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Giant Sloths and Sabertooth Cats: Extinct Mammals and the Archaeology of the Ice Age Great Basin

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Limitations on Chinese immigration and fishing reduced their involvement by the end of the nineteenth century. The passage of a ban on exporting abalone in 1913 and drying abalone in 1915 effectively foreclosed Chinese participation in commercial abalone harvesting.

Chapter 8 considers the ongoing legacy of abalone harvesting. Around 1898, the commercial take was expanded to subtidal species by the Japanese, who pioneered diving as a way to harvest red abalone. As overharvesting exhausted the red and black abalone populations, the harvesting expanded to smaller subtidal species, including green and pink abalones. The pressure on all species has increased as more people have developed a taste for the meaty mollusk. Only recreational take of red abalone is still allowed north of San Francisco.

The concluding section of this important book examines the historical ecology of abalone along the California coast. Braje makes a strong case for the use of long-term harvest records to establish policies and catch limits. This is arguably the most important aspect of the book and holds considerable interest for public and scientific audiences alike. It shows how archaeology can and should play an important role in addressing modern problems. For those considering sharing research with a broad readership, Braje's ambitious book offers many useful ideas. Tackling a problem that has such obvious relevance is an excellent choice.

Giant Sloths and Sabertooth Cats: Extinct Mammals and the Archaeology of the Ice Age Great Basin

Donald K. Grayson
Salt Lake City: University of Utah Press, 2016,
320 pp., ISBN 978-1607814696, $24.95 (paper).

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This volume is an easy-to-read guide to the extinct late Pleistocene mammals of the Americas, with a specific focus on the Great Basin. Grayson has compiled a wealth of information, from a wide variety of sources, on the archaeology, paleontology, and ecology of some 37 genera of mostly large mammals. The pages are packed full of an assortment of maps, drawings, photographs, and abundant witticisms. Across seven chapters, Grayson explores in detail what we know about these intriguing beasts and the science behind our knowledge, all the while imparting an infectious enthusiasm for both the animals themselves and the process of scientific discovery.

Chapter 1 starts off with a captivating tale of mysterious footprints that were discovered at the Nevada State Prison quarry in 1882. At first thought to be the "footprints of monster men," these footprints took the media and the scientific community by storm. A number of scientists visited the prison, and consequently a number of papers on the footprints were published. A bitter dispute arose, with some staunchly defending a human origin of the prints, and others arguing that the prints were those of a giant sloth. It was not until decades later that it became clear that the prints were indeed those of a giant sloth. With this provocative introductory narrative, Grayson illustrates how long megafauna have been causing controversy within the academic community and precisely how personal this type of research can get. The Nevada State Prison quarry footprints serve as a cautionary example about jumping to conclusions with limited evidence—a theme that is pervasive throughout the volume.

Chapter 2 presents an overview of the Great Basin, including its differing definitions (hydrographic and floristic), the current flora of the region, and a synopsis of the characteristics of surrounding areas. He compares this with details of the Great Basin during the last Ice Age: the many Pleistocene lakes, the effect of the Younger Dryas, and vegetational history. The information in this chapter is essential background for what is to follow.

Over a third of the book, presented in Chapter 3, consists of an engaging description of a "zoologically

impoverished world." It begins with a history of our knowledge of extinctions—from the year 1800, when extinctions were validated as a real phenomenon, to later in the nineteenth century when extinctions were discovered in North America. What follows after the historical overview is perhaps the most valuable feature of this volume: an exhaustive review of the 77 total genera of mammals that were lost at the end of the Pleistocene in South and North America. For each genus, Grayson provides a description of its natural history, what is known about the associated archaeology and paleontology, and adds many other pertinent data. The level of detail given for each genus is impressive—he covers everything from the composition of giant sloth dung balls, to the antler configurations of the mountain deer and stag-moose, to the discovery of a mysterious model of the diminutive pronghorn on central Utah's Dugway Proving Range (proudly showcased in a photograph with an "anonymous" aging Great Basin field worker!). Special attention is given to those genera that have thus far been found in the Great Basin, and those that are likely to be discovered there eventually. Additionally, the discussion of each extinct North American genus is accompanied by drawings, photographs, and maps of its occurrence. It should perhaps be noted, however, that these maps are labelled as "late Ice Age distributions" and are compiled principally from the FAUNMAP II database. Those familiar with FAUNMAP will be aware of how wide the date ranges are for many sites in the database, and that these temporal assignments are thus necessarily coarse-grained.

