INTRODUCTION

To the United States of America, to found at Washington, under the name of the Smithsonian Institution, an Establishment for the increase & diffusion of knowledge among men.
—James Smithson, Last Will and Testament, 23 October 1826

Cultures are continually co-produced in the interactions I call "friction": the awkward, unequal, unstable, and creative qualities of interconnection across difference.
—Anna Tsing, *Friction: An Ethnography of Global Connection,* 2005

I have touched at numerous points on the notion of discovering and reinforcing new complementarities—between fields of specialization, between internally generated projects and the needs and perceptions of the wider society, and between the increase and the diffusion of knowledge. . . . And it should be our goal to make the Smithsonian Institution a place where these activities not only coexist but work together to create a larger truth.
—Robert McCormick Adams, Eighth Secretary of the Smithsonian Institution, *Smithsonian Year,* 1985

This book is about the growing tension between research and outreach in the museum. This tension—and related debates about the balance between education and entertainment, science and spectacle, didactic and participatory learning, insularity and advocacy—has its roots in the earliest American museums. Today, it permeates all of our knowledge-driven institutions. As a cultural anthropologist, I explore this big problem through a small lens.

The Smithsonian's National Museum of Natural History (NMNH, figure 0.4), whose institutional mission is the "increase and diffusion of knowledge," embodies the tension between research and outreach.[1] It is a historically research-driven—but also the world's most visited—natural history museum. As the museum staff has become more interdisciplinary, the tension between the museum's research and outreach, or public engagement, functions manifests as a clash between curatorial and audience-focused expertise.

In exhibit projects, the tension plays out between curatorial staff—academic, research, or scientific staff charged with content—and exhibitions, public engagement, or educational staff—which I broadly group together

Figure 0.4. The Smithsonian's National Museum of Natural History, September 2012. Photo by the author.

as "audience advocates" charged with translating content for a broader public. I have heard Kirk Johnson, Sant Director of the NMNH, say many times that if you look at dinosaur halls at different museums across the country, you can see whether the curators or the exhibits staff has "won." At the American Museum of Natural History in New York, it was the curators. The hall is stark white and organized by phylogeny—or the evolutionary relationships of species—with simple, albeit long, text panels. At the Field Museum of Natural History in Chicago, Johnson will tell you, it was the "exhibits people." The hall is story driven and chronologically organized, full of big graphic prints, bold fonts, immersive and interactive spaces, and touchscreens. At the Denver Museum of Nature and Science, where Johnson had previously been vice president and chief curator, "we actually fought to a draw." That, he says, is the best outcome; a win on either side skews the final product too extremely in one direction or the other. This creative tension, when based on mutual respect, is often what makes good exhibitions.

Such exhibitions are the result of intense political work and compromise that the public never sees. When it is finished, every word, every image, and every object in an exhibition will have been battled over by a group of people visitors will never meet. Despite their desire to be more

transparent, most museums, which disseminate so much public knowledge, are close-doored about this process.

As a museum anthropologist, I employed the second of two facets of my field to study this problem; rather than studying human cultures through museum collections, I conducted a cultural study *of* a museum. I took the museum as my fieldsite, museum departments as cultural groups, and museum staff as research subjects, or what anthropologists call "informants."

I spent a year at the NMNH, where a small interdisciplinary team was planning the museum's largest-ever exhibition renovation. Called *Deep Time,* the project involved a number of interrelated aspects, including: a massive building renovation to update the 1910 wing and restore it to its Beaux-Arts aesthetic; a conservation project to dismantle, conserve, and remount the hall's fossils (many of which had been skewered with iron rods, as had been common practice in paleontology), and a complete exhibition redesign to reinterpret the collections according to current scientific knowledge of the history of Earth and in more engaging ways. The total space was thirty-one thousand square feet—including all of the halls stretching from the museum's rotunda to the west to the back of the building (what are numbered as halls 2–6, see figure 0.5).
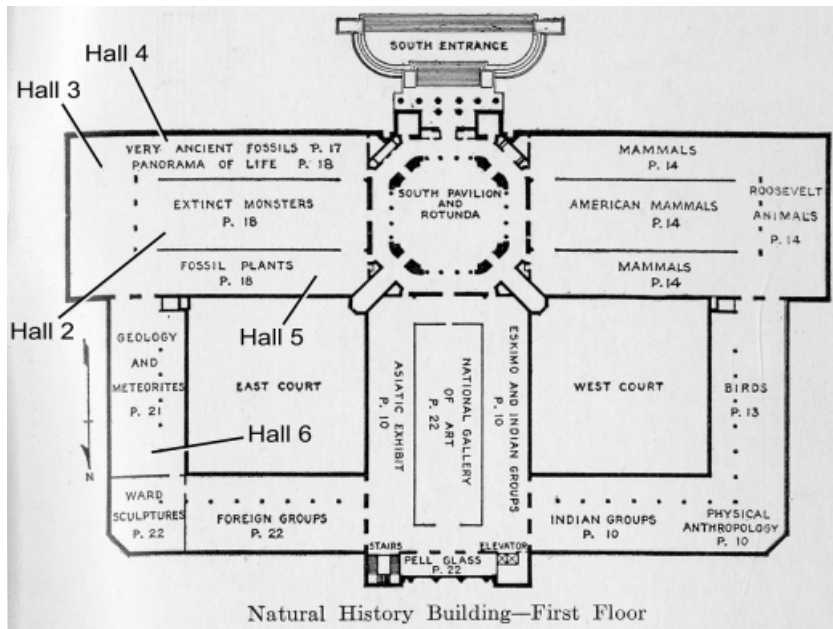

Figure 0.5. Map of the Natural History Building first floor, 1936, altered to show current numbering for halls 2–6. Smithsonian Institution Archives. Image # SIA2009-4096.

At the NMNH, exhibits are developed in successive phases (called 10%, 35%, 65%, and 95%, to be explained shortly). I observed only the conceptual and schematic phases of the exhibit-planning process (primarily the 10% phase), the first part of an ambitious seven-year project. Figure 0.6 gives you a sense of its scale.

Conducting Ethnography in the Museum

Especially in the sciences, museum exhibitions appear to present unbiased, objective facts about the world. This public perception is intensified at the Smithsonian, the "world's largest museum, education, and research complex" and one of the nation's most trusted institutions.[2] Yet the debates about what is presented in a finished exhibition are incredibly human. Like all scientific, and indeed all human, knowledge production, the process is political.

