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Lukas Rieppel, *Assembling the Dinosaur: Fossil Hunters, Tycoons, and the Making of a Spectacle*. Cambridge, MA: Harvard University Press, 2019. ISBN: 9780674737587.

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Introduction by Melanie A. Kiechle, Virginia Tech

I distinctly remember my childhood's dinosaur phase and have delighted to watch the children in my life experience the same wonder and enthusiasm about these prehistoric creatures. Thus, when **Lukas Rieppel's *Assembling the Dinosaur: Fossil Hunters, Tycoons, and the Making of a Spectacle*** hit book exhibits, I was eager to read this contribution to the history of the nineteenth-century United States, science, and capitalism. As has happened to many childhood enthusiasms, historical treatment both opened my eyes and dimmed the charm. Rieppel's exploration of how and why dinosaurs became spectacles illustrates the deep interconnections between violent extraction, performative philanthropy, patriarchal attitudes towards the working classes, and the museum halls where children and adults once (and still!) gazed in wonder at skeletal remains from "deep time." Anyone concerned about capitalism's contemporary effects on scientific research should read Rieppel's book and ponder how our society inherited this relationship.

Tim LeCain opens this roundtable with a thoughtful rumination on the lives and material remains of dinosaurs, noting that both should be topics for environmental historians. LeCain then digs into Rieppel's arguments about knowledge creation and asks excellent questions about the relationship between science and progress, including the possibility for science to support progressive policies.

Coming from the world of museums, **Reed Gochberg** situates the literal and cultural construction of dinosaurs in ongoing developments at the Smithsonian and similar institutions. Gochberg encourages readers to take up many of Rieppel's methodological strategies, considering both the material object as visitors now encounter it and the social and economic contexts within which that material object was collected and displayed.

Like Rieppel, **Alison Laurence** has dismayed audiences by explaining how a treasured dinosaur never existed as displayed; instead, these charismatic chimeras had been cobbled together from the bones of many. Laurence appreciates *Assembling the Dinosaur* as a critical history of dinosaur displays and how they were funded. Thinking about the material connections between the past and the present, Laurence ends with a difficult question—is it possible for modern institutions to break from patterns that are now deeply entrenched?

Elaine Ayers wonders the same thing, especially when she draws our attention to the less savory aspects of the individuals who people Rieppel's study. Reflecting on the eugenic, racist, and sexist allegiances of both the philanthropists who funded dinosaur exhibitions and the curators who accepted these funds, Ayers probes the optimism of contemporary movements and asks if it is even possible for these institutions to be meaningly reformed, decolonized, or celebrated by all.

These are weighty and important questions, to which Lukas Rieppel responds with great care and thought. Taking us back to this book's origins as a dissertation, Rieppel explains how both his questions and motivations changed through the research process. While it may seem obvious, the move from an initial curiosity about popular(izing) science to engaging with and fighting for indigenous stewardship is challenging—especially when scientists continue to celebrate their objectivity. Such work requires far more than these few pages can convey. Inspired by this exchange, may we all take up the necessary tasks.

Before turning to the first set of comments, I would like to pause here and thank all the roundtable participants for taking part. This is my final roundtable as an editor, and it has been a pleasure to work with so many brilliant and generous colleagues over the past seven years. Finally, I would like to remind readers that as an open-access forum, *H-Environment Roundtable Reviews* is available to scholars and non-scholars alike, around the world, free of charge. Please circulate.

Comments by Tim LeCain, Montana State University

Although it will probably be shelved among the history of science books, Lukas Rieppel's fascinating and deeply researched new look at the "assembly" of the modern dinosaur has a lot to interest environmental historians. Dinosaurs have not been with us for some 65 million years now, unless you're going to count birds as their contemporary ancestors (a topic Rieppel explores to good effect). That might strike even the most dedicated advocates of "deep environmental history" as a little *too* deep! Yet before they became treasured fossils and the objects of much breathless fascination and debate, dinosaurs were of course real animals who lived in complex ecological systems—standard topics of environmental historians. Surely we would not be so narrowly anthropocentric as to neglect these particular animals just because no humans (the claims of some imaginative creationists notwithstanding) happened to be around when they were alive? Rieppel clearly would not, and the result at times verges on being a sort of animal history of long-dead animals and hence an environmental history of long-passed environments.

Still, this is first and foremost a work in the history of science, and it not surprisingly reflects that fields long-standing emphasis on social and cultural constructivism. Rieppel spends much of his time on how Americans have understood dinosaurs in ways that reveal the interests and obsessions of the time. Precisely because so little remains of the dinosaurs with their fragmentary fossils, the cultural, economic, and political propensities of what he aptly calls the "Long Gilded Age" (roughly from the end of Reconstruction to World War I) rushed in to fill the gaps. "Dinosaurs tell us a great deal about ourselves," he writes, as those gaps "allowed people to project their fears and anxieties, as well as their hopes and fantasies, onto these alien creatures." (3)

Newly rich industrialists like J. P. Morgan and Andrew Carnegie often played a central role in the discovery and collection of dinosaur fossils and their subsequent interpretation and display in American museums, especially New York's American Museum of Natural History and Chicago's Field Museum. Here the story is more complicated than the oft-made observation that big corporations supported big dinosaurs in order to suggest that their dominance of the American economy was natural and inevitable. Rieppel's interpretation is more subtle and more interesting. He argues that the Morgans and Carnegies of the world used the dinosaurs to suggest a surprisingly progressive parallel between natural and human history. Industrialists supported the study and exhibition of dinosaur fossils and bones not to justify cut-throat "survival of the fittest" capitalism, but rather to support the progressive rationalization of the American economy in ways that would supposedly make it more efficient and benevolent. They argued that much as the harsh competitive world of the dinosaurs gave way to the more intelligent and cooperative era of mammals, so too would the previous American era of harsh competitive capitalism give way to the more intelligent and cooperative world of fully integrated corporate capitalism. In order to best emphasize this progressive narrative, the AMNH and other natural

history museums almost always displayed dinosaurs in the act of attacking prey and in ruthless life and death struggle, whereas "early mammals were exhibited as social and intelligent creatures who cooperated to further some common aim." In sum, "The progressivist claim that social cooperation inevitably replaced individual competition was made all the more credible by the exhibition of real fossil specimens." (174)

This insightful and novel interpretation is perhaps Rieppel's most central argument, and to the degree it deals with Euro-American ideas about nature and natural history, it intersects neatly with and adds nuance to an important strain of environmental history. Many environmental historians have pointed towards the often-regressive use of ideas of "nature" to justify inequities of race, gender, and even class. So what is striking here is that Rieppel shows us that new ideas about nature might also be put to work supporting more progressive policies.