As a testament to his thoroughness, Grayson also describes what is currently known about the eight genera of extinct birds from the Great Basin. He points out that many of these are raptors, such as vultures, eagles, condors, and teratorns. While he doesn't nominate a specific reason for this phenomenon, he concedes that changing climates, along with the extinction of the large mammals that these raptorial birds depended upon for food, undoubtedly played a roll. The chapter ends with what, to many, represents the most interesting aspect of the late Pleistocene extinctions: not only did so many mammals go extinct at the end of the Pleistocene, but a majority of them were large mammals. Why this was the case is explored in the final chapter.

Grayson takes the next three chapters to provide background information that is key to fully comprehending the issues surrounding the extinctions. Chapter 4 explains the complexities involved in dating fossils, including how radiocarbon dating works, the different methods used and both their faults and merits, and provides a case study to show how difficult this process can be. This chapter also includes a table listing directly-dated extinct mammals along with their associated sources, as well as a table listing trustworthy last-appearance dates for most of the North American extinct mammalian genera. These tables alone—meticulously compiled from many different sources—make the book an invaluable resource for anyone researching this topic.

In Chapter 5, Grayson reviews five of the most important and well-analyzed late Pleistocene sites in and around the Great Basin: Fossil Lake, Oregon; Gypsum Cave, Nevada; Smith Creek Cave, Nevada; Mineral Hill Cave, Nevada; and the Huntington Mammoth Site, Utah. Through anecdotes and histories of each site, Grayson paints a picture of their intricacies and how they have shaped (and continue to shape) our understanding of the Pleistocene megafauna.

The beginning of Chapter 6 fills in the final piece of necessary background with a discussion of Clovis sites, Clovis points, stemmed points, and evidence for pre-Clovis peoples. Grayson then offers his own observations on evidence he believes relevant to the problem of extinctions in the Great Basin. Noting earlier observations that grazing-intolerant grasses are prevalent in the Great Basin, while dung beetles are scarce, he begins to build the argument that large mammals must have been rare in the Great Basin during the Ice Age. He then points out that plants armed against herbivores that are smaller than six feet in height are relatively common in the Great Basin today, but armed plants greater than six feet in height are relatively rare in comparison with their numbers in the neighboring warm deserts. This, he suggests, may indicate that tall plants in the Great Basin did not need to defend against tall herbivores because the latter were uncommon during the Pleistocene. It is undeniably clever and intriguing to utilize plant anatomy in order to estimate the potential population density of large herbivores, and this argument warrants further testing and evaluation.

The final chapter outlines three explanations for the extinctions: human hunting, extraterrestrial impacts, and climate change. The assessment is balanced, with

supporting and opposing evidence presented for all three. Clearly Grayson is most supportive of the climate change hypothesis, but he acknowledges the possibility that multiple causes may have been at play in any given context. As he has emphasized in the past, he ends with a call to enhance our understanding by producing local, individual species histories—and this book is a good stepping stone towards such research.

Readers hoping for a more detailed analysis of the causes of the extinctions, however, may be disappointed that the book does not treat the issue in more detail. In Chapter 7, Grayson does touch on a few cases where the species- and regionally-specific studies he encourages have proven successful (292). For example, we now know that horses were extinct in Alaska by about 12,500 years ago—a full 1,000 years after human arrival—and that this local extinction was preceded by a rapid decline in horse body size and concurrent climatic and vegetational changes. We also know that mastodons were extinct in Alaska and the Yukon before 30,000 years ago, based on a detailed record of directly-dated mastodon bones and teeth. These intriguing analyses clearly support Grayson's leanings towards a climate explanation for the extinctions, and his brief summaries here will certainly motivate interested readers to dig deeper into this growing literature.

