written in Britain between 1833-1836, spanning a variety of scientific disciplines and enjoying widespread acclaim.²³ Each book used nature to illustrate the creative powers of God. One of these treatises was William Buckland’s *Geology and Mineralogy*. In it, Buckland wrote at length about what he believed were some of the earliest life forms in Earth’s history, the Silurian trilobites of the Dudley limestone beds in England. They have visibly

²² Jacob Green, *A Monograph of the Trilobites of North America* (Philadelphia: JBrano, 1832).

²³ Jonathan Topham, “Science and Popular Education in the 1830s: the Role of the ‘Bridgewater Treatises’” in *The British Journal for the History of Science* 25 (1992): 397.

complex “schizochroal” eyes—in other words, they have compound eyes, similar to modern bees and flies. These eyes, Buckland offered, were proof of divine design.²⁴ He held that the trilobite’s “nearly four hundred microscopic lenses” emerged far too early in Earth’s history to be explained by anything other than divine design. They were just too advanced—in archaeological terms, it would be like finding “a microscope, or telescope, in the hand of an Egyptian Mummy.”²⁵

Buckland’s *Bridgewater Treatise* was another defense of the field of geology, and it was also an argument for the existence of a god. This book was widely read in the United States, at precisely the time when American natural historians were working on cataloguing and describing the New York trilobites uncovered because of the Erie Canal project. One writer praised Buckland’s argument as a fortification of Christian doctrine from “the attacks of geologists.”²⁶ Over the next several decades, American authors followed in Buckland’s footsteps, using evidence from their own continent to support their conclusions about questions of divinity. Trilobite eyes were an ever-prominent example that continued to serve as a proof of design (and later, as both a confirmation *and* refutation of evolutionary theory). As one writer put it, trilobites could “increase our wonder and admiration at the goodness of Divine Providence.”²⁷

²⁴ The trilobite lineage goes back at least 91 million years earlier than Buckland’s Silurian specimens, which for modern readers, helps to explain the complexity of the Dudley trilobite eyes.

²⁵ William Buckland, *Geology and Mineralogy Considered with Reference to Natural Theology*, *Bridgewater Treatises on the Power, Wisdom, and Goodness of God, as Manifested in the Creation Treatise VI* (London: WPickering, 1836), 376.

²⁶ J. Horwitz, “A Vindication of the Cosmogony of Moses from the Attacks of Geologists,” *The Baltimore Literary and Religious Magazine (1835-1841)*; *Baltimore*, December 1839, 529.

²⁷ “The Pre-Adamite World, and Its Inhabitants.,” *The National Magazine; Devoted to Literature, Art, and Religion (1852-1858)*; *New York*, July 1856.

The impulse of some Americans to defend their faith against the encroachment of geological discoveries is part of the story of the democratization of knowledge and ideas about wonder in the early nineteenth century. The newspaper columns of the 1830s and 40s illustrate that even the Americans for whom it was too expensive or challenging to read Buckland had access to theories about trilobites and evolution. In the late nineteenth century, ordinary Americans participated at every step of the scientific process. Some collected their own specimens, some read challenging columns about the latest scientific theories in their local newspapers, and as we have already seen, some philosophized in their metaphorical armchairs about what it all meant. All the while, these Americans were building a nation, and trilobites had their place in the story of the construction of an American identity, too.

CHAPTER 3

THE WONDER OF AMERICA

In the early nineteenth century, it became a priority for Americans to begin fashioning a national identity—but this was no easy task. The early American republic contained within its borders diverse groups of people, many of them immigrants, with a multiplicity of religions and belief systems. In the beginning, their apparent disunity made it appear unlikely they would be able to win their war for independence, much less form a cohesive nation. This process of forging a new “American” identity has been one of the major themes explored in the historiography of the Revolution and early Republic since the 1960s.¹ Americans also struggled with a fear of inferiority when Europeans, most famously Georges Louis Leclerc and Comte de Buffon, wrote theories about the degeneracy of the continent. Thomas Jefferson’s *Notes on the State of Virginia* in 1781 responded to those notions and laid the foundations for establishing the relative superiority of nature in the U.S. compared to Europe. Some of the earliest American histories were written in the 1820s, as Americans began to rhetorize their national story, and certain traits were claimed as “American” qualities.

Considered the first American school of art, the Hudson River school created landscape images that highlighted ancient majesty. By emphasizing mountains and natural beauty the likes of which had not been seen in Europe, they addressed the inferiority complex that said America was the “new” world—immature, lacking history and cultural wonders. But as Americans expanded westward and encountered more of their country’s natural splendor, many realized

¹ Bernard Bailyn, *The Ideological Origins of the American Revolution* (Cambridge, Massachusetts: Harvard University Press, 1967). On the role of print culture in developing national identity, see Benedict R. O’G Anderson, *Imagined Communities: Reflections on the Origin and Spread of Nationalism* (London: Verso Editions/NLB, 1983).

