

# Designing Experimental Research in Archaeology: Examining Technology Through Production and Use

Jeffrey R. Ferguson (ed.)

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It is probably safe to say that most archaeologists have carried out some form of experimentation. Most of these experiments are singular efforts that yield limited insights regarding the archaeological record or are carried out as part of educational exercises. As a result, many are conducted without a fuller understanding of the theoretical and methodological issues pertinent to the experiment, and thus produce idiosyncratic results or fall prey to the same methodological errors of previous experiments. As someone who has casually tried a few experiments over the years and been largely unsatisfied, it was with great interest that I read *Designing Experimental Research in Archaeology*.

This edited volume comprises eleven chapters and a short preface that address the issues of how archaeologists design experiments and the mistakes and shortcomings to avoid based on the experiences of the contributors. In the preface, Ferguson outlines four goals for each contribution to the volume, which include a relevant literature review, the potential and limitations of each type of experiment, the development of an experiment, and mistakes to avoid in the process.

The first chapter, by Marsh and Ferguson, is an introduction to some of the theoretical and methodological issues associated with archaeological experiments. Traditionally, archaeological experiments have been fraught with both a lack of scientific rigor and of a theoretical base. Influenced by the work of Schiffer et al. (1994), the authors argue that experimental archaeology, conducted as part of a long-term program of experiments, can enhance our ability to make archaeological inferences. One advantage of an experimental program is the ability to generate larger samples than those typically found in the archaeological record. They also note that archaeologists have to wrestle with the question of whether to conduct experiments in controlled lab-like settings, in which variables can be held constant, or natural field experiments that are “messier” but perhaps more akin to past settings. Each of these themes recurs in subsequent chapters, indicating the need to address these questions in archaeological experiments.

Chapters Two and Three, by Harry and Beck respectively, focus on experimentation with ceramics. Harry’s contribution is concerned primarily with ceramic manufacturing technology, whereas Beck emphasizes the use and alteration of ceramic vessels. Both papers emphasize the

need for comprehensive experimental programs consisting of long-term experiments rather than isolated archaeological experiments. Another commonality between the papers is their emphasis on the importance of ethnoarchaeology to experimental archaeology. However, Harry views ethnoarchaeology as a more limited tool because the appropriate ethnographic analogies are often missing and many archaeological questions cannot be answered by appealing to the ethnographic record. A strength of Harry’s paper, from the perspective of carrying out and evaluating experiments, is her critical use of examples from her own research. In each case, she points out ways in which the experiments can be improved, demonstrating the effectiveness of an experimental archaeology approach to problem domain.

Chipped stone artifacts are the focal points for Chapters Four and Five. Carr and Bradbury examine chipped stone debris, while Bamforth looks at the role of microwear analysis in experimental archaeology. Carr and Bradbury point out that one area where experimentation can be particularly productive is in minimizing the problem of equifinality (the endproduct potentially resulting from several different pathways). They also provide a discussion of “good” experiments and the role of theory in experimental approaches. I find this to be important for two reasons. First, the absence of theory in experimental archaeology has been one of its longstanding criticisms. Second, their explicit discussion of theory shows how experimental archaeology fits within the realm of archaeological theory. Bamforth’s chapter points out that while few archaeologists are microwear specialists, nearly all claim to be able to distinguish between used and unused flaked artifacts. He further points out problems associated with our concepts of tool form and tool use, such that many of our assumptions about artifact shape and use are unsupported. Avoiding these problems is possible through microwear analysis. The potentials and limitations of use wear are discussed along with suggestions for building an experimentally based program of microwear analysis.

Chapter Six (Jeske, Winkler, and Blodgett) explores experiments with heat alteration of lithic raw materials. The initial work with heating materials by Jeske was carried out for educational purposes and only later subjected to more rigorous standards of experimentation. Thus, much of the earlier work was largely impressionistic and highly variable in terms of results. This is a good example of what

other authors call “archaeological experiments” leading to a more rigorous program of experimentation (experimental archaeology). Unlike some of the other chapters, this contribution is not as explicit in discussing the theoretical underpinnings of experimental archaeology. However, it provides a nice balance by portraying a different intellectual context for conducting experimental archaeology.

Ground stone experiments are the focus of Chapter Seven by Adams. While ground stone experimentation has generally lagged behind that of chipped stone, Adams notes that there is an ample ethnographic record available for ground stone technologies. However, she points out the potentially ambiguous relationship between form and function in which some forms have variable functions. She advocates using experimentation to determine use wear patterns for a variety of materials in order to explore the range of variation in ground stone functions.