For example, Ugan and Byers (2007) have examined the radiocarbon record of mammoths and mastodons in relationship to the human radiocarbon record in Europe, Siberia, and North America, and shown that proboscidean population sizes are more tightly linked to climate changes than human population growth. Similarly, Boulanger and Lyman (2014) use not only the radiocarbon record, but also dung fungus abundance, genetics, and paleoclimatic data to show that megafaunal populations in northeastern North America began to decline more than 1,000 years before human arrival, and that they only overlapped for a short period of time. Surovell et al. (2016), however, reconstruct radiocarbon-based population histories of North and South American megafauna and show a north-to-south trend in initial population declines that follows the hemispheric pattern of human colonization and thus appears consistent with overkill.

These types of studies are growing in number, and researchers are increasingly bringing together multiple lines of evidence and focusing on individual species in specific areas—just as Grayson has been suggesting for some time. Furthermore, recent advances in methodology have allowed us to more accurately reconstruct human and megafaunal population histories in specific geographic locations; for example, ancient DNA (e.g., Campos et al. 2010; Haile et al. 2009) has facilitated the analysis of genetic diversity as a means of retrodicting population changes, and radiocarbon date frequencies and summed probability curves have also served as proxies for both human and megafaunal population levels (e.g., Boulanger and Lyman 2014; Chaput and Gajewski 2016; Surovell et al. 2015).

On the whole, this book is an enjoyable and extraordinary contribution that certainly belongs on the shelf of anyone interested in the extinct megafauna of the Americas. Grayson provides a compelling synthesis of many different areas of research, as can be seen in the voluminous bibliography. The photographs and drawings sprinkled throughout the book are alluring additions that vividly bring this tale of giant sloths and sabertooth cats to life. Grayson's casual writing style is both captivating and accessible to the general public, and scholars and non-scholars alike will find themselves learning—and laughing—from cover to cover.

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Disturbing Bodies: Perspectives on Forensic Anthropology

Zoë Crossland and Rosemary Joyce,
Santa Fe: School for Advanced Research Press, 2015,
244 pp,. ISBN 9781938645556, $39.95 (paper).

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Disturbing Bodies, edited by Zoë Crossland and Rosemary Joyce, is a reflective and reflexive exploration of the roles and responsibilities of anthropologists who work with the dead. This collection of papers, written by and for forensic anthropologists, forensic archaeologists, and bioarchaeologists, is unusual in that it does not deal with technical methods of excavation or osteological interpretation. Rather, it presents and interrogates the anthropological side of the work, introducing theoretical considerations such as the multivalent personhood of the decedent, the role of investigators as "truth makers," the involvement of stakeholders and descendent communities, and the responsibility to represent and balance all of these components.

Several themes emerge and intertwine through these chapters. Differences in the practice of forensic anthropology and bioarchaeology are explored, including different modes of engagement, stakeholders, and methodologies. The responsibilities of researchers are considered, as well as the effects of the work on the researchers themselves. The ethics of engaging with the dead are discussed, including the opportunity to address past atrocities by providing evidence to correct politically skewed or revisionist histories.

The introductory chapter, by Crossland and Joyce, opens by addressing the relatively new field of forensic exhumation. The double meaning of the title, "Disturbing Bodies," evokes both the effect of exhumation in disturbing the resting place of the dead, and the agency of exhumed bodies to disturb historical narratives or to affect the peace of mind of the living. The renewed presence of the dead among the living is fraught with a multitude of meanings for all stakeholders, including the practitioners themselves. The co-authors of this chapter invite discussion and exploration of these meanings.

The next two chapters reflect on the role of forensic archaeologists responding to state terrorism and political violence. Luis Fondebrider writes from his perspective as a member and co-founder of the Argentine Forensic Anthropology Team (*Equipo Argentino de Antropología Forense* or EAAF). Isaias Rojas-Perez writes about his experience working in postwar Peru. Both men address issues of community involvement in locating and exhuming remains, and stress that building relationships with the victims' loved ones is a key component of completing forensic investigations in South and Central America. This approach is contrasted with the removed focus on technical and scientific dimensions, typical in the U.S.A., Canada, the U.K., Europe, and Australia (although exceptions are noted for the World Trade Center identification project, and the work of JPAC-CIL, now DPAA). Of particular note is the importance of honoring local ways of knowing, and the hesitancy of many researchers to do so. Rojas-Perez laments, "The voice of the forensic expert cannot relate to the lay voice except in terms of either exclusion or subordination of the latter" (p. 52).