“they could take pride in the sublimity, vastness, and beauty” the land possessed.² They were bolstered by the opinions of famous geologists: even Charles Lyell remarked that “we must turn to the *New World* if we wish to see in perfection the oldest monuments of the earth’s history.”³ The Hudson River school painters took a special interest in geology. Thomas Cole, the founder of the art movement, became quite educated in the science and even had a small collection of curiosities that included fossils, crystals, minerals, and archaeological artifacts.⁴ He took special care when sketching in the field to note particular geological details.⁵ In 1980, art historian Barbara Novak noted that their paintings showcased the visual reality that “with every geological discovery, America got older.”⁶ To be able to depict this fact through representing the geology of a valley or mountain range was of prime importance to these men.

As settlers pushed westward, it was in the government’s interest to make the case that it was the destiny of Euro-Americans to improve the virgin land and exploit its resources. As these early Americans explored and altered the landscape, they also occasionally uncovered abundant treasure troves: sometimes gold, sometimes coal, and sometimes fossils. News of these discoveries further confirmed popular views of American exceptionalism and that industriousness would be richly rewarded. One example of that American industriousness was the massive infrastructure project called the Erie Canal, and it was tied up with notions about the

² Rebecca Bedell, *The Anatomy of Nature: Geology and American Landscape Painting, 1825-1875* (Princeton, NJ: Princeton University Press, 2001), 6.

³ Quoted in Bedell, 6.

⁴ “Thomas Cole’s Rock Collection. Artifact, Undated. Thomas Cole National Historic Site, Catskill, NY,” Explore Thomas Cole, n.d., <http://www.explorethomascole.org/scrapbook/items/221>.

⁵ Bedell, *The Anatomy of Nature: Geology and American Landscape Painting, 1825-1875*, 19.

⁶ Barbara Novak, *Nature and Culture: American Landscape and Painting, 1825-1875* (New York: Oxford University Press, 1980), 58.

usefulness of scientific pursuits. In 1817, New York governor Dewitt Clinton broke ground on the 350-mile-long canal, which cost \$7 million and was finished in 1825.⁷ The Erie Canal cut through bedrock layers of mostly Silurian-age ocean deposits (over 400 million-year-old rocks), and those deposits contained what would become some of the most famous trilobite beds in the world. News of fossil discoveries spread quickly, leading in some cases to new capitalist endeavors.

In the case of Trenton Falls, New York, natural wonders inspired tourism. In the mid-nineteenth century, naturalists and vacationers flocked to Trenton Falls—just north of Utica, a town that grew up with the Erie Canal—to see the waterfalls, natural scenery, and abundant trilobites.⁸ After a day of hiking, tourists could retire to the Rural Retreat, a “house of refreshment” with a “well furnished bar” built by Rev. John Sherman.⁹ In 1844, Sherman published a report of the area that effectively functioned as a travel brochure. It is full of spiritually loaded descriptions reminiscent of a Hudson River School painting: Trenton Falls “stands without a rival competitor” as “a scene that no pen can describe . . . where every landscape painter always drops his pencil.”¹⁰ As for the fossils, Sherman names the trilobites as the most interesting of all. The specimens found there include an extraordinarily large species called *Isotelus gigas*, complete specimens of which had “been nowhere else obtained, either in

⁷ David Spanagel, *DeWitt Clinton and Amos Eaton: Geology and Power in Early New York*, vol. 102 (Baltimore, MD: Johns Hopkins University Press, 2015), <https://academic.oup.com/jah/article/102/1/246/686435>.

⁸ Hamilton Child, ed., *Gazetteer and Business Directory of Oneida County, NY for 1869* (Syracuse: Printed at the Journal Office, 23 & 24 E. Washington Street, 1869): 113; Jacob Green, *A Monograph of the Trilobites of North America: With Coloured Models of the Species*. (Philadelphia: JBrano, 1832): 13.

⁹ Sherman, *A Description of Trenton Falls, Oneida County, NY*, 9.

¹⁰ Sherman, 10.

Europe or America.”¹¹ Jacob Green mentions Trenton Falls in his 1832 *Monograph on the Trilobites of North America* as evidence that trilobites once “swarmed” certain places in America. “There are very few of the numerous visitors to that romantic cascade, whose curiosity is not awaked, by the multitude of these petrified beings, seemingly of another world, which are there entombed,” Green remarks. This wonder-infused language illustrates that trilobites were a major selling point for tourists.

