

REVIEW

THE ARCHAEOLOGY OF NORTH PACIFIC FISHERIES

Edited by Madonna L. Moss and Aubrey Cannon, 2011. University of Alaska Press, Fairbanks. Paper, 320 pages, photos, line drawings, maps, tables, index. ISBN: 978-1-60223-146-7; \$45.00

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As the editors of *The Archaeology of North Pacific Fisheries* point out in their introduction (p. 6), zooarchaeological analysis of fish remains is a relatively young field of study, with only a few decades of specialized attention in the eastern North Pacific. The contributions to this volume, though just a sampling of the work currently being conducted around the eastern North Pacific, highlight the depth and range of approaches that characterize the state-of-the-art in the zooarchaeological analysis of fish remains.

For better or for worse, many of the papers retain their conference-presentation flavor—generally long on introductions and background, short on data and interpretations. But this is part of what makes the contributions to this volume so appealing—they offer concise glimpses of each contributor's particular research interests, some of which have been developing for decades. Each chapter has its own list of references, which allows for easy follow-up and cross-referencing.

Zooarchaeologists are still struggling with fundamental issues that have plagued fish bone analyses from day one: density-mediated destruction of bone, recovery bias, and taxonomic identification. Many of the chapters in this volume detail innovative approaches to these challenges. Smith, Butler, Orwoll and Wilson-Skogen (Chapter 4), for instance, add an important body of data that allows for an evaluation of survivorship of cod (*Gadus macrocephalus*) bones relative to those of salmon (Salmonidae). In my opinion, the possibility of density-mediated destruction of bone should be evaluated for every assemblage analyzed, regardless of the apparent state of preservation. As more

and more taxa are added to the list for which we have bone density data, our ability to understand how time has structured our assemblages will only improve.

Of course, none of this matters if we continue to use recovery methods that we know (and have known for decades) significantly bias against smaller-bodied taxa and against small skeletal elements of large-bodied taxa. Recognizing that we cannot use the same excavation and recovery strategies to sample for all classes of faunal remains, Cannon, Yang and Speller have developed a sampling protocol that uses bucket augers to recover large spatially and temporally representative samples of fish bones from shell middens (Chapter 5; see also Cannon 2000; Caldwell, Chapter 14; Brewster and Martindale, Chapter 15). Cannon et al.'s approach seems to solve many of the problems associated with traditional excavation and recovery methods, providing a nice balance between cost-effectiveness, degree of site destruction, and recovery of faunal remains. However, I think that a combination of intensive sampling for fish and extensive sampling for other classes, such as mammals, will ultimately be necessary for understanding the full range of subsistence activities represented at any given site.

With these relatively recently developed tools for (a) recovering a representative sample of an assemblage and (b) evaluating the degree to which density-mediated attrition of bone has structured that sample, there still remains the problem of species-level identification—a problem felt most acutely in the analysis of salmon remains. Several approaches are advocated in this volume,

ranging from circumstantial evidence based on locations of sites (e.g., Prince, Chapter 7), to combinations of metric, radiographic, and isotopic analyses (Orchard and Szpak, Chapter 2; Orchard, Chapter 8), to the relatively expensive, but extremely effective use of genetic analyses (Cannon et al., Chapter 5).

None of these approaches is perfect—the analyses advocated by Orchard are not 100% reliable, and the uncertainty appears to be higher in areas geographically distant from where Orchard developed and tested the approach. And while DNA-based identifications can be expected to be reliable when they are derived in meticulously maintained ancient DNA labs, it is not feasible to submit a full assemblage for such analyses. As with Cannon et al.'s balanced approach to sampling midden sites for fish bones, a combination of the approaches described here will probably yield the most consistent and reliable results.

Even if we some day reach a point where we can identify the majority of fish remains with certainty, I think it is unlikely that zooarchaeologists will ever be able to divine the subtle and sophisticated nuances of fish selectivity documented by Elroy White in his interviews with Heiltsuk elders (Chapter 6). Not too long ago, fish biologists discouraged archaeologists from even *looking* for salmon remains, because of the mistaken belief that the cartilaginous nature of much of their skeletons would ensure their complete destruction in burial contexts (Moss and Cannon, Chapter 1). Of course, we now know that the remains of even strictly cartilaginous fishes, such as ratfish (*Hydrolagus colliciei*) and spiny dogfish (*Squalus acanthias*), are routinely recovered from archaeological sites (Monks, Chapter 9; Caldwell, Chapter 14; Trost, Schalk, Wolverson and Nelson, Chapter 16), along with the nearly ubiquitous assemblages of salmon vertebrae and cranial bones. Who knows what sorts of questions we will be able to address with fish bones if we simply devise new ways to look for the answers?

Although much of the general public is not yet aware of it, I think it is safe to say that archaeologists working in the eastern North Pacific have finally found the correct prescription for overcoming decades of collective “salmon-opea” (cf. Monks 1987). However, we still have a long way to go. First and foremost, all of the chapters in this volume share a general goal of developing a deeper understanding of the cultural, spiritual, and caloric importance of fish to peoples both ancient and modern living on the Pacific Coast. Efforts by Betts, Maschner and Clark (Chapter 11) and Moss, Butler and Elder (Chapter 17) clearly show the potential of archaeofaunas in general, and fish remains in particular, to contribute to a larger goal of informed natural resource management. The potential for zooarchaeology is still growing and at an unprecedented pace, as the contributions to Moss and Cannon's *The Archaeology of North Pacific Fisheries* demonstrate.

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