In the 1990s, scholars were writing about the "culture wars" in museums, as shows like the Glenbow Museum's *The Spirit Sings* and the Royal Ontario Museum's *Into the Heart of Africa* erupted in controversy, and a Smithsonian exhibition on the *Enola Gay* bomber was canceled.[3] Today, when facts themselves are under attack, there is even more pressure on the people who work in museums to present convincing evidence for the stories they tell. At the Smithsonian, the impacts of finished exhibitions are enormous. The NMNH attracts seven to eight million visitors each year,[4] and many exhibits remain installed for thirty years—that's up to 240 million people who might be impacted by the final product of an exhibition
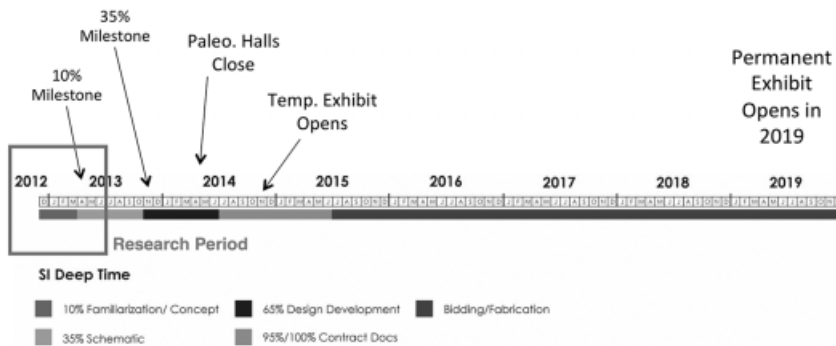

Figure 0.6. *Deep Time* exhibit timeline. Courtesy of the Office of Exhibits, National Museum of Natural History, Smithsonian Institution.

process. An exhibition about dinosaurs—every six-year-old's favorite subject in a natural history museum, or anywhere—involves added pressure and publicity.

Fossil mounts are a natural history museum's rock stars. The recent success of *Jurassic World* brought back to the fore the *Jurassic Park/Walking with Dinosaurs/Barney* craze of the 1990s. Shows like *Dinosaur Train* and the seemingly never-ending stream of IMAX films ensure that, as W. J. T. Mitchell wrote in 1998, "the world is overrun with dinosaurs—or rather, with dinosaur images." Imagery of these iconic creatures has "escaped from the laboratory and the museum, cropping up in shopping malls, theme parks, movies, novels, advertisements, sitcoms, cartoons and comic books, metaphors and everyday language."[5] For a museum, this pop-culture baggage actually makes their display more complicated. It's not enough that dinosaurs are big and cool. Museum staff want to know how to mobilize them to inspire an interest in more complicated topics, like evolution or climate change. This is a conundrum that plagued the exhibit team I observed. From my first entrée into the exhibit process, it was clear that *Deep Time* aimed to both harness this popular energy and combat diluted renderings of past worlds, focusing on an ecosystem- and climate-driven perspective. As the *Deep Time* project proposal read,

> We live at a unique moment in Earth's 4.6-billion-year history: the point at which a single species, *Homo sapiens,* has the awareness and capacity to change the life support systems of the entire planet. Today, we are altering the composition and temperature of the atmosphere, the chemistry of the ocean, the distribution of ice, land and water, and the diversity of life. Geology shows that Earth is resilient, but humans have set in motion forces that are inducing a global climate that has not existed for millions of years . . .[6]

The tension between research and outreach, increase and diffusion, was therefore inherent in the very topic of the exhibit.

I began this project to ask how changing institutional cultures impacted the public communication of science. I wanted to do an ethnographic study—or a firsthand, embedded, and detailed observational study—of a big, bureaucratic museum. Although this might sound odd coming from an anthropologist, in fact anthropologists have been studying Western cultures and bureaucracies for some time now.[7] More than fifty years ago, anthropologist Laura Nader called for anthropologists to "study up"—to study our own societies and not just "primitive" ones.[8] Then as now, doing ethnography at home is one way anthropologists can act as citizen scholars who make a difference in public life.[9] There exist good institutional eth-

nographies of other sites, including a few heritage sites and theme parks, but there are very few ethnographies conducted in museums.[10] As anthropologists Richard Handler and Eric Gable asserted, "most research on museums has proceeded by ignoring much of what goes on in them."[11]

This is in part because it is difficult to get the kind of access to a museum needed to do truly embedded ethnography using participant observation—observation done by participating rather than being a "fly on the wall."[12] It's a method we sometimes jokingly call "deep hanging out," and it means becoming part of the cultural group you study and understanding their point of view.

This book therefore builds on *New History in an Old Museum,* which traces the production and consumption of messages at a historical tourist site.[13] However, during the research for that book, as in communication scholar Susan Davis's work on Sea World,[14] the researchers were never fully embedded in the institution's internal culture.

This book builds more closely on two important previous studies, both of which traced the production of exhibits. The first is Sharon Macdonald's foundational museum ethnography, *Behind the Scenes at the Science Museum,* which took an exhibition on food at London's Science Museum in the late 1980s as its subject.[15] This study picks up where Macdonald left off, by tracking many of the shifts that have taken place since the 1980s. The second is Jennifer Shannon's ethnographic study at the National Museum of the American Indian, which, like this book, takes an ethnographic lens to collaboration in a bureaucratic exhibit process.[16] However, where Shannon made institutional collaboration with outside Native communities her subject, I look at the internal collaborative processes at a museum while also providing an anthropological approach to the study of science exhibitions.

I also wanted to speak to wider trends across the museum field; to find out how many of the sweeping scholarly claims about changes in museums proved true "on the ground."[17] As institutions with origins in the nineteenth century, national museums in particular have struggled with their identity in the mid- to late twentieth century. It is no longer enough to be a place that collects and catalogues the world. The last thirty years have produced a wide-ranging literature about the drastic changes undergone by museums—most notably a shift in focus toward increasing public access amid new economic constraints. There appear to be two camps this work falls into: one aspirational, one apprehensive.

On the one hand, the literature suggests that museums are democratizing, that is, increasing access to the public, encouraging collaboration, and using digital technologies that expand their public potential. Museums

have embraced their educational role.[18] Since the 1980s, museum scholars have questioned the all-knowing tone of museum curators and their exhibit interpretation.[19] Across the museum field, it is now accepted that learning is constructivist, or shaped by visitors' personal experiences and interests.[20] In the growing field of museum education, research in informal learning and psychology has shown the centrality of visitors' contexts, emotions, and motivations in forming new understandings.[21] Knowledge-building is a co-constructed, discovery-based process that can happen only if museums think holistically about the environments and experiences they generate, which has in turn led to new innovations in educational approaches.[22]

Most recently, museum director Nina Simon's idea that museums should be, at their core, participatory, community-driven spaces has taken the museum world by storm.[23] In anthropology, museums are working to "decolonize," that is, to promote new ethical paradigms, collaborate with originating communities, and embrace Indigenous models of knowledge.[24]

Such developments have fostered new attitudes toward the communication not only of science but of all subjects.[25] These shifts are reflected in emerging forms of museum expertise, evidenced by growing programs in specialties such as museum communication, exhibition planning and design, museum management, museum education, audience research, and exhibit writing.[26]

On the other hand, museums have been criticized for their move to corporate sponsorship, "Disneyfication," and resorting to "blockbuster exhibitions" or expensive rebranding schemes.[27] As museum administrators face severe funding cuts, their financial self-sufficiency often dictates drastic compromises: pressure to "edutain," adopt corporate institutional models, or solicit private funding.[28] Much of this literature posits the notion that, as elsewhere in capitalist society, market logic has infiltrated institutions and spaces where it does not belong.[29]

Anthropologist Brian Noble's recent *Articulating Dinosaurs* has investigated the ways this "specimen-spectacle tension" played out at the Royal Ontario Museum's Maiasaur Project in the late 1990s, and the ways that increasing pressure to edutain "mutated" curator's goals for the exhibition.[30] That study is more so an anthropology of dinosaurs and their social and cultural history—focusing on the cultural imagination of *Tyrannosaurus rex*, "King of the Tyrant Saurians," at the beginning of the twentieth century, and the "Good Mother Lizard," *Maiasaura peeblesorum* at its end.[31] Whereas Noble conducted "retrospective" interviews with staff and visitors during the run of an exhibition,[32] the research in this book was conducted while embedded with a team at a project's start. Noble also follows the trajectory of two curators and the specimens they stewarded

through exhibitions at two different historical eras. As he recognizes, the second exhibit was much more team driven, "itself telling of the shift in museum milieus from a top-down, expert-privileging modality in the early twentieth century to a more democratically configured, if market-interested, modality in the late twentieth century."[33] This book takes that shift, more than dinosaurs or their representation, as its subject.

