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One inclusive view of archaeology is that the field is concerned with providing theoretically informed narratives of the cultural past that arise from unbiased engagements with the archaeological record. To achieve this lofty objective, archaeologists routinely examine their assumptions about the interpretation of archaeological variability (e.g., Schroeder 2013), as well as ideas regarding the creation, organization, and analysis of problem-specific data (e.g., Jackson 2014). This widespread, and accelerating, practice of critical reflection promotes disciplinary renewal, which in turn enables the development of robust methods and contributes to insights about how to conduct archaeological studies of human behavior and evolution in ways that are not constrained by disciplinary privilege (Lyman 2007) or political partiality (Leone and Potter 1992).

But these are relatively recent developments (Fagan 2005) and contrast sharply with simplistic late-nineteenth to mid-twentieth century conceptualizations of the emergence and interpretation of archaeological variability (Longacre 2010; Meltzer 1985). Looking back, this period of “innocence” (Clarke 1973), easily appreciated with a casual examination of *Man the Tool-Maker* (Oakley 1949), *Ancient Man in North America* (Wormington 1957), *World Prehistory: An Outline* (Clark 1961), or *The Old Stone Age* (Bordes 1968), evokes a time when accounts of human prehistory were largely uncontroversial and comfortably familiar. Everyone is aware, of course, that this state of affairs was upended

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*Thinking about Materiality,
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more than half a century ago when Lewis R. Binford (1962) observed that archaeologists conduct their investigations with an incomplete understanding of the archaeological record—its properties, sources of variability, and inferential potential. Since then, archaeologists have labored, and continue to struggle, in hope of understanding the factors that influence the formation and content diversity of the archaeological record (e.g., Barton and Riel-Salvatore 2014; Bar-Yosef et al. 2005; Jelinek 2013; Lucas 2012; March et al. 2014; Schiffer 1987; Shott 1998; Sullivan 2008; van der Veen 2007; Weiner 2010). Now largely unbound from its former conceptual constraints (Trigger 1991), archaeology today is populated by handfuls of theoretical approaches and interpretive paradigms, all intended to enlighten investigations of the world's extraordinarily diverse archaeological records (e.g., Bintliff and Pearce 2011; Hodder 2012; Preucel 2006; Rathje et al. 2013; Schiffer 2012; Wallace 2011).

In fact, hardly a week goes by without the archaeological community receiving word that a stunning new discovery has shattered what were considered settled matters in human prehistory and evolution, or that new methods now challenge archaeologists to rethink how best to study the remains of the cultural past. For instance, consider this sample of recent dispatches from the field:

- Chronostratigraphic and artifactual evidence from Kenya has pushed the origins of the archaeological record to 3.3 mya (Harmand et al. 2015).
- Geoarchaeological and paleohydrological data show a strong connection between the timing and magnitude of Mississippi River flood events and the rhythm of cultural dynamics at Cahokia (AD 600–1350), west-central Illinois, which is one of the largest pre-Columbian settlements in North America (Munoz et al. 2015).
- Micromorphological analysis of sediments combined with the distributional analysis of burned flints from Tabun Cave, Israel, indicate that mid-Pleistocene hominins learned to control fire and use it habitually far earlier than previously thought (Shimelmitz et al. 2014).
- Correlation of distinctive growth patterns of wood recovered from seven Chaco Canyon Great Houses (northern New Mexico) with those of harvesting locales in distant (> 75 km) mountain ranges, revealed a previously unsuspected source, as well as a shift in the ranges that supplied construction timber for Chaco's massive ancestral Puebloan structures (ca. AD 850–1140; Guiterman et al. 2016).