Intriguingly, these early 20th century ideas seem to anticipate more contemporary scientific theories that emphasize group or herd cooperation rather than cut-throat individual competition. I wondered if there really was some scientifically grounded progress among these Gilded Age scientists and their supporters rather than just another case of social ideas shaping science? At times, Rieppel does suggest that there were genuine moments of scientific progress here that were not just constructs. This reflects Rieppel's innovative, albeit less well developed, attempt to treat the dinosaurs, or at least their material remains, as actors in and of themselves—an approach that resonates with recent neo-materialist theories that attempt to move beyond the anthropocentrism of the constructivist period. Rieppel hints at this more materialist framing right at the start: "The dinosaur is a chimera," he writes, yet it was chimera that emerged from both "biological evolution" and "human ingenuity." (1)

As the book makes clear, while the ancient dinosaurs are obviously no longer with us, their fossilized remains very much are. In this sense, dinosaur fossils are clearly a part of our contemporary environment and hence amenable to analysis through the methods of environmental historians. Indeed, Rieppel's novel approach suggests that we think of these fossils as somewhat akin to natural resources like coal, copper, and gold. I was especially fascinated by Rieppel's framing of the mad Gilded Age hunt for western dinosaur bones as a variation on the contemporaneous exploration for minerals in the American West. While the first dinosaur fossils to attract western scientific interest had been unearthed in England, in the second half of the 19th century the Utah, Montana, and other western states became the richest sources for these mysterious remains of the deep past. Many of the most famous dinosaurs both then and now were found in the West, including the Brontosaurus, Stegosaurus, and Allosaurus (an earlier and smaller Theropod that resembled the later T. Rex.) An American fossil hunter, Rieppel argues, were rather like "a mineral prospector who has just uncovered a promising vein of silver or a valuable seam of coal." (32) They were often a good deal less interested in the prestige of being associated with a scientific enterprise and a good deal more interested in the profits to be made. Likewise, bone hunters often called rich fossil areas "pay-dirt" or "treasure dirt." And

more than a few prospectors moved freely back and forth between searching for minerals and fossils.

In this bold equation of mineral mining and fossil mining, Rieppel's book engages with a topic that clearly fits under the environmental history rubric. Yet this equation also points towards a broader and more interesting idea of environmental history, one that encompasses the entire material environment and how it sparked both economic and cultural change. Just as the American exploitation of valuable mineral resources like gold, silver, and copper, fueled its *industrial* growth, Rieppel suggests that the discovery of these fossils also fueled its *scientific and cultural* growth, easing the nation down certain paths. In this sense, dinosaurs too were part of the Gilded Age extractive economy that built the United States into an economic superpower. The tremendous individual wealth generated by mineral extraction and industrialization in turn fueled the American assembly of its western dinosaurs, which in turn helped to justify big business, American exceptionalism, and the status of a nouveau riche industrialists as champions of science, civic uplift, and public service. In a way that less spectacular natural history artifacts could not, "Dinosaurs lent themselves to the building of spectacular displays that attracted throngs of visitors to the museum, which was crucial to cement the argument that industrial capitalism could produce genuine public goods in addition to profits." (9)

Indeed, I wondered if Rieppel might not have taken this parallel between mineral resources and dinosaur bones even deeper. Dinosaurs themselves are gone, but their fossils are part of our contemporary material environment, occupying a fascinating border land between geology and biology, the very distant past and the relatively recent present. Jurassic Park fantasies aside, I will never surprise a grazing *Brontosaurus* while hiking through Montana's badlands, but I might very well stumble across her material remains, as have generations of other humans before me.
These are, of course, the real bones of real animals, and in that sense the dinosaurs are quite literally still with us. Moreover, when trying to assemble these long dead creatures from only their bones, paleontologists relied heavily on living animals. The British sculptor Waterhouse Watkins, for example, modeled his dinosaurs for the celebrated Crystal Palace display in the mid-1850s on elephants and rhinos. To this day, reconstructing the dinosaur depends heavily on our understanding of the biology of contemporary animals and their evolution. The biology of the past may be gone, but the principles of evolutionary biology most certainly are not.

Regardless, Rieppel's take on assembling the dinosaurs offers a model for how historians might assemble a new way of understanding the past, one that recognizes the influence of both the cultural and the material, and perhaps most radically, suggests that these are inextricably connected. Thanks to Rieppel's trail blazing work in the history of science, perhaps a self-professed environmental history of the dinosaur will not be too far behind?

Comments by Reed Gochberg, Concord Museum

On June 8, 2019, the Smithsonian National Museum of Natural History unveiled a redesigned Hall of Fossils. The result of several years of research and planning, the new "Deep Time" exhibit features skeletons arranged in various dynamic poses, inviting visitors to imagine living creatures caring for their young, engaged in battle, and fighting for survival. These reimagined displays reflect recent developments in paleontology research over the last few decades—as well as the corporate sponsorship of David H. Koch, for whom the gallery is named. Within the Hall of Fossils, the intertwined relationships between science, capitalism, and spectacle are on full display.

Such close ties are hardly new to the contemporary science museum. Lukas Rieppel's *Assembling the Dinosaur: Fossil Hunters, Tycoons, and the Making of a Spectacle* (Harvard University Press, 2019) traces the interconnected histories of science and capitalism during the Gilded Age in the United States, revealing how the rise of corporations and the investments of Andrew Carnegie, J. P. Morgan, and others helped to fuel widespread interest in excavating extinct species and placing them on display in natural history museums. Dinosaurs had a distinctive appeal for corporate tycoons seeking to establish their own elite status through philanthropic ties to natural history museums. Yet assembling the dinosaur, as Rieppel effectively demonstrates, also involved the labor of numerous other individuals, including field collectors, dealers, museum curators, and artists. Their processes of excavation, collection, and reconstruction also coincided with the shifting status of natural history museums. Throughout this period, museums sought to balance between competing goals of spectacle and entertainment, increasing institutional bureaucracy, and efforts to articulate a scientific research mission. By examining this history, Rieppel provides a significant contribution to how we might continue to understand the relationships between material culture, the history of museums, and the role of capitalism in shaping the study and popularization of science.

Scholars have long understood dinosaurs as constructed images. Extinct and prehistoric, they require contemporary paleontologists to speculate about their features, movements, and habits. Visualizations of dinosaurs have shifted over time, from the imaginative drawings and three-dimensional models of nineteenth-century sculptors such as Benjamin Waterhouse Hawkins to more contemporary renderings of dinosaurs as the ancestors of birds. *Assembling the Dinosaur* pushes the idea of the dinosaur as a construction in new and important directions, however, through its focus on tracing the varied forms of labor, commodification, and consumerism that surrounded fossil skeletons during the Gilded Age. The excavation of dinosaur skeletons in the American West was closely tied to the mining industry and broader investments in resource extraction during the late nineteenth century. While fossils may not have been subject to the exact same systems of valuation as other geological resources, they were soon bound up in similar economies of trade, exchange, and circulation. Dealers based in Wyoming, Kansas, and other excavation sites soon began

corresponding with professors, curators, and collectors, consciously establishing relationships of mutual trust that would enable them to derive the most profit from their findings. For collectors such as Carnegie and Morgan, dinosaurs also represented an opportunity to accumulate symbolic capital. By purchasing specimens and offering philanthropic gifts to natural history museums, they hoped to proclaim their elevated social status and provide large-scale evidence of their commitment to civic engagement.