The fossils and geological structures at Trenton Falls were so important to scientists that for some time, a portion of the Silurian was named the Trenton period. As geologist James Dana wrote in an 1863 textbook, “the Trenton period is remarkable for its extensive limestone formation.” Dana confirms that the period was named for the falls near Utica, and later notes an illustration of “one of the largest Trilobites of the Trenton rocks, the *Asaphus gigas*, — a species sometimes found a foot long.”¹² Importantly, the trilobites and other natural wonders at Trenton Falls were not merely for geologists to appreciate. Sherman clearly hoped regular middle-class Americans would continue to visit his development as thousands already had. He sought to convince them with promises that the falls were completely safe (only one drowning had occurred), there were no dangerous animals (although there was an occasional moose), and there was no chance of their religious convictions being shaken by exposure to geological formations and fossils (“I see nothing here incompatible with the Mosaic history,” the reverend proclaims).¹³ Trenton Falls, and other places like it, were the consequence of the economic development that accompanied the building of the Erie Canal.

¹¹ Sherman, 20.

¹² James Dwight Dana, *New Text-Book of Geology Designed for Schools and Academies*, Fourth (New York: Ivison, Blakeman, Taylor, & Co, 1883), 210–15.

¹³ Sherman, *A Description of Trenton Falls, Oneida County, NY*.

The excavation of the Erie Canal exposed miles of bedrock, greatly benefiting geologists in search of fossils and clear sections of stratigraphy to document. Through the daring undertaking of such an enormous civic project, New York geologists were scientifically and culturally rewarded with miles of bedrock exposures to study. This was important for several reasons. One is the obvious fact that the more bedrock is exposed, the more chances there are for finding specimens. Also, fresh roadcuts (and canal-cuts, as the case may be) provide the best opportunities for finding fossils, before weathering and vegetation have taken their toll on the exposures and the treasures they hold.

The bedrock layers made visible by the Erie Canal excavation were scientifically important, and they were important for the fame of the trilobite. They revealed a wealth of spectacular fossil finds, including many new species, and made travel easier for those who wished to visit natural spectacles and fossil hotspots such as Trenton Falls. During this time, New York geologists documented dozens of trilobites that were similar to, but not quite the same as, fossils of the same rock layer found in very different parts of the world. This fact inspired wonder in the minds of naturalists who could only imagine why this might be.¹⁴ In a show of patriotic fervor, Amos Eaton, founder of the Rensselaer School and one of the key geologists on the Erie Canal project, created an entirely new geological nomenclature system based upon the stratigraphy of New York. His “New York system” was well-received by other geologists, and his choice to come up with a localized naming system raised important questions about American contributions and value in the larger scientific community.¹⁵ Timothy Conrad, the first State Paleontologist for New York, documented and catalogued the countless specimens that he

¹⁴ Green, *A Monograph of the Trilobites of North America*, 12.

¹⁵ Spanagel, *DeWitt Clinton and Amos Eaton: Geology and Power in Early New York*, 142.

and his colleagues discovered during the State Geological Survey, including those of the Trenton limestone.¹⁶ It seems he was particularly fascinated with the exceptionally well-preserved trilobites, as he is generally credited as the author of an 1840 poem entitled “Ode to the Trilobite” which reads in part:

And since the trilobites have passed away
The continent has been formed, the mountains grown
In oceans’ deepened caves new beings play,
And Man now sits on Neptune’s ancient throne.
The race of Man shall perish, but the eyes
Of Trilobites eternal be in stone,
And seem to stare about with wild surprise
At changes greater than they yet have known.¹⁷

While geologists made scientific advances, at the same time politicians made use of the talents of newly-trained geological engineers to carry out planning and construction, making it a mutually beneficial arrangement between natural history and the capitalist government. In *The Artificial River*, Carol Sheriff emphasizes how geologists and engineers helped nineteenth-century Americans triumph over nature through the Erie Canal project. New Yorkers were eager to conquer nature, and they said so constantly. “Nature” in this context refers to the concept of “wilderness”: they wished to conquer the wild, frightening West. New Yorkers celebrated the completion of the Erie Canal in 1825 with the launching of a boat called “Noah’s Ark.” It moved from west to east, loaded with bounty from the interior of the country, including animals and even two Native American boys. Sheriff underscores that this represents “the subjugation of the wilderness, including the subduing of its human inhabitants.”¹⁸ She demonstrates how the

¹⁶ Timothy A. Conrad, *Report on the Paleontological Department of the Survey of New York*, New York Geological Survey Annual Report 2, 1838.

¹⁷ Wim Sissingh, *Poetic Eruptions of Earth Science: Images of Former Time and Life 1600-1900*, vol. 148, Utrecht Studies in Earth Sciences (Utrecht: UU Department of Earth Sciences, 2017).