These tightly controlled studies, among numerous others (see Harrison-Buck 2014), attest to the necessity of determining how the phenomena that archaeologists seek to understand arose and came to express the properties

that are implicated in addressing different problems (Karkanas et al. 2015:1–2). They illustrate, as well, the significance of a key attribute of twenty-first-century archaeological inquiry—the cultural past is “constantly being recreated” (Shanks 2007:591). The consequentiality of this idea is not that archaeologists are compulsive revisionists but that the consideration of new evidence, which arises commonly from new survey and excavation discoveries (e.g., Watson et al. 2015) and the application of advanced theoretically inspired methods (e.g., Caruana et al. 2014), invariably shifts our understandings of the nature of the cultural past, as the studies in this volume demonstrate. It is not surprising, therefore, that the field has sustained a recent surge in dialogues concerning the influence of the “ontological turn” in anthropology (e.g., Bessire and Bond 2014; Pedersen 2012; Swenson 2015), particularly with respect to discussions regarding the likelihood of alternative past cultural “worlds,” their discoverability, and “the problem of confirmation” (Alberti 2014; Jackson 2016). Nevertheless, these modern conversations dovetail seamlessly with David L. Clarke’s (1973) call for critical self-examination of archaeology’s epistemological foundations and illustrate the complex, shifting relationships between knowledge claims and what constitutes evidence in support of them (Wylie 2011).

In continuing to explore the disciplinary consequences of these developments, the studies in this volume employ a variety of theoretical approaches and assess their suitability for addressing persistent problems in the field. For instance, a well-established theoretical subfield in archaeology, analytic theory (Clarke 1968; Schiffer 1988), which even today is still broadly concerned with considerations of “typological revision” (Fowles 2011:898 [in Alberti et al. 2011]) and artifact classification (Zedeño 2009), is squarely aligned with investigations of Paleolithic assemblage variability (chapters 4, 10, 13, and 14). In these respects, the authors of these studies are not only investigating ways to develop “impartial methodologies” (Shanks 2007:589), but are arguing as well that certain units of analysis are more advantageous than others for understanding aspects of assemblage variation that register the evolutionary significance of different artifact designs (e.g., Shea 2013).

Similarly, aspects of ecological and evolutionary theory are entailed in several studies in this volume that focus on resolving how lithic assemblage variability expresses regional-scale survival strategies when the objects of analysis are retouched artifacts (chapter 2), unretouched artifacts (chapter 5), or both retouched and unretouched artifacts (chapter 6). These diverse analyses are instructive because they reveal how different external theoretical frameworks—behavioral ecology (Coddling and Bird 2015) in chapter 2, evolutionary theory (Cannon and Broughton 2010) in chapter 5, and niche-construction theory

(Smith 2011) in chapter 6—enable thoughtful assessments of the principle that variability among lithic assemblages is attributable to problem-solving strategies that humans develop in response to living among geographically heterogeneous and seasonally dynamic resource distributions (Holdaway and Douglass 2012:123). Moreover, the critical rethinking reflected in these chapters illustrates how the adoption of either an obligate (chapters 2 and 5) or facultative (chapter 6) ecological paradigm—that is, resource availability or potential productivity either is restricted to a fixed set of conditions (obligate) or it is not (facultative)—has profound consequences for inferring the effects of land-use on lithic artifact production, use, and discard.

For the past decade, archaeologists worldwide have been exploring the degree to which reconsiderations of the relations between humans and their handiwork (material culture, material remains, “the material,” or things; e.g., Hodder 2012; Joyce 2012; Pearson 2004; Walker and Schiffer 2006; Wallace 2011) create opportunities to interrogate archaeological variability in ways that enable previously inaccessible or understudied aspects of the cultural past, and their connections to the modern world, to be revealed (e.g., Shanks 2012). For instance, artifacts that formerly had been marginalized or ignored in archaeological investigations, because of their low frequency or oddness, now have been reinterpreted in terms of theories of materiality (e.g., a “theory of bundling” [Pauketat 2013:35]; see also Zedeño 2009) as objects specifically designed to mediate uncertainty, risk, or danger (chapter 12). Also, aspects of what broadly can be considered agency theory (Barrett 2012; Varien and Potter 2008) are featured here in (1) a cross-cultural archaeological study that explores how social inequality and reproduction are registered in burial accompaniments (chapter 11) and (2) several studies that investigate how regional political dynamics and “centers” come to be expressed archaeologically in architectural remains (chapters 3, 7, and 9) and ceramics (chapter 8).