By examining how corporate capitalism informed and structured these practices, *Assembling the Dinosaur* provides a fascinating glimpse of the various figures who were involved in the process of bringing dinosaurs from field sites in the American West to the galleries of museums in New York, Pittsburgh, and beyond. Collectors and dealers such as Harlow Reed, Barnum Brown, and Charles Sternberg played a significant role in introducing fossil specimens to the institutions that would later house them. Unlike more informal networks that had often shaped the exchange of specimens among naturalists in previous eras, these were business relationships. Curators needed to be able to verify the authenticity of specimens in order to determine their value, and museums increasingly relied on corporate practices of vertical integration in order to manage an ever-growing bureaucracy of staff and establish systems of trust and accountability. In order to present their work as rigorous and authoritative, museum curators also sought to avoid any hint of inaccuracy in order to maintain a balance between research and entertainment. Even public exhibits, however, manifested the influence of corporate capitalism. Artists produced detailed renderings, illustrations, and dioramas that narrated a version of prehistory focused on competition, mirroring broader debates about how to apply Charles Darwin's theories to the marketplace. Within a few decades, novels and films such as *The Lost World* would follow suit, setting the tone for numerous adaptations that would continue throughout the twentieth century. By focusing on the influence of corporate capitalism on such transactional relationships and public representations, Rieppel highlights the new forms of value and systems of exchange that were assigned to the fossils on display.

These combined elements of corporate accountability and imaginative speculation also demonstrate the numerous contradictions that shaped broader cultural fascinations with dinosaurs during this period. Even the reconstructed dinosaur itself was a fabrication that combined science and artifice. As Rieppel notes, such "tensions—between illusion and reality, artifice and authenticity, science and spectacle—were particularly acute when it came to the exhibition of fossilized dinosaurs" (202). The development of natural history museums throughout the nineteenth century was marked by similar kinds of anxieties about the relationship between "serious" science and spectacle. The founders of the American Museum of Natural History in New York may have sought to distinguish their institution from the hoaxes and sensationalist exhibitions of P.T. Barnum's American Museum downtown, yet they often hoped to capitalize on similar elements of visual spectacle and entertainment in order to draw in audiences. Moreover, the speculation involved in reconstructing a dinosaur—identifying missing bones, filling in gaps with fabricated

replicas, conjecturing about habits—required curators to walk a fine line between imagination and empirical authority. In developing exhibits, museums aimed to present an authoritative account of the dinosaur that might distinguish their new approaches from the spectacular entertainments of previous eras.

Assembling the Dinosaur offers several major contributions to how we understand the material culture of natural history and the history of museums during the late nineteenth century. In particular, Rieppel offers a valuable method for exploring the social and economic contexts that surround the collection and display of museum specimens. This approach involves moving across geographical sites of labor and interpretation, tracing the figures who contribute to the process of excavating and exchanging objects, and documenting the numerous kinds of materials used to produce museum displays. While his stated focus is on the dinosaur, Rieppel's rich and extensive use of archival materials offers a potential model for how we might reconsider other kinds of museum specimens. The specimens stored in museum vaults each have their own unique collecting histories, suggesting numerous opportunities to reconsider the role of individual collectors, museum staff, and materials involved in their preservation, storage, and display. In this sense, Rieppel's approach opens up further possibilities for examining questions of authenticity and authority across various kinds of collections and archives.

Assembling the Dinosaur also offers several new ways of understanding the history and development of museums during the late nineteenth century. Rieppel's emphasis on the intertwined relationship between science and capitalism provides a valuable addition to broader discussions of the role of corporations and wealthy donors in establishing both science and art museums during the Gilded Age. Like the Rembrandt paintings and classical sculptures donated to major municipal art museums, dinosaurs functioned as a similar form of symbolic capital that enabled wealthy tycoons to establish their social and civic credibility. Yet Rieppel also demonstrates how the ties to corporations extended far deeper. In particular, his reading of museum account books reveals how the role of wealthy donors was not limited to the initial funding of museums or the growth of their collections. Instead, it impacted the very functioning of these institutions on a day-to-day level, including more bureaucracy, paperwork, and top-down management structures that were explicitly designed to be legible to trustees and donors. By focusing on these elements, Rieppel offers a more nuanced account of how capitalism was felt in the everyday practices and management of museums as institutions. Such issues of accountability remain especially relevant as museums face increased scrutiny about the backgrounds and commitments of their boards of trustees. As a result, Rieppel's work has the potential to inform larger discussions about the longer history of such practices and their effects in contemporary museums.

Similarly, Rieppel's discussion of the anxieties about authority and entertainment within the nineteenth-century natural history museum has broader implications for how we understand the history of scientific institutions, as well as more contemporary forms of science education and entertainment. Curators at the

American Museum of Natural History may have wished to signal a sharp turn from the spectacular exhibits of Barnum's Museum, but both the museum's visitors and its collections seem to have resisted such fixed categories. In many ways, this book highlights the constantly blurred lines between authority and spectacle in the development of museums, suggesting how this history resists clear periodization. As much as they may have sought to articulate a new seriousness of purpose or more clearly defined disciplinary specializations, the museums established during the Gilded Age were indebted to their predecessors. *Assembling the Dinosaur* highlights the numerous anxieties that accompanied this process, suggesting an ongoing negotiation between science and entertainment that perhaps remains unresolved. Additionally, by turning to novels and film in the later chapters, it also suggests how the rise of other forms of media (including television and digital media) have posed additional challenges. In this sense, it raises broader questions about whether the history of museums—and of scientific institutions more broadly—has always involved trying to define scientific expertise against some perceived threat of appearing too close to "mere" entertainment.

By providing a detailed and nuanced account of how dinosaur skeletons arrived in the galleries of many natural history museums, *Assembling the Dinosaur* not only allows us to think more deeply about the systems of labor, exchange, and value that surrounded these particular specimens, but to consider their implications for the development of natural history museums more broadly. In this way, it opens up fascinating questions and possibilities for further exploration that will continue to shape how we approach material culture and the role of museums in the history of science.