¹⁸ Carol Sheriff, *The Artificial River: The Erie Canal and the Paradox of Progress, 1817-1862*, 1st ed (New York: Hill and Wang, 1996), 34.

practical applications of science tied directly to American westward expansion and manifest destiny. It was also a “tribute to republicanism,” she points out. The canal was seen as a singularly American accomplishment, one that could only have been achieved by enterprising and persevering Americans.¹⁹

The influence of the Erie Canal was not limited to New York. Its success also created opportunities for scientists and politicians in other parts of the United States. In the early 1820s, Pennsylvania lawyer Peter A. Browne began to crusade for a geological survey in his state, but it was not until the completion of the Erie Canal that the legislature began to see the practical applications of such an endeavor. Scientific arguments were not sufficient to begin the project, but the added economic incentive of potential iron, coal, and salt—which a House committee tellingly referred to as “hidden treasures”—ensured the formation of a five-year program and the hiring of a state geologist, Henry Darwin Rogers in 1836. That same year, the Virginia legislature appointed Rogers’ brother, William Barton Rogers, to do the same in their state, and over the next several years, the two brothers conducted their respective geological surveys. Both men saw ups and downs in the amount of political support they received, which corresponded closely to how focused they remained on the economic, not scientific, implications of the surveys. Henry in particular gained powerful enemies because of his occasional deviations from his patriotic (and capitalistic) duty, such as when he failed to locate new veins of iron and when he wrote of his skepticism of the long-term viability of coal-mining in Schuylkill County.²⁰ Nevertheless, that the two surveys happened at all is a testament to the triumph of the Erie Canal

¹⁹ Sheriff, 35. Priesendorf, “Historiographical Essay: Field Science in America.”

²⁰ Sean P. Adams, “Partners in Geology, Brothers in Frustration,” *Virginia Magazine of History and Biography* 106, no. 1 (1998): 5–35.

in showing politicians that geology was an economically useful pursuit. The Erie Canal's success, and the wonders that were made accessible by its construction, were a quintessentially American success that contributed to an American identity.

CHAPTER 4

COLLECTING WONDER

The opening of the Erie Canal and the new bedrock exposures it exposed uncorked the secret of the region's fossils. Tourists and naturalists flocked to Trenton Falls and other scenic areas, in part to collect their own fossils. Historians have noted that notable fossil localities are spread throughout the country, and when one is discovered, it can often cause a "gold rush" of sorts. Local, scientifically untrained people who know the lay of the land and are often the discoverers or the first on the scene have an advantage over professional paleontologists in these situations.¹ In the Trenton Falls area, locals took advantage of the opportunity by selling trilobites to visitors who did not have the time or the luck to get some themselves. The market was apparently so good that one man even took to producing and selling fakes.² One local family has a longer legacy than any other, however. The patriarch, Hiram Rust, was an amateur fossil collector who learned that he could do more with his trilobites than put them in a cabinet, eventually getting into the business of selling them. His son, William Palmer Rust, was known to have one of the best cabinets of trilobites in New York, and both were well-known by professionals and amateurs alike in the state. The younger Rust later took a young man named Charles Doolittle Walcott under his wing, and Walcott went on to become an American paleontology legend who famously discovered the Burgess Shale Lagerstätte.³ These two men excavated trilobites in the late 1800s from a layer of stratigraphy that geologists call the Rust formation of the Trenton group, and the quarry where they worked is called the Walcott-Rust

¹ Kohler, "Finders, Keepers," 445.

² "Trenton Falls Geology" (Informational trail sign, Trenton Falls Scenic Trail, Trenton, NY, n.d.).

³ Ellis Leon Yochelson, *Charles Doolittle Walcott, Paleontologist* (Kent, Ohio: Kent State University Press, 1998), 9–10.

quarry. Both men were uneducated, yet their proximity to world-class fossil localities made them respected experts.

The “gold rushes” to fossil localities are a reminder that fossils are a type of treasure. People collect them for all sorts of reasons. Some see it as recreational, simply a part of the experience of being outdoors and taking note of the natural world. For others, it is a scientific endeavor—collecting new specimens is a necessity to answering the questions that nature poses. Plenty of people have hunted fossils for materialistic reasons, selling them to tourists, museums, and other collectors. For many, it is simply the thrill of the chase, a “fever” of sorts stemming from the knowledge that at any moment, a great discovery of a prized specimen may be made.