ORGANIZATION OF THE VOLUME

Having situated the contributions to this volume theoretically, we now discuss how the investigation of problems involving classes of archaeological phenomena, using cases drawn from a range of biogeographical settings worldwide (figure 1.1), is facilitated when diverse perspectives and modes of inquiry are brought to bear on their resolution. For instance, the volume’s first section—Advances in Interpreting Regional Archaeological Records—consists of five chapters that explore how the analysis of spatial distributions of artifacts, assemblages, and sites at different spatial scales provides new insights

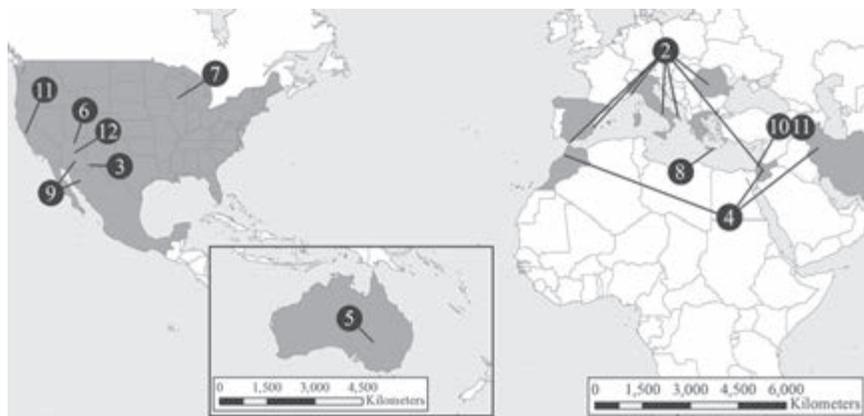


FIGURE 1.1. *Geographical distribution of the archaeological studies discussed in this volume. Numbers in circles refer to chapters.*

regarding mobility strategies, interaction patterns, the organization of technology, and the factors that promote a “sense of place.” This section begins with a study by C. Michael Barton and Julien Riel-Salvatore (chapter 2). According to the authors, the undeniable importance of stone tools to human survival makes variability among these artifacts a key factor in understanding the effects of climate change on hunter-gatherer adaptations (see also Barton and Riel-Salvatore 2014). In support of this proposition, their analysis of 167 assemblages from 31 localities in western Eurasia indicates a fundamental shift in land-use patterns that arose in response to environmental changes during the Upper Pleistocene, which ultimately bestowed a competitive advantage to and ensured the success of anatomically modern humans (AMH), in contrast to their contemporaneous neighbors, the Neanderthals.

In chapter 3, Barbara J. Roth tackles an enduring problem in archaeology, understanding the emergence and socioeconomic consequences of “persistent places,” with a fresh analysis of the heavily studied Mimbres River valley of southwestern New Mexico. Earlier surveys there had documented a number of pithouse and pueblo sites, and many of them were clustered in particular locales on the landscape (e.g., Pool 2013). Subsequent excavations revealed long-term use of some of these areas, with many occupations dating to the Early Pithouse period (beginning ca. AD 200). Employing the concept of “persistent places,” Roth shows how protracted occupation of specific areas consequentially shaped Mimbres economic and social interactions (cf. Hegmon and Nelson 2007). Her study will be of interest to those archaeologists who are concerned

with understanding how the emergent archaeological record itself affects the trajectory of regional cultural change as people live on and react to a landscape that becomes increasingly crowded by large numbers of abandoned settlements.