Comments by Alison Laurence, Stanford University

In *Assembling the Dinosaur: Fossil Hunters, Tycoons, and the Making of a Spectacle*, Lukas Rieppel argues, persuasively and accessibly, that vertebrate paleontology and industrial capitalism were entangled in a mutually beneficial relationship in the United States during the Long Gilded Age, or the period of heightening economic inequality that extends from the collapse of Reconstruction to the onset of the Great Depression. Industrialists like Andrew Carnegie provided museums with the money to fund expensive fossil hunting expeditions and labor-intensive fossil exhibitions. In turn, the museums' spectacular dinosaur displays allowed these tycoons, now rebranded as philanthropists, to claim social and cultural legitimacy while also defending inequitable economic conditions. Pointing to the fossil halls that thrilled the urban masses, these men could argue that the concentration of wealth in the pockets of a few was beneficial to the public good and, moreover, was a disparity necessary to the expensive endeavor of making cultural and scientific marvels available to the people. Dinosaurs thus functioned as cultural artifacts through which industrialists "naturalize[d] the evolution of American capitalism" (9). I wonder if Rieppel could take this claim even further. Beyond naturalizing the system, did dinosaurs help to fossilize it? That it, has the legitimacy conferred by paleontology and museum display not just acclimatized American capitalism but made it more enduring and difficult to replace?

Strategically, Rieppel uses the charismatic and capacious character of the dinosaur to communicate larger histories. Such an approach makes this text appropriate to assign on a wide range of syllabi. For instance, the chapter called "Tea with *Brontosaurus*," which examines high- and lowbrow dinosaur displays, would certainly be at home in a museum studies or history of science course. But it could also do important work in a class focused on the history of the Gilded Age and Progressive Era, or the history of New York City, or the history of popular culture. Similarly, "Andrew Carnegie's *Diplodocus*," which attends to the steel magnate's conspicuous donations of dinosaurs to museums across Europe and the Americas, would offer insights to students enrolled in courses on the U.S. in the world as well those digging into the history of business or the timely topic of social networks. I would be thrilled to see a chapter or two from *Assembling the Dinosaur* assigned in a Modern U.S. survey course, which I'm sure would come as a welcome surprise to undergraduates working their way through curricular requirements. Rieppel's text would offer these students a unique perspective on a key current of modern history—capitalism—and, at the same time, it would open their eyes to the possibilities of historical research.

Assembling the Dinosaur is a scholarly monograph that will attract audiences beyond the academy and so the remainder of my comments and questions will focus on three interrelated topics—chimeras, charisma, and (with apologies for abandoning the alliteration) museum pasts and futures—that have implications for this broader readership.

Rieppel begins his book with the claim that the dinosaur as we know it is a chimera, drawing on multiple definitions of that word (though not the one signifying the fire-breathing monster of Greek myth). He means that the objective of reconstructing an authentic, true-to-life dinosaur is illusory, for these creatures are impossible to observe in life, and that the dinosaurs displayed in museums are themselves chimerical, or composites of fossilized bone and plaster. It is rare to find a fully fossilized dinosaur in the field. Perhaps a scavenger dragged part of the animal away before it was covered over by sediment, or maybe the animal *was* preserved in its entirety but the elements eroded exposed areas before fossil hunters happened upon it. While museum field scientists were disappointed when their finds proved to be only fragmentary, their dismay was countered by the realization that the Rocky Mountain West was, essentially, filthy with fossils. The sheer volume of fossils unearthed allowed them to piece together bones that once belonged to different bodies. "Mounted dinosaurs," Rieppel explains, are "often cobbled together from fragmentary pieces belonging to separate specimens, many of which had been collected in different quarries… Sometimes, curators even combined fossils from individuals that did not belong to the same taxonomic group, effectively inventing a new kind of organism in the process" (206-7). The "Brontosaurus," which debuted at the American Museum of Natural History in 1905 and saw New York elites like the Morgans and the Roosevelts take tea in its shadow, is a famous example of just such a chimera (described by Rieppel on pp. 65-70).

Some years ago, at a meeting of the American Historical Association, I gave a talk that featured this "Brontosaurus" and called attention to the fact that its body was made up of different individual dinosaurs (including non-brontosaurs) as well as plaster parts. At the conclusion of the panel, a woman approached me to share, half in jest, that my talk had ruined her childhood memories of the big sauropod that resides on Central Park West. She was kidding, and yet she wasn't. The dinosaur was a charismatic, singular character from her past and this revelation forced her to question her faith in the institution that engaged in such seeming deceit. Of course this practice of crafting chimeras was not without its detractors. Some paleontologists objected in particular to the use of well-disguised plaster casts that suggested to museum visitors they were looking at a fully fossilized specimen (207). In general, though, museum administrators held that this practice was necessary to convey to the general public that fossil animals were once real creatures.

The complaint that the conference attendee shared with me is echoed by similar expressions of disappointment that I have heard while eavesdropping on school groups as they tour fossil halls. Invariably, a student will ask, "Is that a real dinosaur?" Docents might dance around the question or philosophize about fossils as transubstantiated specimens or admit that the creature before them is not entirely real. No answer satisfies everyone in the crowd. These charismatic creatures enchant audiences, but their chimerical nature threatens to undermine the authority of the museum that relies on them for attendance. Rieppel reveals that museums anticipated these kinds of reactions and were self-conscious of the fact that dinosaurs "posed substantial risk to… institutional credibility." Natural history museums

attempted to win visitors' trust and convince them to receive dinosaur displays "as fact rather than fiction," despite chimerical deceit, by designing "vivid exhibits that advertised their own authenticity" (182). This included calling attention to the material connection between the creature on display and the creature that lived tens of millions of years ago, an indexical relationship that contemporary commercial dinosaur displays could not claim.

Museums further persuaded visitors to trust in these reconstructions by complementing dynamically posed dinosaurs with other visual aids. Readers may already be familiar with Charles Knight's murals, which clothed the fossil animals in flesh and represented them in living (if hypothetical) color. Knight's paintings further gave visitors a sense of the lush environment these animals inhabited, far different from the now arid landscape where they were unearthed, which intimated environmental change over time.[1] Readers may be less familiar with the reflexive exhibition strategies that the museum deployed to show visitors the *process* by which these dinosaurs came to be in the museum. For example, hand-colored transparencies installed in the gallery windows offered visitors to the American Museum of Natural History's dinosaur hall a glimpse of fossil fieldwork. Produced from photographs taken by museum staff during their expeditions, these transparencies made visible some of the labor that went into these displays and further attested to the fact that these specimens were well and truly dug up out of the earth, and not just molded from plaster. Panel mounts performed a similar authenticating task in the fossil hall. Not unlike a bas relief in effect, panel mounts are plaster sheets into which fossils are embedded. These displays gave visitors the sense that they were looking at a dinosaur still entombed in its rocky matrix. Transparencies and panel mounts replicated the moment of discovery and helped visitors understand the relationship between field science and museum exhibits. Taken all together, Rieppel argues, these diverse modes of display created a "narrative account of their own production history" (215).