America’s treasure-hunting inclinations have long been a part of the national identity, from the Yukon gold rush to the *Curse of Oak Island*. Lesser-known stories of treasure hunting abound, however. From 1780 to 1830, for instance, the northeastern part of the United States was a hotbed of treasure-seeking activity. People sought pirate’s treasure, sealed Spanish mines, and even ancient Native American riches. Their activities were steeped in supernatural tradition—the treasures were often said to be protected by spirits—and drew both scorn and interest from their friends and families. Contemporaries sometimes referred to the fascination as a “mania,” one that afflicted men and women of all ages. The Mormon leader Joseph Smith, Jr. was a famous participant in this treasure-seeking culture, becoming a “seer” as a teenager and later discovering his “Golden Bible” following guidance from dreams.⁴ Historian Alan Taylor, who has researched dozens of instances of treasure manias, has argued that these activities can reveal much about the worldviews of early rural Americans. Treasure, he says, was part of a “supernatural economy”

⁴ Alan Taylor, “The Early Republic’s Supernatural Economy: Treasure Seeking in the American Northeast, 1780-1830,” *American Quarterly* 38, no. 1 (1986): 8–10, <https://doi.org/10.2307/2712591>.

that appealed to the poor. In the new republic, the idea that hard work would mean financial success was accepted by rural Americans, but for many, it was untenable. Faced with difficult conditions, many felt that “recovering a treasure would redress the unjust variance between the seeker’s condition and his self-image.”⁵ Taylor writes that the culture of treasure-seeking eventually declined because of “accumulated disappointments.” (25) By the 1830s, while the urge to find treasure remained, the focus shifted westward, and treasures became more tangible: “western treasure tales deemphasized spiritual obstacles in favor of natural obstructions: landslides, erosion, and collapsed tunnels.”⁶ Those who could not go west may have turned their attention to the natural treasures in their own backyards.

In the northeastern part of the United States, many people learned that they could find fossils rather easily if they knew the right spots to look. The author of one fascinating article published in Bangor, Maine in 1846 expressed amusement at the names by which unschooled people often called natural history specimens. Corals might be referred to as a honeycomb or wasp nest, for instance, or an ammonite might be thought to be a coiled petrified snake. The author claims to have recently examined someone’s collection, “and I saw one object labelled ‘petrified intestines of a squirril,’” which was actually “nothing more than the shell *Serpula*.”⁷ That the owner of the specimen, almost certainly not a scientist, saw fit to label their personal collection of items is noteworthy, for it reveals a particular dedication and pride. Another common mistake the author complains about is this one:

⁵ Taylor, 21.

⁶ Taylor, 25–26.

⁷ J. G. M., “Wrong Names for Right Objects,” *Bangor Daily Whig and Courier*, January 13, 1846.

“In some sections of our country the people will show you not a few *petrified frogs*. Now look at the fossil and you will see that it consists of three lobes: that is, the back seems to be divided into three longitudinal sections, with shallow furrows (I am writing for the plain reader) running across. This is not observed in frogs. ‘Well it is not a frog, pray, sir, what is it’—‘Be patient, and I will tell you. It is a *trilobite*.’”⁸

It may seem strange to the modern reader that a trilobite could be mistaken for a frog, but it is in fact quite reasonable. In New York and Ohio, one exceptionally common genus has a striking resemblance to frogs, especially if seen from the front. “Mouth large, lunate, resembling that of a toad or frog,” was how Jacob Green described it.⁹ Green even named one of these species *Calymene rana* (now *Eldredgeops rana*), as *rana* is Latin for frog. Green did not mention whether he chose this name because he personally saw the trilobites as froglike or if it was a folk term. In either case, he gave the comparison legitimacy when he enshrined it in scientific nomenclature. The Bangor newspaper article writer was less generous, arguing that mistaken fossil identities “have been handed down from the olden time; but the day has come when they should be corrected and abandoned.”¹⁰ This statement makes it clear that there was—and had been for some time—a significant culture of amateur fossil collecting in the United States.

Collecting trilobites was an important part of local culture in some towns in the northeastern United States in travel narratives by British authors who visited America in the 1850s. William Ferguson, for instance, traveled across the United States by train and boat. His book *America by River and Rail*, published 1856, takes the reader through the northeast states

⁸ J. G. M.

⁹ Green, *A Monograph of the Trilobites of North America*, 41–42.

¹⁰ J. G. M., “Wrong Names for Right Objects.”

and even as far as Iowa. In every city he visited, Ferguson interacted with Americans and tried to participate in local life. His stop in Cincinnati was no different in this respect. When in Cincinnati, do as the Cincinnatians do: collect fossils. According to Ferguson, “Mr. Clark lent me a hammer, and armed himself with a strong Spanish dagger—a first-rate weapon for digging out fossils.”¹¹ Mr. Clark, an Ohio local, took Ferguson to a hilly area with some cliffs of exposed strata. Ferguson recalled, “We spent several hours among them very pleasantly, collecting fossils, notwithstanding that the intense glare of the hot sun on the light-coloured rocks was very painful.”¹² Ferguson’s adventure played out in the same city where a fictional little girl named Amy Strong would later collect *her* fossils. If children and tourists had access to these curiosities, surely many Americans benefited from this accessibility of wonder.