The interpretive utility of time-honored stone-tool typologies has come under intense scrutiny lately because of the expansion of alternative perspectives for interpreting the “meaning” of assemblage variability (e.g., Bisson 2000; Monnier 2006; Shea 2013; see also Shott 2008). Building on these exchanges, Deborah I. Olszewski (chapter 4) posits that variation among formal tool types that postdate the Middle Paleolithic is indicative of reduction sequences rather than the expression of different “cultures” (see also, e.g., Dibble 1995; Will et al. 2015). By its nature, reductive technology constricts available options in stone-tool production and retouching episodes, thereby trumping the effects of prevailing cultural differences. The merits of this reductive approach are illustrated with an analysis of Middle Eastern (Nebekian and Zarzian) and North African (Iberomaursian) Epipaleolithic assemblages. As Olszewski demonstrates, because lithic reduction strategies frequently respond to and are contingent on local situations, we should expect to encounter multiple technological convergences in the absence of cultural connections or continuity. Archaeologists working in other regions of the world and with material that originated during different time periods should appreciate immediately the significance of this study because it illustrates an approach for deconstraining interpretations that have been tied too closely to single referent (unicausal) explanations for assemblage variability (e.g., “cultural” or “mental template” differences [see chapter 13, this volume]).

In chapter 5, Simon J. Holdaway, Justin I. Shiner, Patricia C. Fanning, and Matthew J. Douglass discuss the importance of considering context, raw material access, occupation duration, technology, and artifact reuse at the landscape scale of analysis (cf. Surovell 2009). With the results of a dozen years of research on surface scatters of stone artifacts in western New South Wales, Australia, the authors highlight the inferential significance of regional patterns of lithic assemblage variability using measures such as cortex ratio (Dibble et al. 2005; Douglass and Holdaway 2011) as well as the patterning provided by radiocarbon dates from heat-retainer hearths. They conclude that their “contextual analysis” approach enables a reconsideration of the nature of Aboriginal society at the margins of the Australian arid zone during the mid to late Holocene, that is, their mobile lifestyle emphasized the centrality of provisioning people rather than places.

For many years, mobility-based models of technological organization have been used to explain changes in lithic artifact production and patterns

of regional abandonment in the prehispanic American Southwest (e.g., Torres 2000). After reviewing the history of debitage analysis in Southwest archaeology, Alan P. Sullivan III (chapter 6) evaluates the Expedient Core and Adaptive Diversity hypotheses (Parry and Kelly 1987; Upham 1984) that employ such models. With debitage and tool assemblage data from five types of archaeological sites (dating between the eighth and sixteenth centuries AD) in the Upper Basin area of northern Arizona, the author concludes that, in contrast to the expectations of both hypotheses, significant bifacial tool manufacture occurred during this period at both perennial home bases and contemporaneous short-term, task-specific workplaces. This finding implies that the applicability of mobility-based models of technological organization, which were inspired by hunter-gatherer ethnoarchaeology or ethnography, may be more restricted than originally thought (Kelly 1992; McCall 2012). More generally, his study illustrates that normative categories of human behavior (e.g., logistic foragers) and their alleged archaeological consequences (e.g., limited activity sites) are imperfectly connected, at best, particularly in cases where lithic technology was designed to acquire and process resources that materialized in anthropogenic ecosystems (Haws 2012:72–73; Smith 2011).

The second section of the volume—Venerable Sites Revisited—illustrates how new theoretical perspectives and methods promote the reinterpretation of important archaeological sites, such as Myrtos-Pyrgos (Crete), Aztalan (Wisconsin, USA), Tabun Cave (Israel), Casa Grande (Arizona, USA), and Casas Grandes (Chihuahua, Mexico), that have figured prominently in accounts of New World and Old World prehistory for decades.