Likewise facing such trends in their recent *Life on Display,* historians Karen Rader and Victoria Cain analyze dioramas and other natural-life displays in the twentieth century alongside the wider museum shift toward public education and outreach.[34] This book differs in two ways. First, by taking a case-study approach, I provide detailed insights into many of the tensions that Rader and Cain identify. Second, I address the science- and research-driven side of the museum and its intersections with outreach.

This book thus focuses on a large-scale museum in which I witnessed how the grounded reality of institutional life corresponded with the theorization of wider change. Following historian of science Thomas Kuhn's canonical work on scientific revolutions, I could see whether some major shift or transformation in paradigm had occurred.[35] I therefore chose an ethnohistorical approach—that is, drawing on archival and oral history as well as current observation and sources—to understand whether some major sea change had indeed occurred in museums in the last thirty years and, if so, when it had taken place. An exhibition featuring dinosaurs—as one curator called them, "a gateway drug to science"—was a perfect case.

In the present age of "alternative facts," this book attempts to say something bigger about all knowledge production. This is one small contribution to a larger movement to understand the anthropology of knowledge—to reveal the social process of generating, debating, and circulating ideas.[36]

The Research Origins and Methods

In the spring of 2011, one of the many emails I sent to institutions across the United States and Canada elicited a series of positive responses. Elizabeth Duggal, then Associate Director for Public Engagement at the NMNH, replied that my project seemed interesting from her managerial perspective. She suggested that I get in touch with Dr. Scott Wing, curator of fossil plants, who dealt frequently with students. In his usual fashion, Scott welcomed me to call him about the prospect of undertaking a project at the NMNH. That autumn, Scott met me for a casual lunch, where he told me that he was working on a new exhibit project called *Deep Time,* a

project to reenvision the entire Fossil Hall complex. It was a massive project that had been in the works for a number of years; it turned out that some of the team had expressed interest in having the process documented. In turn, Scott introduced me to Dr. Michael Mason, then assistant director for exhibitions, whom I found to be a like-minded cultural anthropologist and who proved to be an important advocate and mentor.

The planning for *Deep Time* was about to begin in earnest. Michael, who was committed to innovation and experimentation in exhibits, was open to inviting an ethnographer into the exhibition process. He agreed to let me join and document the process, given my background in museum studies and audience research, both as an embedded ethnographer and as an advocate for public engagement in the process. I was granted a predoctoral NMNH Visiting Student fellowship from the Smithsonian Office of Fellowships and Internships (OFI), hosted by Michael Mason as my advisor for one year: from September 2012 to September 2013. My role in the exhibition development process would be to research public engagement initiatives at other institutions; in other words, to do "horizon scanning" that would inform *Deep Time* decisions on how to approach public engagement. I also undertook a visitor study of the FossiLab space in the existing hall. The rest of my time would be spent on my research—documenting the development process by attending meetings, taking notes, and conducting interviews. In this way, I would be able to attend meetings with a specific role on the team, and I would be held to the same practical and ethical standards as staff. My paperwork, background check, and badge were processed through the OFI, and I was very graciously given an office in Exhibits (more on this in chapter 2). It was thus through good timing and the open-mindedness of NMNH staff that I came to take *Deep Time* and its planning team as a case study.

Throughout, I melded ethnographic and ethnohistorical methods. In the summer of 2012, I began research in the Smithsonian Institution Archive's (SIA) formidable collections of exhibits files, correspondence, blueprints, photographs, and annual report drafts. Of particular value were the daybooks and correspondence of the museum's first curator of vertebrate paleontology, Charles W. Gilmore. Archival sources allowed me to construct much of the pre-1960s history as I will recount in chapter 1. Beyond that, the archives yielded a vast repository of records through the 2000s that helped to flesh out the ethnographic and oral history data that I collected at the museum.[37]

I quickly discovered that NMNH staff have deep institutional memory. Many retired scientific staff members who have been with the institution for more than forty years come to the museum every day. I was generously

given access to many internal and informal "archives" in the institution—staff bookshelves and desk drawers that stored rich repositories of institutional and exhibits history. In oral history interviews, these documents as well as the NMNH's internal photographic collections proved essential for my overall research, and also served as important memory cues.[38]

On 13 September 2012, I began a part-time position working for the *Deep Time* project in the Office of Exhibits under Michael Mason's supervision, initiating participant observation for the project. For anthropologists, being a true participant in the activities of a fieldsite is a defining method, because it allows you to understand the people you work with and their perspectives. We also take collaboration—the idea that both you and your research subjects not only understand the project but anticipate its mutual benefits—very seriously as a method.[39] Working for the exhibit project would allow me to do this work ethically and in good faith. In September 2012, I began researching audience engagement initiatives at other museums for the project and attending meetings.

Initiating participant observation in Exhibits took some negotiation and at times was a tense process for both me and Smithsonian staff. During my first meetings with leaders in Exhibits, there was some hesitation from staff over the prospect of having an ethnographer document the exhibit process. (This is not all that surprising, because embedded ethnography is generally an awkward enterprise, especially at first. Now that I have worked on my own exhibit projects, I see how an observer's presence would be weird and disconcerting.)

In particular, staff were concerned about how an observer would influence the dynamic of the group, especially when it was a newly formed team of people from disparate backgrounds and disciplines. There was also conversation about what, precisely, being an ethnographer would mean—would I always have my "ethnographer's hat" on? Would hallway conversations be fair game? Would I be a participant at some meetings (or for parts) and an observer at others? While we joked about the possibility of my wearing a Dr. Seuss "ethnographer's hat" whenever I adopted my ethnographer's lens, the conversation had a serious tone.

In the end the group decided that I should use differently colored notebooks to start—I had a red "project notebook" for use when I was doing audience engagement work, and an "ethnographer's notebook" to make obvious to the team that I had my ethnographer's hat on.[40] We also discussed whether I ought to record audio at exhibit meetings. Once again, the issue of the group dynamic came up, as well as what I might do with the recordings. In the end, it was decided that I should only take written notes in meetings. By midyear, someone suggested that I try typing out

notes, but the group immediately rejected my single-meeting experiment with this method because of its cold, impersonal, court-transcript feel.

Getting official institutional permission to conduct the study was also complicated. The project (and my consent forms) received approval from the University of British Columbia's (UBC) Behavioural Research Ethics Board as well as the Smithsonian's Institutional Review Board. I had permission from the Department of Paleobiology and the Office of Exhibits, and their leadership. However, midway through the project the exhibit's designers, contracted through the architecture and design firm Reich + Petch (R+P), asked a seemingly simple question—could they legally sign my consent forms? In fact, this turned out to be quite complicated.