Fossil collecting was an undoubtedly popular activity for visitors to New York, as well. Joseph Gurney, a Quaker banker, told a similar story in a private travel letter to British novelist Amelia Opie, this time in 1841, from Utica, New York. He was collecting fossils in a place that was only popularized because of the Erie Canal. “The West Canada creek, a branch of the Mohawk river, here forms several distinct cascades (two of which are of considerable height) over dark limestone rocks,” he said. “These are composed of numerous thin and perfectly level strata, in which are found first-rate specimens of Trilobites, and other fossil remains of a world no longer known. Abundantly we were repaid for a ramble of two or three hours along the banks of this falling stream.”¹³ Note that, although neither of them were paleontologists, Gurney did

¹¹ William Ferguson, *America by River and Rail; or, Notes by the Way on the New World and Its People* (London: James Nisbet and Co, 1856), 297, <https://www.loc.gov/item/02002409/>.

¹² Ferguson, 297.

¹³ Joseph John Gurney and Amelia Opie, *A Journey in North America, Described in Familiar Letters to Amelia Opie* (Norwich: Printed for private circulation by Josiah Fletcher, 1841), 299–300.

not have to describe to Opie what a trilobite was. Perhaps stories of the Erie Canal and the fossils it uncovered were traveling the world in the decade previously.

As in many cases in the history of science, these sources surrounding trilobite collecting and other fossil collecting reveal the activities of, primarily, wealthy white men. Of course, it is a certainty that women, indigenous people, enslaved people, and poor people collected fossils as well. In fact, the distinctive features of the collecting sciences, including paleontology, mean that they tend to be more open to a wider array of social groups. As historians Robert Kohler and Henrika Kuklick have observed, socially speaking, “the field is a site conducive to innovation,” at least compared to laboratories.¹⁴ Invertebrate fossil collecting – along with birdwatching and plant collecting—was probably one of the few ways that underprivileged groups of people could participate in the scientific process.

There are hints that women, for instance, may have been actively involved in fossil collecting in the early nineteenth century. For one thing, there are known examples of women being intimately involved in other sciences. Jane Colden, born in 1724, was America’s first female botanist. Her father, Cadwallader Colden, trained her to understand plant anatomy. She described hundreds of plants in the vicinity of her home, corresponding with European experts and becoming a respected botanist. At least one of her Linnaean plant descriptions were published in a scientific journal.¹⁵ Through the nineteenth century, middle-class ladies enjoyed learning about science topics through journals, magazines, and even in-person lectures. The author of an 1847 article in *The Louisville Journal* praising a recent lecture on fossil plants by a Dr. Owen (probably David Dale Owen, later the State Geologist of Kentucky) took note of

¹⁴ Henrika Kuklick and Robert E. Kohler, “Introduction,” *Osiris* 11, no. 1 (January 1, 1996): 12, <https://doi.org/10.1086/368752>.

¹⁵ Gronim, *Everyday Nature*, 112–17.

women in attendance: “We feel glad to see the ladies taking an active interest in these geological lectures. Some of their sex have won high distinction in the science.”¹⁶ The article went on to praise Eliza Maria Gordon-Cumming, a Scottish paleontologist who was highly regarded by Louis Agassiz.

While many women undoubtedly had interest in paleontology, it is difficult to know for certain whether many women found time to venture outside and pursue their curiosity. But several of the aforementioned cultural references from the later nineteenth century featured women as collectors, such as the woman who scoffed at her new husband for confusing a trilobite with a graptolite and the little Cincinnati girl who hunted for trilobites with her friends. These may well be fictional examples, but it is possible there were real people who inspired the stories. They may be unknowable, however. Women in science have historically been rendered invisible, even when they were intimately involved. Historian of science Naomi Oreskes rejected earlier claims that women were invisible in science because our culture values objectivity, and women tend to be more “relational.” Instead, she argues that the quality more valued than objectivity is heroism, which tends to dismiss women’s work in the lab and the field as “routine.”¹⁷ In either case, the effect is the same: women may have been actively involved in paleontology, whether as professionals or amateurs, and their participation may have never been documented.

In addition to collecting their specimens, Americans commonly wished to know more about them, and they especially wanted to keep and display them. In nineteenth-century

¹⁶ “Dr. Owen’s Lecture on Tuesday Evening,” *The Louisville Journal*, January 14, 1847.

¹⁷ Naomi Oreskes, “Objectivity or Heroism? On the Invisibility of Women in Science,” *Osiris* 11 (January 1996): 87–113, <https://doi.org/10.1086/368756>.