In chapter 7, Sissel Schroeder and Lynne Goldstein explore the extent to which nineteenth-century surveyors' maps of pre-European archaeological sites across eastern North America developed under the presumption that the region's occupational history was short, which served to establish a timeless view of the past that persists today in many of the interpretations of the physical layout of mound sites in this region (Meltzer 1985). Mississippian mound sites (ca. eleventh to seventeenth centuries AD), in particular, continue to be rendered as though their attributes—platform mounds, palisades, one or more plazas, and structures—were all built, used, and abandoned nearly simultaneously. Interpretations of site organization at the palisaded mound site of Aztalan serve as an example of the hegemony of flat or timeless archaeological cartography. Drawing on theoretical frameworks that feature time perspectivism (Bailey 2007) and comparisons with other palisaded Mississippian sites across the Southeast, the authors offer an alternative to the timeless view of Aztalan's site structure, one that focuses on understanding the complex

processes and archaeological consequences that are associated with the development of coalescent communities (see also chapter 11, this volume).

Eschewing the investigation of features, such as heroic temples and iconic palaces (e.g., Galaty and Parkinson 2007) that (until recently) epitomized classical archaeology, Emilia Oddo and Gerald Cadogan (chapter 8) instead reassess the pottery assemblage that accumulated in Cistern 2 at the Bronze Age site of Myrtos-Pyrgos, Crete, after it collapsed and was repurposed as a “dump” during the Neopalatial period (1750–1450 BC). Pivotal to their analysis are considerations of the stratigraphic relations among ceramic cross-joins, as well as observations regarding wear on the sherds’ surfaces and breakage points (cf. Tenwolde 1992). Integration of both sets of observations reveals that, following the cistern’s disuse as a water-holding facility, the ceramic assemblage accumulated in it during a single depositional cycle. In addition, the stratigraphic concentration of sherds with little wear suggests that they originated from household-debris clearing or related “feasting” activities that immediately predated the destruction of Myrtos-Pyrgos by fire. These new understandings provide a basis for the authors to assess the interpretive sufficiency of models of regional sociopolitical complexity on ancient Crete (e.g., Knappett 2009).

In chapter 9, David R. Wilcox considers how the detailed analysis of post-occupational architectural characteristics of two large adobe sites in the southern American Southwest—Casa Grande (Coolidge, AZ) and Casas Grandes (or, Paquimé, Chihuahua, Mexico)—has consequences for estimating the populations of these late prehistoric centers, which have been implicated in models of Southwest prehistory for more than a century (Fowler and Cordell 2005). Here, the author focuses his discussion on a recent study by Whalen et al. (2010) that argues the population of Paquimé did not exceed about 2,500 people—widely regarded as a threshold for the emergence of social complexity (Kosse 1996). Drawing on his study of post-abandonment architectural disintegration and fill processes at Casa Grande, on observations made by early visitors (Obregón and Bartlett) to Casas Grandes, and on a detailed examination of how the main building at Paquimé deteriorated, the author infers a somewhat higher population estimate for the site, at least 3,000 people, and explores its theoretical and regional political implications.

Next, Gary O. Rollefson (chapter 10) contrasts his earlier analysis of bifaces from the reexcavation of Tabun Cave (1967–1972), Israel—which produced one of the most precisely controlled collections of Lower and Middle Paleolithic artifacts in the Levant (Jelinek 1982)—with that based on a new model of biface production. In his study, the author describes how experiments involving biface and cleaver manufacture have shown that the technological features

of these implements often are suppressed in interpretations that favor morphology (e.g., Quintero et al. 2007). This protocol results in a bias toward classifying these artifacts as various types of bifaces rather than as cleavers, which are butchery or cutting implements. The implication of such “misclassification” is that the prevalence of cutting/butchering activities is underreported in assemblage interpretations. As it turns out, cleavers are far more common in the Tabun assemblage than the author’s original analysis indicated and, importantly, occur in much higher frequencies at a number of other sites in the Levant. Such typological confusion becomes problematic, moreover, for those researchers who use the frequencies of bifaces in evolutionary models that postulate a correlation between the expansion of hominin cognitive abilities and technological differentiation (see Nowell 2010 for a review of these issues).