Chapter Eight, by Jolie and McBrinn, examines experimentation with fiber artifacts. Unlike many other types of experiments, these perishable artifacts are largely underrepresented. As with several of the other papers, the authors distinguish between archaeological experiments and experimental archaeology, the former representing most of the work with perishable artifacts. They also advocate a program based approach to the subject in order to build upon previous experimental results. As an additive technology, perishables reflect the manufacturing process and manufacturing decisions made along the way. The authors note that most of the work to date has been technological in nature, but that a comprehensive program that integrates technology with performance, context, and ethnoarchaeology is a desired goal. Finally, they recognize that a certain level of experience in making and using perishable artifacts is important, if not necessary, for gaining meaningful insights into the experiments.

Whittaker examines atlatl experiments in Chapter Nine. He points out the way in which questions of archaeological interest led to experiments with the atlatl. Historically, these have included the relationship of the atlatl to the bow, distinguishing atlatls from arrowpoints by size and weight, and understanding the function and capability of the atlatl. The latter is the focus of most experimentation, though Whittaker notes that while there are different ideas about how atlatls function, experimenters face the difficulty of providing a level of comparability given the range in atlatl types. One source of experimental data identified by Whittaker are recreational atlatlists who through standard competitions provide insights into the accuracy and distance parameters likely achieved by prehistoric hunters.

The final two chapters are concerned with bone artifacts (Bement) and experimental zooarchaeology (Lubinski and Shaffer). Bement suggests that bone tools and associated experiments should be analyzed in a similar fashion to chipped stone as both are reductive technologies. Thus, there should be associated debris, use-wear, and scars reflective of the manufacturing process. Perhaps most interesting about this chapter is Bement’s emphasis on context-specific experimentation in which the archaeological

sample is the starting point for the experiment. As a result, he argues that generalized studies of butchering and bone manufacture are of little use because they miss or overlook the importance of situational or context-specific factors and how these affect variability. Lubinski and Shaffer provide a more general overview of experimental zooarchaeology, noting the contribution of both controlled and actualistic studies to the field, the importance of formation processes, and the role of ethnoarchaeology. They also stress the need for multiple working hypotheses in interpreting zooarchaeological assemblages and use of experimental approaches to evaluate various hypotheses. Perhaps more than any other contribution to the volume, this chapter is more generalized in its approach and is not illustrated by a singular case study.

Despite the different material foci of the chapters, there are a number of common themes that emerge from this volume. First, there is the issue of whether experiments should be carried out in a controlled or naturalistic setting. While the authors differ regarding this issue, most would agree that it is up to the experimenter to justify this within the context of the research questions of interest. Second, many of the contributors note the importance of approaching experimental archaeology as part of a systematic program. They distinguish experimental archaeology from archaeological experiments, viewing the latter as being of limited applicability to the field in general. Third, the issue of theory in experimental archaeology is raised in many of these papers. Jolie and McBrinn (p. 165) view theory as a vehicle for identifying what data to collect and how we move from data to interpretation. For many of the papers, there is a conscious, direct effort to address this issue of theory. In other papers, this is not explicitly stated, but theory does appear to be part of the approach. In this respect the different academic and training backgrounds of the contributors are valuable. As a result, the volume does not have a monolithic approach to the issue of experimentation, but rather, includes different viewpoints or ways of carrying out these activities. Ultimately, I find this variation in training and viewpoints to be an important part of demonstrating the ways in which experimental archaeology can be conducted.

Overall, I found this edited volume to be a valuable resource, one I would recommend for use by both professional and avocational archaeologists interested in experimental archaeology. Additionally, the volume would be a suitable text for use in an advanced undergraduate or graduate course. Not only are different types of archaeological materials represented by these experiments, but the literature reviews for each of the technologies is detailed and an excellent starting point for anyone wishing to pursue experiments in these areas. Furthermore, problems or difficulties within each area are noted and suggestions for avoiding or minimizing them proposed. Lastly, generalized steps for proceeding with the experiments are provided by each author, enabling the reader to follow the common thread associated with successful execution of experimental approaches.

**REFERENCE**

Schiffer, M.B., J.M. Skibo, T.C. Boekle, M.A. Neupert, and M. Aronson. 1994. New Perspectives on Experimental Archaeology: Surface Treatments and Thermal Response of the Clay Cooking Pot. *American Antiquity* 59:197–217.