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EDITOR'S SPECIAL FEATURE INTRODUCTION

Introduction to Special Feature on Experimental Archaeology

The use of experimental studies in archaeology is almost as old as the discipline itself. At the core of experimental archaeology is the premise that all activities in the archaeological record were shaped by human hands and therefore should be replicable. Experiments provide a means for testing specific inferences and perceived wisdoms about phenomena and theories. More to the point, archaeological theory or ethnographic narratives may lead to conclusions that after experimentation we find to be incorrect. Two of the three studies in this special section use experimental or replicative studies to test specific phenomena or to pioneer new tec (Barbier and Buonasera). The third study follows a slightly different tack by conducting a modern ecological experiment that informs the analysis of archaeological studies (Jazwa and Jantz). In this introduction to the section, I briefly place each of these contributions within both California and Great Basin anthropology, and within the broader context of experimental studies.

The two studies that align with the more traditional definition of experimental archaeology each seeks to answer specific questions concerning California's archaeological record.

Barbier and Buonasera each address artifacts and theories that are part of the canon of California archaeology. Shell beads have long been recognized as very significant cultural elements in Native California societies, where they appear to have served as a true currency. Barbier, in a novel approach to determining the value of shell beads, generates quantitative data on the labor costs of bead manufacture. Taking it a step further, he examines the relative costs involved in manufacturing different bead types, and therefore changes through time in efforts invested in the bead trade. By putting a cost on bead manufacture, the relative wealth of individuals as measured through burial lots, as well as larger economic trends involving both producers and consumers of beads, are apparent. Furthermore, as he states, Barbier's data provide a baseline for future studies that can directly compare the time associated with manufacturing beads with that associated with foraging, making it possible to evaluate the trade-offs in the decisions associated with the near-commercial production of beads during the Late Period in central and southern California (Arnold and Graesch 2001; Arnold and Munns 1994).

One of the most persistent ideas in California archaeology is the notion that the origin of acorn-dominant economies is marked by the replacement of millingslabs and handstones by a mortar and pestle technology (Basgall 1987; Baumhoff 1963). Buonasera uses traditional experimental techniques to directly measure the efficiency of various grinding surfaces for processing small seeds and acorns. She finds that larger, deeper mortars are universally more efficient for processing all types of plant remains. Her results provide further support for the recent assertion by Rosenthal and Hildebrandt (2019) that mortar use was much older in California than previously thought, and that intensification in the Late Period was much more driven by the use of small seeds than by that of acorns. Perhaps the most interesting result of Buonasera's experiment is the conclusion that mortar depth, and the accompanying labor associated with manufacturing deeper mortars, is related more to how permanent a settlement is—or at least how likely it is that someone will be returning to reuse a mortar time and again—than it is to the type of resources being processed.

California mussel (*Mytilus californianus*) is perhaps the most commonly recovered shell species along the entire California coast. Mussel shells are an ideal data source for coastal archaeologists. They are durable, offer direct evidence of subsistence practices, and they grow continuously throughout the year and throughout their life, allowing for reconstructions of mussel ecology. Beyond this, locked inside their mineral make-up is a record of seasonal fluctuations in sea surface temperature, which permits the reconstruction of paleo-oceanographic conditions and seasonal patterns of site occupation (Jew et al. 2013a, 2013b; Jones et al. 2008). Unfortunately, oceanographers and modern ecologists are often hesitant to accept the results of archaeological studies because they feel that they lack scientific rigor. Jazwa and Jantz's contribution to this special section provides further validation for the use of stable isotopes as archaeological data, while identifying potential pitfalls in the method. They find that the mineral content (and therefore the validity of isotopic ratios) of shells is affected by their charring on coals but not by other cooking techniques, and they caution against the use of visibly burned shells in such studies. These data complement and expand upon those from recent studies that have refined methods for measuring mussel shell length (Campbell and Braje 2015; Glassow et al. 2016; Singh and McKechnie 2015), and from modern ecological studies by archaeologists that have demonstrated vast intrapatch variations in growth rate, as well as differences in growth rate related to location in the water column (Thakar et al. 2017a, 2017b). Altogether, these studies further legitimize the use of archaeological science in paleoenvironmental reconstruction.

The four studies in the following section offer a small sample of the experimental work currently being conducted in California and the Great Basin, and reinforce the value of such studies to our efforts to refine our picture of the past. Publishing successful applications of experimental archaeology as well as cautionary tales of potential methodological and interpretive shortfalls moves scientific inquiry forward. Studies such as these narrow the focus of what is possible and provide insights into the past that seeds, shells, and shaped stone alone cannot otherwise offer.

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