The final section of the volume—Cross-Cultural, Conceptual, and Experimental Perspectives—includes four studies that examine the theoretical constructs that archaeologists often use to interpret assemblage variability, and explore the possibility that archaeological phenomena, widely separated in time and space, share features that can be used to enhance inferences about the socioeconomic factors that influence mortuary practices, the meaning of “exotic” artifacts, and the causes of variation in artifact form.

Drawing from two classic examples of complex hunter-gatherer societies (in the Near East and the San Francisco Bay area in northern California), Brian F. Byrd and Jeffrey Rosenthal (chapter 11) highlight how changes in socioeconomic strategies (e.g., resource intensification) were correlated with an elaboration of mortuary practices (Bandy and Fox 2010). As they show, age-grade-related mortuary practices functioned as stabilizing forces to integrate communities, which underscores two significant points. First, mortuary practices among transegalitarian groups can vary independently of political complexity. Second, because mortuary practices can change dramatically over relatively short periods of time, the search for broad cross-cultural trends requires diachronic investigations (e.g., Silverman and Small 2002), which robust archaeological studies, such as theirs, provide.

In chapter 12, John C. Whittaker and Kathryn A. Kamp present an analysis of a class of stone tools, found occasionally at prehistoric sites in the American Southwest, comprising artifacts that are unusual in terms of form, material, context, and indications of use (cf. Mills 2004). The authors observe that, because these artifacts are ambiguous and relatively uncommon, the patterned behaviors they represent are rarely considered seriously in archaeological studies. However, they present new evidence to support their claim that many of these atypical lithic items can be interpreted as powerful ritual objects (e.g.,

Brown and Walker 2008; cf. Alberti and Bray 2009:339–340), a suggestion bolstered by ethnographic examples of stone tools being used as offerings, symbols of social status, protection against malevolent beings, lightning, and other dangers, as well as gifts from the ancestors.

Philip G. Chase (chapter 13) discusses the epistemological usefulness of the “mental template” concept that archaeologists have routinely employed to interpret the degree to which assemblage variation reflects the evolution of human cognitive ability, symbolism, and language (cf. Wadley’s [2013] concept of “cognitive complexity”). As he shows, the term itself is hopelessly ambiguous and is defined differently by different analysts. For these and other reasons, Chase concludes that “mental template” should be dropped entirely from the literature as a descriptive and explanatory taxon. No longer constrained by the mental-template concept, the author argues that Paleolithic archaeologists, in particular, now can profitably turn their attention to developing testable behavioral models of interassemblage variability (e.g., Shipton et al. 2013).

In chapter 14, Zeljko Rezek, Sam Lin, and Harold L. Dibble make the case for the role of highly controlled experiments in understanding how flakes form (see also Rezek et al. 2011). The authors propose that properly designed experiments enable the study of the effects of particular independent variables—such as the angle and force of the detaching blow—on flake form that are not apparent in artifact replication studies. In addition, the authors review some of the limitations of earlier controlled experiments and describe a new experimental design that eliminates much of the artificiality inherent to this approach, thereby contributing to a synthetic model of assemblage formation dynamics.

FINAL THOUGHTS

In closing, we would like to emphasize that each chapter in the volume endorses the proposition that, because archaeological research proceeds at different spatial and temporal scales, and engages different theoretical frameworks and methodological protocols (e.g., Robb and Pauketat 2013), determination of the origins and histories of archaeological phenomena is essential in evaluating their relevance for resolving significant problems in world archaeology (Wylie 2008). With this perspective, orthodoxy is challenged, research-worthy controversies are defined, and strong inferences about the evolutionary pathways of humankind are thoughtfully developed and impartially evaluated (Bauer 2013). Mindful of the challenges, opportunities, and responsibilities that come with the investigation of the archaeological record, we think that archaeologists who aspire to learn about the ontological diversity of past

cultural worlds ought to be encouraged by the possibility that their investigations will be enriched by epistemological frameworks that, as the following chapters exemplify, focus on understanding how Earth's archaeological phenomena came to be as they are today.

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