For reasons Rieppel makes clear, fossil halls tend to be more self-aware (and more self-conscious) than other natural history museum exhibit spaces. Institutional history is useful to fossil halls insofar as it legitimizes the chimerical creatures on display. Is there room there for Rieppel's critical history too? At present, calls to decolonize and diversify museum collections (and museum payrolls) are reaching a fever pitch. With respect to natural history museums, such demands focus most pointedly on anthropology departments, though paleontology is implicated in harmful colonial relations too (29). *Assembling the Dinosaur* demonstrates that dinosaur displays have long incorporated historical elements alongside natural historical specimens. Might this text then guide museums toward display practices

[1] Victoria Cain has traced how scientists, artists, and administrators at the American Museum of Natural History negotiated to produce scenes of the prehistoric past. See Victoria E. M. Cain, "'The Direct Medium of the Vision': Visual Education, Virtual Witnessing and the Prehistoric Past at the American Museum of Natural History, 1890-1923," *Journal of Visual Culture* 9, no. 3 (December 2010): 284–303; On the prehistoric climate of the U.S. West and how it was invoked to encourage settlement, see Daniel Zizzamia, "Restoring the Paleo-West: Fossils, Coal, and Climate in Late Nineteenth-Century America," *Environmental History* 24, no. 1 (January 2019): 130–56.

that critique institutional histories, acknowledge the relationship between paleontology and corporate capitalism, and work toward reparative relations? This is, I admit, a rosier vision of museums than exists in reality. Still, I am curious about the ways in which Rieppel hopes for his text to be taken up by audiences beyond the academy.

By happenstance (or perhaps by the work of a clever marketing team at Harvard University Press), *Assembling the Dinosaur* found a proving ground almost immediately. The very same month it was released—June 2019—the Smithsonian's National Museum of Natural History re-opened its fossil hall after a five-year renovation. What was once, many decades ago, known as the *Hall of Extinct Monsters* is now called *Deep Time*, a name that communicates curators' ambitions to show environmental change over time at a geological rather than a historical scale. The exhibition's longer title, *The David H. Koch Hall of Fossils – Deep Time*, added a timely exclamation mark to Rieppel's important argument. Like the museum's hall of human origins, *Deep Time* is named for now-deceased major donor David Koch of the Koch Industries conglomerate who, along with his brother Charles, poured millions into political *and* philanthropic causes. Koch money has also poured into think tanks and advocacy groups that resist environmental regulations and climate change mitigation plans that would threaten the profits of Koch Industries, which began as an oil business. Museum scientists have insisted that Koch's donation had no impact on the exhibit's narrative, still this affiliation pulled *Deep Time* into a broader conversation about cultural institutions and their ties to unsavory donors. Rieppel took advantage of the serendipitous timing to tell readers of *The Washington Post* how this was "an age-old strategy among wealthy elites, who have long used highly visible acts of conspicuous generosity to distract attention away from a more secretive, and questionable, political agenda."[2]

Commenters, as they are wont to do, expressed skepticism of his well-reasoned article and complained about *everybody making everything political these days…* If these irascible Internet users had bothered to read the article with care or page through *Assembling the Dinosaur*, they would recognize that the mutually beneficial relationship between paleontology and American industrial capitalism is deeply rooted. "Shouldn't our natural history museums refuse to take money derived from energy companies such as Koch Industries?" This is the question that ruffled the feathers of *The Washington Post* readership. To conclude, then I want to throw Rieppel's question back at him, with one revision. Not "should" they, but can they? Can natural history museums break the ties that bind them to concentrated wealth? I ask this not from an ethical perspective but from a historical angle, given what *Assembling the Dinosaur* has revealed to us. Is it possible to make such a breach or is the relationship established during the Long Gilded Age so entangled as to be set in stone?

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[2] Lukas Rieppel, "The Smithsonian's new dinosaur hall is a marvel. But its ties to David Koch are a problem," *Washington Post*, June 9, 2019; See also Danielle Knight, "How Wealthy Tycoons Helped Assemble Dinosaurs," *1A*, July 2, 2019.

Comments by Elaine Ayers, Gallatin School of Individualized Study

"The dinosaur is a chimera."[3] Thus begins Lukas Rieppel's radically new political and economic history of paleontology in the Gilded Age United States, focused more on how these amalgamations of fossilized bones, plaster casts, and metal wires were used and abused by, perhaps paradoxically, philanthropic white men rather than by the hypermasculine collectors working and fighting over bones in the field. For Rieppel, it's not just the dinosaur that is a chimera. Certainly, dinosaurs constructed and displayed at institutions like the American Museum of Natural History were manmade products of a lengthy, laborious process that included Indigenous collectors, working-class laborers, a rising class of paleontological experts, industrial systems like railroads and steel production and the men who profited from them, and, of course, the highly funded didactic and sensationalized displays that came to characterize natural history museums across the U.S. But in this adeptly argued and well researched book, spanning approximately fifty years and delving deep into the economic and political histories of Gilded Age America, Rieppel makes a case for the cobbled-together constructedness of scientific institutions and knowledge production in and out of the museum more broadly, exposing the labor behind productions of evolutionary deep time. This is, at its heart, a story about capitalism, and the main characters are the wealthy white men whose names (and dollars) still haunt our galleries: Morgan, Carnegie, Rockefeller, and, one might argue given the current moment, Sackler.

Amidst overlapping, braided arguments, one of Lukas's most compelling arguments is that industrialists consciously used the growing field of paleontology to legitimize and naturalize their own monopolistic, capitalist power. Sensationalized displays of brontosaurus and diplodocus in the halls of the early-twentieth century AMNH drew visitors in with their highly publicized and well-illustrated events, turning dinosaurs into spectacles for the men, women and children who patronized these institutions, but they also supported political arguments about progress, evolution, survival, and extinction. Rieppel complicates oversimplified historiographical claims of links between sauropod violence ("nature red in tooth and claw") and monopolistic capitalist competition, arguing, instead, that as obsolete "objects" of the past, dinosaurs spoke more towards progressive, top-down narratives of (very specific) humans who could "actively shap[e] the social, cultural, and material context in which they lived."[4] For paleontologists like Henry Fairfield Osborn (a staunch eugenicist) and their philanthropic patrons, exhibitions served as instruments of power, to use Tony Bennett's classic term, in staving off the degeneration of the upper classes while advising museum visitors in how to behave as productive American citizens.[5] While these didactic systems of "civilization" through display run rampant in the field of museum studies, Rieppel artfully weaves them and expands on them in histories of

[3] Lukas Rieppel, *Assembling the Dinosaur: Fossil Hunters, Tycoons, and the Making of a Spectacle* (Cambridge: Harvard University Press, 2019).
[4] Rieppel, *Assembling the Dinosaur,* 145.
[5] Tony Bennett, *The Birth of the Museum: History, Theory, Politics* (London: Routledge, 2013).

evolution, collecting, and knowledge formation more broadly. Successfully bridging fields, Rieppel makes it clear that science in inseparable from American philanthropy, labor, and purposeful advertising through cultures of display.