America, naturalists placed newly-discovered trilobite species into cabinets both public and private. Jacob Green pointed out that “rare and unique specimens, particularly of fossil species, are often scattered through different cabinets.” When working on his trilobite monograph in the early 1830s, he visited at least 23 cabinets.¹⁸ Not all of the cabinets belonged to universities and museums. Evidence of curiosity cabinets belonging to people in the upper echelons of society is common. An auction advertisement from 1835 announces the auction of a “large cabinet, (5 feet by 4) containing 28 drawers” containing “a collection of upwards of 200 specimens,” including trilobites and a set of *Megalonyx* bones. The advertisement assures the savvy reader that all of the samples are “correctly labelled with the names and localities.”¹⁹ In 1842, when English geologist Charles Lyell visited New York City and gave several lectures, the owners of C. W. Peale’s Old Curiosity Shop hurried to capitalize on the influx of interest, taking out an ad in the *New-York Tribune*: “Those persons attending Prof. Lyell’s Lectures on Geology are respectfully informed that they can be supplied . . . with geological cabinets, containing from 25 specimens upwards, at the moderate price of 12 cents and upwards, in neat wooden boxes.”²⁰ This advertisement taps into the desire to possess a small bit of wonder, even for those who could not afford extravagant specimens and did not live in a place where they could easily collect items for themselves.

For some Americans, exposure to fossils and other curiosities came only through exhibitions and museums. An 1835 advertisement in the *Lancaster Intelligencer and Journal* sheds light on the popular exhibits of the era—and the perceived values of museum-goers.

¹⁸ Green, *A Monograph of the Trilobites of North America*, 25.

¹⁹ “Cabinet of Fossils, Minerals, &c.,” *The National Gazette*, June 4, 1835.

²⁰ *New-York Tribune*, April 8, 1842.

Landis's Museum claims to have a newly expanded selection of curiosities that will thrill its visitors. The main attraction was a "cosmorama," a type of attraction that was popular in the nineteenth century that allowed sightseers to view a location through panoramic perspective pictures, often as tall as the room itself. The landmarks featured in Landis's cosmorama were Niagara Falls, the city of Quebec, and the Doncaster Races in England. Of this group, Niagara Falls receives top billing as "the greatest natural curiosity in the world." Among the latest additions to the museum, the advertisement brags, are "40 different specimens of Trilobites" as well as "Indian curiosities." Interestingly, while the museum did feature exotic specimens, the only one mentioned in the clipping is an African ostrich. The writer seems most interested in promoting American wonders, be they waterfalls, trilobites, or Native American artifacts. Finally, to promote special pricing for children, the advertisement concludes that "it is desirable the youth should have an opportunity of improvement by reading the great Book of Nature."²¹ The proprietor of Landis's Museum clearly saw his establishment as a place of public education as well as national pride and wonder.

Perhaps no museum proprietor was more famous in this era than Phineas Taylor Barnum. His American Museum in New York City was the site of many natural history specimens, scientific exhibits, exotic live animals, and the first public aquarium in the United States. Barnum took the collections seriously, sometimes claiming that the objective of his famous hoaxes was to draw people in to view the legitimate museum displays.²² But he was much better known for his "humbugs." The first was Joice Heth, an elderly woman who Barnum hired for showcase in many northeastern American cities in 1835. He marketed her as a 161-year-old

²¹ "Landis's Museum," *Lancaster Intelligencer and Journal*, February 27, 1835, Newspapers.com.

²² A. H. Saxon, "P. T. Barnum and the American Museum," *Wilson Quarterly* 13, no. 4 (1989): 135.

former slave who had taken care of George Washington when he was an infant. Audience members were frequently allowed to inspect the woman closely. After Heth's death, an autopsy revealed the woman was less than eighty years old.²³ Several years later, another attraction, the "Feejee Mermaid," launched Barnum into celebrity. Barnum had a particular talent for hyping an attraction while at the same time sowing seeds of doubt in the audience's mind. According to one advertisement for the mermaid, "implicitly believed by many scientific persons, while it is pronounced by other scientific persons to be an *artificial* production . . . at all events whether this production is the work of *nature or art* it is decidedly the most stupendous curiosity. . . ." For Barnum, "seeing is definitely not believing."²⁴ He appealed directly to the individualistic Americans who distrusted the validity of expert opinion. The clever marketing made it irresistible for members of the public to view the attraction and decide for themselves whether it was a hoax or a true wonder. Barnum's museum became the cultural standard throughout course of his career. By the time the American Museum burned in 1868, other museums in the city followed its low-brow entertainment model of humbuggery.

Today, Barnum is mostly known as a trickster, whereas Charles Willson Peale has a more generous legacy as a public educator. Historian James Cook has pointed out, however, that the truth is not quite so straightforward. After all, Barnum purchased many of the items for the American Museum from the Peale family.²⁵ Furthermore, Peale was a showman in his own right. An 1822 self-portrait, *The Artist in His Museum*, illustrates the point. Peale stands with one arm lifting in welcome to the viewer while the other arm lifts a curtain to reveal the wonders of his

²³ James W. Cook, *The Arts of Deception: Playing with Fraud in the Age of Barnum* (Cambridge, Massachusetts: Harvard University Press, 2001), 4–10.