While under contract with the Smithsonian, the designers' creative work is essentially owned by the institution. Could they, then, as independent individuals, consent to my study in their capacity as Smithsonian contractors?[41] The question moved up the institutional chain to the Office of General Counsel (OGC), the Smithsonian's legal branch. The result was a reexamination of my content forms by my PhD supervisor, UBC Legal, the acting director of Exhibits, and the OGC, who negotiated new terminology (appendix A as well as an overall "Content Sharing Agreement," where the "subject matter content provided by Smithsonian staff and contractors in the interviews and exhibit-planning meetings (the "Smithsonian Content") shall be owned by the Smithsonian, including copyright, in accordance with the underlying contract between the contractors and the Smithsonian," and the actual recordings—written, audio, visual—are owned by me. We each have a "royalty-free, non-exclusive, irrevocable license to use, reproduce, and transmit" this material. Institutional trust thus required significant legal as well as social work.

From the official *Deep Time* launch in December up to the following April, I attended all full-team *Deep Time* workshops. This was what might be called a "thick description" phase.[42] For anthropologists, thick description is an approach to documenting and writing about a cultural field you are studying that accounts for as many contextual (rather than merely factual) details as possible. At workshops and meetings I took detailed, handwritten notes of as much as I could get down about the content of conversations and which team members were speaking.[43] During this phase I also made detailed audio recordings of my reflections each day. These functioned as fieldnotes proper—or lengthier accounts of my observations of meetings and other events, as well as general observations, thoughts, ideas, and conundrums.[44]

During the next (called 35%) phase, I took more generalized notes to understand the broader process. The 35% phase includes the fleshing out

of more specific content for each section of the exhibit, as well as the selection of large-scale specimens and elements that determine the building and engineering infrastructure.[45] From the beginning of my fellowship until its end in September 2013, I was also included in all email and document exchanges.

Thanks to Michael, I had the advantage of the very gracious allotment of an office in Exhibits, which meant that I was fully immersed there from mid-September to June. When two new writers joined the *Deep Time* team in July and my research shifted to interviews and oral history work, I moved to Paleobiology, where I had an office from July to September. The following year, as I wrote up the research, I had an office in the director's hallway. While not an intentional research plan, residence in very different institutional spaces helped me understand the cultural distinctions between the museum's departments. It also brought my own positionality to the fore. I was clearly more comfortable in Paleobiology, a department filled with academics. I realized then that being an academic in training had probably put me in a dubious position when I started in Exhibits, where I'm sure they all recognized that potential bias.

I also learned a great deal about organizational divisions through oral history interviews with longstanding staff in Exhibits and Paleobiology.[46] During oral history interviews I tried to focus on changes over time in the priorities and roles of different departments and actors in the exhibits process, as well as overall cultural shifts in institutional culture at the museum.[47]

At the end of April as the 10% phase concluded, I also began conducting interviews with nearly all the Core, External/Advisory, and Approval Team members of both the *Deep Time* and Temporary Exhibit Teams. In these interviews, I focused on people's particular backgrounds and expertise and their individual perspectives on the *Deep Time* process to contextualize their contributions to exhibit meetings. For some of the team members, these interviews were also oral history interviews, as several members of the current team had worked at the institution for upward of thirty years.

All in all, in addition to countless informal conversations with current and former staff, I conducted fifty-six recorded interviews in the institution—twenty-two audio-recorded interviews with Core, Advisory/Extended, and Approval Team members, thirty-two oral history interviews (twenty-five audio-recorded; seven written-recorded)—and had formative, formal conversations with another sixteen current and former staff.[48]

As the prologue relates, in July I accompanied members of the Temporary and Permanent Teams and other Smithsonian staff to the field. Hosted by the Marmarth Research Foundation on the outcrops of the Hell

Creek Formation, we spent a week scouting for microfossils, digging up large vertebrates, and collecting fossil plants. On the trip I kept a detailed field diary of the group's activities and personal reflections and took photographs of the processes of scouting and collecting as well as preparing fossils for shipment back east.

In sum, the project involved three methods: first, archival research at the Smithsonian Institution Archives and internal (often informal) archives; second, oral history interviews with longstanding staff, primarily in Exhibits and Paleobiology but also across a wide range of museum roles and expertise; and third, interviews and participant observation among the *Deep Time* team.

The Argument

At the Smithsonian, I contend, the tension between research and outreach is inherent in its twofold 1846 mission—the *increase* and *diffusion* of knowledge. In the last sixty years, these two aspects of the institution's mission have become increasingly polarized. Placing that shift in the 1950s and not in the 1980s—as much of the literature has suggested—is one of the contributions of this study.

Today, increasingly specialized experts—in subdisciplines of science, museum project management and development, exhibit design, exhibit label writing, and museum education—are responsible for planning exhibitions. Mounting an exhibition is thus a social experiment where people from different backgrounds and otherwise isolated departmental cultures, languages, and ideologies come together to plan something they all imagine differently.

Tensions are also high because museum staff care deeply about what they do. For most of them, educating the public about the most important historical, scientific, political, or artistic movements of our time is more than a job—it is an aspirational worldview, a moral position, and a professional responsibility. Exhibitions are also hugely time consuming and expensive. Planning an exhibit at the Smithsonian, at the world's most visited natural history museum, and on the National Mall means that the stakes are high. To say that every finished exhibition is the result of intense compromise is an understatement. As Michael Mason once remarked to me, "it's more like rugby."

Exhibits projects offer unique insight into the workings of an institution because they arise in a microcosm of the museum. There, what I have called "frictions" and "complementarities" are debated, dramatized, and performed (among a small group of increasingly interdisciplinary people).

The first of these terms I borrow from anthropologist Anna Tsing, who wrote a multisited, global ethnography focusing on the "creative frictions" embedded in debates about Indonesian rainforests in the late 1980s and 1990s.[49] She argues that cultures are coproduced through "friction," which she defines as "the awkward, unequal, unstable, and creative qualities of interconnection across difference."[50]

Collaboration, she shows, is "not a simple sharing of information," because collaborators don't necessarily "share common goals."[51] Exhibit development involves the meeting of very particular expert knowledge. I found that professionalized disciplines negotiating the development of an exhibit act as a kind of cultural diversity. Exhibit meetings are ripe with "zones of awkward engagement."[52]

However, I also found that there was something more aspirational to the particular frictions I encountered in the Smithsonian's exhibit-planning process. I came across the term "complementarities" in an annual report from 1984, as I was writing chapter 2. Robert McCormick Adams, secretary of the Smithsonian Institution during some of its most fiscally stringent years, noted the importance of complementarities to the Smithsonian:

> I have touched at numerous points on the notion of discovering and reinforcing new complementarities—between fields of specialization, between internally generated projects and the needs and perceptions of the wider society, and between the increase and the diffusion of knowledge. . . . And it should be our goal to make the Smithsonian Institution a place where these activities not only coexist but work together to create a larger truth.[53]

It struck me that this summed up the unique social field of the Smithsonian and the people who drive its activities. At the Smithsonian, distinct fields are imagined as coming together in partnership. Both the institution and its staff are often caught in the middle of paradoxical values, disciplines, and goals. Yet I chose this term because it seemed to capture aspirations of the institution and its staff to overcome these fissions.[54]