Rieppel's work can be easily taught across a wide variety of courses, from undergraduate courses in American history that focus on politics and economics to, in my case, graduate-level courses in museum studies. Approachable in its argument and subject matter (who can turn down a book on dinosaurs?), I have paired *Assembling the Dinosaur* with, maybe unexpectedly, readings on objectivity and authenticity in classes on the history and theory of museums. Read against object-centered studies of what it might mean for collections to claim some sense of "reality"—whether in the form of a chimeric dinosaur model cobbled together from genuine fossils and plaster casts or in remarkably realistic glass representations of botanical specimens, or mechanically reproduced photographs at the turn of the twentieth century, Rieppel reveals a subtler argument about truthfulness (or the lack thereof) exhibited in cultures of display. Claims towards "truth," he seems to say, functioned as political sleights of hand for men like J.P. Morgan and Andrew Carnegie. These Gilded Age Robber Barons, working hand-in-hand with paleontologists dependent on their support, twisted and carefully selected scientific facts and objects to their own benefit, increasing their ever-growing fortunes while funding paleontological collecting and, indeed, worthwhile education for scores of schoolchildren awed by fossil skeletons like the AMNH's now-infamous brontosaurus. The "trickle-down effect" is implicit here—education through entertainment, fueled by capitalist motivations, quite literally built the halls of our most prized institutions. The idea that the dinosaurs we engage with at natural history museums are, in fact, far from "real" is an exciting and compelling one—especially for students reading this work for the first time—and I would encourage Rieppel to comment on these questions of objectivity, authenticity, and capitalism beyond his historic, object-focused examples. Rieppel skirts the metaphor, but he suggests, at times, that the *real* chimera are not the dinosaurs but, rather, the scientific institutions that produced them.

Rieppel seems hesitant to make explicit the current stakes of his work. If capitalism (and, much more implicitly for him, racism and sexism) have formed the very foundations of museum culture within the United States, how—or *can*—these institutions ever be reformed? Whether museums can ever really be "decolonized," in any sense of the term, is a hotbed issue, especially in the immediate wake (or midst?) of nation-wide Black Lives Matter protests and a global pandemic that has disproportionately affected Black and Brown bodies, many of whom hold frontline positions at the very museum Rieppel studies. On this point, Rieppel remains circumspect. In understanding his work as a larger engagement with questions of objectivity and authenticity, at least within my own courses, I wonder how Rieppel might extend these questions to ongoing concerns about the philanthropic funding structures of current museums in the United States. Do ongoing claims towards "truthfulness" continue to distort museums' roles as sites of education and,

simultaneously, entertainment, while consolidating who *creates* these "truths" to wealthy, usually white, often male individuals?

Indeed, at times, I wonder whether Rieppel plays it too "safe" with his work—something that I hope, and expect, will change now that he has tenure, and something that is easily attributable to *Assembling the Dinosaur* being his first book. In recent workshops, Rieppel's writing has dealt more explicitly with Indigenous interactions with fossils, and I would push him to take what he has posed as a collaborative effort up wholeheartedly.[6] Rieppel has demonstrated a remarkable ability to craft nuanced, thoughtful, approachable political and economic arguments out of sources that many historians of science might relegate to cultural and material history, and the field of museum studies (with myself included) stands to learn from the weight of such scholarly moves. Indeed, Rieppel seems to delight in subverting readers' expectations through his careful argumentative structure. A gripping tale of sensationalized dinosaurs at the American Museum (including a tea party around the brontosaurus, recalling the highly publicized 1853 New Year's Eve dinner inside of the Crystal Palace's iguanodon, attended by scientific luminaries including Richard Owen and William Buckland) easily shifts into a story about Gilded Age capitalism.[7] Nineteenth-century plaster casts of prehistoric birds and "sea serpents" become material traces of authority and credibility in a time when collections expanded dramatically within the United States.[8]

As Rieppel himself has acknowledged, his discussions of gender, race, and sexuality are limited at best, and he seems hesitant to speak explicitly about the fact that most of the figures in his story are trapped within complicated and sometimes violent constructions of admittedly wide-ranging white masculinity in the late-nineteenth and early-twentieth centuries. His story takes place largely in the echoing halls of the museum rather than in the field, but it's difficult to ignore that part of the "spectacle" assigned to dinosaurs during this roughly fifty-year period catered towards ideals not just of industrial wealth but of swashbuckling collectors working in the "Wild West," appealing to the new publics that Rieppel describes so well. Rieppel re-centers the geographic history of paleontological knowledge production to, largely, New York City and other urban centers, and I appreciate his urge to present a *new* kind of main character: the Robber Baron considered with maintaining monopolistic industry as "an example of evolutionary progress," using their fossilized spoils as "a powerful tool

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[6] See, for instance, Lukas Rieppel, "Locating the Central Asiatic Expedition: Circulation and Accumulation in Early 20th Century Natural History," Collections and Collecting Working Group, Consortium for the History of Science, Technology & Medicine, 20 November 2020.

[7] James Secord, "Monsters at the Crystal Palace," in *Models: The Third Dimension of Science,* ed. Soraya de Chararevian and Nicholas Hopwood, eds. (Stanford: Stanford University Press, 2004), 138-169.

[8] Lukas Rieppel, "Plaster Cast Publishing in 19th Century Paleontology," *History of Science* 53.4 (2015): 456-91; ibid., "Albert Kock's Hydrarchos Craze: Credibility, Identity, and Authenticity in 19th Century Natural History," in Carin Berkowitz and Bernard Lightman, eds., *Science Museums in Transition: Cultures of Display in Nineteenth-Century Britain and America* (Pittsburgh: University of Pittsburgh Press, 2017), 139-61.

to help naturalize the evolution of American capitalism."[9] Nevertheless, as we well know, capitalism affected, and continues to affect, different bodies differently, and I wonder how the "strategic alliances" forged between industrialists and collectors might point towards uneasy negotiations of white masculinity during this very period.[10]

Beyond these minor quibbles—no book, of course, can do it all—Rieppel's ability to spin such compelling, field-crossing arguments out of seemingly specific subjects—precisely the quality that leads me to assign his work in classes semester after semester—gestures towards the potential strengths of future projects conducted in collaboration with Indigenous experts. By focusing on individual objects, institutions, and events, Rieppel is able to spin much larger stories, seemingly bigger than the sum of their parts, about intricate political and economic history that might, at least on the surface, appear impenetrable to cultural historians or museum studies specialists.