²⁴ Cook, 84-5.

²⁵ Cook, 75.

museum. Natural history specimens line the left wall, the mastodon is visible to the right, and many portraits hang high on the walls. On the floor in front of the artist are more bones and a turkey, perhaps ready for taxidermy. A few visitors are walking about, including a woman and a small child. Peale was in his eighties when he painted this work, so it is probably reasonable to see it as a statement of his most important values—it is how he wanted to be remembered. It clearly emphasizes education, but the showmanship is still undeniable.²⁶

The narrative that portrays Peale as a man of honor whose Enlightenment ideals inspired him to educate the public and Barnum as a huckster whose humbuggery degraded the nation is probably somewhat exaggerated, and in any case, it is not the most important distinction between them. Peale's principles about education and virtue were dependent upon elites serving as educators and mediators between the wonders of nature and the uneducated masses. Art historian Rebecca Bedell has pointed out that in *The Artist in His Museum*, it is Peale that controls the lifting of the curtain. It is he who possesses the paintbrush and palette, the taxidermy tools, and the shelves to organize his specimens. He portrays himself as a collector of nature whose responsibility it is to take the raw materials of nature and transform them, “through the application of his intellect, knowledge, and skill, into displays like those behind him that can reveal the underlying order and meanings of nature.”²⁷ P. T. Barnum, on the other hand, had a talent for tapping into the mass psychology of everyday Americans in the 1830s and 1840s. Barnum always presented his hoaxes, such as the Automaton Chess Player and the Feejee Mermaid, as decide-it-for-yourself attractions. He invited regular Americans—including the

²⁶ Charles Willson Peale, *The Artist in His Museum*, 1822, Oil on canvas, 1822, Pennsylvania Academy of Fine Arts, <https://www.pafa.org/museum/collection/item/artist-his-museum>.

²⁷ Bedell, *The Anatomy of Nature: Geology and American Landscape Painting, 1825-1875*, 11.

lower and middle classes—to examine the evidence he presented and evaluate whether they believed the natural or technological wonder was real. He was not the interpreter, and did not cater to elites, professors, and experts. He appealed instead directly to the American people to be their own interpreters of fact, and it fit with the democratic, egalitarian spirit of the time.²⁸

This larger movement of a democratic spirit is why trilobites and other invertebrate fossils show up again and again as representatives of wonder in early nineteenth century America. Trilobites demonstrate that the nature of wonder changed to reflect the evolving sensibilities of a nation. They allowed access to knowledge without gatekeepers at a time when many Americans had a distaste for authority and expertise. These small items were also demonstrative of a hidden ancient past for the relatively new country whose inhabitants were motivated to show Europeans that America was, in many ways, superior to the old world. Trilobites in New York became a testament to the triumph of American ingenuity in the Erie Canal project. People all over the United States took to collecting fossils as a hobby, creating their own curiosity cabinets and further claiming these objects as belonging to the people. The frequent mentions of trilobites in later nineteenth century literature are hardly surprising—Americans had established a culture of wonder from 1800-1850 that allowed trilobites to prosper in the American imagination.

²⁸ Neil Harris, *Humbug: The Art of P. T. Barnum* (Chicago: University of Chicago Press, 1973), 74–75.

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VITA

Emma Blankenship Priesendorf was born and raised in the Kansas City, Missouri area. She earned her Associate of Arts degree at Metropolitan Community College of Kansas City. While at MCC, she received an Outstanding Contribution to the College award for her work promoting social justice causes on campus. She was also the recipient of the Crystal M. Field Award for Student Writing, the Academic Achievement Award, and the MCC Board of Trustees Full Tuition Scholarship. She graduated with high honors in 2013.

Emma attended Rockhurst University from 2013 to 2015, where she earned a Bachelor of Arts in History, graduating *summa cum laude* in 2015. Her senior capstone project titled “Paracelsianism and the Theoretical Foundation for Chemical Medicine” was one of five papers nationwide chosen for publication in *History Matters: An Undergraduate Journal of Historical Research*. While at Rockhurst, Emma received the Hugh Owens Prize in History and the Senior Gold Medal, awarded to the highest-ranking senior in a graduating class.

After gaining valuable experience in the museum industry, Emma attended the University of Missouri-Kansas City from 2018 to 2021 to pursue a Master of Arts degree and further her interest in the history of science. While there, she served as the president of the History Graduate Student Association. She presented her research, "The Outlaw Antiquarian: Richard Verstegan's Transformation of the English Origin Story" at the Midwest Junto for the History of Science in 2019.

Currently, Emma is a community relations manager at Park University. She lives in Kansas City, Missouri.