A word on terminology: I use the term "production" in two ways in this book. In Exhibits terminology, "production" involves the process of building, manufacturing, assembling, or physically making the exhibits, as well as the staff who work in these areas. It is also a later phase of the overall exhibit-development process. Here, the term is also used as anthropologists use it, to talk about the total social process of creating something. I often use "exhibit" and "exhibition" interchangeably, because the first term is used colloquially in the museum, although many museum professionals consider an exhibit to be a small-scale display or case, and an exhibition to be a holistically planned gallery or set of galleries. Another word I use

often is "outreach." In historical sections of the book I use it as a blanket term to describe all of the emergent professionals and departments that are involved in public-facing museum work—education, exhibits, press, programming, and so on. Today, because the former Office of Education is now called "Education and Outreach," education staff members are also called "outreach" staff. I have tried to use terms like "audience-focused," "audience advocates," "education and exhibits," "noncuratorial" or "non-scientific" staff to describe broad cultural differences across roles and perspectives in the museum that divide along these lines. This is not to say, of course, that offices such as Education and Exhibits do not have differing perspectives and expertise, because they do. In chapter 2, I outline some of these subpower divisions. However, painting this broad picture allows for tracing wider trends in museum culture.

I investigate the fracture between research and outreach as it plays out in three main social arenas: first, among increasingly interdisciplinary staff; second, in debates about the exhibit content development; and third, amid a broader institutional culture. Exploring *group dynamics,* I trace debates that manifest through the increasingly interdisciplinary, specialized, and isolated groups involved in producing exhibits. Through *content development* debates, I examine what these groups debate and produce. I describe the Exhibit Team's debates about how, under what scientific paradigm, and with what kinds of display technologies they will portray the processes and interconnectivities of the deep history of Earth in static things. Third, framing the other two (in chapters 1 and 6), I describe the context for these debates, through a close examination of the NMNH's historical and contemporary *institutional culture.* I trace debates in broader strategies for exhibits at the museum, the vision for what exhibits ought to be and how they ought to communicate science within the broadest vision for the institution—its mission, goals, and place in (here primarily U.S.) society. In each arena, I describe frictions and then a few areas where complementarities allow for compromise or consensus.

If managed well, I argue that friction yields to complementarity, resulting in creativity and a better, more balanced final product.

The Structure of the Book

Extinct Monsters to Deep Time describes the growth of the tension between the research and outreach functions of the museum in the twenty-first century. The book provides a grounded perspective of the inner workings

of a museum and the behind-the-scenes collaborative processes of communicating science to the public. I meld ethnohistorical and ethnographic approaches to investigate the production of the Smithsonian's fossil exhibits, focusing primarily on the radical modernization period of the postwar period to the present. The chapters intersperse ethnographic observation of the first six months of planning for the NMNH's largest-ever exhibit renovation, *Deep Time* (to open in June 2019), with chapters that historically contextualize this process.

In chapter 1 I explore *institutional culture* to the end of World War II: the early contexts for the increase and diffusion of knowledge through an account of intersections between early fossil displays and the development of the Smithsonian Institution, the public museum, and paleontology as a scientific field. I describe the early contexts for burgeoning museum expertise and modes of display. Tracing the early roots of frictions and complementarities, I show the beginnings of the museum's mission to both increase and diffuse knowledge, at a much smaller scale and scope.

In chapters 2–5 I describe two aspects of exhibits production: *group dynamics* and *content development.* I have broken both of these two arenas into contemporary and historical chapters. In chapters 2 and 3, I explore *group dynamics* in exhibit development, where chapter 2 describes the contemporary roles and processes for *Deep Time* and chapter 3 describes the contexts for interdisciplinarity. In chapter 2 I describe the dynamics between different cultures of expertise in the museum. When experts with different training who are ordinarily isolated in departments come together in the exhibit planning, the tensions among them illustrate wider divisions between research and outreach in the institution. In chapter 3 I describe exhibits expertise from the modernization revolution of the mid-1950s to the present. I focus on the increasingly professionalized and interdisciplinary experts who come together to plan exhibits, as well as on some of the shifts in perspectives and compromise this entails. These dynamics embody the shift in the Smithsonian's mission from a narrower, scholarly notion of "increase and diffusion" to "diffusion and increase," an era in which the institution has looked outward to reaching and understanding the broadest public.

In chapters 4 and 5 I explore exhibit *content development* through my grounded case study of fossil displays from the late 1950s to the present; chapter 4 is about the contemporary planning for *Deep Time,* and chapter 5 traces the context for *Deep Time* from the postwar era. Chapter 4 therefore uses my ethnographic research, including meeting observations, interviews, fieldnotes, and reflections, to describe current debates about content for *Deep Time.* I describe four major debates. These debates gen-

erated decisions about the tone and approach to the entire exhibition: (1) *layers of interpretation,* or the emphasis on individual real things (fossils) versus story-driven interpretation (e.g. labels, dioramas, videos); (2) *levels of resolution,* or the use of in-depth, detailed renderings of life on Earth at particular times or places versus narrative approaches to big trends in the history or story of Earth; (3) *tone of technologies,* or experimentation with heavier uses of new media versus tried-and-true, durable technologies; and (4) *levels of engagement,* or to what extent the exhibition would cede authority to the public or maintain its scientific authority.

1. Layers of Interpretation: real ⟷ interpretation
2. Levels of Resolution: detail ⟷ abstraction
3. Tone of Technologies: reliability ⟷ innovation
4. Levels of Engagement: authority ⟷ participation

In each case I describe two extremes of perspective (friction) and where the team came to early consensus (complementarity).

Chapter 5 uses team and oral history interviews along with archival research to reconstruct the development of many early content debates for both science and its communication. There, I describe debates on and solutions to illustrating increasingly complex and interconnected systems with objects, augmented by increasingly story-driven texts, and sophisticated audiovisual technologies.

In chapter 6, having shown how teams of experts produce content today, I return to broader institutional contexts for the increase and diffusion of knowledge. I show that in mission, staffing, and administrative actions, the Smithsonian's *institutional culture* has shifted its emphasis toward diffusion and outreach since the 1950s. The NMNH has resisted aspects of this shift, maintaining a fairly traditional scholarly community in its curatorial departments. The widening gap between research and outreach cultures is causing increased tensions, some productive and some highly unproductive.

These chapters are framed by an introduction and a conclusion, which address the broader theoretical and museological relevance of the research. I have also included a prologue and an epilogue to the book, not only to do justice to the fieldwork experiences facilitated in undertaking this research but also to frame my analysis with a grounded description of the two ends of the Smithsonian's mission. The process of excavating and prospecting for fossils was a window into the ways that paleobiologists today conduct research and "increase knowledge." The epilogue, which describes the arrival in the spring of 2014 of the "Nation's *T. rex*" is a window into the grounded impacts of both the world stage on which the Smithsonian now finds itself

and the continued iconic power of dinosaurs. This is one instance in which I saw the expansion of the Smithsonian's mission of "diffusion."

As you will see in each chapter, different methods yield very different kinds of information, and that is reflected in the tone of my writing. Chapters 1, 3, 5, and 6 rely primarily on archival and oral history methods. Their tone is somewhat more detached, and each works to contextualize my ethnographic chapters in a historical framework. The prologue, epilogue, and chapters 2 and 4 are based entirely on ethnographic methods and are more personal and narrative in tone.