Rieppel makes a fascinating claim—that paleontology "laid bare the deep time horizons of modern capitalism," arguing that industrialist ideas of future-oriented "progress" were, in fact, dependent on historical excavations of the deep past.[11] Along this vein, I would encourage Rieppel to continue to mine museum archives for the uneven, branching traces of profound economic and political inequality that form their very foundations. In working towards better institutional futures as museum professionals, we need to confront the violent histories written into the very bones (or plaster casts) that draw in so many visitors; we need to confront, as Ho-Chunk museum historian Amy Lonetree writes, "the hard truths" of cultural colonialism within which we work.[12] In collaborating with Indigenous experts and by telling bigger stories, Rieppel's remarkable aptitude in forming strong, pointed, approachable arguments out of chimerical source material bodes well for future work both within and beyond the academy.

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[9] Rieppel, *Assembling the Dinosaur,* 9.
[10] Rieppel, *Assembling the Dinosaur,* 11.
[11] Rieppel, *Assembling the Dinosaur,* 12-13.
[12] Amy Lonetree, "Museums as Sites of Decolonization: Truth Telling in National and Tribal Museums," in *Contesting Knowledge: Museums and Indigenous Perspective,* ed. Susan Sleeper-Smith (Lincoln: University of Nebraska Press, 2009), 322-337.

Response by Lukas Rieppel, Brown University

It was a distinct pleasure to read the smart and generous reviews of my book by Elaine Ayers, Reed Gochberg, Alison Laurence, and Tim LeCain. Each of them caused me to see parts of my argument in a new light. And all of them offer critical reflections that point to fruitful new areas of exploration and interpretation.

With so many thoughtful interlocutors at the metaphorical roundtable, it is hard to know where to begin. But a good place to start is LeCain's observation that, "Just as the American exploitation of valuable mineral resources like gold, silver, and copper fueled its *industrial* growth, … the discovery of fossils fueled its *scientific and cultural* growth." This insight gets right to the heart of the matter: my book links the science of dinosaur paleontology and the institution of natural history museums to the political economy of extractive capitalism. Economic extraction not only provided the incentive for what historians often, and euphemistically, call "westward expansion." It also led directly to the excavation of countless vertebrate fossils, many of which were unearthed by mineral prospectors who sold their discoveries for a profit. Having been disinterred, the biggest and most spectacular dinosaurs were then shipped via the transcontinental railroad to newly established museums located in industrial centers such as Chicago, Pittsburgh, and New York. These museums, in turn, were financed by capitalists such as Andrew Carnegie, many of whom made their immense fortunes from mineral extraction. Because of their close association with the period's booming extractive economy, dinosaurs quickly emerged as a favored means for the self-presentation of wealthy elites. Gilded Age Robber Barons flaunted their conspicuous generosity by building museums that wowed a socially diverse audience with awe-inspiring exhibits showcasing these prehistoric monsters.

Like many of the reviews in this roundtable, Gochberg highlights the political stakes of this history, linking it to the recently opened "David H. Koch Hall of Fossils - Deep Time" at the Smithsonian Institution. Alison Laurence makes that connection as well, noting the irony that Koch not only paid for a museum exhibit about vertebrate paleontology, he also "poured millions" into "think tanks and advocacy groups that resist environmental regulations and climate change mitigations plans." Wealthy elites during the first Gilded Age acted similarly, using their philanthropic bequests to suggest that American capitalism could generate public goods in addition to private profits, thereby shoring up the social legitimacy of a political economy that aroused enormous controversy during a period of widespread labor unrest. Because they were so outlandish in appearance and prodigious in size, dinosaurs became an especially attractive target for philanthropic largesse. Wealthy industrialists recognized the value of these lumbering behemoths, which reliably drew working people into the museum's public galleries, where visitors encountered didactic exhibits about evolutionary advancement that taught moral lessons of right living and appropriate conduct. Attracting a socially diverse audience was essential for museums to succeed at their stated mission of educating and "uplifting" the laboring classes. Without exhibits that catered to popular tastes, these institutions would have

opened themselves to the charge of being no more than vanity projects that showcased the immense wealth of the period's social elite.

Because *Assembling the Dinosaur* is framed as a critique of elite cultural politics during America's first Gilded Age, Ayers is correct to point out that my book lavishes a great deal of attention on the lives of "wealthy white men whose names (and dollars) still haunt our galleries." When I began writing the dissertation that eventually became this book, I wanted to use dinosaurs as a case study in late 19th and early 20th century popular science. But the more I learned about the history of these extinct animals, the more I realized how much popular science was (and remains) tied up with class politics and social hierarchy. During the second half of the 19th century, natural history came to be seen as an especially pious and respectable leisure pursuit. The careful inspection of individual plants and animals, as well as the taxonomic comparisons required to organize a specimen collection, were widely believed to teach object lessons about God's rational plan for creation. Moreover, insofar as it cultivated the faculty of reason, the practice of natural history was also seen as an effective counterweight to the radical ideas sweeping through working class communities at the time. As an especially perceptive nineteenth century reader put it, the principle aim of popular science was "to stop our mouths with kangaroos."[13] But to understand the role played by popular science in the creation of an immensely unequal and deeply stratified society, it is not enough to investigate the exploitation of working people. The power of moneyed elites to shape institutions after their own image, and in their own interests, is equally important. In science as well as in capitalism, money is power! For that reason, my book investigates how privileged elites leveraged their social, political, and financial capital to shape popular perceptions of the deep past.

Assembling the Dinosaur argues that science played an important role in the performance of bourgeois social distinction, far more so than is often acknowledged. But that was not because Gilded Age scientists were easily corrupted or willing to say and do anything their wealthy benefactors desired. In fact, they did exactly the opposite, jealously guarding their institutional autonomy and insisting that philanthropic bequest had to be offered without any obvious strings attached. This helped to ensure that the mutually beneficial alliance between science and capitalism that emerged during America's first Gilded Age would be far more subtle, sophisticated, and insidious than a mere *quid quo pro*. In fact, it was precisely because museum curators staunchly upheld the fiction that science was not for sale that wealthy elites came to regard them as such a lucrative investment. In other words, because Gilded Age scientists were so anxious to showcase the "purity" of their motives and the "objectivity" of their knowledge, wealthy industrialists like Andrew Carnegie and investment bankers like J.P. Morgan found them to be an ideal means to display one's genuine altruism and civic engagement. The claim of science's objectivity and institutional autonomy also helped to ensure that didactic exhibits

[13] James Secord, *Victorian Sensation: The Extraordinary Publication, Reception, and Secret Authorship of Vestiges of the Natural History of Creation* (Chicago: University of Chicago Press, 2000), 48.

which used dinosaurs to help naturalize, and thus justify, the "evolutionary advancement" of American capitalism would be regarded authentic and trustworthy.