Deep Time and the Museum Field

As a museum ethnography, this book provides a grounded look at today's museums and the challenges they face. Taking the world's largest and most visited natural history museum as a case study, it speaks to what is happening in museums broadly. Such transparency might cultivate more informed, critical visitors as well as better-equipped museum administrators and project managers.

As a young professional in the museum field, I have found that the tensions I observed at the Smithsonian, namely between curatorial and audience-focused expertise in the museum, are ubiquitous. Across museums, stereotypes abound. Curators are perceived to relish their institutional prestige: they refuse to cut objects in exhibit projects, tend to write in overly long, inaccessible jargon that they are convinced is perfect, dislike change, talk down to other staff, and are poor team players. Audience advocates are perceived to "dumb down" exhibit content while not really understanding it, and are seen as overly demanding while being highly sensitive about their expertise, or department, and its importance.

Among museum professionals, I often find myself defending curatorship as a practice and downplaying my PhD as a life course. Among academics and curators, I justify museum work as a career path, and I am often put in the awkward position of trying to explain or make light of research-outreach staff conflicts. There are valid reasons for the (mis)perceptions on both sides. Having done this research, I feel that it is my responsibility to take very seriously the knowledge of all experts at the table in museum projects. I hope that this is a bigger trend among the next curatorial generation and that this book inspires that respect.

Literature about other museums reveals that what I found at the Smithsonian—new techniques and technologies for museum communication, the professionalization of museum disciplines, and changes in the organi-

zational structure of the museum—are taking place elsewhere.[55] Across the field, museums are grappling with their primary function: whether to be centers for research or outreach apparatuses. Understanding the ways these changes affect daily life for the people who work in museums will help us to identify the conflicts that make it difficult to do this important work. In nonprofits, libraries, museums, archives, and even universities, tensions between departments and their staffs, under increasing financial strain, can prevent the productive collaborations we aspire to. Rather than combating difference and disciplinary prejudice, we should be identifying common goals. Understanding other disciplinary perspectives and their roots promotes better work environments, richer projects, and greater impact.

As an ethnography of experts and knowledge production more broadly, this book intends to reveal the power struggles inherent in all interdisciplinary institutions that seek to develop and communicate new ideas. The cross-cultural tensions I observed at the NMNH can be found not only in other kinds of museums but in hospitals, think tanks, and corporations. I hope readers will recognize aspects of the "frictions" and "complementarities" described here in their own familiar institutions.

If I have done my job well, the book will also raise larger questions: Who speaks for science and how does it get represented? How does information become agreed upon and classified as fact? How do we know what we know? Or, more simply, as Shari Werb, assistant director for education, put it, "these people who are funded by the public—how do we translate their really important research in a way that the public can understand it?"

In a fraught political environment, museums are well placed to set some parameters for these conversations—to be leaders in the public discourse. Through intense cross-cultural debate, every museum idea, story, or statement has been painstakingly scrutinized and translated for public consumption. It is exactly this process that should allow museums to lead global conversations about critical scientific topics such as climate change. As museums grapple with their futures in the new millennium, I hope that this small ethnography contributes to their empowerment.

Notes

1. "James Smithson, Last Will and Testament, October 23, 1826," Smithsonian Institution Archives, retrieved 1 May 2014 from http://siarchives.si.edu/history/exhibits/stories/last-will-and-testament-october-23-1826.
2. "Welcome," Smithsonian Institution, retrieved 25 April 2018 from https://www.si.edu.

3. See Eva Mackey, "Postmodernism and Cultural Politics in a Multicultural Nation: Contests over Truth in the *Into the Heart of Africa* Controversy," *Public Culture* 7, no. 2 (1995): 403–32; Richard H. Kohn, "History and the Culture Wars: The Case of the Smithsonian Institution's Enola Gay Exhibition," *Journal of American History* 82, no. 3 (1995): 1036–63; Shelley Ruth Butler, "The Politics of Exhibiting Culture: Legacies and Possibilities," *Museum Anthropology* 23, no. 3 (2000): 74–92; Steven Dubin, "Incivilities in Civil(-Ized) Places: 'Culture Wars' in Comparative Perspective," in *A Companion to Museum Studies,* ed. Sharon Macdonald (Malden, MA: Blackwell, 2008): 477–93.

4. According to the Smithsonian Organization and Audience Research Office (formally Office of Policy and Analysis), during the time I conducted this research, visitor numbers at the NMNH were 7,378,612 in FY 2012, 8,281,983 in FY 2013, and 7,047,560 in FY 2014. Whitney Watriss and David Karns, personal correspondence, 22 October 2018.

5. W. J. T. Mitchell, *The Last Dinosaur Book: The Life and Times of a Cultural Icon* (Chicago: University of Chicago Press, 1998), 5.

6. "The Deep Time Project: 4.6 Million Years of Global Change," unpublished project proposal, National Museum of Natural History, Smithsonian Institution, Washington, DC, 2009.

7. For example, in the 1980s, George Marcus and Michael Fischer's formative *Anthropology as Cultural Critique* (Chicago: University of Chicago Press, 1986), 125–26, drew on precedents in anthropological work to ask anthropology "to study home societies with as much detail and rigor as comparative 'other' societies" and "to serve as a form of cultural critique for ourselves," 1. See Marcel Mauss's *The Gift: The Form and Reason for Exchange in Archaic Societies,* trans. W. D. Halls (New York: Routledge, 1990 [1954]); Margaret Mead's *Coming of Age in Samoa: A Study of Adolescence and Sex in Primitive Societies* (New York: Penguin, 1954); and early work in Chicago school urban studies by William Lloyd Warner and others, e.g. William Lloyd Warner and Josiah Orne Low, *The Social System of the Modern Factory: The Strike, a Social Analysis* (Hartford, CT: Yale University Press, 1947),

8. Laura Nader, "Up the Anthropologist—Perspectives Gained from Studying Up," in *Reinventing Anthropology,* ed. Dell H. Hymes (New York: Vintage, 1969): 284–311.

9. Ibid.

10. See, for instance: Georgina Born, *Rationalizing Culture: Ircam, Boulez, and the Institutionalization of the Musical Avant-Garde* (Berkeley: University of California Press, 1995); Richard Harper, *Inside the IMF: An Ethnography of Documents, Technology and Organisational Action* (San Diego, CA: Academic Press, 1998); Annalise Riles, *The Network Inside Out* (Ann Arbor, MI: University of Michigan Press, 2000); Karen Ho, *Liquidated: An Ethnography of Wall Street* (Durham, NC: Duke University Press, 2009); Barry Dornfeld, *Producing Public Television, Producing Public Culture* (Princeton, NJ: Princeton University Press, 1998); and Bruno Latour and Steve Woolgar's *Lab-*

oratory Life: The Construction of Scientific Facts (Princeton, NJ: Princeton University Press, 1986). Two formative studies of heritage sites include Aviad Raz, *Riding the Black Ship: Japan and Tokyo Disneyland* (Cambridge, MA: Harvard University Press, 1999), and Gwyneira Isaac's ethnographic work on producing knowledge and the formation of the A:shiwi A:wan Museum and Heritage Center. See Gwyneira Isaac, *Mediating Knowledges: Origins of a Zuni Tribal Museum* (Tucson: University of Arizona Press, 2007).

11. Richard Handler and Eric Gable, *The New History in an Old Museum: Creating the Past at Colonial Williamsburg* (Durham, NC: Duke University Press, 1997): 9.

12. Other similar scholarly work takes the form of reflections by curators or other exhibition team members themselves in a first-person narrative as opposed to an ethnographic observation. For a relevant Smithsonian example, see, for instance, Steven Lubar "The Making of 'America on the Move' at the National Museum of American History," *Curator* 47, no. 1 (January 2004): 19–51.

13. Handler and Gable, *New History in an Old Museum.*

14. Susan Davis, *Spectacular Nature: Corporate Culture and the Sea World Experience* (Berkeley: University of California Press, 1997).

15. Sharon Macdonald, *Behind the Scenes at the Science Museum* (Oxford: Berg, 2002). Another much shorter study (approximately two hundred hours over two years) was undertaken by Charlotte Lee, which documented a traveling natural history museum exhibition about dogs but importantly looks at communities of practice among an exhibit team. See "Reconsidering Conflict in Exhibition Development Teams," *Museum Management and Curatorship* 22, no. 2 (2007): 183–99.

16. Jennifer Shannon, *Our Lives: Collaboration, Native Voice, and the Making of the National Museum of the American Indian* (Santa Fe, NM: School for Advanced Research Press, 2014).

17. On encouraging more grounded anthropological work in museums, also see Mary Bouquet, *Academic Anthropology and the Museum: Back to the Future* (New York: Berghahn Books, 2001).

18. See Eilean Hooper-Greenhill, *Museums and Their Visitors* (New York: Routledge, 1994); Michael Ames, *Cannibal Tours and Glass Boxes: The Anthropology of Museums* (Vancouver: University of British Columbia Press, 1992); George E. Hein, *Learning in the Museum* (New York: Routledge, 1998).

19. For example, Eilean Hooper-Greenhill, *The Educational Role of the Museum* (New York: Routledge, 1999).

20. On current approaches to museum learning, see Philip Bell, Bruce Lewenstein, Andrew W. Shouse, and Michael A. Feder, *Learning Science in Informal Environments: People, Places, and Pursuits* (Washington, DC: The National Academies Press, 2009); John Howard Falk, Joe E. Heimlich, and Susan Foutz, *Free-Choice Learning and the Environment* (Plymouth: Altamira Press, 2009); and John H. Falk and Lynn D. Dierking, *Learning from Museums: Visitor Experiences and the Making of Meaning* (Plymouth: Altamira Press, 2000).

21. On influential theories of childhood learning-as-process, motivation, and the importance of structured curriculum design that builds on existing knowledge "scaffolding," see Jerome S. Bruner, *The Process of Education* (Cambridge, MA: Harvard University Press, 1999 [1960]).

22. On the construction of knowledge, context, and presenting multiple perspectives, see Rand J. Spiro, Brian P. Collins, Jose Jagadish Thota, and Paul J. Feltovich. "Cognitive Flexibility Theory: Hypermedia for Complex Learning, Adaptive Knowledge Application, and Experience Acceleration," *Educational Technology* 43, no. 5 (2003): 5–10. For earlier influential development and psychology literature on this topic, see for example, Lev S. Vygotsky, "Interaction between Learning and Development," in *Mind in Society: The Development of Higher Psychological Processes,* ed. Michael Cole, Vera John-Steiner, Syvlia Scribner, and Ellen Souberman (Cambridge, MA: Harvard University Press, 1978): 71–91.

23. See Nina Simon, *The Participatory Museum,* retrieved 15 May 2014 from http://www.participatorymuseum.org; Bernadette Lynch, "Whose Cake Is It Anyway? A Collaborative Investigation into Engagement and Participation in 12 Museums and Galleries in the UK" (London: Paul Hamlyn Foundation, 2011); Christian Heath and Dirk vom Lehn, "Interactivity and Collaboration: New Forms of Participation in Museums, Galleries, and Science Centres," in *Museums in a Digital Age,* ed. Ross Parry (New York: Routledge, 2010): 266–81.

24. On ethics, see Janet Marstine, *The Routledge Companion to Museum Ethics: Redefining Ethics for the Twenty-First Century Museum* (New York: Routledge, 2011); on collaboration, see Bernadette Lynch, "Collaboration, Contestation, and Creative Conflict: On the Efficacy of Museum/Community Partnerships," in *The Routledge Companion to Museum Ethics,* ed. Janet Marstine (London Routledge, 2011): 146–63; Luke Eric Lassiter, *The Chicago Guide to Collaborative Ethnography* (Chicago: University of Chicago Press, 2005), and Viv Golding and Wayne Modest, *Museums and Communities: Curators, Collections and Collaboration* (New York: Bloomsbury, 2013); on incorporating Indigenous models of knowledge, see, for example, Christina F. Kreps, "Non-Western Models of Museums and Curation in Cross-Cultural Perspective," in *A Companion to Museum Studies,* ed. Sharon MacDonald (Malden, MA: Blackwell, 2010), 457–72, and Christina F. Kreps, *Liberating Culture: Cross-Cultural Perspectives on Museums, Curation, and Heritage Preservation* (New York: Routledge, 2003); and Laura L. Peers and Alison K. Brown, *Museums and Source Communities: A Routledge Reader* (New York: Routledge, 2003).

25. On the public communication of science, see John Durant, *Museums and the Public Understanding of Science* (London: The Science Museum, 1992).

26. Patrick J. Boylan, "The Museum Profession," in *A Companion to Museum Studies,* ed. Sharon MacDonald (Malden, MA: Blackwell, 2010).

27. On corporatization, see Mark W. Rectanus, *Culture Incorporated: Museums, Artists, and Corporate Sponsorships* (Minneapolis: University of Minnesota

Press, 2002); on "Disneyfication," see Alan Bryman, "The Disneyization of Society," *Sociological Review* 47, no. 1 (1999): 25–47; John Terrell, "Disneyland and the Future of Museum Anthropology," *American Anthropologist* 93, no. 1 (1991); on blockbuster exhibitions and rebranding, see Nick Prior, "Postmodern Restructurings," 515, and Steven Conn, "Science Museums and the Culture Wars," in *A Companion to Museum Studies,* ed. Sharon MacDonald (Malden, MA: Blackwell, 2010).

28. Most recently on edutainment and engagement in natural history displays, see Karen A. Rader and Victoria E. M. Cain, *Life on Display: Revolutionizing U.S. Museums of Science and Natural History in the Twentieth Century* (Chicago: University of Chicago Press, 2014). On broader critiques, see Ruth Rentschler and Ann-Marie Hede, *Museum Marketing: Competing in the Global Marketplace* (London: Butterworth-Heinemann, 2007), 62–64; Fiona Mclean, *Marketing the Museum* (New York: Routledge, 2002); Victoria D. Alexander, *Museums and Money: The Impact of Funding on Exhibitions, Scholarship, and Management* (Bloomington: Indiana University Press, 1996); John Howard Falk and Beverly Sheppard, *Thriving in the Knowledge Age: New Business Models for Museums and Other Cultural Institutions* (Plymouth: Altamira Press, 2006); Anthony Alan Shelton, "Museums and Anthropologies: Practices and Narratives," in *A Companion to Museum Studies,* ed. Sharon Macdonald (Malden, MA: Blackwell, 2011). On the dominant mode of production as increasingly one of "spectacle," see Guy Debord *Society of the Spectacle,* trans. Ken Knabb (London: Rebel Press, 1983 [1967]).