Of course, there was a dark side to the story as well. Ayers makes this point with particular clarity, insisting that "capitalism affected, and continues to affect, different bodies differently," prompting her to wonder "how the 'strategic alliances' forged between industrialists and collectors might point towards uneasy negotiations of white masculinity during this period." That's an incisive critique, and she is right to point out that much more remains to be written about the racial and gender politics of dinosaur paleontology. One important aspect of this topic concerns the gendered divisions of labor in natural history. As the historian Gail Bederman has shown, the North American West emerge as a privileged site for the performance of white masculinity in the nineteenth and early twentieth century.[14] Along with ranchers, big game hunters, and mineral prospectors, scientists played an important role in this process. The paleontologist Othniel Charles Marsh, for example, led several "expeditions" of Yale University undergraduates to collect fossils in the proverbial "Wild West" during the 1870s. Numerous photographs, newspaper articles, and scientific reports document scientists' collective ambition to assert masculine vigor, courage, and strength by taking part in ritualized buffalo hunts alongside of other stereotypical means to expose themselves to the rigors of outdoor life. But that does not mean women were entirely absent from the history of paleontology. Barnum Brown's first wife, Marion, for example, regularly accompanied her husband into the field, whereas his second wife, Lillian, even wrote a memoir about their adventures looking for dinosaurs in remote parts of the world.[15] Women did important work inside the museum as well, especially as illustrators and exhibit designers. Finally, female public-school teachers are another important but frequently overlooked part of the story. Teachers in New York were encouraged to attend evening lectures at the museum, where curators taught them how to communicate the moral and educational content of their exhibits to students. The widespread obsession with dinosaurs that emerged among children in the second half of the twentieth century thus cannot be understood without taking the gendered labor of teachers who exposed their students to the museum's imposing fossil displays into account.[16]

By way of conclusion, I'd like to embed the science of paleontology within the history of American imperialism and settler colonialism. As the historian Lawrence Bradley has shown, countless vertebrate fossils have been extracted from sovereign

[14] Gail Bederman, *Manliness and Civilization* (Chicago: University Of Chicago Press, 1995).
[15] Lilian Brown, *I Married a Dinosaur* (NY: Dodd, Mead & Co., 1950).
[16] While this history largely remains to be written, some tantalizing clues about its potential can be found in Victoria Cain's work on pedagogy at the museum. See, for example, Victoria E. M. Cain, "'The Direct Medium of the Vision': Visual Education, Virtual Witnessing and the Prehistoric Past at the American Museum of Natural History, 1890-1923," *Journal of Visual Culture* 9, no. 3 (December 1, 2010): 284–303; Victoria Cain, "'Attraction, Attention, and Desire': Consumer Culture as Pedagogical Paradigm in Museums in the United States, 1900-1930," *Paedagogica Historica* 48, no. 5 (2012): 745–69.

Indigenous lands.[17] This connects directly to an important point that LeCain makes in his review, which is that although (most) dinosaurs went extinct at the end of the Cretaceous period, "their fossils are part of our contemporary material environment, occupying a fascinating border land between geology and biology, the very distant past and the relatively recent present." Indeed, as imposing and often awe-inspiring features of North America's natural landscape, fossils admit a wide range of different meanings and interpretations. When Marsh visited the Red Cloud Agency during the autumn of 1874, for example, he learned that Oglala Lakota people have long taken a keen interest in the large vertebrate fossils that are so abundantly preserved in the White River Badlands. Although Red Cloud's warriors warned him to steer clear of their treaty lands, Marsh was so covetous of these fossils that he and his military escort entered the Badlands at night under the cover of darkness, eventually shipping several tons of petrified bones for study and display back to New Haven.

Further examples of American scientists dispossessing specimens for their so-called "permanent collections" are not hard to find in the archives. Nor are they confined to the United States. Only a few decades after Marsh stole fossils from Lakota treaty lands, China's recently consolidated Guomindang government accused the American Museum of Natural History of illegally exporting valuable fossils from the Gobi Desert. In response, the American Museum went on a publicity campaign to humiliate Chinese scientists before the international scientific community, claiming they sought to hamper scientific research by preventing the circulation of specimens. Because prehistoric fossils hailed from a time before human beings had even evolved, they argued, these specimens belonged equally to all mankind. In response, the Guomindang passed a new law through its legislative Yuan, which officially designated vertebrate fossils and similar objects of knowledge a form of state property.[18] While limits on tribal sovereignty have hampered similar developments in the United States, some Native nations have begun taking steps protect vertebrate fossils as part of their natural heritage. Perhaps most notable in this regard is the Standing Rock Sioux, whose tribal council passed a comprehensive Paleontology Resource Code in February of 2015.[19]

The expropriation of vertebrate fossils from recently conquered lands in North America calls to mind an important comment about the need to "decolonize and diversify museum collections" in Laurence's review. In a pointed question, she asks whether historical work such as mine could help "guide museums toward display practices that critique institutional histories" and "work toward reparative relations?" I have been asking myself the same question. To that end, I have spent the past several years visiting the Pine Ridge Indian Reservation and other Lakota treaty lands to develop collaborative relationships with Native people who are working to

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[17] Lawrence Bradley, *Dinosaurs and Indians: Paleontology Resource Dispossession from Sioux Lands* (Denver: Outskirts Press, 2014).
[18] Lukas Rieppel and Yu-chi Chang, "Locating the Central Asiatic Expedition," *Isis* 14, no. 4 (2023).
[19] Standing Rock Sioux Tribal Council, Resolution No. 053-15, Title XXXIII Paleontology Resource Code, Ordinance No. 312-07.

convince scientists of their role in the history of American imperialism and Indigenous dispossession. Besides incorporating more traditional knowledge about the deep past into their public exhibits and acknowledging their complicity in the violent history of settler colonialism, museums should foster a dialogue with tribal governments about the repatriation of natural history specimens. Insofar as these efforts are still hindered by the idea that prehistoric fossils are fundamentally different from human remains and archeological artifacts, historians may be able to help expose the self-serving rationale behind such artificial distinctions. Hopefully, this will help spur the creation of new tribal museums to receive repatriated specimens, hire Indigenous scientists and exhibit designers, and begin to imagine a radically different institutional vision of what a truly decolonial natural history museum could be.[20]

[20] Amy Lonetree, *Decolonizing Museums: Representing Native America in National and Tribal Museums* (Chapel Hill: University of North Carolina Press, 2012).

About the Contributors

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