29. Rosalind Krauss, "The Cultural Logic of the Late Capitalist Museum," *October* 54 (1990): 3–17; on utilitarian thinking and capitalism as a cultural system, see Marshall D. Sahlins, *Culture and Practical Reason* (Chicago: University of Chicago Press, 1976); on widespread institutional cultures of audit and assessment, see Marilyn Strathern, *Audit Cultures: Anthropological Studies in Accountability, Ethics, and the Academy* (New York: Routledge, 2000).

30. Brian Noble, *Articulating Dinosaurs: A Political Anthropology* (Toronto: University of Toronto Press, 2016), 357, 319.

31. Ibid., 6.

32. Noble conducted interviews from 1997 to 1999 about the show planned in late 1993 and opened in 1995; ibid., 178.

33. Ibid., 23.

34. Rader and Cain, *Life on Display.*

35. Thomas S. Kuhn, *The Structure of Scientific Revolutions* (Chicago: University of Chicago Press, 2012 [1962]): 111–34.

36. See again, Isaac, *Mediating Knowledges.*

37. I was also in the privileged position as a second-generation oral historian to be able to consult Pamela Henson's thirty years' worth of Smithsonian oral history work. Her transcripts and recordings of interviews are invaluable for understanding earlier generations' reflections on changes at the museum.

38. I also scanned thousands of internal Paleobiology and Exhibits documents and photographic prints and thousands of Chip Clark photographs (the mu-

seum's long time photographer) from an internal archive in the Imaging Lab's rapid scanner, and I selectively transcribed hundreds of pages of archival and internal document texts.

39. See the handbook on ethical collaborative work, Lassiter, *Chicago Guide to Collaborative Ethnography.*

40. At first, as a kind of facetious way of easing into this, I purchased a rustic-looking Barnes & Noble notebook with recycled, beige paper to act as my "ethnographer's" notebook. Soon, though, I adopted black Moleskine notebooks as a more condensed and better-quality technology.

41. Further terminology appears in individuals' contracts. From author's Purchase Order, 25 September 2013, "Rights-in-Data Clause," Office of Contracting, Smithsonian Institution.

42. Clifford Geertz, *The Interpretation of Cultures* (New York: Basic Books, 1989).

43. These were detailed, on-record ethnographic "scratch" notes, sometimes in the heat of discussion resembling what James Clifford calls *inscription*—"A participant-observer jots down a mnemonic word or phrase to fix an observation or to recall what someone has just said"—but can include much more detailed accounts of people's turn of phrase or fully transcribed comments, described by Sanjek as "fuller observation or responses." All notes were later reviewed, paginated, indexed, and selectively transcribed. In many cases I transcribed scratch notes directly. This has meant, particularly for meeting conversations, quoting people in phrases and partial sentences. Direct scratch note quotations are presented as direct quotes, cited using the last name of the speaker and the month, day, and year as Last Name, M.D.YY. I have tried in this book, when filling in the gaps inherent in these scratch notes, to write descriptive sentences and paragraphs and to use my audio recordings and additional notes to retain the character, meaning, and intention of people's contributions. See Roger Sanjek, "A Vocabulary for Fieldnotes," in *Fieldnotes: The Makings of Anthropology,* ed. Roger Sanjek (Ithica, NY: Cornell University Press, 1990), 95–96.

44. This process of translation was a form of analysis and *description*—"the making of a more or less coherent representation of an observed cultural reality . . . for later writing and interpretation aimed at the production of a finished account." Ibid., 97.

45. During this process, I also had access to weekly audio-recorded curatorial content meetings, in which the Core curatorial team met with other relevant curators to focus the narrative for each exhibit section or time period.

46. I began this stage of my research just as the 10% exhibit phase was ending in April (and as I became fluent enough in Paleo and Exhibits-speak to conduct interviews of worth). With the help of the exhibit team and many members of both departments, I quickly assembled a long list of interviewees who had worked anywhere from six months to more than forty years at the Smithsonian.

47. I also had the opportunity in May to plan a celebration of the fiftieth anniversary of the Department of Paleobiology. Brian Huber, department chair,

allowed me to help organize the program and to present my preliminary historical research. I solicited nine participants to follow my presentation with stories about the history of the department, their experiences in it, and their memories of Paleobiology exhibits at the museum. Pamela Henson generously recorded the entire event, and Brittany Hance, then an intern with the Imaging Lab, photographed it. I drew great energy and oral historical material from this event, and I was introduced to many new informants whom I would interview in the months afterward.

48. In both contemporary interviews and oral history interviews, I kept many of the questions the same for all interviewees, in part because I was interested in how different departmental and disciplinary backgrounds intersected with people's viewpoints and preoccupations. All interviews were reviewed and selectively transcribed; all team interviews were transcribed for more thorough analysis and coding. Interviews were conducted in a semi-structured format.

49. Anna L. Tsing *Friction: An Ethnography of Global Connection* (Princeton, NJ: Princeton University Press, 2005), x.

50. Ibid., 4.

51. Ibid., 13.

52. Ibid., x; Tsing also shows how the "work of the universal" is created through frictions. This is an important point when considering *Deep Time* and the recent history of exhibitions that portray the record of life on Earth. The development of these exhibits is in many ways also a universalizing project, one that tries to unify all of human history in line with a deeper history of the Earth and its environment. While not a "globalized" fieldsite like Tsing's, *Deep Time* exhibit meetings did create a space of global imagining and universal goals for a "sustainable future." Humans must, together, understand their impact on the Earth, and what they can do to change behaviors accordingly. See Tsing, *Friction,* 1–2.

53. Robert McCormick Adams, "Statement by the Secretary," in *Smithsonian Year 1985: Annual Report of the Smithsonian Institution for the Year Ended September 30, 1985* (Washington, DC: Smithsonian Institution Press, 1986), 18–19.

54. It also captures relevant literature on museums as fraught but productive "contact zones." In this line of thinking, the museum is a place where different knowledges, cultural visions, and community interests are negotiated. See Mary Louise Pratt, *Imperial Eyes: Travel Writing and Transculturation* (New York: Routledge, 1992), and James Clifford, *Routes: Travel and Translation in the Late Twentieth Century* (Cambridge, MA: Harvard University Press, 1997).

55. On trends of this kind broadly, see, for instance, Patrick J. Boylan, "The Museum Profession," in *A Companion to Museum Studies,* ed. Sharon MacDonald (Malden, MA: Blackwell, 2010), 415–30; on team approaches to design and managing conflict, see "Successful Team Dynamics," in Martha Morris, *Managing People and Projects in Museums: Strategies That Work* (New York: Rowman & Littlefield, 2017), 113–26. On the move to new expertise in ed-

ucation, see Lisa C. Roberts *From Knowledge to Narrative: Educators and the Changing Museum* (Washington, DC: Smithsonian Institution Press, 1997). See, in the UK context, Robert Geoffrey William Anderson. "To Thrive or Survive? The State and Status of Research in Museums," *Museum Management and Curatorship* 20, no. 4 (2005): 297–311.